# Coal Combustion Residuals

# Design and Construction Plans Rev. 1

# Cell 5

Prepared for
Minnkota Power Cooperative, Inc.
Milton R. Young Station

January 2024

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# Coal Combustion Residuals

# Cell 5 - Design and Construction Plans Rev. 1

# January 2024

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# 1.0 Introduction

Minnkota Power Cooperative, Inc. (MPC) operates the Milton R. Young Station (MRY), near Center, North Dakota. MRY operates two lignite-fired cyclone boilers, resulting in production of coal combustion residuals (CCR). The CCR are disposed of in a surface impoundment and landfill located immediately south of the plant. CCR management is subject to Federal Standards for the Disposal of Coal Combustion Residuals in Landfills and Surface Impoundments per 40 CFR 257 Subpart D. Cell 5 is a new CCR surface impoundment permitted under North Dakota Department of Environmental Quality (NDDEQ) solid waste management facility Permit No. 159, in accordance with North Dakota Administrative Code (NDAC) 33.1-20-08.

This document, "Coal Combustion Residuals - Design and Construction Plans – Cell 5," has been developed to satisfy the requirements of 40 CFR §257.74(c)/NDAC 33.1-20-08-04.3.c, as they apply to MPC's new CCR surface impoundment Cell 5.

Cell 5 was constructed in multiple phases (Phase 1A completed in 2022, Phase 1B in 2023, and Phase 2 to be completed in 2027). Phase 1A construction included site stripping, overburden removal to expose and remove lignite coal, and embankment construction. Phase 1B construction included piping systems installation, and composite liner installation. The Cell 5 composite liner up to the internal bench elevation 2080 was completed in October 2023 and filling of the cell will commence soon after with the water level not to exceed elevation 2076. Phase 2 construction is anticipated to be commence and be completed in 2027 and will raise the composite liner to elevation 2098, at which point the maximum operation level will increase to elevation 2093. This document will be updated accordingly when Cell 5 Phase 2 construction is complete.

# 2.0 Cell 5 Design and Construction Plans

Cell 5 design and construction plans information as specified in 40 CFR §257.74(c)/NDAC 33.1-20-08-04.3.c is described below:

***(c)(1)(i)/c(1) The name and address of the person(s) owning or operating the CCR unit; the name associated with the CCR unit; and the identification number of the CCR unit if one has been assigned by the state.***

Minnkota Power Cooperative Inc.
Milton R. Young Station
Cell 5 - Solid Waste Management Facility Permit No. SP-159
3401 24th Street SW
Center ND 58530
Telephone: 701-795-4000
Technical Contact: Scott Hopfauf
Senior Environmental Engineer: 701-794-8711
E-mail: shopfauf@minnkota.com

***(c)(1)(ii)/c(2) The location of the CCR unit identified on the most recent U.S. Geological Survey (USGS) 7 ½ minute or 15 minute topographic quadrangle map, or a topographic map of equivalent scale if a USGS map is not available.***

See Figure 1 attached.

***(c)(1)(iii)/c(3) A statement of the purpose for which the CCR unit is being used.***

Cell 5 will receive CCR generated at the MRY.

***(c)(1)(iv)/c(4) The name and size in acres of the watershed within which the CCR unit is located.***

Cell 5 is located in the 1,617,200 acre Painted Woods-Square Butte watershed (Hydrologic Unit Code (HUC) 10130101).

***(c)(1)(v)/c(5) A description of the physical and engineering properties of the foundation and abutment materials on which the CCR unit is constructed.***

See the site characterization report included in Appendix A for native soil and foundation material information.

See the construction drawings included in Appendix B for the cross sections and stratigraphy.

***(c)(1)(vi)/c(6) A statement of the type, size, range, and physical and engineering properties of the materials used in constructing each zone or stage of the CCR unit; the method of site preparation and construction of each zone of the CCR unit; and the approximate dates of construction of each successive stage of construction of the CCR unit.***

See the construction drawings included in Appendix B and the construction specifications included in Appendix C.

Cell 5 liner construction started in 2023 (Phase 1B) with site stripping and embankment construction beginning in 2022 (Phase 1A). Cell 5 liner up to elevation 2080 was completed in October 2023. Cell 5 liner from elevation 2080 to elevation 2098 (final Cell 5 liner elevation) will be completed in Phase 2, anticipated in the fall of 2027.

***(c)(1)(vii)/c(7) At a scale that details engineering structures and appurtenances relevant to the design, construction, operation, and maintenance of the CCR unit, detailed dimensional drawings of the CCR unit, including a plan view and cross sections of the length and width of the CCR unit, showing all zones, foundation improvements, drainage provisions, spillways, diversion ditches, outlets, instrument locations, and slope protection, in addition to the normal operating pool surface elevation following peak discharge from the inflow design flood, the expected maximum depth of CCR within the CCR surface impoundment, and any identifiable natural or manmade features that could adversely affect operation of the CCR unit due to malfunction or mis-operation.***

See Figures 2, 3 and 4 attached.

***(c)(1)(viii)/c(8) A description of the type, purpose, and location of existing instrumentation.***

Three nested vibrating wire piezometers (VWP's) were installed in the North embankment of Cell 5 in the Fall of 2022. The VWP's were installed to monitor pore water pressure in the Northern embankment during excavation at the embankment toe as part of Cell 5 construction. The location of the VWP's are shown in Figure 2.

***(c)(1)(ix)/c(9) Area-capacity curves for the CCR unit.***

See Figure 5 attached.

***(c)(1)(x)/c(10) A description of each spillway and diversion design features and capacities and calculations used in their determination.***

Cell 5 does not include any spillways as described in the inflow design flood control plan posted on the MPC CCR web site.

***(c)(1)(xi)/c(11) The construction specifications and provisions for surveillance, maintenance, and repair of the CCR unit.***

See Appendix C for construction specifications for each phase of construction.

Cell 5 was built in accordance with the Construction Quality Assurance/ Quality Control Plan included in Appendix D.

Weekly inspections will be performed on Cell 5 in accordance with 40 CFR §257.83/NDAC 33.1-20-08-05.4 to monitor instability or other potential issues with the CCR unit; an example of the weekly inspection report is included in Appendix E

***(c)(1)(xii)/c(12) Any record or knowledge of structural instability of the CCR unit.***

There is no record or knowledge of structural instability for Cell 5.

# 3.0 Recordkeeping

40 CFR §257.74(c)(1)/NDAC 33.1-20-08-04.3.c, states, *"No later than the initial receipt of CCR in the CCR unit, the owner or operator unit must compile the design and construction plans for the CCR unit, which must include, to the extent feasible, the information specified in this section."* The design and construction plans documentation requirement is assumed to be complete when it is placed in the MPC facility operating record. MPC will place the design and construction plans documentation in the facility operating record in accordance to 40 CFR §257.105(f)/NDAC 33.1-20-08-08.1.f.

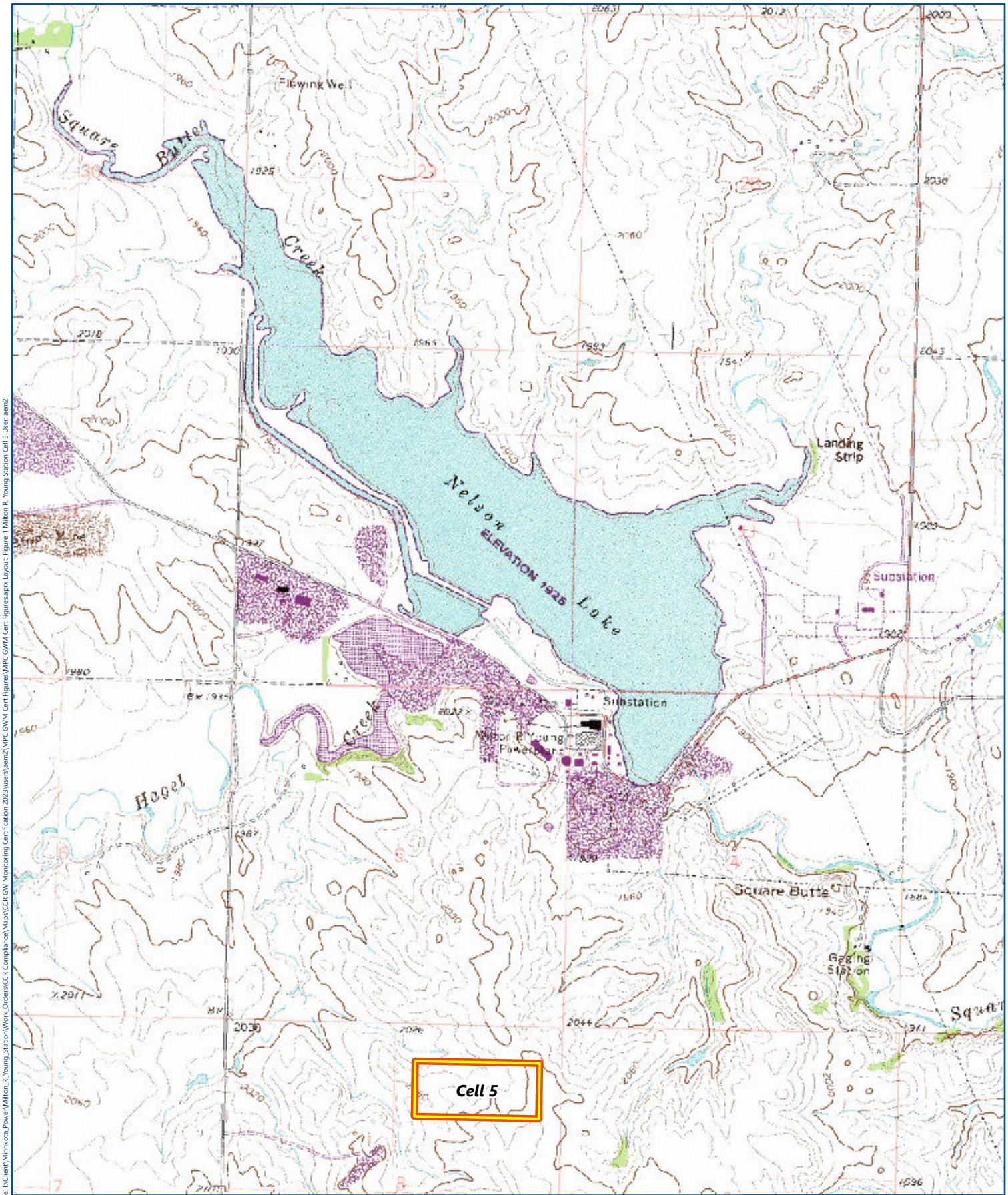
MPC will maintain a copy of the most recent version of the design and construction plans in the facility's operating record. According to 40 CFR §257.74(c)(2)/NDAC 33.1-20-08-04.3.c(13), *"If there is a significant change to any information compiled under this section, the owner or operator [MPC] of the CCR unit must update the relevant information and place it in the facility's operating record"*

MPC will retain a copy of each applicable file included in this design and construction plans documentation *"until the CCR unit completes closure of the unit"* as prescribed in 40 CFR §257.105(f)(13)/NDAC 33.1-20-08-08.1.f(9).

# 4.0 Reporting

When the initial design and construction plans documentation, and successive changes to the design and construction plans documentation, are placed in the operating record, they will be made publicly available on the MPC CCR web site in compliance with 40 CFR §257.107(f)(12)/33.1-20-08-08.3.e, Publicly Accessible Internet Site Requirements. Additionally, to comply with 40 CFR §257.106(f)(12)/33.1-20-08-08.2.e, Notification Requirements/Record Submission Requirements, MPC will *"notify the State Director… when [the design and construction plans] has been placed in the operating record and on the owner or operator's publicly accessible internet site."* Notification to the State Director will be made to waste@nd.gov as requested by the North Dakota Department of Environmental Quality.

# Figures



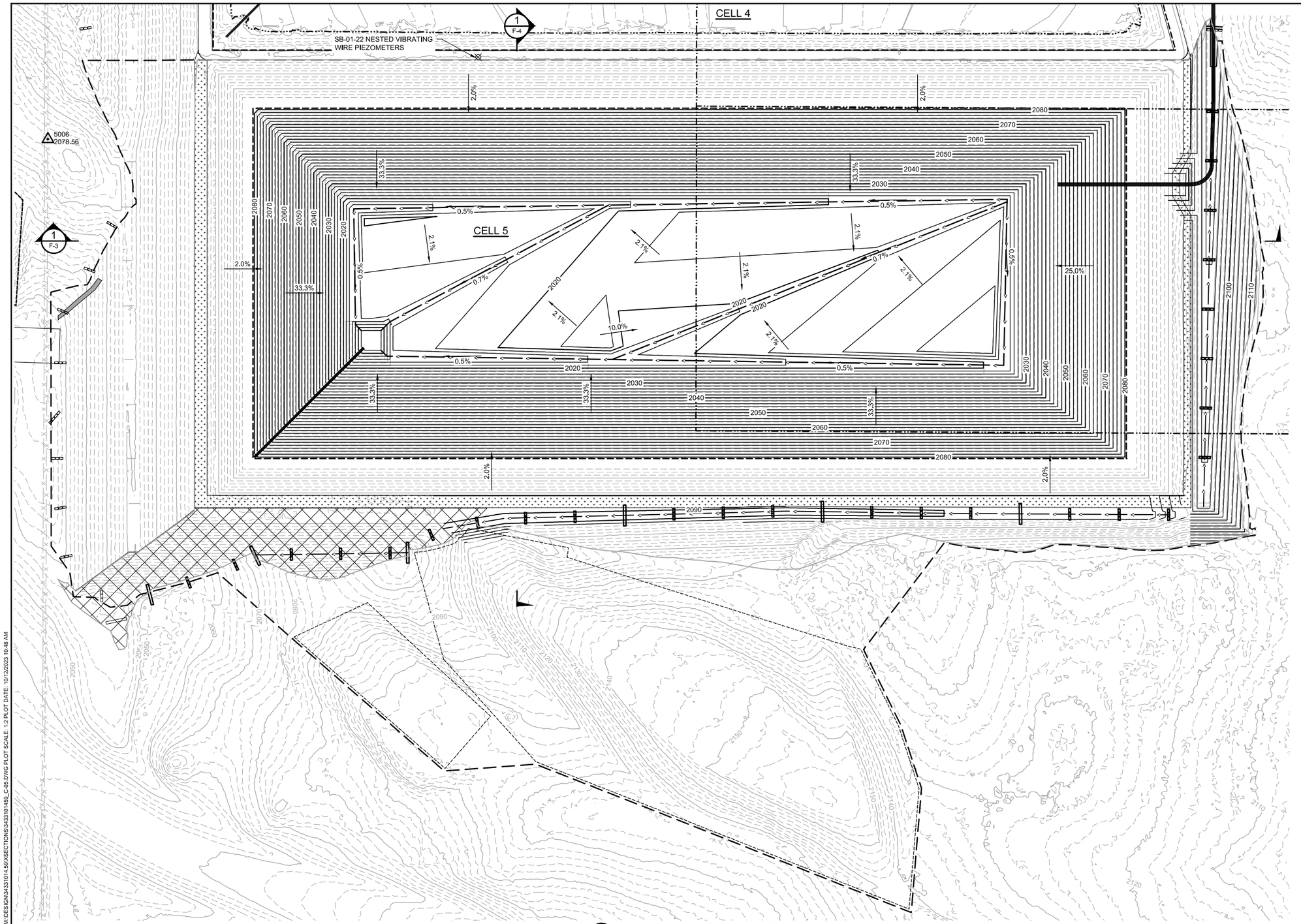

U.S. Geological Survey (USGS)
7-1/2 minute quadrangle topographic map

0 1,000 2,000 3,000 4,000
Feet

MILTON R. YOUNG STATION
CELL 5
Minnkota Power Cooperative
Oliver County, North Dakota

FIGURE 1

Barr Footer: ArcGISPro 3.1.3, 2023-10-06 14:25 File: I:\Client\Minnkota_Power\Milton_R_Young_Station\Work_Orders\CCR Compliance\Maps\CCR GW Monitoring Certification 2023\users\aem2\MPC GWM Cert Figures\MPC GWM Cert Figures.aprx Layout: Figure 1 Milton R. Young Station Cell 5 User: aem2




## LEGEND

- EXISTING 10' MAJOR CONTOUR (2000)
- EXISTING 2' MINOR CONTOUR
- PROPOSED 10' MAJOR CONTOUR (2100)
- PROPOSED 2' MINOR CONTOUR (2098)
- EXISTING ROAD
- FEDERAL COAL LIMITS
- FENCE LINE
- WATERLINE
- MH7AB — EXISTING MANHOLE
- MW97-2 — MONITORING WELL
- CP10 2109.27 — CONTROL POINT
- PROPOSED GEOMEMBRANE LIMITS
- PROPOSED DRAINAGE PIPE
- PROPOSED PIPELINE
- STRAW BALE
- PROPOSED GRAVEL PAVEMENT
- TEMPORARY RESTORED SLOPE COMPLETED IN CELL 5 PHASE 1A CONSTRUCTION

## NOTES:

1. PHASE 2 COMPOSITE LINER RAISE TO EL. 2098 TO BE COMPLETED 2027.

1 C-02 PLAN: CELL 5

0 100 200

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| | | | | | RECORD |
| | | | | | RELEASED TO/FOR |

10/13/2023

DATE RELEASED: A B C 0 1 2 3


BARR

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| Date | 10/13/2023 |
| Drawn | AWK |
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| Approved | SWH |

Minnkota Power COOPERATIVE

A Touchstone Energy® Cooperative

# MINNKOTA FGD POND CELL 5
CENTER, NORTH DAKOTA

CELL 5
PLAN

| | |
|---|---|
| BARR PROJECT No. | 34331014.59 |
| CLIENT PROJECT No. | |
| DWG. No. | FIGURE 2 |
| REV. No. | A |


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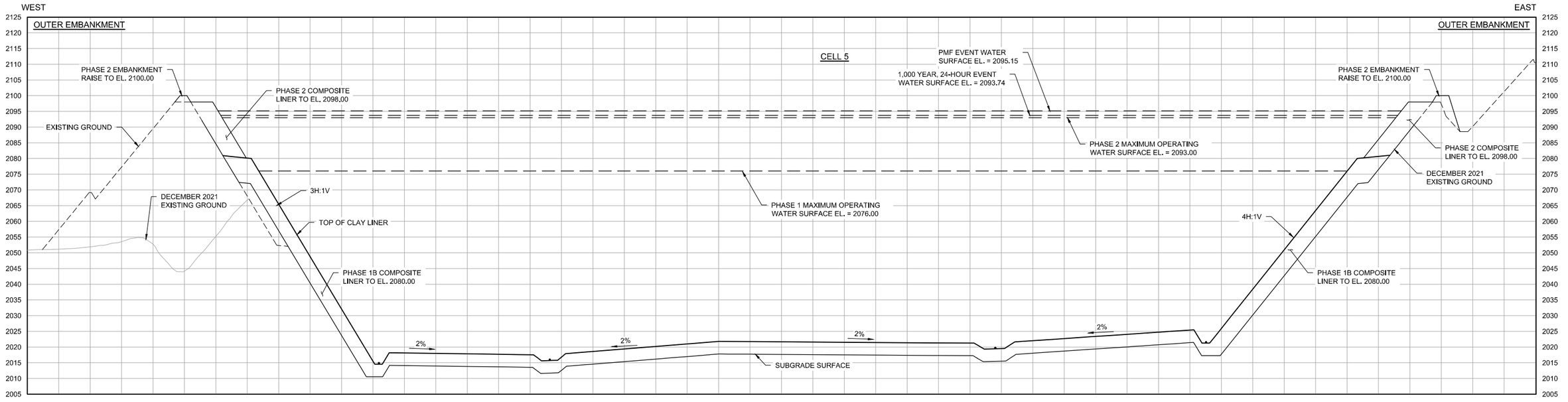


1 C-05 SECTION: OVERALL WEST - EAST

SCALE IN FEET HORIZONTAL: 0, 100, 200

SCALE IN FEET VERTICAL: 0, 20, 40

NOTES:

1. PHASE 2 COMPOSITE LINER RAISE TO EL. 2098 TO BE COMPLETED 2027.

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| Scale | AS SHOWN |
| Date | 10/13/2023 |
| Drawn | TCK |
| Checked | AWK |
| Designed | - |
| Approved | SWH |

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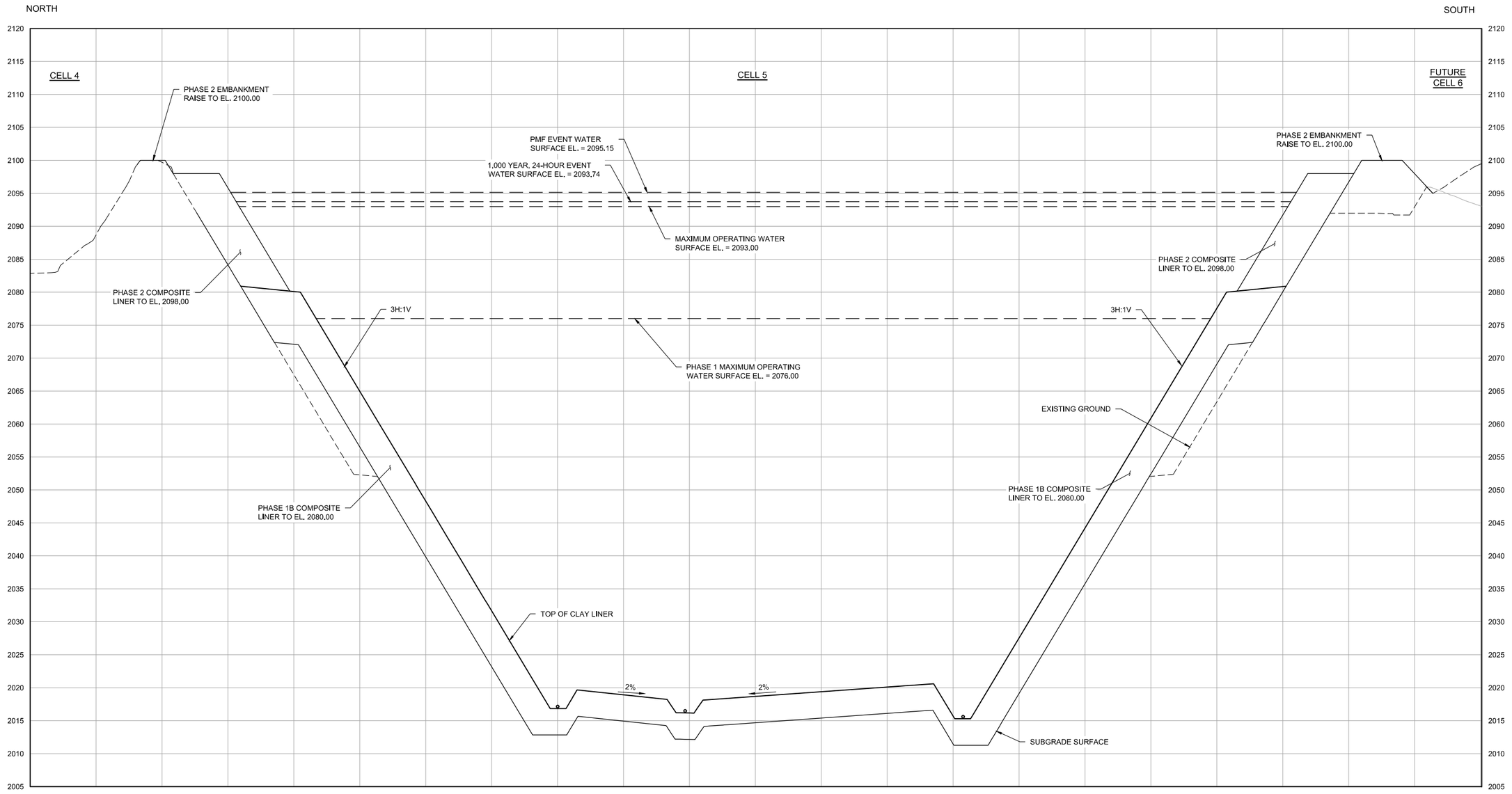
MINNKOTA FGD POND CELL 5
CENTER, NORTH DAKOTA

CELL 5
OVERALL SECTION WEST - EAST

BARR PROJECT No. 34331014.59
CLIENT PROJECT No.
DWG. No. FIGURE 3
REV. No. A




1 / C-05 SECTION: OVERALL NORTH - SOUTH

0 40 80 SCALE IN FEET HORIZONTAL

0 10 20 SCALE IN FEET VERTICAL

NOTES:

1. PHASE 2 COMPOSITE LINER RAISE TO EL. 2098 TO BE COMPLETED 2027.

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DATE RELEASED: 10/13/2023 — A B C 0 1 2 3


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| Scale | AS SHOWN |
| Date | 10/13/2023 |
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| Checked | AWK |
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| Approved | SWH |

Minnkota Power COOPERATIVE
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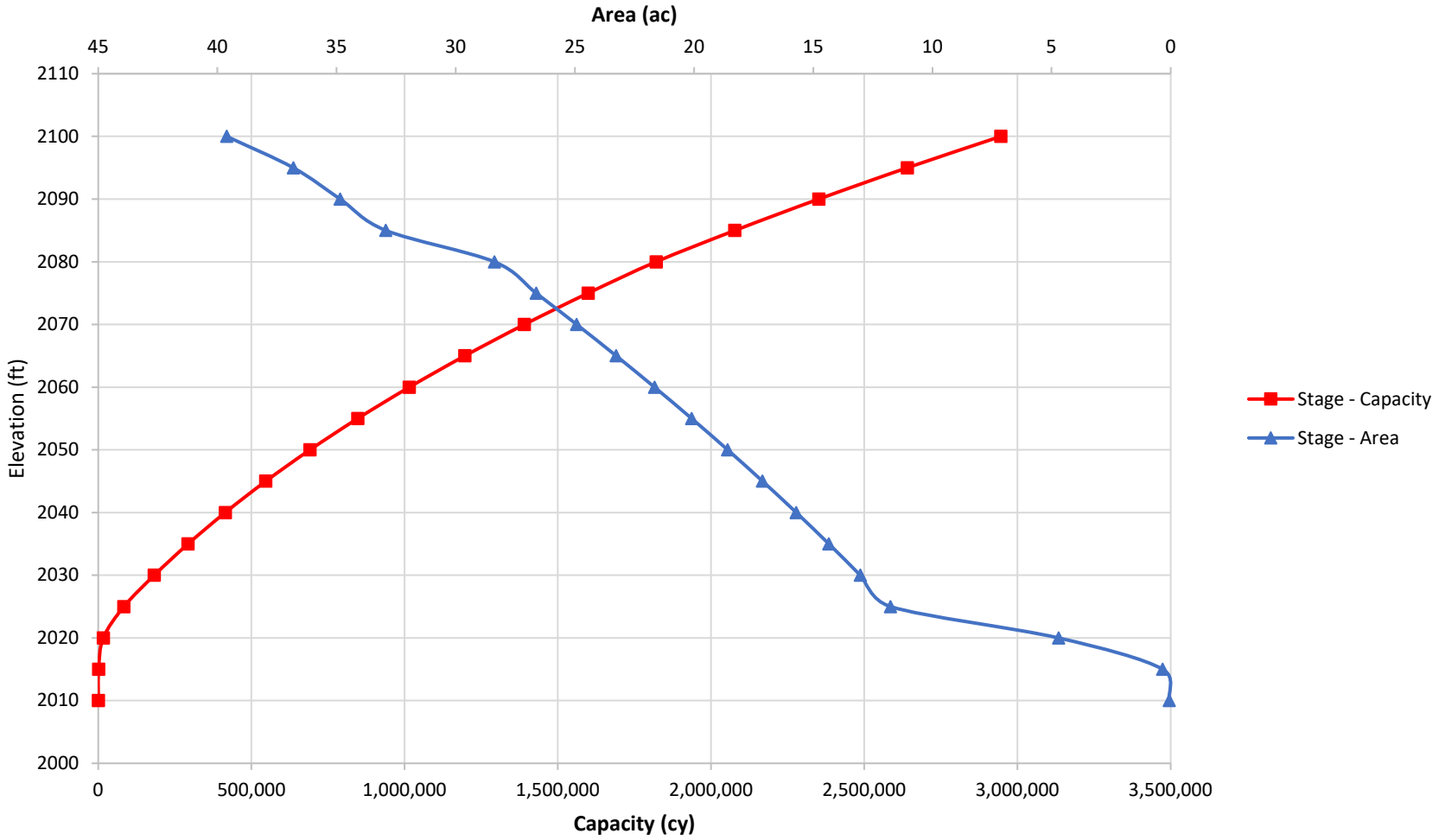
# MINNKOTA FGD POND CELL 5
CENTER, NORTH DAKOTA

## CELL 5
## OVERALL SECTION NORTH - SOUTH

| | |
|---|---|
| BARR PROJECT No. | 34331014.59 |
| CLIENT PROJECT No. | |
| DWG. No. | FIGURE 4 |
| REV. No. | A |

**Figure 5**
**Cell 5 Area - Capacity Curve**



# Appendix A

## Site Characterization Investigation Report and Environmental Monitoring System Proposal for Modification to NDDH Solid Waste Permit SP-159

# *Site Characterization Investigation Report and Environmental Monitoring System Proposal for Modification to NDDH Solid Waste Permit SP-159*

***Milton R. Young Station***
***Coal Combustion Waste Disposal Facility***
***Center, North Dakota***

***Prepared for***
***Minnkota Power Cooperative, Inc.***

***September 2012***

BARR

# *Site Characterization Investigation Report and Environmental Monitoring System Proposal for Modification to NDDH Solid Waste Permit SP-159*

## *Milton R. Young Station*
## *Coal Combustion Waste Disposal Facility*
## *Center, North Dakota*

***Prepared for***
***Minnkota Power Cooperative, Inc.***

***September 2012***

BARR

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Fax: (952) 832-2601

# Site Characterization Investigation Report and Environmental Monitoring System Proposal for Modification to NDDH Solid Waste Permit SP-159

## Milton R. Young Station
## Coal Combustion Waste Disposal Facility
## Center, North Dakota

**Prepared for**
**Minnkota Power Cooperative, Inc.**

**September 2012**

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# Executive Summary

1. The site conceptual hydrogeologic model developed in the 1990's remains valid, with a few small adjustments based on additional data collected in the intervening time.
    a. The hydro-stratigraphic units are: an upper confining unit, a water table aquifer, and a lower confining unit.
    b. The upper confining unit consists mostly of shale and mudstone, with some layers of sandstone, siltstone and lignite. There are a number of partially saturated units including sandstones and the Hagel coal bed that in some places form perched zones of water within the upper confining unit. The perched zones of water have limited extents.
    c. There are approximately 70 feet of very low permeability clay in the upper confining unit between the base of the cells and the water table aquifer.
    d. The water table varies from about El 1920 to 1900 feet below the facility, or about 100 feet below the bottoms of the cells. The top of the sand unit that forms the water table aquifer is at about El 1910 to 1950 feet. The lower confining unit has not been definitively identified in borings to date. The maximum observed thickness of the water table aquifer is 98 feet, which also equals the maximum observed saturated thickness.
    e. Groundwater flow in the water table aquifer is generally west to east, and appears to flow from Hagel Creek, which is west and northwest of the facility, to Square Butte Creek, which is northeast and east of the facility, bending around Nelson Lake.
    f. There is one known water supply well downgradient of the facility, approximately 3,000 feet distant. It is at a former homestead site and is not in use.

2. The design of the facility has not changed substantially since the first site permit.
    a. Each cell covers about 30 acres and is approximately 70 feet deep. Cells 1 and 2 have compacted clay liners; Cell 3 and future cells will have composite liners. From the hydrogeological perspective, this is the most significant change to the facility design as it should further reduce risk of a release.
    b. Flue gas desulfurization (FGD) waste is slurried into the cells. Water is returned from the cell back to the plant. Once a cell is full of FGD waste, the slurried waste is dewatered, and coal ash is deposited over the FGD waste, with the final cover at a height of El 2140-2147 feet. Cell 1 is currently receiving dry ash, and Cell 2 is receiving wet FGD waste. Cell 3 is in construction. Cells 4, 5, and 6 are proposed.
    c. The Hagel coal bed is excavated in the area of the cells as part of cell development. The remnant Hagel coal bed outside of the cells represents a potential migration route. The section of liner adjacent to the Hagel coal bed is therefore much thicker than the rest of the liner. In addition, a gradient control system is installed under the liner adjacent to the Hagel coal bed.

3. The groundwater monitoring conducted since the facility was developed has found no evidence of a release. Given the long travel time of water from the cells to the water table

due to the low permeability upper confining unit, the site is suitable for this type of facility and the monitoring system is appropriate.

   a. There are four monitoring wells screened in the Hagel coal. The two southern wells have been consistently dry since they were installed; well 2001-01R is typically dry and water is consistently found only well 97-1.
   b. There are two upgradient water table wells, 92-5A and 92-6A, and three downgradient water table wells, 92-3, 95-4, and 92-2A.
   c. The monitoring system is sufficient for Cells 1 and 2.
   d. There are wells south of Cell 3, including a Hagel well (well 91-34C) and a water table well (well 92-1). While these wells will need to be abandoned when Cell 4 is developed, well 92-1 is downgradient of Cell 3 and well 91-34C is adjacent to Cell 3, and these wells can be incorporated into the monitoring program immediately.
   e. Development of Cells 4, 5, and 6 is far enough in the future that no monitoring points are required in the next several years. New wells will be needed as these cells are developed.

4. Proposed future work includes:
   a. Complete baseline monitoring of well 92-1.
   b. Install a water table monitoring well on the east side of Cell 3. This well is not immediately needed due to the existence of well 92-1.
   c. Complete slug tests on any new water table aquifer wells.

# 1.0 Introduction

This report was prepared on behalf of Minnkota Power Cooperative, Inc. (MPC). Minnkota operates the Milton R. Young power station (the plant), and disposes of flue gas desulfurization (FGD) waste and ash on site, respectively wet waste and dry waste. This report addresses future groundwater monitoring at Cell 3 (in construction) of the facility, as well as the characterization and long range monitoring plans for proposed future Cells 4, 5, and 6.

## 1.1 Purpose of Report

Per NDDH Guideline 3 (NDDH, 2009), the purpose of the site characterization is "to determine the suitability of the site for the management of solid waste, provide geotechnical information for design and installation of a groundwater monitoring system, and provide geotechnical bases for design and construction of the facility."

The MPC waste facility has been in operation for nearly 20 years, and the Site has been well investigated, characterized, and monitored. Past work demonstrated that the site is suitable for this facility. As such, this report addresses the proposed facility expansion, the incremental gains in information over time at the existing facility and the new information from the expansion area. This report provides a brief summary of the site characterization work completed in the past, updates information as appropriate, and provides recommendations for the expansion of the monitoring system as the facility is expanded.

This report is submitted in fulfillment of the requirement for a site Preliminary Evaluation Report, the Site Characterization Investigation Report, and the Environmental Monitoring System Proposal. The Groundwater Monitoring Plan is published separately.

## 1.2 Scope of Work

North Dakota Administrative Code 33-20-13-01 requires adequate site hydrogeological characterization be completed before the construction of a solid waste management facility. The MPC FGD waste disposal site was so characterized and permitted and constructed in the mid-1990s. MPC is applying to modify the permit including three additional cells. This report briefly revisits the previous site characterization, and provides updates of relevant information. Finally, this report proposes an expansion of the groundwater monitoring system to address Cell 3, which is currently in construction. Proposed Cells 4, 5, and 6 are sufficiently far enough in the future that MPC does not need to address groundwater monitoring in those areas at this time.

# 2.0 Description of Site Hydrogeology

Regional geology has been described in several of the previous site reports, and is not re-iterated herein. Previous reports include:

Barr Engineering Co., May 17 2012. *Cells 4, 5, and 6 Drilling Report*. Letter report to Scott Hopfauf, Minnkota Power Cooperative, Inc.

Barr Engineering Co., October 2011. *Pre-application for Modification to NDDH Solid Waste Permit SP-159 (to Laterally Expand a Currently Permitted Facility), Milton R. Young Station Coal Combustion Waste Disposal Facility*. Prepared for Minnkota Power Cooperative, Inc.

Barr Engineering Co., 1995. *Phase 1 Investigation and Assessment Report, Minnkota Power – Butterfly Ponds.* Prepared for Minnkota Power Cooperative, Inc.

Barr Engineering Co., 1994. *Permit Application for Milton R. Young Station Flue Gas Desulfurization Sludge Disposal Site*. Prepared for Minnkota Power Cooperative, Inc.

Barr Engineering Co., 1993. *Facility Impacts Evaluation, Milton R. Young Station Flue Gas Desulfurization Sludge Disposal Site*. Prepared for Minnkota Power Cooperative, Inc.

Barr Engineering Co., 1992. *Feasibility Study for Milton R. Young Station Flue Gas Desulfurization Sludge Disposal Site*. Prepared for Minnkota Power Cooperative, Inc.

## 2.1 Site Location and Facility Description

The currently permitted solid waste disposal facility is located near Center, North Dakota primarily in the SE ¼ of Section 5, T141N, R83W, Oliver County, North Dakota. The solid waste disposal facility is proposed to be modified to add the quarter-section directly adjacent to and south of the currently permitted facility. The lateral expansion will be located in the NE ¼ of Section 8, T141N, R83W. The facility is located southwest of the Milton R. Young Station.

Figure 1 shows the location of the currently permitted facility, as well as the overall power plant property boundary. Much the facility lies within the mining permit BNCR-9401 held by BNI Coal Ltd. Figure 2 is a map of the Site and the proposed laterally-expanded facility.

Figure 3 shows the engineered structures at the Site. The facility currently consists of two active cells, and one cell in construction. Cell 1 is receiving dry waste and Cell 2 is receiving wet waste. Each cell covers about 30 acres. The tops of the dikes are at El 2100 feet, and the base of each cell is El 2020 feet. Cells 1 and 2 have been constructed with a compacted clay liner. MPC proposes to utilize a composite liner (native clay overlain by a geomembrane) for all future cells—Cells 3, 4, 5, and 6. Wet waste is pumped to the active cell. Water is returned to the plant via a set of pipes. Once a cell has been filled to design capacity with wet waste, the slurried waste in the cell is dewatered

and disposal of dry material begins. The cover system for the cells is presented in the Engineering Report (Barr, 2012).

## 2.2 Existing Site Borings and Wells

The hydrogeology of the Site is based on the findings from nearly 100 borings and wells. Many of these borings have been completed by BNI Coal Ltd. for the purpose of evaluating coal resources; these borings provide generally good stratigraphic information. Minnkota has also completed many soil borings and wells specifically to evaluate the Site for constructability of the cells and for evaluating the hydrogeology. Table 1 summarizes site borings, and these are shown on Figure 4. Table 2 summarizes site wells; logs of the site wells are in Appendix A. Per Guideline 3 (NDDH, 2009) for hydrogeological investigations, sites up to 50 acres should have 20 soil borings, and larger sites should have an additional boring for each additional 10 acres. The characterization of the proposed future total of six cells covering approximately 180 acres should therefore be based on at least 33 borings, and the site has well more than that minimum.

Under the existing facility permit, MPC monitors nine wells:

- There are four wells screened in the Hagel coal bed, 2001-01R and 2006-08-1R on the west side, and 97-1 and 2006-08-4R on the east side. Wells 2006-08-1R and 2006-08-4R have historically been dry. Well 2001-01R has been dry since it was installed in 2010, and its predecessor was periodically dry. Well 97-1 is the only Hagel well to consistently contain water. When water is found in the wells, the water elevation ranges from about El 2026 to 2031 feet.
- There are two upgradient water table wells, 92-5A and 92-6A, and three downgradient water table wells, 92-2A, 92-3A, and 95-4. The water table ranges from about El 1920 feet on the upgradient (west) side to about El 1900 feet on the downgradient (east) side.

## 2.3 Site Geology

The Site geology is described in detail in previously submitted reports. The site soils are described in the pre-application report (Barr, 2011). Following is a brief description of the geology. The area is covered with a layer of glacial deposits which is mostly clayey till plus some sandy outwash, ranging from zero to about 20-feet thick. The uppermost bedrock is the Sentinel Butte Formation. About half of the Sentinel Butte Formation has been eroded away, so the Site is underlain by the lower half of the formation, which is on the order of 250 feet thick.

Figure 4 is a map of the site showing the structural contours of the base of the Hagel coal bed. The Hagel coal bed is a distinct marker bed in the area. The base of the Hagel coal bed ranges from about

El 2000 to 2060 feet, and is generally between El 2020-2040 feet. Where not thinned by erosion, the Hagel coal bed ranges from about 6.6 to 8.5 feet in thickness, averaging about 7.7 feet.

Figure 5 shows the locations of cross section Figures 6 and 7 that illustrate the overall site geology.

The upper part of the Sentinel Butte Formation at the Site is dominated by claystone, shale, silty shale, and siltstone, with some sandstone, lignite, and limestone beds. The beds are poorly lithified, and so may be described as clay, silt, and sand. Beds grade vertically and laterally, for instance from a silty shale to a siltstone, or a sandstone to a silty shale. Several units are discontinuous. As noted above, the Hagel coal bed is one of the most continuous beds in this part of the formation.

A distinct blue-tinted sandstone exists a short distance below the Hagel coal bed. This unit has limited extent, and transitions laterally into a silty clay. While this unit is typically identified as a sandstone in the field, it is classified as a clayey sand (SC) under the Unified Soil Classification System.

The geotechnical and hydrogeological drilling investigation for Cells 4, 5, and 6 (Barr, 2012) included extensive laboratory testing of the upper, clay-rich part of the Sentinel Butte Formation. These results are summarized in Table 3.

The lower part of the Sentinel Butte Formation is dominated by sandstone. The sandstone is poorly cemented, and ranges from a gray to bluish-gray fine-grained clayey to silty sandstone to a medium-grained sandstone. There are discontinuous beds of clay and lignite up to 12 feet thick within the sandstone, so the sandstone is likely not a single deposit. The top of the sandstone is at about El 1910 feet on the north side of Cell 1 and rises to about El 1942 feet at well 92-1 within proposed Cell 4. Several site borings have terminated within the sandstone, and several have terminated a few feet into underlying clay and lignite units. The bottom of well 95-2A is at about El 1821 feet, and this boring penetrated 98 feet of sandstone.

## 2.4 Hydrology

The Site is on the northern edge of an upland area. The nearest surface water bodies are therefore north of the site. Northwest of the site is Hagel Creek, which flows into Nelson Lake. Nelson Lake is a reservoir used by the plant, and is maintained at about El 1925 feet. Square Butte Creek flows into Nelson Lake north of where Hagel Creek enters, and Square Butte Creek flows out of the southeast part of Nelson Lake. Square Butte Creek is northeast and east of the Site.

There are no significant hydrologic features located on the Site; Figure 8 shows the USFWS National Wetland Inventory wetlands near the site. Most of these are stock ponds. The average annual precipitation is 17.48 inches at Center with nearly half occurring during May-July.

## 2.5 Site Hydrogeology

Following are the general hydrogeologic characterizations of the geologic units in the area:

**Coleharbor Formation**—Currently there is no direct evidence from driller's logs and literature if the formation is saturated at the Site. The till is a mixture of clay, silt, sand, and gravel with low hydraulic conductivity that yields little or no water. There is anecdotal evidence that deposits of glacial outwash sand in low areas underlain by clay/claystone/shale bedrock may be saturated for periods of time.

**Sentinel Butte Formation**—As noted by Carlson (1973), there are no major aquifers in the Sentinel Butte Formation. Fractured lignite and sandstone beds within the Sentinel Butte Formation yield water to many of the domestic and stock wells in western Oliver County (Carlson, 1973). The quantity of water within the sandstone beds, which tend to be silty, is dependent on the grain size and thickness. The degree of fracturing, the size and extent of the fractures in the lignite, and the transmissivity of the overlying and underlying beds determine the quantity of water within the lignite beds.

### 2.5.1 Groundwater Elevations

Minnkota has installed monitoring wells around Cells 1, 2, and 3. The monitoring wells have been installed at a variety of depths, including the Hagel coal bed and numerous sand/sandstone beds within the Sentinel Butte Formation. The groundwater elevation data has been reported in the annual monitoring reports for the facility, and representative values of groundwater elevations are used in this report. Table 4 summarizes selected groundwater elevation data from site wells that have not been part of the ongoing monitoring program; these include one water table well (92-1) and three wells screened in units above the water table aquifer (Hagel coal bed, "blue" sandstone and an unnamed sandstone). In general, the groundwater level data suggests the following:

- Perched zones of water of limited extent exist in the Hagel coal bed and in the "blue" sandstone a short distance below the Hagel coal bed. Wells in these units may or may not have water and there are underlying dry units. These perched zones tend to have limited extent due to a number of factors:
    - Some units have limited original extent. For instance, it appears the "blue" sandstone was never deposited north of Cell 3 or south of Cell 4.
    - Many of these units have been eroded away along the sides of the ridge upon which the facility has been developed. The extent of both the Hagel coal and the "blue" sandstone are limited by erosion. This daylighting of the beds allows groundwater to drain from the formations.
    - The units within the cell footprints and above El 2020 feet, including the Hagel coal bed and the "blue" sandstone, are excavated during construction of the facility cells. Construction of Cells 3 and 4 will remove the majority of the "blue" sandstone.

  The Hagel coal bed varies in elevation. The bottoms of the two Hagel monitoring wells where groundwater has been found, wells 97-1 and 2001-01, are at El 2023 and 2025 feet. These wells are near Cell 1. The bottoms of the dry Hagel wells by Cell 2 are at El 2040 and 2046 feet (wells 2006-08-1R and2006-08-4R) and the bottom of the dry Hagel well in the Cell 4 area is at El 2049 feet (well 91-34C). The Hagel coal bed is above El 2040 feet in Cell 3, and the Hagel coal bed was exposed in Cell 3 from the fall of 2011 through the spring of 2012, and no water was observed coming out of the coal into Cell 3. Elevation alone may be an important factor controlling where the Hagel coal contains water.

  Well 91-34B is screened in the "blue" sandstone, just below the Hagel coal bed. This well is not part of the monitoring program and so water level data is sparse. However, water levels were recorded each time it was checked in 1991 and then again in 2012, at El 2031 to 2041 feet. The "blue" sandstone was exposed and excavated during the Cell 3 construction in the summer of 2012, and no water was observed coming out of it.

  Well 91-34A is screened in an unnamed sandstone between the "blue" sandstone and the water table aquifer, with the base of the screen at El 1999.8 feet. Like well 91-34B, it has not been monitored regularly, but each time it has been checked this well was dry.

- A water table aquifer exists in the sandstone occurring generally below El 1950 feet with an uncertain lower boundary. Figure 9 is a map of the water table. Figure 10 is a graph of the water table elevations over time, showing that it has been stable during the life of the facility. The aquifer appears to be confined in the northwest part of the site, but under water table conditions elsewhere. The water table below the facility varies from about El 1920 feet on the west side to El 1900 feet on the south and east sides. It appears the water table is continuous with the following surface water bodies:
    - Hagel Creek to the west and northwest which is above El 1925 feet
    - Nelson Lake at El 1925 feet

- Square Butte Creek and Square Butte Creek aquifer to the northeast and east which is below El 1880 feet

### 2.5.2 Hydraulic Conductivities

Table 4 summarizes laboratory tests conducted for the investigation of proposed Cells 4, 5, and 6 (Barr, 2012). This work focused on the clayey units, which dominate the upper part of the bedrock at the facility. The lab results are sorted a number or ways to provide comparison of data from units identified in the field as silty shales or as shales. In addition, the units above and below the Hagel coal bed are identified. There are some slight differences in grain size distributions, but the differences do not appear to be significant. The geometric mean of the permeabilities of the all of the shales is $1.5x10^{-8}$ cm/sec. Combining the 2011 results with past test results (n=24) provides a geometric mean of $2.4x10^{-8}$ cm/sec.

Little is known of the lignites and sand layers above the water table aquifer. There are only a few wells in these units, and many of the wells are dry. Lignite coal beds within the Sentinel Butte Formation commonly produce approximately 1 gal/min (Armstrong, 1985). Recent testing has not included tests of the lignite. As noted in previous site reports, Freeze and Cherry (1979) report hydraulic conductivity values of $10^{-4}$ to $10^{-2}$ cm/sec. Freeze and Cherry note that the permeability of coal beds varies with depth of burial, and below 100 m coal beds rarely produce usable quantities of water. The depth to the Hagel coal bed ranges from about zero to nearly 90 feet, averaging about 40 feet. Slug tests were completed on well 92-2B, which is screened across a lignite bed below the Hagel coal bed at a depth of 55 feet, resulting in a calculated hydraulic conductivity of $2.1x10^{-6}$ cm/sec.

Table 5 summarizes field slug tests conducted on the site water table aquifer wells, as reported in previous studies. One additional well, well 95-4, has been installed subsequently, but has not been tested. The geometric mean horizontal hydraulic conductivity of the water table wells is $1.3x10^{-5}$ cm/sec.

Work on Cell 3 in 2009 included a vertical permeability test of clayey sand (the "blue" sandstone, boring 09-004 at 42.5-52 feet) with a result of 6 x 10-7 cm/sec. In the summer of 2012, a bail down test was conducted on well 91-34B, and the calculated horizontal hydraulic conductivity is $3.6 \times 10^{-7}$ cm/sec (analysis is in Appendix A). The hydraulic conductivity of the "blue" sandstone is closer to

that of the shales than it is to the water table aquifer. Note that when this well is bailed down, it takes several weeks for the water level to recover.

### 2.5.3 Groundwater Flow Velocity

The Engineering Report (Barr, 2012) includes a detailed geotechnical analysis and the HELP (Hydrologic Evaluation of Landfill Performance) modeling, each which includes seepage analysis. The geotechnical analysis seep modeling used very conservative assumptions to determine a worst-case water content of soil in order to evaluate dike stability. The HELP model confirmed that the cover and liner designs exceeded performance requirements for minimizing percolation into the facility and leakage out of the facility based on the Cell 3 design (which is also proposed for future cells).

Vertical flow is complex given the many and differing geologic units, the varying degree of saturation of the bedrock units, and the varying depths of water in the cells over time as they are filled and dewatered. Seepage through the liner into the Hagel coal bed was evaluated in detail in previous work (Barr, 1993; NDDH, 1994). The Hagel coal bed is just under the side slope of the facility cells. The Hagel coal bed is a potential conduit for seepage to move laterally to the ground surface. Following is a simple calculation of flow through the original liner:

$V = k * i/n$

Where V = velocity

k = hydraulic conductivity = $1 \times 10^{-7}$ cm/sec (upper boundary based on lab tests)

i = gradient = 60 feet of head (assumes cell is full of water) / 4 feet (approximate thickness of clay liner)

n = porosity = 0.35 (typical value from Freeze and Cherry, 1979)

This calculation suggests water may flow through a 4-foot thick liner within a year. In response to this, the facility design now includes a thicker section of liner adjacent to the Hagel coal bed to reduce the gradient across the liner. This thicker section of liner also extends across the face of the blue sand. The facility design now also includes a gradient control drain system installed just outside the liner to intercept seepage through the liner.

It is unlikely that the confining layer underlying the facility will ever become fully saturated. Under a simple scenario that assumes the confining layer is fully saturated, and the ponds provide a continuous source of water for an indefinite period, the travel time through the confining unit is on the order of hundreds of years. Vertical groundwater flow will be affected by joints and fractures and

inhomogeneities in the bedrock. Zones of higher permeability like lignite beds would intercept vertically moving water and divert it laterally. Given that the ponds will only be full of water on a temporary basis, about 10 years each, modeling has shown that it is unlikely that the vertically migrating wetting front will ever reach the water table (Barr, 1993).

Horizontal flow in the water table aquifer can be similarly approximated:

$V = k * i/n$

Where V = velocity

k = hydraulic conductivity = 1 x 10-5 cm/sec (based on slug tests)

i = gradient = 0.007 to 0.013 (based on water table contours)

n = porosity = 0.35 (typical value from Freeze and Cherry, 1979)

This calculation produces a horizontal groundwater flow velocity in the water table aquifer of 0.2 to 0.4 foot/year. Each cell is about 1,600 feet across in the direction of groundwater flow. This suggests that it takes the groundwater about 2,000 years to flow halfway across the footprint of the facility.

The recent investigations have not significantly changed the hydrogeologic characteristics discussed here.

### 2.5.4 Site Conceptual Model

The site conceptual hydrogeologic model is shown on Figure 11. This model was originally published in the Facility Impacts Evaluation (Barr, 1993); the version in this report has been modified slightly from the original based on the ensuing 20 years of monitoring and site investigation.

There are three major hydrogeologic units: the upper confining unit, the water table aquifer, and the lower confining unit.

The upper confining unit consists primarily of low-permeability clayey units, but also contains more permeable layers of siltstone, sandstone and lignite. Based on accumulated test data, the hydraulic conductivity of the confining layer has been updated. Some of the permeable layers are saturated in some places and so act as perched aquifers, but most have limited extent and limited significance. Correlations and connectivity of some of these layers are uncertain; for instance the correlations of the thin lignite beds shown on cross section Figures 6 and 7 is tenuous. Therefore, most of these are not significant to the overall model. The Hagel coal bed is the most significant permeable layer in

the upper confining unit, and is continuous except where removed by facility construction and erosion. Monitoring indicates that the Hagel coal bed is dry except at the north end of the facility. The previous version of the conceptual model assumed that one of the minor lignite beds was laterally continuous across the site and limited by either Hagel Creek or the ground surface, and that there were then two confining units, one above and one below this lignite. The version presented here does not assume that the minor lignites identified in the boring logs, varying from 0.5 to 2.5 feet thick and apparently absent in some locations, are laterally continuous and widely extensive enough to act as an independent hydrostratigraphic unit. While there may be some lateral movement of groundwater in the permeable zones, groundwater movement in the confining unit is primarily downward.

The current version of the conceptual model is unchanged from the previous version with respect to the water table aquifer. No new hydraulic conductivity data has been generated. The monitoring conducted since the publication of the previous version of the conceptual model has found consistent water levels, with groundwater elevations near El 1920 feet on the west side of the facility and near El 1900 feet on the east side of the facility. These fall on a straight-line projection from Hagel Creek to Square Butte Creek, suggesting connection and control by the surface water.

The lower confining unit has not been definitively identified in the site borings to date. Several of the deep site borings terminated in the sandstone of the water table aquifer. Several of the borings terminated in lignite and/or clay units but only penetrated a few feet. Given that there are apparent lignite and clay beds several feet thick within the larger sand body that forms the water table aquifer, the conceptual model has been modified to indicate the uncertainty about the location and nature of the lower confining unit.

## 2.6 Potential Receptors

Potential receptors include surface water and wells. Information on area wells comes from MPC files, the North Dakota State Water Commission data base, the County geologic report (Croft, 1970), and a recent survey completed by BNI Coal Ltd. Much of this area is subject to possible future coal mine development.

Wells and surface water monitoring points within 2 miles of the Site are shown on Figure 12, and Table 6 provides details. Appendix B contains logs and information on these wells. Most of the water supply wells are upgradient of the site, and therefore are not potential receptors. One downgradient well, Deichert well 1, is described as a windmill well on an abandoned farmstead, and

if it is still in use it is likely a water supply for stock. The other recorded downgradient well, Manny 1, is likely abandoned. The nearest active water supply wells, cross gradient from the Site, are the power plant wells. Given their proximity to Nelson Lake, the plant wells are unlikely to be affected by the facility.

Hagel Creek and Nelson Lake are higher in elevation than the water table aquifer. During the site work in the 1990s, concern was raised about possible movement of leachate through a perched zone, specifically the Hagel coal bed, which could travel via seepage and then overland flow to surface water. Mathematical calculations at the time suggested this was unlikely to occur due to the low permeability of the facility liner. To further reduce risk, the facility is designed with seepage control collectors under the clay liner along the Hagel coal bed, and Hagel coal bed monitoring wells were included in the groundwater monitoring program. Four of five Hagel wells are consistently dry.

Square Butte Creek is downgradient of the site, and the water elevations suggest that the water table aquifer discharges to Square Butte Creek and the Square Butte Creek aquifer. The facility's groundwater monitoring program includes monitoring wells downgradient of the site, and these wells would indicate if there were any impacts to the water table aquifer from the facility. To date, there has been no indication of any such impact.

The evaluations and conclusions reported in the Facility Impacts Evaluation (Barr, 1993) remain valid. Based on the design and operation of the facility and the natural site characteristics, there does not appear to be a risk of the facility leachate impacting the water table aquifer or Nelson Lake or Square Butte Creek or surficial soils and plants near the subcrop of the Hagel coal bed.

# 3.0 Summary of Proposed Investigation Activities

The site hydrogeological characterization as presented in the previous section is adequate, although incremental work is appropriate to address a few data gaps.

## 3.1 Monitoring System Modifications

The monitoring system is adequate for Cells 1 and 2. Development of Cells 4, 5, and 6 is sufficiently far enough in the future that no wells need to be installed at this time.

### 3.1.1 Cell 3 Monitoring

Based on the water table map, well 92-1 is downgradient of Cell 3. Also near well 92-1 is the Hagel coal bed well 91-34C. Given the lack of risk posed by the facility via the groundwater pathway because of the thick low-permeability clay units underlying the facility, minimal groundwater monitoring is required. While these wells will need to be abandoned when Cell 4 is developed, these wells are downgradient of Cell 3 and could be incorporated into the monitoring program immediately. Figure 13 shows the proposed monitoring system, including the proposed location for the new Cell 3 monitoring well that will be needed when well 92-1 is abandoned.

Following installation, the reference point elevations of the new monitoring well will be determined by a North Dakota Licensed Land Surveyor. The horizontal location, top of riser and ground surface elevation at each location will be provided. The survey will provide a consistent reference datum between the existing and new monitoring wells to provide useful data to be used to aid in the interpretation of flow direction. Monitoring wells will be surveyed to 0.1-foot lateral accuracy and 0.01-foot vertical accuracy for the top of riser elevations. Flow directions and potentiometric contour maps will be developed for the Site, following the completion of the monitoring well survey. The maps will be included in the subsequent annual report for the facility.

### 3.1.2 Baseline Groundwater Sampling

After the new monitoring well has been installed and purged, baseline groundwater quality will be established per the Groundwater Monitoring Plan.

## 3.2 Aquifer Testing

Slug tests should be completed on new wells that are installed in the water table aquifer.

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# Tables

# Table 1
## Summary of Borings
## Minnkota Power Cooperative, Inc.

| Boring Number | Date Completed | Coordinates (State Plane NAD27) | | Ground Surface Elevation (ft. MSL) | Total Depth (ft) | Hagel Bed Elevation (ft MSL) | | Hagel Bed Depth (ft) | |
|---|---|---|---|---|---|---|---|---|---|
| | | Northing | Easting | | | Top | Base | Top | Base |
| **91-001** | 11/14/1991 | 509498.97 | 1819377.12 | 2040.2 | 60 | 2023.2 | 2016.7 | 17 | 23.5 |
| **91-002** | 11/14/1991 | 508995.69 | 1820001.25 | 2044.9 | 60 | 2030.4 | 2024.4 | 14.5 | 20.5 |
| **91-003** | 11/14/1991 | 509013.56 | 1820614.50 | 2092.2 | 180 | 2032.2 | 2024.7 | 60 | 67.5 |
| **91-004** | 11/14/1991 | 508940.72 | 1821200.75 | 2042.7 | 40 | 2031.7 | 2025.7 | 11 | 17 |
| **91-005** | 11/14/1991 | 508681.33 | 1821593.59 | 2026.7 | 37 | No Hagel Bed | | No Hagel Bed | |
| **91-006** | 11/14/1991 | 508551.50 | 1821217.25 | 2060.1 | 60 | 2035.1 | 2027.1 | 25 | 33 |
| **91-007** | 11/14/1991 | 508557.34 | 1820628.25 | 2099.6 | 100 | 2032.6 | 2024.6 | 67 | 75 |
| **91-008** | 11/14/1991 | 508548.47 | 1819931.00 | 2062 | 60 | 2030.5 | 2022.0 | 31.5 | 40 |
| **91-009** | 11/14/1991 | 508068.03 | 1819879.50 | 2080.7 | 80 | 2033.2 | 2024.7 | 47.5 | 56 |
| **91-010** | 11/14/1991 | 508189.44 | 1820620.00 | 2101.1 | 100 | 2036.1 | 2028.1 | 65 | 73 |
| **91-011** | 11/14/1991 | 508151.81 | 1821187.50 | 2084.9 | 80 | 2034.9 | 2027.4 | 50 | 57.5 |
| **91-012** | 11/14/1991 | 507891.46 | 1821695.71 | 2048.4 | 120 | No Hagel Bed | | No Hagel Bed | |
| **91-013** | 10/21/1992 | 507786.25 | 1821149.25 | 2102.5* | 100 | 2044 | 2036 | 58.5 | 66.5 |
| **91-014** | 10/21/1992 | 507779.50 | 1820611.12 | 2094.5* | 80 | 2045.5 | 2037 | 49.0 | 57.5 |
| **91-015** | 10/21/1992 | 507747.19 | 1819948.75 | 2080* | 80 | 2042 | 2034 | 38.0 | 46.0 |
| **91-016** | 11/14/1991 | 507380.32 | 1820038.49 | 2051 | 60 | No Hagel Bed | | No Hagel Bed | |
| **91-017** | 11/14/1991 | 507368.38 | 1821135.38 | 2086.9 | 80 | 2049.4 | 2041.9 | 37.5 | 45 |
| **91-018** | 11/14/1991 | 507422.97 | 1821656.10 | 2037.5 | 60 | No Hagel Bed | | No Hagel Bed | |
| **91-019** | 11/14/1991 | 507110.50 | 1821703.71 | 2037.3 | 60 | No Hagel Bed | | No Hagel Bed | |
| **91-020** | 11/14/1991 | 506666.07 | 1821928.85 | 2048.7 | 60 | No Hagel Bed | | No Hagel Bed | |
| **91-021** | 11/14/1991 | 506626.62 | 1821107.75 | 2098.8 | 80 | 2057.8 | 2049.8 | 41 | 49 |
| **91-022** | 11/14/1991 | 507030.44 | 1821126.50 | 2090.9 | 80 | 2049.4 | 2041.9 | 41.5 | 49 |
| **91-023** | 11/14/1991 | 507380.62 | 1820596.50 | 2090.4 | 80 | 2052.4 | 2044.4 | 38 | 46 |
| **91-024** | 11/14/1991 | 507010.62 | 1820595.25 | 2090.9 | 80 | 2048.4 | 2040.4 | 42.5 | 50.5 |
| **91-025** | 11/14/1991 | 506640.69 | 1820587.88 | 2077.8 | 120 | 2051.8 | 2043.8 | 26 | 34 |
| **91-026** | 11/14/1991 | 506973.94 | 1820052.75 | 2070.2 | 60 | 2048.7 | 2041.7 | 21.5 | 28.5 |
| **91-027** | 11/14/1991 | 506615.33 | 1820044.31 | 2044.6 | 60 | No Hagel Bed | | No Hagel Bed | |
| **91-028** | 11/14/1991 | 506864.62 | 1819649.50 | 2062.2 | 60 | 2047.2 | 2039.7 | 15.0 | 22.5 |
| **91-029** | 11/14/1991 | 508276.38 | 1819592.88 | 2058.2 | 60 | 2029.2 | 2022.2 | 29 | 36 |
| **91-030** | 11/14/1991 | 507787.58 | 1819538.76 | 2057.8 | 100 | No Hagel Bed | | No Hagel Bed | |
| **91-031** | 11/14/1991 | 507395.78 | 1820326.62 | 2067.3 | 60 | 2049.8 | 2043.8 | 17.5 | 23.5 |
| **91-32** | 10/9/1991 | 509198.81 | 1820672.62 | 2103.0 | 98.5 | 2032.7 | 2025.0 | 70.3 | 78 |
| **91-33** | 10/10/1991 | 508168.78 | 1820623.38 | 2102.3 | 77 | 2033.8 | 2029.3 | 68.5 | 73 |
| **91-34** | 10/12/1991 | 506622.28 | 1820991.75 | 2109.5 | 111.5 | 2056.5 | 2049.5 | 53 | 60 |
| **92-1** | 8/20/1992 | 506927.38 | 1816927.88 | 2109.1 | 202.0 | No Hagel Bed | | No Hagel Bed | |
| **92-2** | 8/13/1992 | 501857.00 | 1816674.12 | 2031.8 | 165.0 | No Hagel Bed | | No Hagel Bed | |
| **92-3** | 8/13/1992 | 501315.78 | 1820086.00 | 1990.5 | 91.5 | No Hagel Bed | | No Hagel Bed | |
| **92-4** | 8/6/1992 | 503234.38 | 1823393.50 | 2026.8 | 127 | No Hagel Bed | | No Hagel Bed | |
| **92-5** | 8/10/1992 | 511831.81 | 1818933.62 | 2006.5 | 96.0 | No Hagel Bed | | No Hagel Bed | |
| **92-6** | 8/10/1992 | 507654.90 | 1819095.50 | 2012.0 | 115.5 | No Hagel Bed | | No Hagel Bed | |
| **92-7** | 8/24/1992 | 508149.83 | 1820594.93 | 2104.5 | 248.0 | No Hagel Bed | | No Hagel Bed | |
| **92-8** | 9/12/1992 | 508855.12 | 1820214.72 | 2065.2 | 61.0 | No Survey | 2027.2 | No Survey | 38 |
| **92-9** | 9/12/1992 | 510459.47 | 1817072.00 | 2096.3 | 97.0 | No Survey | 2021.3 | No Survey | 75 |
| **92-10** | 9/9/1992 | 510656.97 | 1817071.38 | 2044.1 | 60.0 | No Hagel Bed | | No Hagel Bed | |
| **92-11** | 8/31/1992 | 510858.69 | 1817063.75 | 2092.3 | 77.0 | 2035.3 | 2026.3 | 57 | 66 |
| **92-12** | 9/3/1992 | 511117.12 | 1817053.75 | 2087.3 | 75.0 | 2028.3 | 2022.8 | 59 | 64.5 |
| **92-13** | 9/8/1992 | 511278.12 | 1817046.38 | 2009.1 | 61.0 | No Hagel Bed | | No Hagel Bed | |
| **92-14** | 9/2/1992 | 511489.88 | 1817042.38 | 2092.8 | 77.0 | 2029.8 | 2020.8 | 63 | 72 |
| **92-15** | 9/3/1992 | 511722.56 | 1817038.00 | 2079.3 | 58.0 | 2031.3 | 2026.3 | 48 | 53 |
| **95-01** | 1995 | 509873.76 | 1820557.24 | 2072.31 | 42.5 | 2036.8 | 2031.3 | 35.51 | 41.01 |

# Table 1
## Summary of Borings
## Minnkota Power Cooperative, Inc.

| Boring Number | Date Completed | Coordinates (State Plane NAD27) | | Ground Surface Elevation (ft. MSL) | Total Depth (ft) | Hagel Bed Elevation (ft MSL) | | Hagel Bed Depth (ft) | |
|---|---|---|---|---|---|---|---|---|---|
| | | Northing | Easting | | | Top | Base | Top | Base |
| **95-02** | 1995 | 509678.18 | 1820561.82 | 2072.12 | 42 | 2038.6 | 2032.1 | 33.52 | 40.02 |
| **95-03** | 1995 | 510126.05 | 1820938.64 | 2071.16 | 50 | No Hagel Bed | | No Hagel Bed | |
| **95-04** | 1995 | 510120.77 | 1820294.02 | 2070.71 | 44 | 2031.7 | 2027.7 | 39.01 | 43.01 |
| **95-05** | 1995 | 509058.97 | 1820605.21 | 2094.77 | 70 | 2032.8 | 2025.8 | 61.97 | 68.97 |
| **95-06** | 1995 | 508586.99 | 1820264.86 | 2081.16 | 57.5 | 2034.7 | 2025.2 | 46.46 | 55.96 |
| **95-07** | 1995 | 509192.87 | 1820403.07 | 2083.41 | 59 | 2035.4 | 2026.4 | 48.01 | 57.01 |
| **95-08** | 1995 | 508983.93 | 1821003.45 | 2065.83 | 42 | 2033.8 | 2025.8 | 32.03 | 40.03 |
| **95-09** | 1995 | 509138.76 | 1819706.18 | 2031.42 | 25 | No Hagel Bed | | No Hagel Bed | |
| **95-10** | 1995 | 509391.67 | 1820884.48 | 2077.67 | 53 | 2035.9 | 2026.5 | 41.77 | 51.17 |
| **95-11** | 1995 | 509407.58 | 1820204.51 | 2070.17 | 41 | 2038.5 | 2030.7 | 31.67 | 39.47 |
| **SB99-1** | 1/19/1999 | 512141.58 | 1821256.15 | 2093.40 | 63 | 2031.4 | No Survey | 62.00 | No Survey |
| **SB99-2** | 1/20/1999 | 512290.19 | 1821125.59 | 2104.40 | 66 | 2040.4 | No Survey | 64.00 | No Survey |
| **SB99-3** | 1/21/1999 | 512620.05 | 1820854.06 | 2059.10 | 22 | 2037.6 | No Survey | 21.50 | No Survey |
| **SB99-4** | 1/21/1999 | 511964.50 | 1821528.37 | 2086.60 | 44 | 2043.1 | No Survey | 43.50 | No Survey |
| **SB99-5** | 1/22/1999 | 508706.74 | 1820941.09 | 2063.30 | 27 | 2037.3 | No Survey | 26.00 | No Survey |
| **SB99-6** | 1/21/1999 | 508537.99 | 1821081.37 | 2093.90 | 52 | 2042.4 | No Survey | 51.50 | No Survey |
| **SB99-7** | 1/22/1999 | 508494.24 | 1821368.17 | 2099.60 | 60 | 2041.1 | No Survey | 58.50 | No Survey |
| **SB99-8** | 1/22/2009 | 512407.13 | 1821101.20 | 2075.90 | 42 | 2037.9 | No Survey | 38.00 | No Survey |
| **SB99-9** | 1/25/1999 | 512506.16 | 1820988.09 | 2107.20 | 72 | 2047.7 | No Survey | 59.50 | No Survey |
| **SB99-10** | 1/26/1999 | 512727.69 | 1820766.56 | 2086.60 | 52 | 2035.1 | No Survey | 51.50 | No Survey |
| **SB99-11** | 1/26/1999 | 512718.42 | 1820682.10 | 2086.00 | 47 | 2040.0 | No Survey | 46.00 | No Survey |
| **SB99-12** | 1/22/1999 | 512537.41 | 1820705.45 | 2057.20 | 9 | No Hagel Bed | | No Hagel Bed | |
| **SB2000-A** | 11/8/2000 | 508864.38 | 1820405.67 | 2053.70 | 62 | 2032.7 | 2024.7 | 21.00 | 29.00 |
| **SB2000-B** | 11/8/2000 | 508847.71 | 1820836.92 | 2059.80 | 62 | 2036.3 | 2028.3 | 23.50 | 31.50 |
| **SB2000-C** | 11/9/2000 | 508862.39 | 1821350.55 | 2067.50 | 62 | 2035.5 | 2028.0 | 32.00 | 39.50 |
| **SB2000-D** | 11/10/2000 | 508676.18 | 1820440.40 | 2057.20 | 62 | 2037.2 | 2025.7 | 20.00 | 31.50 |
| **SB2000-E** | 11/10/2000 | 508662.29 | 1820755.67 | 2053.40 | 62 | 2040.4 | 2032.4 | 13.00 | 21.00 |
| **SB2000-F** | 11/9/2000 | 508639.38 | 1821384.15 | 2062.90 | 62 | 2039.9 | 2031.4 | 23.00 | 31.50 |
| **SB2000-G** | 11/11/2000 | 508472.02 | 1820317.48 | 2058.60 | 62 | 2040.1 | 2032.1 | 18.50 | 26.50 |
| **SB2000-H** | 11/10/2000 | 508485.21 | 1820810.54 | 2055.60 | 62 | 2042.1 | 2035.1 | 13.50 | 20.50 |
| **SB2000-I** | 11/9/2000 | 508449.10 | 1821341.79 | 2065.20 | 62 | 2043.2 | 2033.7 | 22.00 | 31.50 |
| **SB2000-J** | 11/11/2000 | 508527.57 | 1821045.95 | 2056.70 | 15 | 2042.7 | No Survey | 14.00 | No Survey |
| **SB2000-K** | 11/11/2000 | 508528.27 | 1820541.79 | 2055.50 | 15 | 2040.5 | No Survey | 15.00 | No Survey |
| **09-001** | 8/17/2009 | 507447.97 | 1820087.38 | 2055.0 | 63.0 | No Hagel Bed | | No Hagel Bed | |
| **09-002** | 8/18/2009 | 507445.87 | 1821222.98 | 2072.0 | 69.0 | 2051 | 2043 | 21 | 29 |
| **09-003** | 8/19/2009 | 507074.24 | 1820110.25 | 2057.5 | 65.0 | 2051.5 | 2043.5 | 6 | 14 |
| **09-004** | 8/20/2009 | 507056.92 | 1821229.57 | 2083.0 | 80.0 | 2053 | 2046 | 30 | 37 |
| **09-005** | 8/19/2009 | 507238.07 | 1820591.54 | 2070.0 | 65.0 | 2052 | 2044 | 18 | 26 |
| **11-001** | 10/17/2011 | 506585.28 | 1820595.16 | 2079.0 | 58.0 | 2051.4 | 2043.6 | 27.6 | 35.4 |
| **11-002** | 10/17/2011 | 506287.42 | 1819931.83 | 2033.5 | 26.0 | No Hagel Bed | | No Hagel Bed | |
| **11-003** | 10/18/2011 | 506293.64 | 1821244.76 | 2095.0 | 74.5 | 2060.9 | 2052.4 | 34.1 | 42.6 |
| **11-004** | 10/20/2011 | 505818.57 | 1819978.35 | 2050.0 | 31.0 | No Hagel Bed | | No Hagel Bed | |
| **11-005** | 10/19/2011 | 505807.46 | 1821231.99 | 2078.5 | 57.5 | 2064.3 | 2057.5 | 14.2 | 21.0 |
| **11-006** | 10/19/2011 | 505618.22 | 1820652.74 | 2071.0 | 50.5 | 2055.4 | 2048.8 | 15.6 | 22.2 |
| **11-007** | 10/20/2011 | 505353.70 | 1819969.74 | 2059.0 | 40.0 | 2047.4 | 2039.0 | 11.6 | 20.0 |
| **11-008** | 10/19/2011 | 505363.48 | 1821257.01 | 2088.0 | 64.5 | 2061.0 | 2053.5 | 27.0 | 34.5 |
| **11-009** | 10/27/2011 | 504907.15 | 1819973.11 | 2085.0 | 59.5 | 2047.0 | 2038.8 | 38.0 | 46.2 |
| **11-010** | 10/24/2011 | 504931.92 | 1821253.06 | 2116.0 | 94.5 | 2054.0 | 2045.4 | 62.0 | 70.6 |
| **11-011** | 10/27/2011 | 504670.39 | 1820602.49 | 2120.0 | 98.5 | 2048.4 | 2040.0 | 71.6 | 80.0 |
| **11-012** | 10/28/2011 | 504451.39 | 1819956.44 | 2080.0 | 61.0 | 2046.3 | 2038.4 | 33.7 | 41.6 |

# Table 1
# Summary of Borings
# Minnkota Power Cooperative, Inc.

| Boring Number | Date Completed | Coordinates (State Plane NAD27) | | Ground Surface Elevation (ft. MSL) | Total Depth (ft) | Hagel Bed Elevation (ft MSL) | | Hagel Bed Depth (ft) | |
|---|---|---|---|---|---|---|---|---|---|
| | | Northing | Easting | | | Top | Base | Top | Base |
| **11-013** | 10/26/2011 | 504487.94 | 1821278.08 | 2131.5 | 106.0 | 2045.1 | 2036.8 | 86.4 | 94.7 |
| **11-014** | 10/17/2011 | 506286.03 | 1819420.80 | 2024.0 | 26.0 | No Hagel Bed | | No Hagel Bed | |
| **11-015** | 10/14/2011 | 505124.39 | 1819484.84 | 2038.0 | 26.0 | No Hagel Bed | | No Hagel Bed | |
| **11-016** | 10/14/2011 | 504066.62 | 1819491.68 | 2074.0 | 54.5 | 2033.6 | 2026.3 | 40.4 | 47.7 |
| **11-017** | 10/13/2011 | 504049.45 | 1820700.66 | 2120.0 | 95.4 | 2033.2 | 2024.9 | 86.8 | 95.1 |
| **11-018** | 10/12/2011 | 503997.97 | 1821680.79 | 2135.0 | 110.0 | 2049.5 | 2041.5 | 85.5 | 93.5 |
| **11-019** | 10/11/2011 | 505165.30 | 1821658.22 | 2115.0 | 90.5 | 2061.0 | 2054.5 | 54.0 | 60.5 |
| **11-020** | 10/6/2011 | 506035.03 | 1821608.00 | 2113.5 | 89.5 | 2067.3 | 2059.5 | 46.2 | 54.0 |

* Surface elevation estimated from topographical map

ft MSL = feet above Mean Sea Level

**Table 2**
**Summary of Monitoring Well Construction Details**
**Minnkota Power Cooperative, Inc.**

| Well | Elevation Measuring Point | Northing | Easting | Total Depth | Ground Surface Elevation | Base of Grout Seal | Top of Screen | Bottom of Screen | Bottom of Hole | Monitored Zone | Avg Water Level | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 91-34A | 2111.74 | 507227.9 | 1821382.4 | 110 | 2109.8 | 2013.8 | 2009.8 | 1999.8 | 1999.8 | -- | Dry | |
| 91-34B | 2111.32 | 507227.9 | 1821367.1 | 78.5 | 2109.5 | 2043.5 | 2041.0 | 2031.0 | 2031.0 | B | 2036 | |
| 91-34C | 2110.91 | 507227.5 | 1821374.1 | 60 | 2109.2 | 2061.7 | 2059.2 | 2049.2 | 2049.2 | H | Dry | |
| 92-1 | 2110.35 | 507236.0 | 1821343.0 | 235 | 2108.4 | 1910.4 | 1903.4 | 1873.4 | 1873.4 | WTA | 1901 | |
| **92-2A** | 2034.10 | 507613.71 | 182193.91 | 163.8 | 2032.99 | 1903.8 | 1899.2 | 1868.0 | 1868.0 | WTA | 1900 | Former gnd 2031.8 |
| **92-3** | 1992.84 | 509281.26 | 1821900.83 | 153 | 1991.34 | 1858.8 | 1847.8 | 1837.8 | 1837.8 | WTA | 1900 | |
| **92-5A** | 2007.93 | 509305.06 | 1819073.52 | 185.5 | 2007.93 | 1839.1 | 1830.6 | 1820.6 | 1820.6 | WTA | 1917 | Former gnd 2006.1 |
| **92-6A** | 2014.93 | 507623.28 | 1819078.63 | 152.7 | 2013.89 | 1898.9 | 1870.2 | 1860.2 | 1860.2 | WTA | 1919 | Former gnd 2012.9 |
| **95-4** | 1992.41 | 508898.42 | 1821963.02 | 151 | 1994.1 | 1868.0 | 1859.0 | 1849.0 | 1843.0 | WTA | 1900 | New TOC 1994.10? |
| **97-1** | 2090.13 | 509196.44 | 1821216.21 | 69 | 2089.13 | 2033.6 | 2033.1 | 2023.1 | 2023.1 | H | 2030 | |
| **2001-01R** | 2105.13 | 509359.4 | 1820098.5 | 77 | 2101.98 | 2038 | 2035 | 2025 | 2025 | H | Dry | |
| **2006-08-01R** | 2096.16 | 507812.74 | 1819673.85 | 56 | 2093.08 | 2052 | 2050 | 2040 | 2040 | H | Dry | |
| **2006-08-04R** | 2094.33 | 507756.26 | 1821501.62 | 53 | 2096.02 | 2058 | 2056 | 2046 | 2046 | H | Dry | |

Notes
1. Screens packed with silica sand.
2. Grout seal extends to ground surface.
3. Screens and riser pipes 2-inch PVC.
4. Hole diameter 5-1/8-inch.
5. All Elevations are ft MSL.

WTA-Water Table Aquifer
H – Hagel Bed
-- – Data missing

B – “blue” sandstone

Table 3
Summary of Cell 4,5, and 6 Soil Testing

| Sample Location | Classification | GRAVEL (>#4) | SAND (#4- %) | SILT (#200- %) | CLAY (<0.002mm) | P200 (<#200) | Liquid Limit, LL [%] | Plastic Limit, PL [%] | Plasticity Index, PI [%] | Permeability (cm/s) | Permeability, Remolded (cm/s) | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **OUTWASH** | | | | | | | | | | | | |
| 11-015, 2-5 ft | SILTY SAND (SM) - outwash | 0.0 | 76.8 | | | 23.2 | | | | | | INTACT SAMPLE |
| 11-016, 9-31 ft | SILTY SAND (SM) - outwash | | | | | | | | | 2.40E-04 | | INTACT SAMPLE |
| **Till** | | | | | | | | | | | | |
| Cell 5 Comp 1 | LEAN CLAY (CL) | 0.6 | 28.5 | 51.9 | 19.0 | 70.9 | 50 | 15 | 35 | | | |
| Cell 6 Comp 1 | LEAN CLAY (CL) | 1.5 | 27.6 | | | 70.9 | 43 | 15 | 28 | | | |
| Cell 6 Comp 2 | SANDY LEAN CLAY (CL) | 0.9 | 58 | | | 41.1 | | | | | 7.40E-07 | |
| 11-015, 5-24 ft | FAT CLAY (CH) | 0.4 | 1.7 | | | 97.9 | | | | | | INTACT SAMPLE |
| 11-016, 4-36 ft | LEAN CLAY (CL) | 0.2 | 1.3 | | | 98.5 | | | | 2.80E-09 | | INTACT SAMPLE |
| 11-017, 1-16 ft | LEAN CLAY (CL) | | | | | | | | | 7.40E-08 | | INTACT SAMPLE |
| 11-019, 0-34 ft | SANDY LEAN CLAY (CL) | 2.9 | 32.4 | | | 64.7 | | | | 1.10E-08 | | INTACT SAMPLE |
| **Silty shale A2** | | | | | | | | | | | | |
| 11-018, 43-59 ft | FAT CLAY (CH) | 0.2 | 11 | 84.8 | 4 | 88.8 | 75 | 19 | 56 | 3.60E-08 | | INTACT SAMPLE |
| 11-017, 43-49 ft | SANDY SILT (ML) | 0.0 | 32.2 | 61.8 | 6 | 67.8 | 34 | 27 | 7 | | | INTACT SAMPLE |
| **Silty shale A1** | | | | | | | | | | | | |
| 11-020, 19-25 ft | SILT WITH SAND (ML) | 0.0 | 28.3 | | | 71.7 | | | | | | INTACT SAMPLE |
| Cell 6 Comp 4 | FAT CLAY (CH) | 0.0 | 4.3 | 80.7 | 15 | 95.7 | 50 | 18 | 32 | | 3.40E-08 | |
| 11-017, 49-87 ft | | 0.0 | 2.4 | 72.6 | 25 | 97.6 | | | | | | INTACT SAMPLE |
| 11-019, 34-54 ft | FAT CLAY (CH) | 0.0 | 7.2 | 46.3 | 46.5 | 92.8 | 71 | 26 | 45 | | | INTACT SAMPLE |
| **Silty shale B1** | | | | | | | | | | | | |
| Cell 4 Comp 2 | FAT CLAY (CH) | 0.0 | 5.4 | 76.1 | 18.5 | 94.6 | 102 | 19 | 83 | | 3.50E-09 | |
| 11-018, 95-110 ft | FAT CLAY (CH) | 0.0 | 0.1 | 61.9 | 38 | 99.9 | 121 | 22 | 99 | 5.00E-09 | | INTACT SAMPLE |
| 11-019, 73-90 ft | FAT CLAY (CH) | 0.0 | 1.4 | 83.6 | 15 | 98.6 | 78 | 23 | 55 | 8.80E-08 | | INTACT SAMPLE |
| 11-007, 34-40 ft | LEAN CLAY (CL) | 0.0 | 4.9 | 76.1 | 19 | 95.1 | 42 | 23 | 19 | 1.00E-08 | | INTACT SAMPLE |
| 11-020, 54-63 ft | SANDY SILT (ML) | 1.0 | 46.7 | | | 52.3 | | | | 1.20E-08 | | INTACT SAMPLE |
| **Shale A2** | | | | | | | | | | | | |
| Cell 6 Comp 3 | FAT CLAY (CH) | 0 | 1.4 | 60.6 | 38 | 98.6 | 61 | 21 | 40 | | 9.70E-08 | |
| 11-017, 16-43 ft | FAT CLAY (CH) | 0 | 1.3 | 47.7 | 51 | 98.7 | 78 | 24 | 54 | | | INTACT SAMPLE |
| 11-018, 24-42 ft | FAT CLAY WITH SAND (CH) | 3.3 | 15.3 | 39.4 | 42 | 81.4 | 59 | 27 | 32 | | | INTACT SAMPLE |
| 11-020; 7-19 ft | FAT CLAY (CH) | | | | | | | | | 5.10E-08 | | INTACT SAMPLE |
| **Shale A1** | | | | | | | | | | | | |
| Cell 4 Comp 1 | FAT CLAY (CH) | 0.1 | 2.9 | 71 | 26 | 97 | 53 | 17 | 36 | | 6.60E-08 | |
| Cell 5 Comp 2 | FAT CLAY (CH) | 0 | 1.2 | 62.8 | 36 | 98.8 | 52 | 18 | 34 | | | |
| Cell 6 Comp 5 | FAT CLAY (CH) | 0 | 5.1 | 50.4 | 44.5 | 94.9 | 96 | 22 | 74 | | 2.40E-08 | |
| 11-019, 42-44 ft | FAT CLAY (CH) | 0 | 0.7 | 53.3 | 46 | 99.3 | 53 | 24 | 29 | | | INTACT SAMPLE |
| 11-020, 26-46 ft | LEAN CLAY (CL) | 0 | 1.5 | 75.5 | 23 | 98.5 | 48 | 20 | 28 | | | INTACT SAMPLE |
| **Shale B1** | | | | | | | | | | | | |
| Cell 6 Comp 6 | FAT CLAY (CH) | 0 | 0.4 | 56.1 | 43.5 | 99.6 | 71 | 21 | 50 | | 2.20E-08 | |
| 11-019, 61-73 ft | FAT CLAY (CH) | 0 | 0 | 57 | 43 | 100 | 104 | 19 | 85 | | | INTACT SAMPLE |
| **Shale B2** | | | | | | | | | | | | |
| Cell 4 Comp 3 | FAT CLAY (CH) | 0 | 1.2 | 65.8 | 33 | 98.8 | 65 | 17 | 48 | | 9.30E-09 | |
| Cell 5 Comp 3 | FAT CLAY (CH) | 0 | 6.8 | 63.2 | 30 | 93.2 | 63 | 21 | 42 | | 8.40E-08 | |
| Cell 5 Comp 4 | FAT CLAY (CH) | 0 | 1.5 | 88.5 | 10 | 98.5 | 70 | 17 | 53 | | 4.30E-09 | |
| 11-011, 94 ft | FAT CLAY (CH) | | | | | | | | | 1.00E-09 | | INTACT SAMPLE |
| **Shale B3** | | | | | | | | | | | | |
| Cell 5 Comp5 | FAT CLAY (CH) | 0 | 0.5 | 49.5 | 50 | 99.5 | 105 | 18 | 87 | | 2.90E-09 | |
| 11-020, 63-89 ft | FAT CLAY (CH) | 0.0 | 0.1 | 76.9 | 23 | 99.9 | 98 | 20 | 78 | | | INTACT SAMPLE |
| **Till** | **Average** | 1.1 | 24.9 | NA | NA | 74.0 | 46.5 | 15.0 | 31.5 | 2.93E-08 | | |
| | **Max** | 2.9 | 58.0 | NA | NA | 98.5 | 50.0 | 15.0 | 35.0 | 7.40E-08 | | |
| | **Min** | 0.2 | 1.3 | NA | NA | 41.1 | 43.0 | 15.0 | 28.0 | 2.80E-09 | | |
| | **Range** | 2.7 | 56.7 | NA | NA | 57.4 | 7.0 | 0.0 | 7.0 | 7.12E-08 | | |
| | **Geometric Mean** | | | | | | | | | 1.32E-08 | | |
| **Silty Shale** | **Average** | 0.1 | 13.1 | 71.5 | 20.8 | 86.8 | 71.6 | 22.1 | 49.5 | 3.0E-08 | | |
| | **Max** | 1.0 | 46.7 | 84.8 | 46.5 | 99.9 | 121.0 | 27.0 | 99.0 | 8.8E-08 | | |
| | **Min** | 0.0 | 0.1 | 46.3 | 4.0 | 52.3 | 34.0 | 18.0 | 7.0 | 5.0E-09 | | |
| | **Range** | 1.0 | 46.6 | 38.5 | 42.5 | 47.6 | 87.0 | 9.0 | 92.0 | 8.3E-08 | | |
| | **Geometric Mean** | | | | | | | | | 1.8E-08 | | |
| **Shale** | **Average** | 0.2 | 2.7 | 61.2 | 35.9 | 97.1 | 71.7 | 20.4 | 51.3 | 2.6E-08 | | |
| | **Max** | 3.3 | 15.3 | 88.5 | 51.0 | 100.0 | 105.0 | 27.0 | 87.0 | 5.1E-08 | | |
| | **Min** | 0.0 | 0.0 | 39.4 | 10.0 | 81.4 | 48.0 | 17.0 | 28.0 | 1.0E-09 | | |
| | **Range** | 3.3 | 15.3 | 49.1 | 41.0 | 18.6 | 57.0 | 10.0 | 59.0 | 5.00E-08 | | |
| | **Average Above Hagel** | 0.0 | 2.3 | 62.6 | 35.1 | 97.7 | 60.4 | 20.2 | 40.2 | NA | | |
| | **Average Below Hagel** | 0.0 | 1.5 | 65.3 | 33.2 | 98.5 | 82.3 | 19.0 | 63.3 | NA | | |
| | **Geometric Mean Overall** | | | | | | | | | 7.14E-09 | | |
| **Shale and Silty Shale** | **Geometric Mean Overall** | | | | | | | | | 1.50E-08 | | |
| | | **Gravel** | **sand** | **Silt** | **Clay** | **<200** | **LL** | **PL** | **PI** | **Perm** | | |

A1, A2, B1, etc - A1 is the first shale above the Hagel bed, B1, is the first shale below the Hagel bed, etc.

Table 4
Selected Groundwater Elevations

| Well | 92-1 | 91-34A | 91-34B | 91-34C |
|---|---|---|---|---|
| Aquifer | WTA | Unnamed | "B" SS | Hagel |
| Date | | | | |
| 11/26/1991 | -- | Dry | Dry | Dry |
| 12/2/1991 | -- | Dry | 2031.8 | Dry |
| 12/6/1991 | -- | Dry | 2032.9 | Dry |
| 12/30/1991 | -- | 2000.8 | 2037.5 | Dry |
| 1/3/1991 | -- | 2001 | 2038 | Dry |
| 1/9/1991 | -- | 2000.9 | 2038.7 | Dry |
| 9/14/1992 | 1901.18 | -- | -- | -- |
| 11/25/1992 | 1900.2 | -- | -- | -- |
| 5/17/2012 | 1902.6 | Dry | 2041.17 | Dry |
| 7/25/2012 | 1905.33 | Dry | 2040.62 | Dry |

| | |
|---|---|
| WTA | water table aqifer |
| "B" SS | "blue" sandstone |
| Hagel | Hagel lignite bed |

**Table 5**

**Slug Test Data**

| Well No. | Unit | Test Type | K (FT/MIN) | K (CM/SEC) | Geom. Mean K (CM/SEC) |
|---|---|---|---|---|---|
| **91-34B** | Perched - Blue sandstone | Bail down | $7.1 \times 10^{-6}$ | $3.6 \times 10^{-7}$ | NA |
| **92-1** | Water table | Slug Out | $1.0 \times 10^{-6}$ | $5.1 \times 10^{-7}$ | $5.1 \times 10^{-7}$ |
| **92-2A** | Water table | Slug Out<br>Slug In | $8.5 \times 10^{-6}$<br>$5.4 \times 10^{-6}$ | $4.3 \times 10^{-6}$<br>$2.7 \times 10^{-6}$ | $3.4 \times 10^{-6}$ |
| **92-2B** | Perched – lignite below Hagel | Slug In<br>Slug In | $4.3 \times 10^{-6}$<br>$4.0 \times 10^{-6}$ | $2.2 \times 10^{-6}$<br>$2.0 \times 10^{-6}$ | $2.1 \times 10^{-6}$ |
| **92-3** | Water table | Slug In<br>Slug Out | $8.2 \times 10^{-5}$<br>$6.5 \times 10^{-5}$ | $4.2 \times 10^{-5}$<br>$3.3 \times 10^{-5}$ | $3.7 \times 10^{-5}$ |
| **92-4** | Water table | Slug In<br>Slug Out | $7.4 \times 10^{-5}$<br>$2.0 \times 10^{-5}$ | $3.7 \times 10^{-5}$<br>$1.0 \times 10^{-5}$ | $1.9 \times 10^{-5}$ |
| **92-5A** | Water table | Slug In | $4.3 \times 10^{-6}$ | $2.2 \times 10^{-6}$ | $2.2 \times 10^{-6}$ |
| **92-5B** | Perched | NT | -- | -- | -- |
| **92-6A** | Water table | Slug in<br>Slug In | $6.3 \times 10^{-5}$<br>$7.3 \times 10^{-5}$ | $3.2 \times 10^{-5}$<br>$3.7 \times 10^{-5}$ | $3.4 \times 10^{-5}$ |
| **92-6B** | Perched | NT | -- | -- | -- |
| **92-7** | Water table | Slug in<br>Slug Out | $1.2 \times 10^{-4}$<br>$1.0 \times 10^{-4}$ | $6.1 \times 10^{-5}$<br>$5.2 \times 10^{-5}$ | $5.6 \times 10^{-5}$ |

NT = Not tested (insufficient water in well to conduct test).

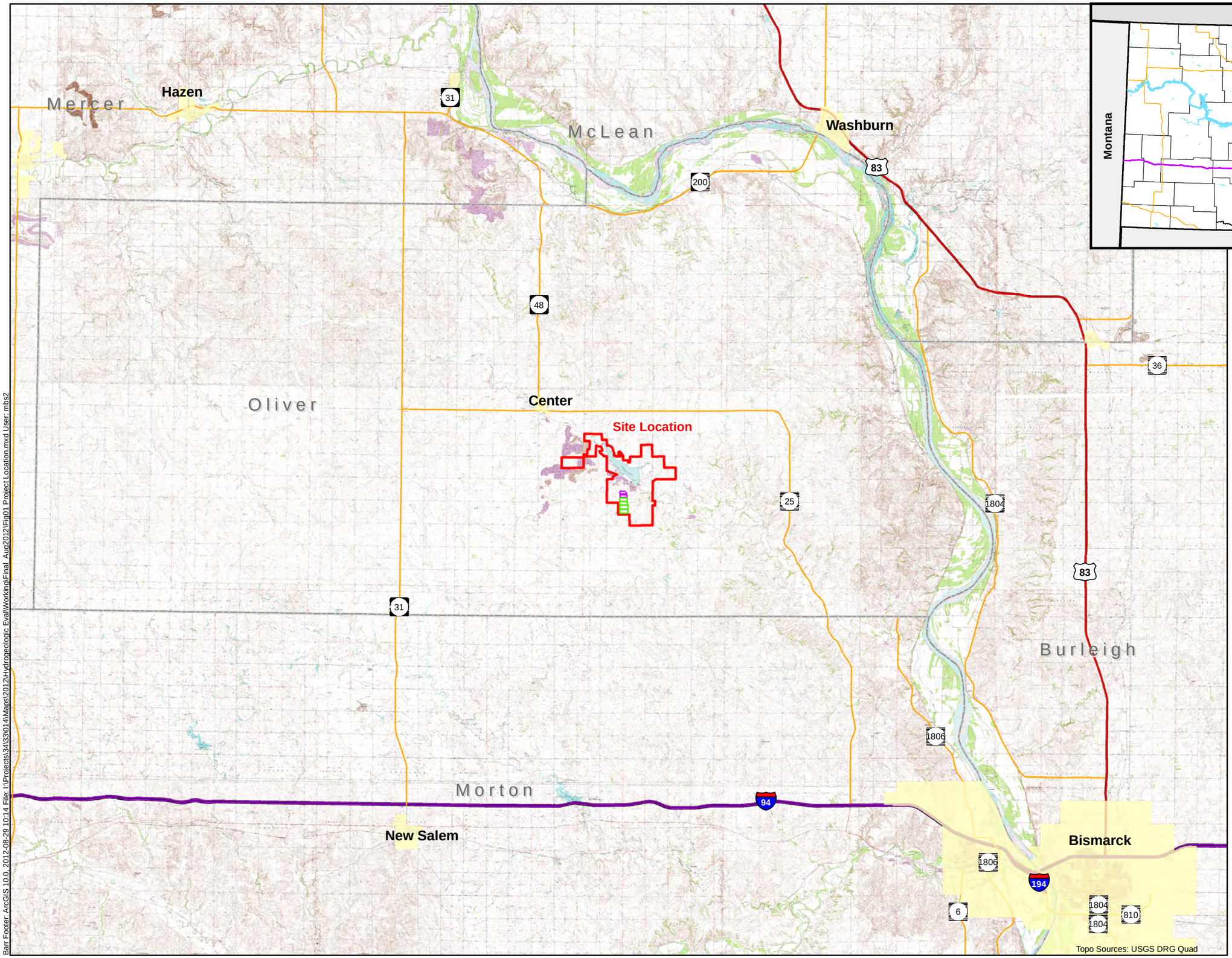
Geometric mean hydraulic conductivity of all water table wells (excludes 92-2B): $K = 1.3 \times 10^{-5}$ cm/sec.

**Table 6**
**Wells Within 2 Miles of Site**

| Well ID | Location | Date | Depth Feet | Diameter | Static Water Level, ft | Information Source | Comment |
|---|---|---|---|---|---|---|---|
| Minnkota A | 141N83W5 AAA | -- | -- | -- | -- | Minnkota | No log |
| Minnkota B | 141N83W4 CCC | 2/25/1975 | 172 | 6-in | 125 | Minnkota | |
| Minnkota C | 141N83W4 CCC | 6/17/1975 | 95 | 4-in | 45 | Minnkota | "to be used for bath rooms" |
| Minnkota D | -- | 6/9/1975 | 190 | 4-in | 160 | Minnkota | "for ready mix plant", abandoned |
| Minnkota E | -- | illegible | 168 | 4-in | 145 | Minnkota | probably 5/25/75, "for ready mix plant", abandoned |
| Minnkota F | -- | 7/1/1974 | 160 | 4-in | 100 | Minnkota | "to be pulled after job completed", abandoned |
| Minnkota G | 142N83W32 CCD | 1958 | 43 | 3-in | 20 | Croft | domestic; likely abandoned |
| Diechert 1 | 141N83W9 CAD | 1954 | 106 | -- | 75 | Croft, BNI | old farm site; not in use as of 8/26/11 |
| Diechert 3 | 141N83W8 CDB | -- | -- | -- | -- | BNI | old windmill base south of house foundation |
| Diechert 4 | 141N83W8 CDB | -- | -- | -- | -- | BNI | destroyed |
| Opp 1 | 141N83W18 CAA | -- | 22.7 | 6 ft | -- | BNI | not in use as of 7/29/11 |
| Schmidt 1 | 141N83W18 ABD | -- | 27 | 24-in | -- | BNI | livestock |
| Schmidt 2 | 141N83W18 ADB | 1953/54 | 200 | 4-in | -- | BNI | domestic water supply |
| Leinuis 1 | 141N83W6 DBB | -- | -- | -- | -- | BNI | |
| Reuther 3 | 141N83W18 BDC | -- | -- | -- | -- | BNI | |
| Reuther 4 | 141N83W18 CDA | -- | -- | -- | -- | BNI | |
| Pazdernick 1 | 141N83W20 AAA | -- | 360 | 2-in | -- | Croft, BNI | Tongue River Formation |
| Duhr 1 | 142N83W30DAD | 1946 | 104 | 6-in | 20 | Croft | domestic and stock; likely abandoned |
| Christman 1 | 142N83W34 CDB | 1957 | 145 | 6-in | 135 | Croft | domestic and stock; likely abandoned |
| Barnhardt 1 | 141N83W5 BBD | -- | -- | 24-in | 21 | Croft | stock, likely abandoned |
| Manny 1 | 141N83W4 DAD | 1965 | -- | 4-in | -- | Croft | domestic and stock; likely abandoned |
| 9423 | 141N83W4 ADD | -- | -- | -- | -- | NDSWC | observation well |
| 9424 | 141N83W4 BC | -- | -- | -- | -- | NDSWC | test well at power station |
| 9425 | 141N83W4 BD | 1967 | -- | -- | -- | Croft, NDSWC | for monitoring Nelson Lake dam? |
| 9426 | 141N83W4 BD | 1967 | -- | -- | -- | Croft, NDSWC | for monitoring Nelson Lake dam? |
| 9427 | 141N83W4 DBD | -- | -- | -- | -- | NDSWC | surface water monitoring point |

Croft - Croft, M. G., 1970, Ground Water Basic Data Mercer and Oliver Counties, North Dakota, North Dakota Geological Survey Bulletin 56 - - Part II.
NDSWC - North Dakota State Water Commission on-line data base accessed July 2012
BNI - BNI Coal Ltd., information gathered 2011

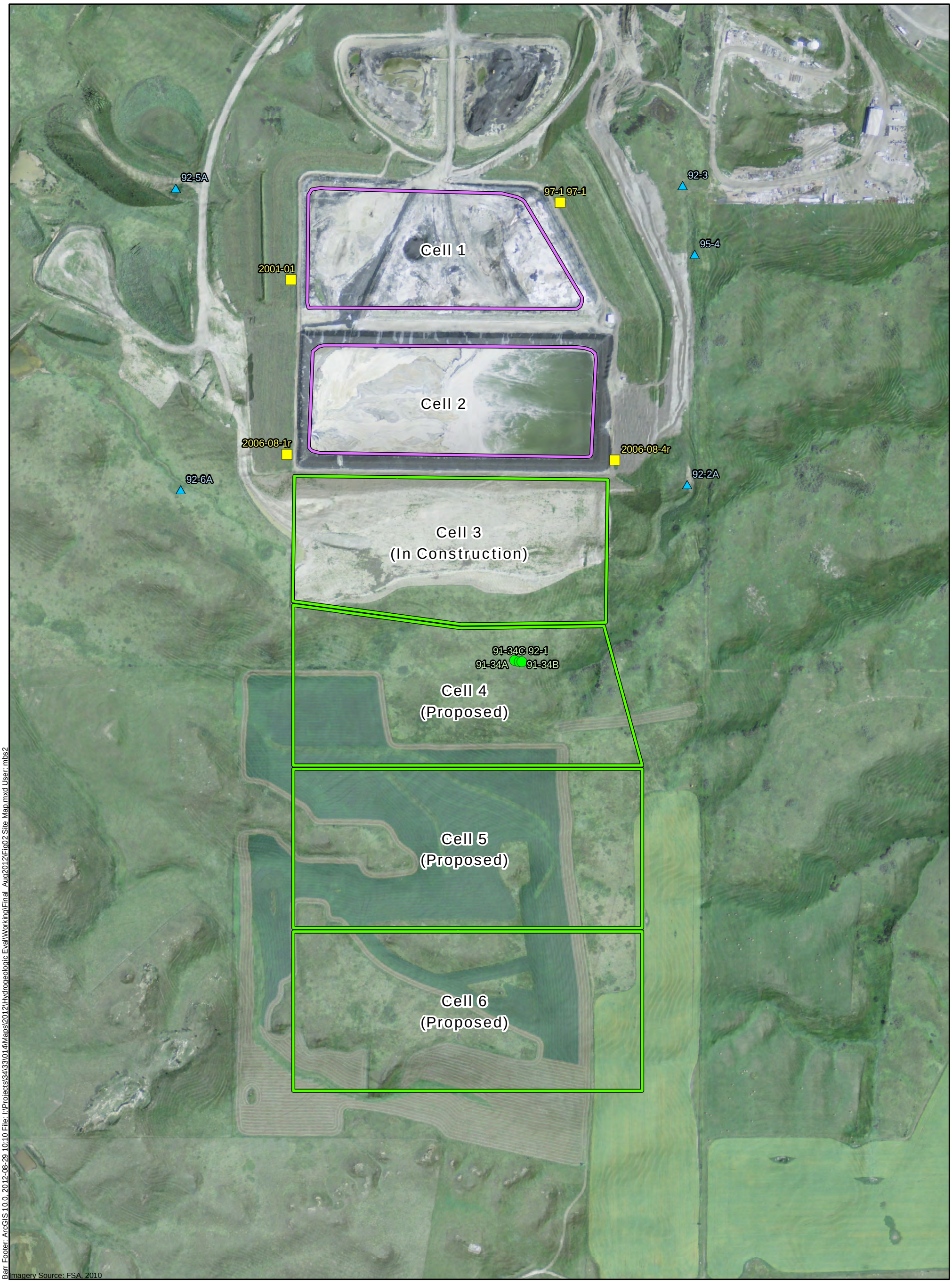
# Figures




Barr Footer: ArcGIS 10.0, 2012-08-29 10:14 File: I:\Projects\3433\014\Maps\2012\Hydrogeologic Eval\Working\Final_Aug2012\Fig01 Project Location.mxd User: mbs2

Figure 1

PROJECT LOCATION
Hydrogeologic Evaluation
Minnkota Power Cooperative, Inc.
Center, North Dakota

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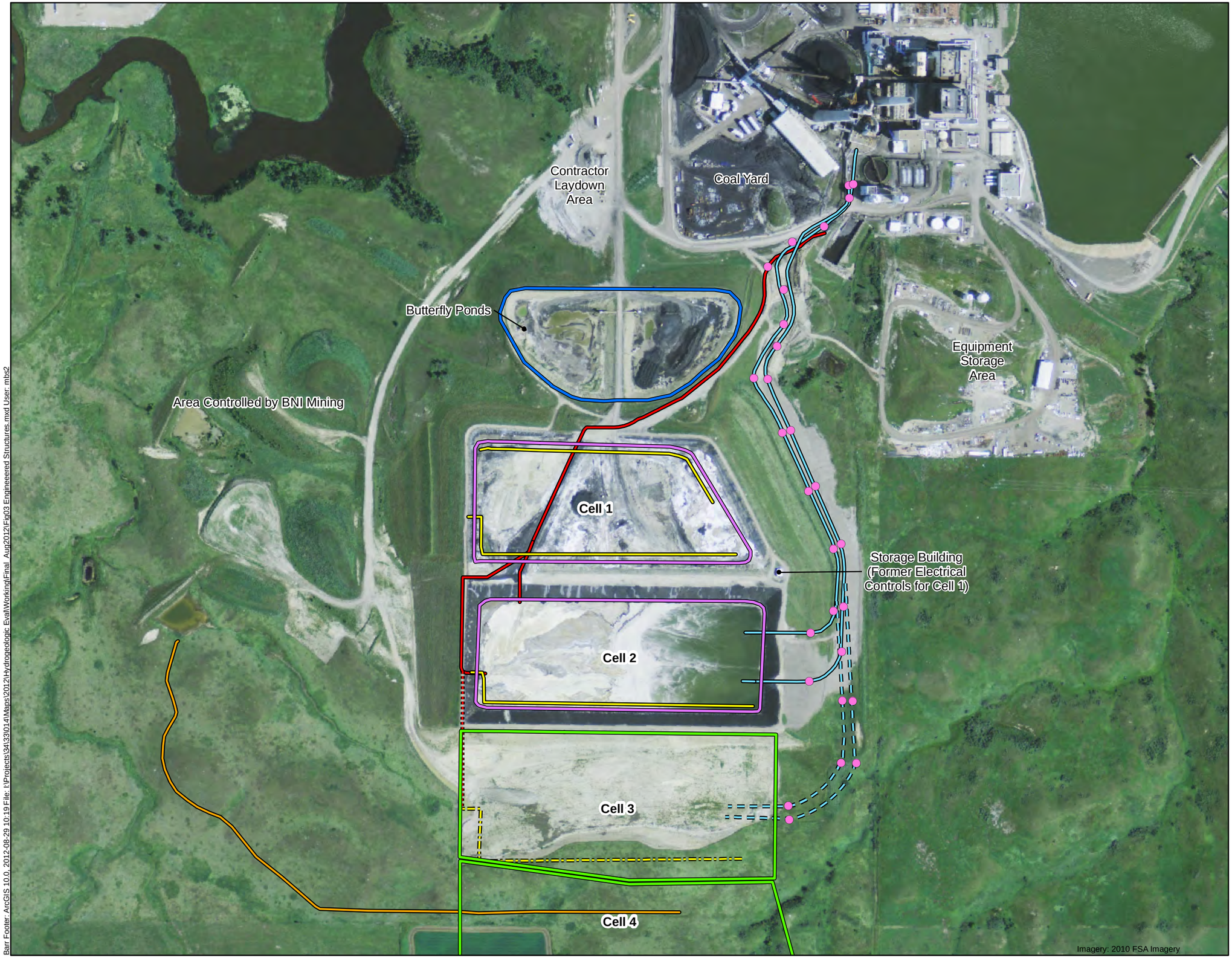
- Site Water Table Monitoring Wells
- Site Hagel Monitoring Wells
- Other Wells
- Approximate Current Cell Location
- Approximate Planned or Proposed Cell Location

Feet
500 250 0 500

Figure 2

SITE MAP
Hydrogeologic Evaluation
Minnkota Power Cooperative, Inc.
Center, North Dakota




Manhole

Gradient Control Pipe (Dashed Where Proposed)

Blowdown Pipe (Dashed Where Proposed)

Water Return Pipe (Dashed Where Proposed)

Ditches

Approximate Current Cell Location

Approximate Planned or Proposed Cell Location

Butterfly Pond

Note: The Gradient Control Pipes from Cells 1 and 2 discharge in Cell 2

N

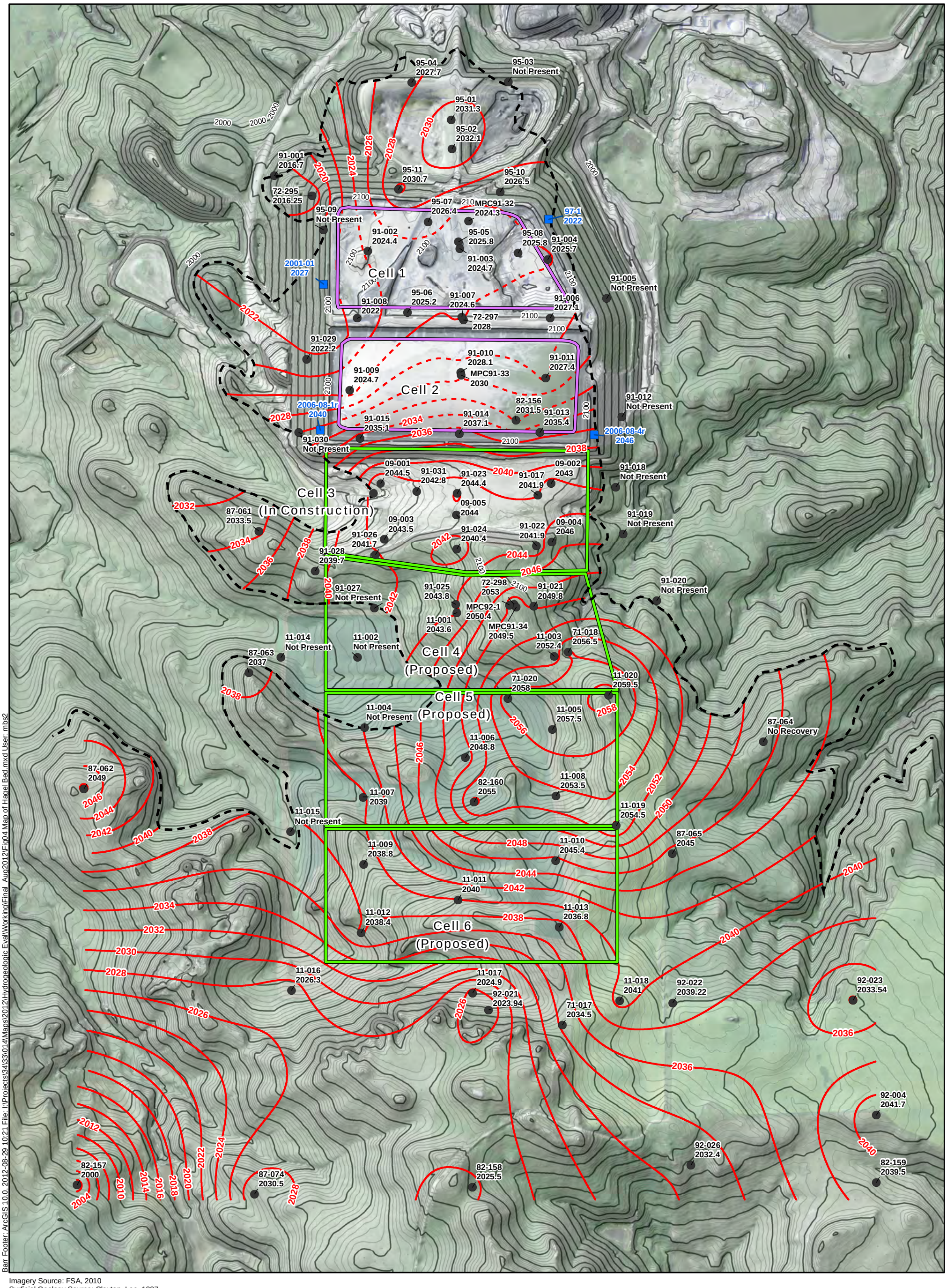
Feet

500 0 500

Figure 3

ENGINEERED STRUCTURES
Hydrogeologic Evaluation
Minnkota Power Cooperative, Inc.
Center, North Dakota

Barr Footer: ArcGIS 10.0, 2012-08-29 10:19 File: I:\Projects\34133\0141\Maps\2012\Hydrogeologic Eval\Working\Final_Aug2012\Fig03 Engineered Structures.mxd User: mbs2




Barr Footer: ArcGIS 10.0, 2012-08-29 10:21 File: I:\Projects\34\33\0114\Maps\2012\Hydrogeologic EvalWorking\Final Aug2012\Fig04 Map of Hagel Bed.mxd User: mbs2

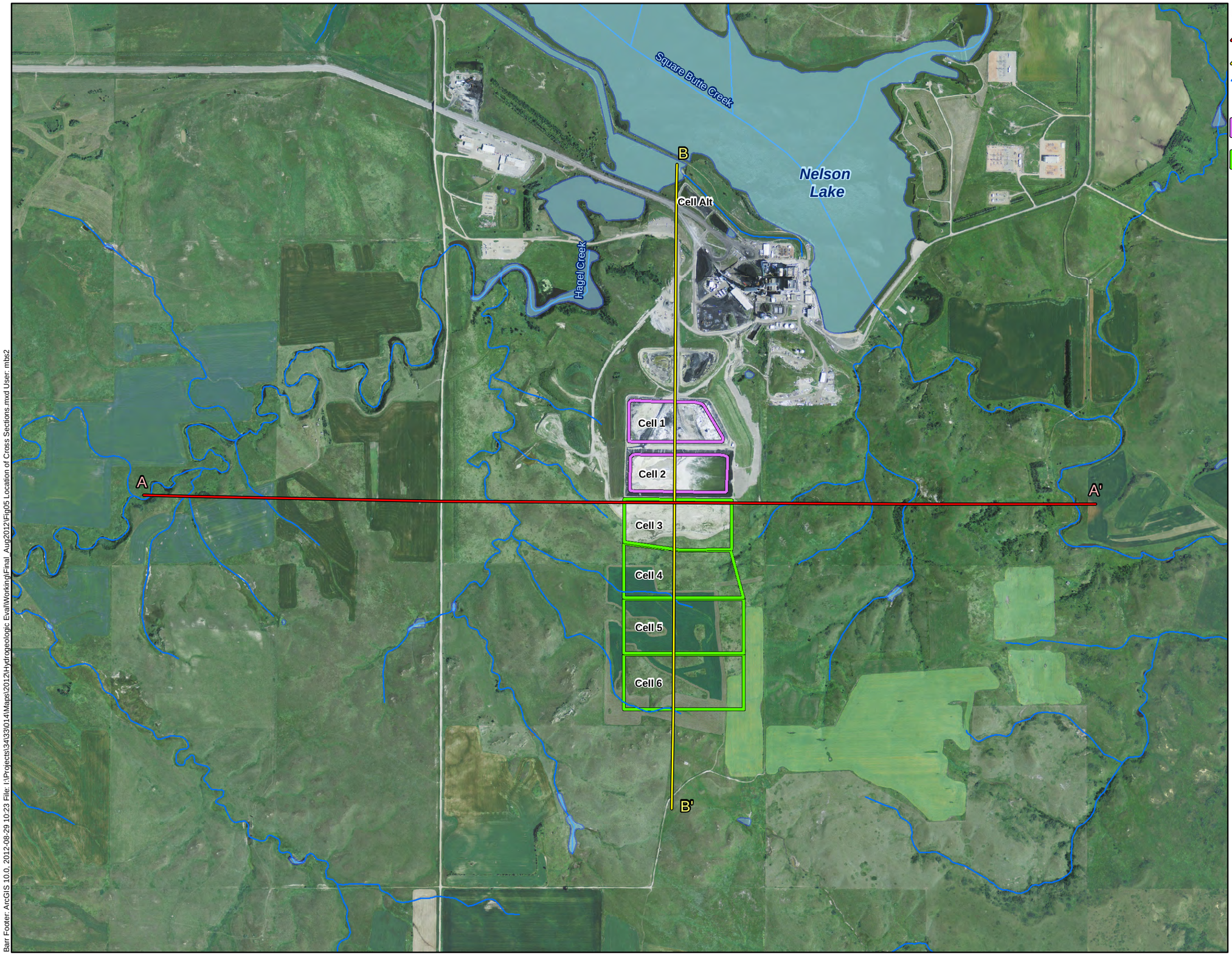
Imagery Source: FSA, 2010
Surficial Geology Source: Clayton, Lee, 1997

- Boring
- Well
- Surface Elevation Contour (2ft Interval)
- Current Base of Hagel Bed Elevation Contour (2 Ft Interval)
- Pre-Mining Base of Hagel Bed Elevation Contour - Now Removed (2 Ft Interval)
- Approximate Limit of Hagel Bed
- Hagel Bed Previously Mined from Cell
- Hagel Bed to Be Mine From Cell (Cell 3 in 2012)

Feet
600 300 0 600

Figure 4

MAP OF HAGEL BED
Hydrogeologic Evaluation
Minnkota Power Cooperative, Inc.
Center, North Dakota




Cross Sections Alignments

- A-A'
- B-B'
- Watercourse (NHD)
- Waterbody (NHD)
- Approximate Current Cell Location
- Approximate Planned or Proposed Cell Location

Data Sources:
Watercourses and Waterbodies acquired USGS National Hydrography Dataset (NHD)
Wetland Locations acquired from USFWS National Wetland Inventory (NWI)

Feet
1,500 0 1,500

Figure 5

LOCATION OF CROSS SECTIONS
Hydrogeologic Evaluation
Minnkota Power Cooperative, Inc.
Center, North Dakota

Barr Footer: ArcGIS 10.0, 2012-08-29 10:23 File: I:\Projects\34133014\Maps\2012\Hydrogeologic Eval\Working\Final_Aug2012\Fig05 Location of Cross Sections.mxd User: mbs2

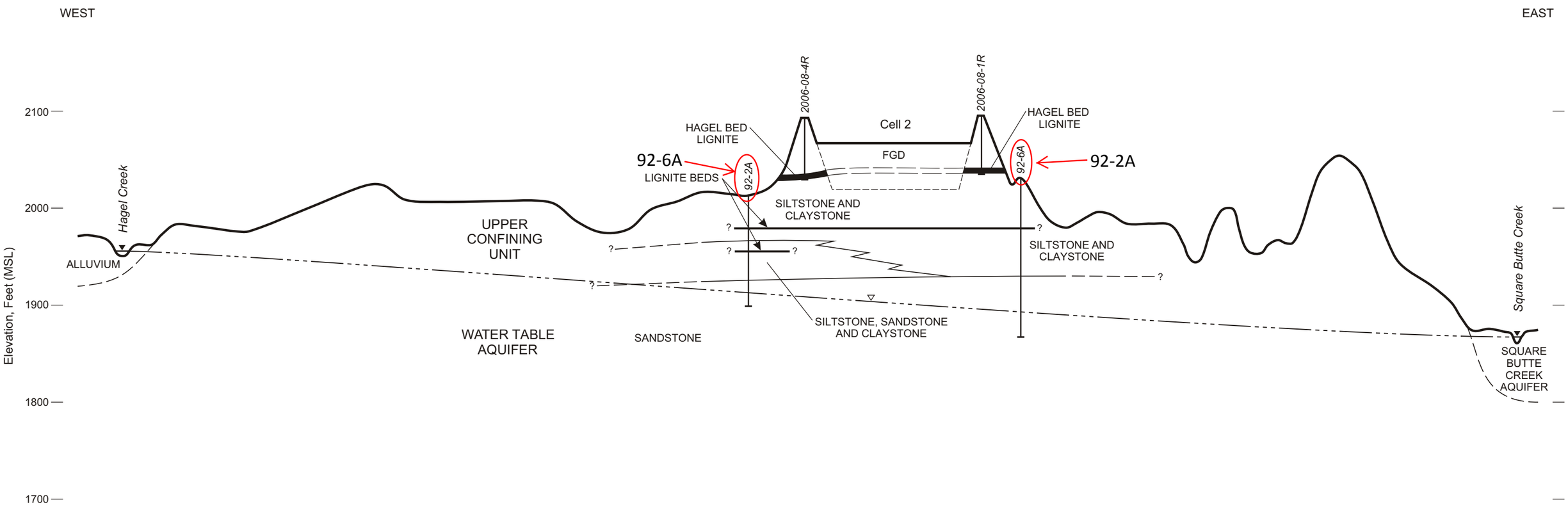



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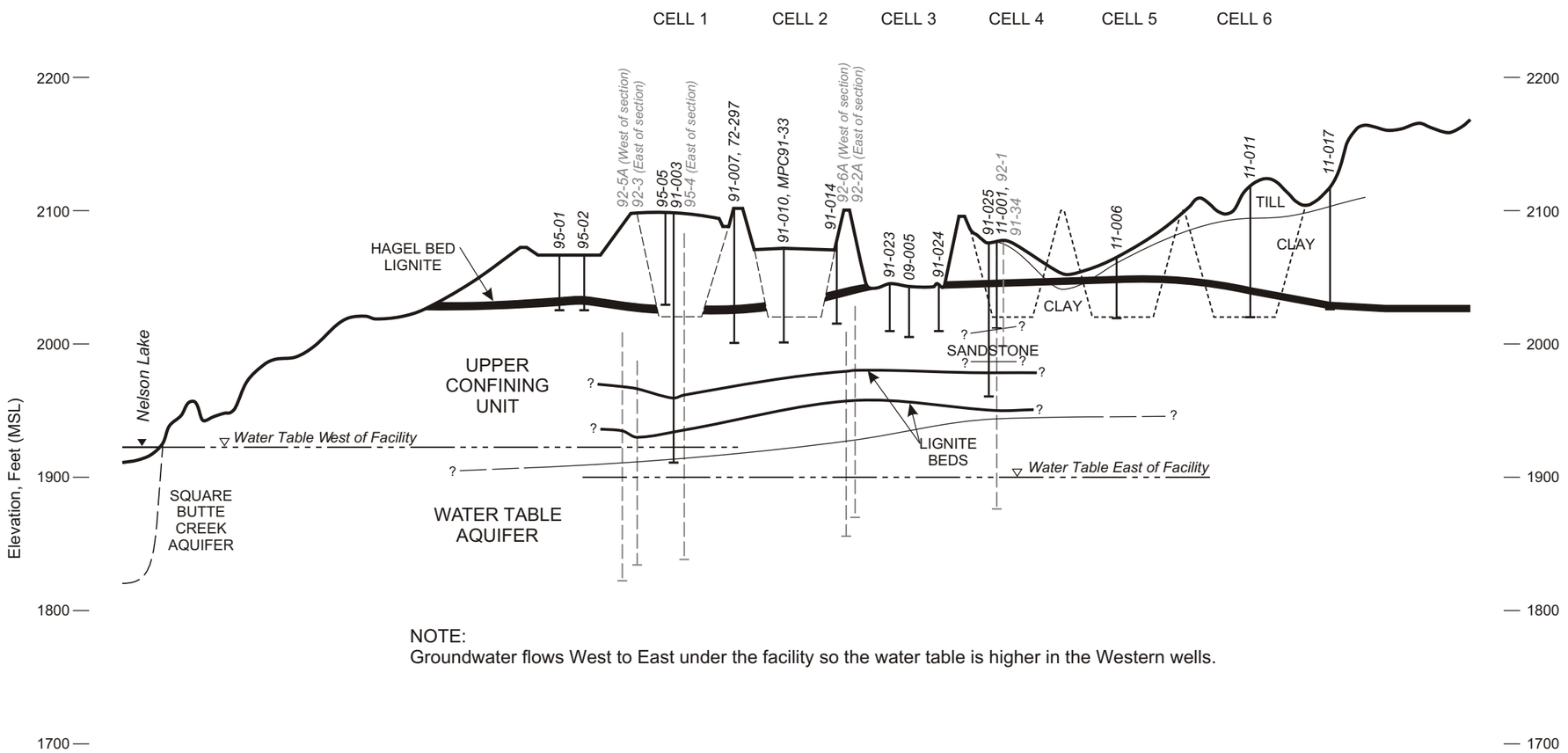
Figure 6

CROSS SECTION A-A'
Minnkota Power Cooperative, Inc.
Milton R. Young Station
FGD Sludge Disposal Site

Revisions made by SFK 7/30/2015

**B**
NORTH

**B'**
SOUTH

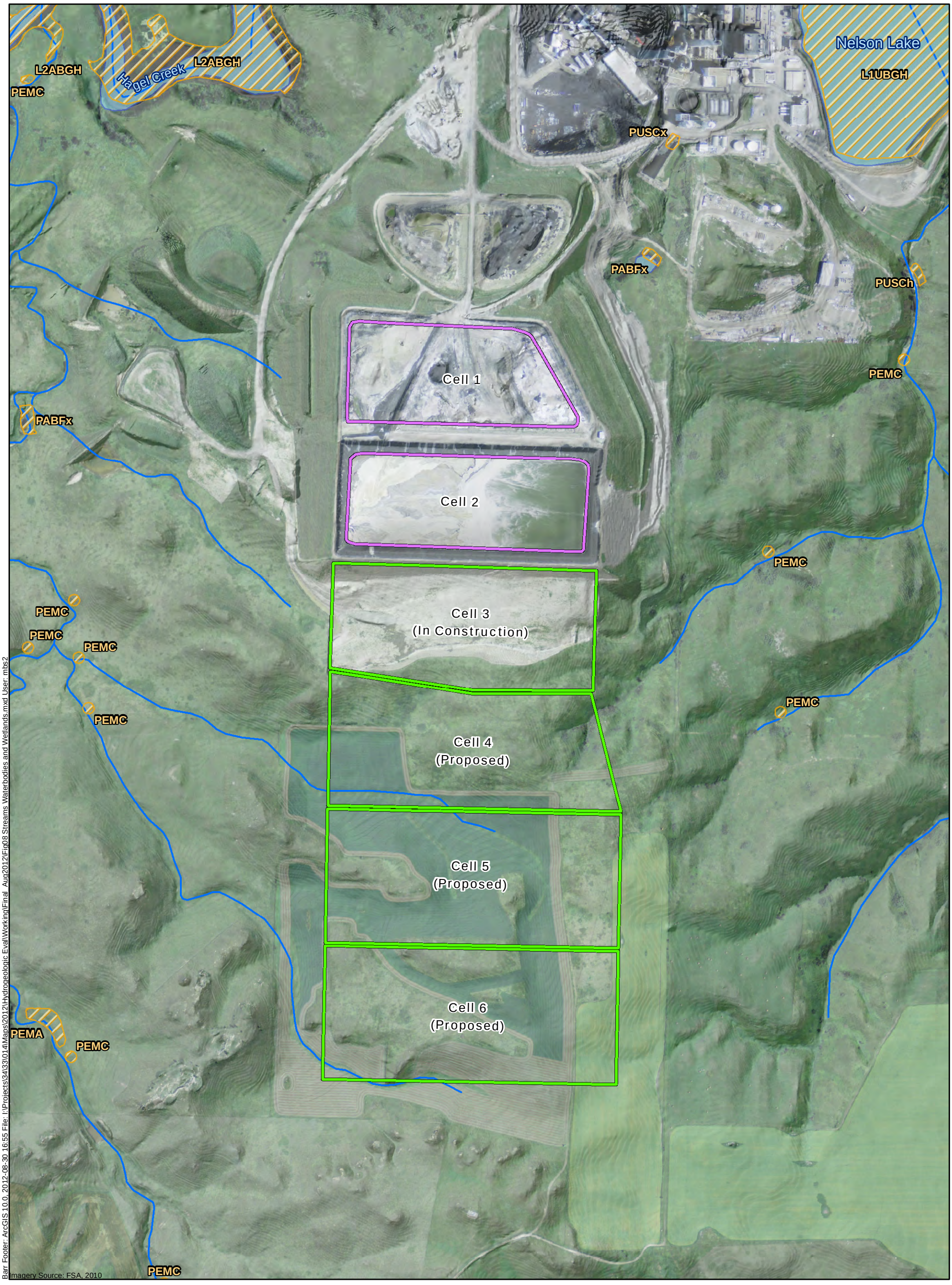



NOTE:
Groundwater flows West to East under the facility so the water table is higher in the Western wells.

P:\Mpls\34 ND\33\34330014LTA\WorkFiles\Figures_Graphics\Cross Section D-D'.CDR RLG 07-16-12

Figure 7

CROSS SECTION B-B'
Minnkota Power Cooperative, Inc.
Milton R. Young Station
FGD Sludge Disposal Site




Barr Footer: ArcGIS 10.0, 2012-08-30 16:55 File: I:\Projects\34\133\014\Maps\2012\Hydrogeologic EvalWorking\Final Aug2012\Fig08 Streams Waterbodies and Wetlands.mxd User: mbs2

- Watercourses
- Waterbody
- Wetland
- Approximate Current Cell Location
- Approximate Planned or Proposed Cell Location

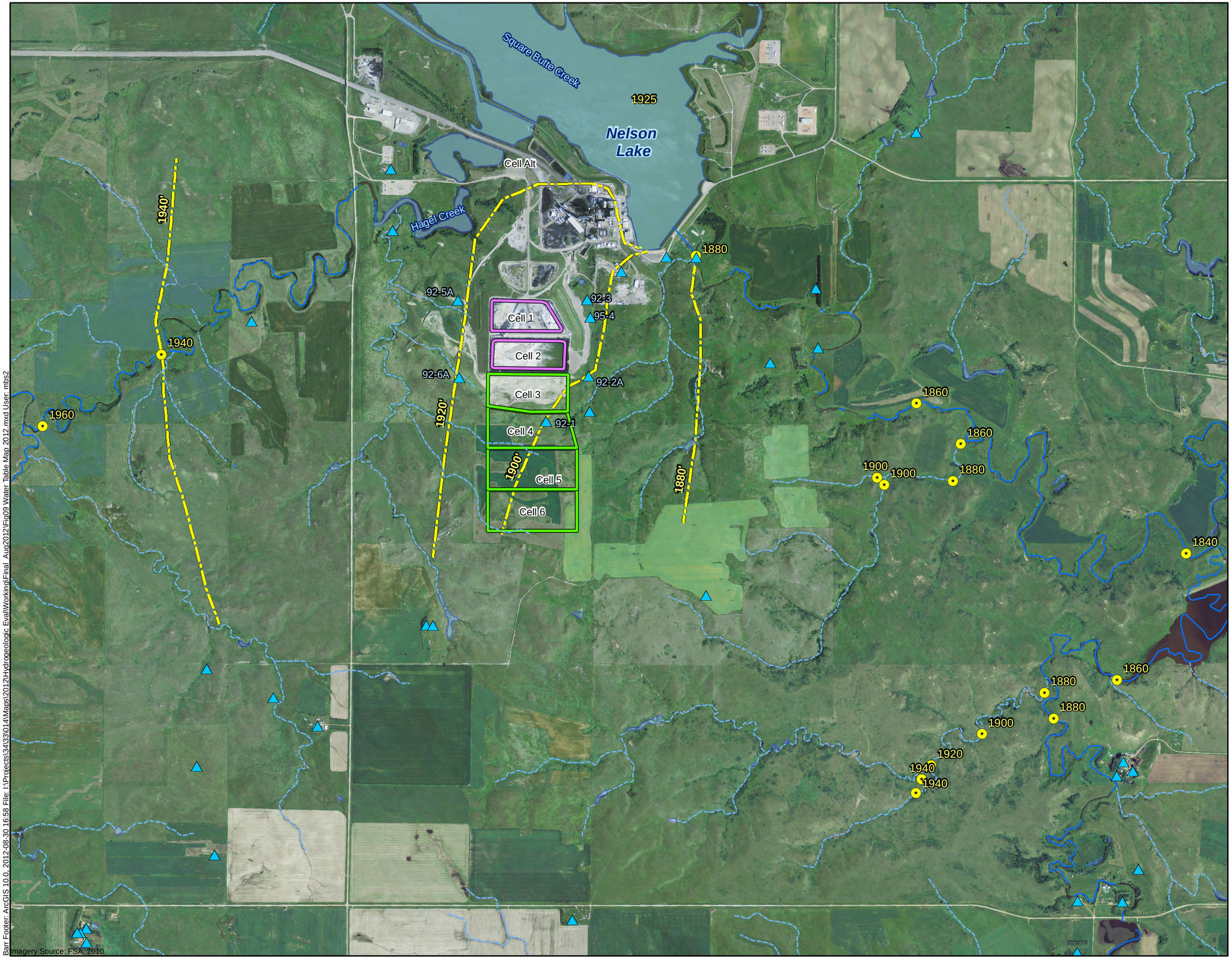
Data Sources:
Watercourses and Waterbodies acquired USGS National Hydrography Dataset (NHD)
Wetland Locations acquired from USFWS National Wetland Inventory (NWI)

N

Feet
600 300 0 600

Figure 8

STREAMS, WATERBODIES, AND WETLANDS
Hydrogeologic Evaluation
Minnkota Power Cooperative, Inc.
Center, North Dakota




Surface Water and Channel Spot Elevation

Site Water Monitoring Well

Water Table Contour

Intermittent Watercourse (NHD)

Perennial Watercourse (NHD)

Approximate Current Cell Location

Approximate Planned or Proposed Cell Location

Feet

2,000 0 2,000

Figure 9

WATER TABLE MAP 2012
Hydrogeologic Evaluation
Minnkota Power Cooperative, Inc.
Center, North Dakota

Barr Footer: ArcGIS 10.0, 2012-08-30 16:58 File: I:\Projects\34133\014\Maps\2012\Hydrogeologic Eval\Working\Final Aug2012\Fig09 Water Table Map 2012.mxd User: mbs2

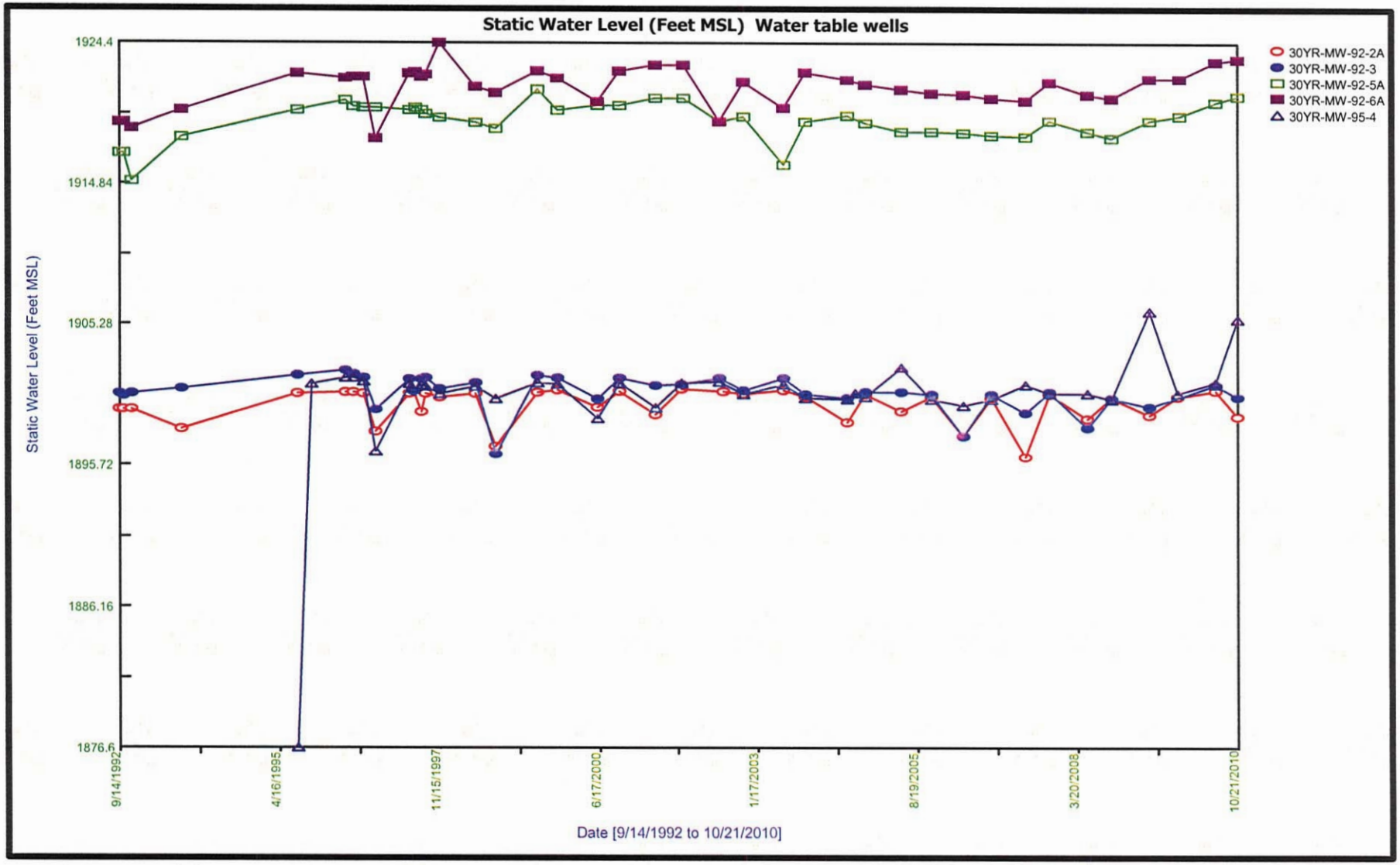
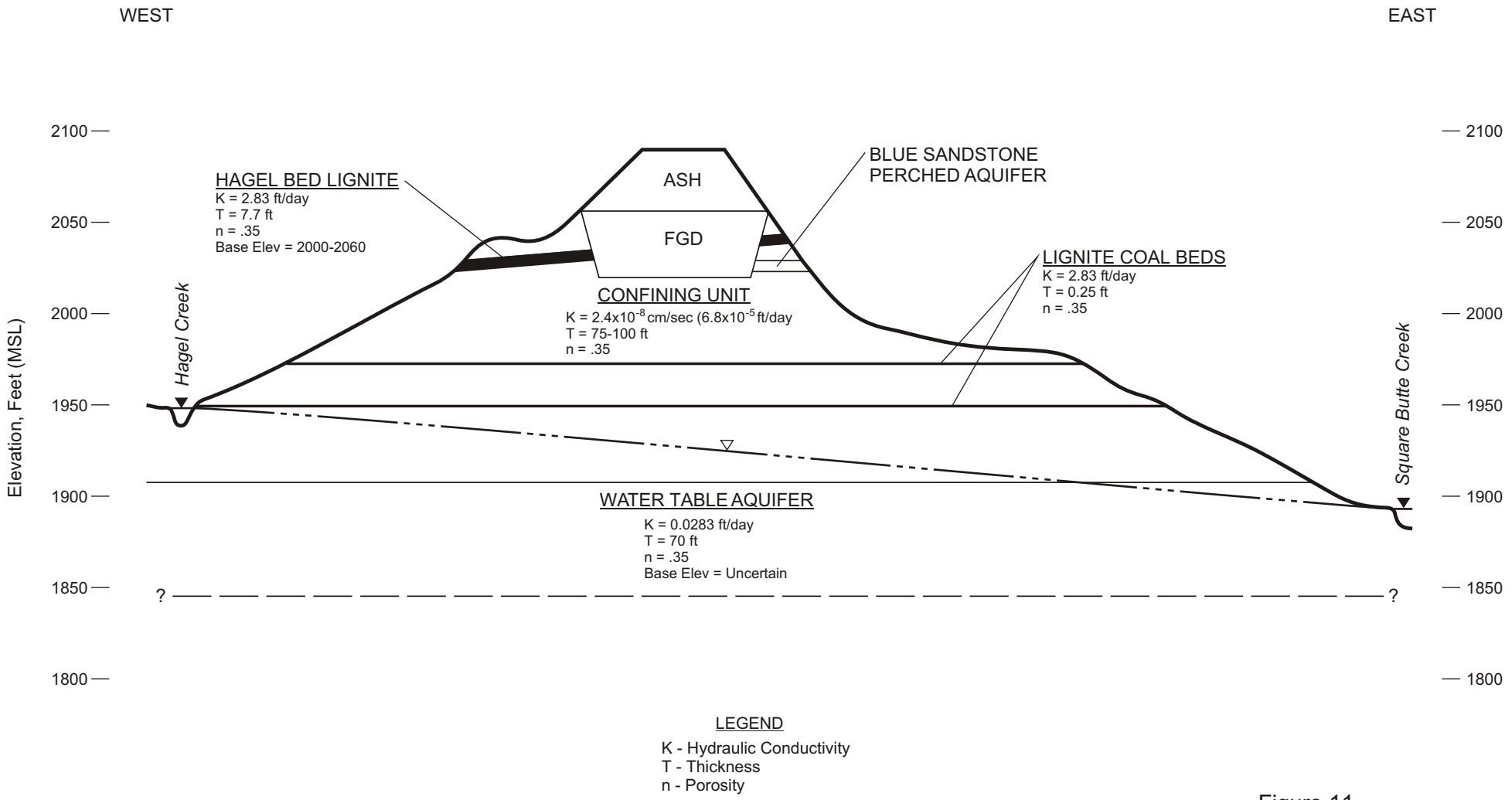



Figure 10

GROUNDWATER ELEVATIONS OVER TIME, WATER TABLE AQUIFER

P:\Mpls\34 ND\33\34330014LTA\WorkFiles\Figures_Graphics\Conceptual Site Model.CDR RLG 08-31-10

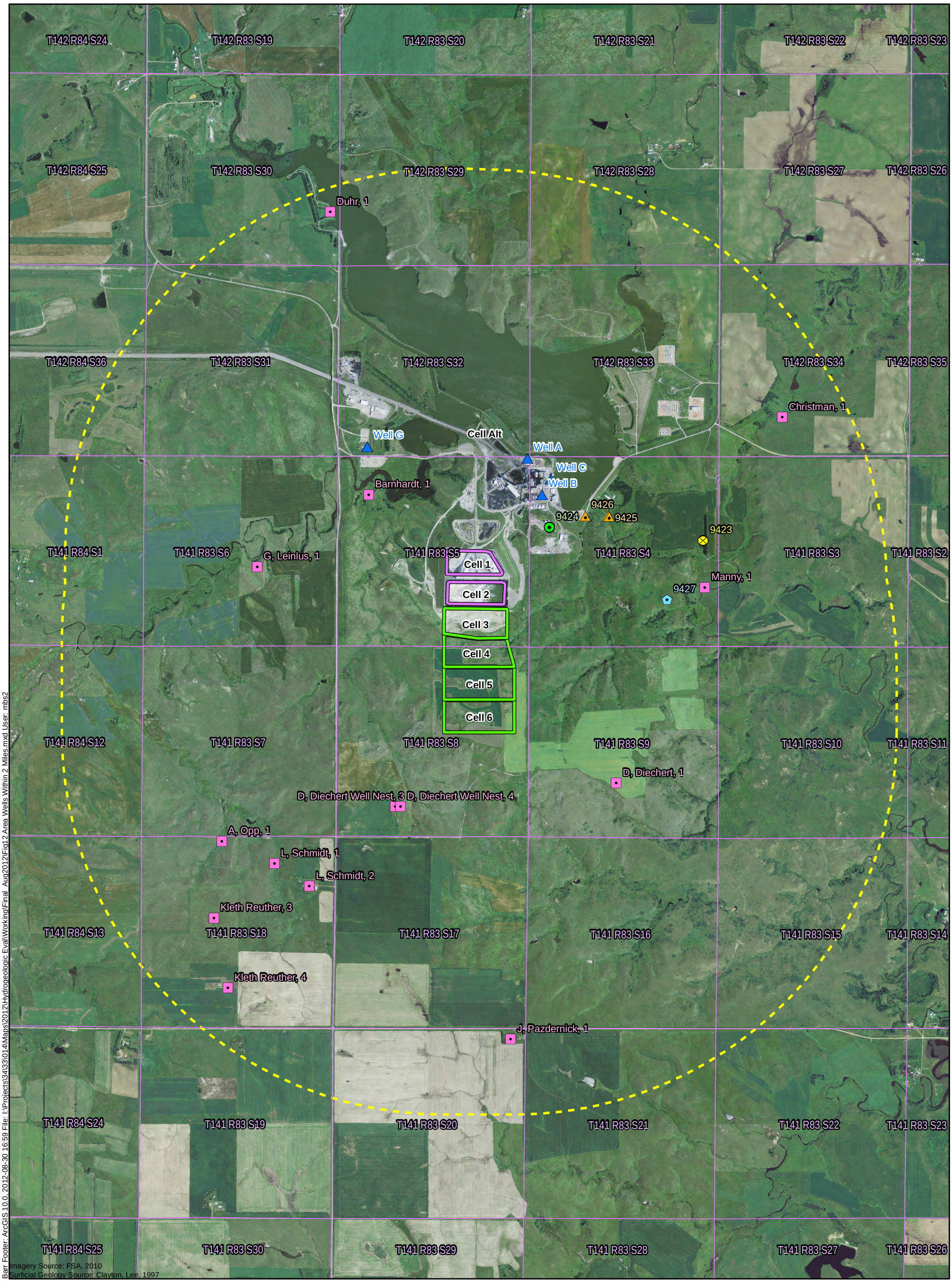



LEGEND

K - Hydraulic Conductivity
T - Thickness
n - Porosity

Figure 11

CONCEPTUAL SITE MODEL
Minnkota Power Cooperative, Inc.
Milton R. Young Station
FGD Sludge Disposal Site




Barr Footer: ArcGIS 10.0, 2012-08-30 16:59 File: I:\Projects\34\33\014\Maps\2012\Hydrogeologic Eval\Working\Final Aug2012\Fig12 Area Wells Within 2 Miles.mxd User: mbs2

- Facility Water Well
- Private Well Within 2mi

NDSWC Well Within 2mi

- Observation Well
- Surface Water Monitoring Site
- Test Hole
- Unknown
- 2 Mile Buffer
- Hagel Bed Previously Mined from Cell
- Hagel Bed to Be Mine From Cell (Cell 3 in 2012)

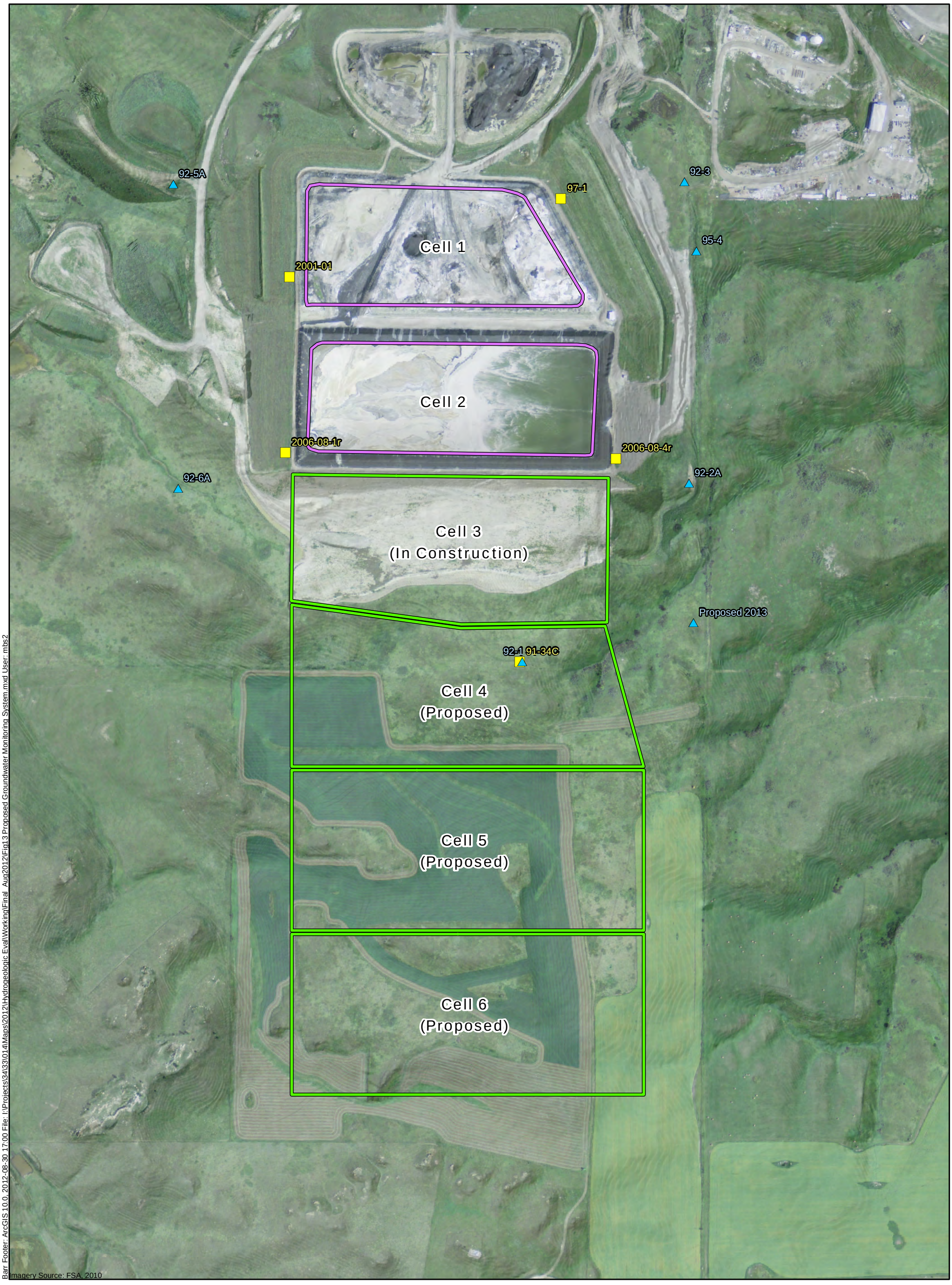
N

Feet

2,500 0 2,500

Figure 12

AREA WELLS WITHIN
2 MILES OF FACILITY
Hydrogeologic Evaluation
Minnkota Power Cooperative, Inc.
Center, North Dakota




Barr Footer: ArcGIS 10.0, 2012-08-30 17:00 File: I:\Projects\34\33\014\Maps\2012\Hydrogeologic Eval\Working\Final Aug2012\Fig13 Proposed Groundwater Monitoring System.mxd User: mbs2

- Site Water Table Monitoring Wells
- Site Hagel Monitoring Wells
- Approximate Current Cell Location
- Approximate Planned or Proposed Cell Location

Feet
500 250 0 500

Figure 13

PROPOSED GROUNDWATER MONITORING SYSTEM
Hydrogeologic Evaluation
Minnkota Power Cooperative, Inc.
Center, North Dakota

# Appendices

# Appendix A

## Logs of Site Monitoring Wells

STATE OF NORTH DAKOTA
**BOARD OF WATER WELL CONTRACTORS**
900 E. BOULEVARD • BISMARCK, NORTH DAKOTA 58501

# WELL DRILLER'S REPORT

State law requires that this report be filed with the State Board of Water Well Contractors within 30 days after completion or abandonment of the well.

**1. WELL OWNER**

Name: Minnkota

Address: Center

**2. WELL LOCATION**

Sketch map location must agree with written location.

92-1
GL2108.4
TOC 2110.35
141-83-5DD
507.235.8 N
1.821.343.1E

NORTH

1 MILE

Sec. (1 mile) Oliver

ground-2108.4

County: _____

¼ SE¼ SE¼ Sec. 5 Twp. 141 N. Rg 83 W.

**3. PROPOSED USE**

☐ Domestic ☐ Stock ☐ Geothermal ☐ Irrigation ☐ Municipal ☒ Monitoring ☐ Industrial ☐ Test Hole

**4. METHOD DRILLED**

☐ Cable ☒ Forward Rotary ☐ Reverse Rotary ☐ Jetted ☐ Bored ☐ Auger

If other, specify: _____

**5. WATER QUALITY**

Was a water sample collected for:
Chemical Analysis? ☐ Yes ☐ No
Bacteriological Analysis? ☐ Yes ☐ No
If so, to what laboratory was it sent? _____

**6. WELL CONSTRUCTION**

Diameter of hole 4.75 inches. Depth 240 feet.

Casing: ☐ Steel ☒ Plastic ☐ Concrete ☒ Threaded ☐ Welded ☐ Other

If other, specify: _____

Hagel

| Pipe Weight: | Diameter: | From: | To: |
|---|---|---|---|
| SDR-21 lb/ftx | 2 inches | +2.8 feet | 207 feet |
| _____ lb/ft | _____ inches | _____ feet | _____ feet |
| _____ lb/ft | _____ inches | _____ feet | _____ feet |

Was perforated pipe used? ☐ Yes ☒ No
Perforated pipe set from _____ ft to _____ feet
Was casing left open end? ☐ Yes ☒ No
Was a well screened installed? ☒ Yes ☐ No
Material PVC Diameter 2 inches
Slot Size 10 set from 207 feet to 237 feet
Slot Size _____ set from _____ feet to _____ feet
Was packer or seal used? ☒ Yes ☐ No
If so, what material bentonite Depth 219 to 198 ft.
(stainless steel, bronze, etc.)
Type of well: Straight screen ☐ Gravel packed ☒
Depth grouted: From 198 To 0
Grouting Material: Cement X Other _____
If other explain: _____
Well head completion: Pitless unit _____
12" above grade X Other _____
If other, specify: _____
Was pump installed: ☐ Yes ☒ No
Was well disinfected upon completion? ☐ Yes ☒ No

**7. WATER LEVEL**

Static water level _____ feet below surface
If flowing: closed-in pressure _____ psi
GPM flow _____ through _____ inch pipe
Controlled by: ☐ Valve ☐ Reducers ☐ Other
If other, specify _____

**8. WELL TEST DATA**

☐ Pump ☐ Bailer ☐ Other
Pumping level below land surface:
_____ ft. after _____ hrs. pumping _____ gpm
_____ ft. after _____ hrs. pumping _____ gpm
_____ ft. after _____ hrs. pumping _____ gpm

**9. WELL LOG**

| Formation | Depth (ft.) From | To |
|---|---|---|
| Topsoil, silty, black | 0 | 2 |
| Clay, silty, yellowish brown, till | 2 | 13 |
| Sand, fine, yellowish brown | 13 | 18 |
| Clay, silty, yellowish gray, bedrock | 18 | 24 |
| Sand, fine, yellowish brown | 24 | 28 |
| Slack coal | 28 | 29.5 |
| Clay, silty, yellowish brown | 29.5 | 34 |
| Clay, silty, medium gray | 34 | 40 |
| Rock, sandstone | 40 | 41 |
| Clay, silty, medium gray | 41 | 51 |
| Lignite | 51 | 58 |
| Clay, silty, medium gray | 58 | 65 |
| Sand, fine, bluish gray | 65 | 73 |
| Clay, silty, medium gray | 73 | 94 |
| Sand, fine, bluish gray | 94 | 106 |
| Rock, sandstone | 106 | 109 |

(Use separate sheet if necessary) Over

**10. DATE COMPLETED** 8/31/92

**11. WAS WELL PLUGGED OR ABANDONED?**

☐ Yes ☒ No
If so, how _____

**12. REMARKS:**

Drilled w/air, 2" cap on bottom of screen, backwashed through screen, 280# of #20-40 silica sand to 201', bentonite chips to 198'. 2350# of cement grout to surface.

**13. DRILLER'S CERTIFICATION**

This well was drilled under my jurisdiction and this report is true to the best of my knowledge.

Water Supply, Inc. 46
Driller's or Firm's Name Certificate No.

Box 1191 - Bismarck, ND 58502
Address

Lewis Knutson 8/31/92
Signed by Lewis Knutson Date

WHITE-DRILLER'S COPY YELLOW-BOARD'S COPY PINK-CUSTOMER'S COPY

# WATER SUPPLY, INC.

2601 Twin City Drive
Mandan, ND 58554

(701) 663-0877

P.O. Box 1191
Bismarck, ND 58502-1191

Minnkota
Center, ND

92-1
GL 2108.4
TOC 2110.35
141-83-5DD
507.235.8 N
1.821.343.1 E

9. WELL LOG (continued from page 1)

| Formation | (Depth Ft) From | To |
|---|---|---|
| Sand, fine, bluish gray | 109 | 120 |
| Rock, sandstone | 120 | 121 |
| Clay, silty, medium gray | 121 | 129 |
| Lignite | 129 | 131 |
| Clay, silty, yellowish brown | 131 | 133 |
| Sand, fine, yellowish brown | 133 | 135 |
| Clay, silty, yellowish gray | 135 | 150 |
| Rock, sandstone | 150 | 152 |
| Clay, silty, yellowish gray | 152 | 159 |
| Lignite | 159 | 160 |
| Clay, silty, yellowish gray | 160 | 166 |
| Sand, fine, bluish gray, about 5% clay | 166 | 194 |
| Clay, silty, medium gray | 194 | 201 |
| Sand, fine, bluish gray, about 10% clay | 201 | 237 |
| Clay, silty, medium gray | 237 | 240 |

El 1942

water table aquifer

11/27/92

# MONITORING WELL FIELD DATA SHEET

Client Minnkota | Proj. No. BFAX-92-083A | Location Center, North Dakota

Well Number 2A | Well Location N.508,212.7; E.1,822,306.3 | Date of Installation 8/12/92

Date of Revision | Crew EB, BR | B.M. Location & Elev. (±0.01)

Stick up above ground (to 0.1') 2.25

Top of riser pipe (w/o cap) Elev. (±0.01') 2034.05

Ground surface Elev. (±0.1') 2031.8

Depth to bottom of surface seal

Approximate water level before installation

Approximate depth of first water encountered in drilling 145'

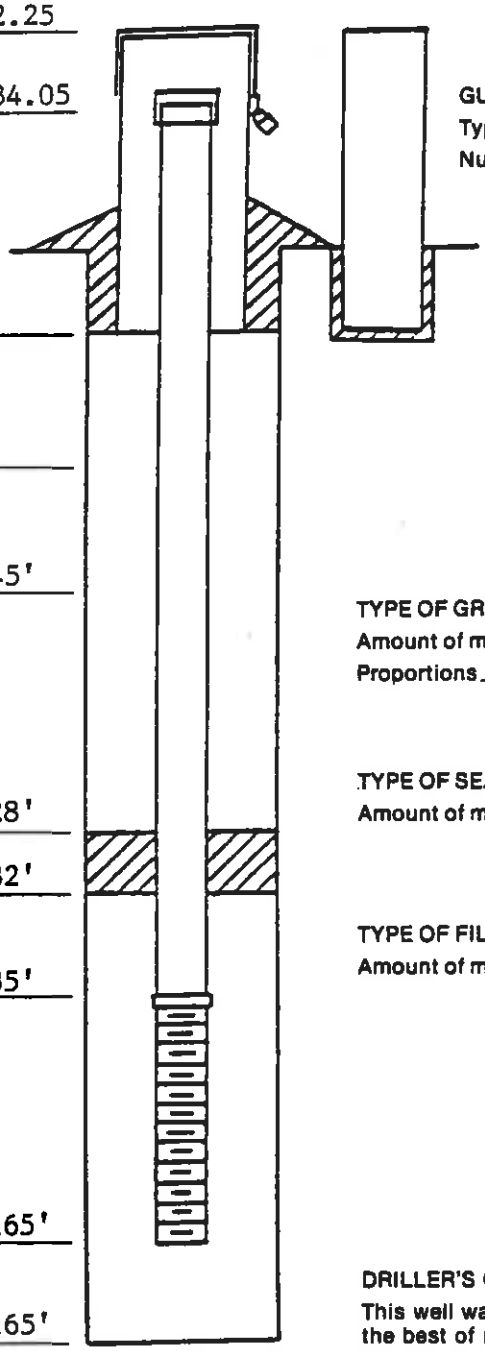
Depth to top of seal 128'

Depth to bottom of seal 132'

Depth to top of screen 135'

Depth to bottom of screen 165'

Depth to bottom of boring 165'



GUARD POST:
Type
Number

Protective Cover:
Type Steel
Length 5'
Lock # 2106

Type of sealing material Bentonite Chips + 6%

RISER PIPE:
Type PVC Flush
Diameter 2"
Total Length 137'
Sections Used 14-10'
Couplings No
Cap Yes ____ No X

TYPE OF GROUT ABOVE SEAL:
Amount of material used
Proportions Bentonite-2, Cement 94#'s

TYPE OF SEALING MATERIAL: Bentonite Chips + 6%
Amount of material used 100#'s

TYPE OF FILTER MATERIAL: Silica Sand
Amount of material used 600#'s

SCREEN:
Type PVC Flush
Slot Size .01
Length 30'
Diameter 2"
Plug/Point Plug

Method of advance:
HSA X I.D. 3 3/4
Casing ____ I.D. ____
Tricone ____ O.D. ____

Method of development:
Air ____
Jet Surge Bail

DRILLER'S CERTIFICATION

This well was drilled under my jurisdiction, and this report is true to the best of my knowledge.

Braun Intertec Engineering, Inc. 569
Driller's or Firm's Name Certificate No.

913 S. 18th Street, Bismarck, ND 58504
Address

Signed by 11-24-92 Date

BRAUN

BOARD OF WATER WELL CONTRACTORS
900 E. BOULEVARD • BISMARCK, NORTH DAKOTA 58501

# WELL DRILLER'S REPORT

State law requires that this report be filed with the State Board of Water Well Contractors within 30 days after completion or abandonment of the well.

**1. WELL OWNER**

Name Minnkota

Address Center

**2. WELL LOCATION**

Sketch map location must agree with written location.

92-3,
GL 1990.8
TOC 1992.74
141-83-4BCC,
509.880.7 N
1.822.283.7 E

NORTH

1 MILE

ground - 1991.3

County Oliver

Sec. (1 mile) ____

SW ¼ SW ¼ NW ¼ Sec. 4 Twp. 141 N.Rg 83 W.

**3. PROPOSED USE**

☐ Domestic ☐ Stock ☐ Geothermal ☐ Irrigation ☐ Municipal ☒ Monitoring ☐ Industrial ☐ Test Hole

**4. METHOD DRILLED**

☐ Cable ☒ Forward Rotary ☐ Reverse Rotary ☐ Jetted ☐ Bored ☐ Auger

If other, specify ____

**5. WATER QUALITY**

Was a water sample collected for:
Chemcial Analysis? ☐ Yes ☐ No
Bacteriological Analysis? ☐ Yes ☐ No
If so, to what laboratory was it sent? ____

**6. WELL CONSTRUCTION**

Diameter of hole 4.75 inches. Depth 153.5 feet.

Casing: ☐ Steel ☒ Plastic ☐ Concrete ☒ Threaded ☐ Welded ☐ Other

If other, specify ____

| Pipe Weight: | Diameter: | From: | To: |
|---|---|---|---|
| SDR-21 lb/ft | 2 inches | ±1.9 feet | 142.5 feet |
| ____ lb/ft | ____ inches | ____ feet | ____ feet |
| ____ lb/ft | ____ inches | ____ feet | ____ feet |

Was perforated pipe used? ☐ Yes ☒ No
Perforated pipe set from ____ ft to ____ feet
Was casing left open end? ☐ Yes ☒ No
Was a well screened installed? ☒ Yes ☐ No
Material PVC Diameter 2 inches
Slot Size 10 set from 142.5 feet to 152.5 feet
Slot Size ____ set from ____ feet to ____ feet
Was packer or seal used? ☒ Yes ☐ No
If so, what material bentonite Depth 137 to 132 ft.
(stainless steel, bronze, etc.)
Type of well: Straight screen ☐ Gravel packed ☒
Depth grouted: From 132 To 0
Grouting Material: Cement X X Other ____
If other explain: ____
Well head completion: Pitless unit ____
12" above grade X Other ____
If other, specify ____
Was pump installed: ☐ Yes ☒ No
Was well disinfected upon completion? ☐ Yes ☒ No

**7. WATER LEVEL**

Static water level ____ feet below surface
If flowing: closed-in pressure ____ psi
GPM flow ____ through ____ inch pipe
Controlled by: ☐ Valve ☐ Reducers ☐ Other
If other, specify ____

**8. WELL TEST DATA**

☐ Pump ☐ Baller ☐ Other
Pumping level below land surface:
____ ft. after ____ hrs. pumping ____ gpm
____ ft. after ____ hrs. pumping ____ gpm
____ ft. after ____ hrs. pumping ____ gpm

**9. WELL LOG**

| Formation | Depth (ft.) From | To |
|---|---|---|
| Topsoil, silty, black | 0 | 1 |
| Clay, silty, yellowish brown, bedrock | 1 | 9 |
| Rock, sandstone | 9 | 10 |
| Clay, silty, medium gray | 10 | 17 |
| Clay, silty, greenish gray | 17 | 19 |
| Sand, fine, bluish gray, about 20% clay | 19 | 26 |
| Lignite | 26 | 27 |
| Clay, silty, medium gray | 27 | 39 |
| Clay, silty to sandy, bluish gray | 39 | 44 |
| Clay, silty, medium gray | 44 | 52 |
| Rock, limestone | 52 | 53 |
| Clay, silty, medium gray | 53 | 65 |
| Lignite | 65 | 66.5 |
| Clay, silty, medium gray | 66.5 | 73 |
| Rock, limestone | 73 | 78 |

(Use separate sheet if necessary) Over

**10. DATE COMPLETED** 9/8/92

**11. WAS WELL PLUGGED OR ABANDONED?**

☐ Yes ☒ No
If so, how ____

**12. REMARKS:**

Drilled w/water, 2" cap on bottom of screen, backwashed through screen, 200# of #20-40 silica sand to 137'. Bentonite chips to 132', 1222# of cement grout to surface.

**13. DRILLER'S CERTIFICATION**

This well was drilled under my jurisdiction and this report is true to the best of my knowledge.

Water Supply, Inc. 46
Driller's or Firm's Name Certificate No.

Box 1191 - Bismarck, ND 58502
Address

Lewis Knutson 9/8/92
Signed by Lewis Knutson Date

WHITE-DRILLER'S COPY YELLOW-BOARD'S COPY PINK-CUSTOMER'S COPY

# WATER SUPPLY, INC.

2501 Twin City Drive
Mandan, ND 58554

(701) 663-0877

P.O. Box 1191
Bismarck, ND 58502-1191


Minnkota
Center, ND

92-3
GL 1990.8
TOC 1992.74
141-83-4BCC
509.880.7 N
1.822.283.7 E

9. WELL LOG (continued from page 1)

| Formation | (Depth Ft) From | To |
|---|---|---|
| Clay, silty, medium gray | 78 | 80 |
| Sand, fine, bluish gray, about 10% gray | 80 | 87 |
| Rock, sandstone | 87 | 88 |
| Sand, fine, bluish gray, about 10% gray | 88 | 153 |
| Lignite | 153 | 153.5 |

BOARD OF WATER WELL CONTRACTORS
900 E. BOULEVARD • BISMARCK, NORTH DAKOTA 58501

# WELL DRILLER'S REPORT

State law requires that this report be filed with the State Board of Water Well Contractors within 30 days after completion or abandonment of the well.

**1. WELL OWNER**

Name Minnkota

Address Center

**2. WELL LOCATION**

Sketch map location must agree with written location.

92-5A
GL 2006.1
TOC 2007.96
141-83SAC/BD
509.871.6 N
1.819.456.7 E

NORTH

1 MILE

Sec. (1 mile)

ground-2007.9

County Oliver

¼ NE¼ NW¼ Sec. 5 Twp. 141 N.Rg 83 W.

**3. PROPOSED USE**

☐ Domestic ☐ Stock ☐ Geothermal ☐ Irrigation ☐ Municipal ☒ Monitoring ☐ Industrial ☐ Test Hole

**4. METHOD DRILLED**

☐ Cable ☒ Forward Rotary ☐ Reverse Rotary ☐ Jetted ☐ Bored ☐ Auger

If other, specify

**5. WATER QUALITY**

Was a water sample collected for:
Chemcial Analysis? ☐ Yes ☐ No
Bacteriological Analysis? ☐ Yes ☐ No
If so, to what laboratory was it sent?

**6. WELL CONSTRUCTION**

Diameter of hole 4.75 inches. Depth 185.5 feet.

Casing: ☐ Steel ☒ Plastic ☐ Concrete ☒ Threaded ☐ Welded ☐ Other

El 1921

If other, specify

| Pipe Weight: | Diameter: | From: | To: |
|---|---|---|---|
| SDR-21 lb/ft | 2 inches | +1.9 feet | 175 feet |
| lb/ft | inches | feet | feet |
| lb/ft | inches | feet | feet |

Was perforated pipe used? ☐ Yes ☒ No

Perforated pipe set from ft to feet

Was casing left open end? ☐ Yes ☒ No

Was a well screened installed? ☒ Yes ☐ No

Material PVC Diameter 2 inches

Slot Size 10 set from 175 feet to 185 feet

Slot Size set from feet to feet

Was packer or seal used? ☒ Yes ☐ No

If so, what material bentonite Depth 170 to 167 ft.

(stainless steel, bronze, etc.)

Type of well: Straight screen ☐ Gravel packed ☒

Depth grouted: From 167 To 0

Grouting Material: Cement x Other

If other explain:

Well head completion: Pitless unit

12" above grade x Other

If other, specify

Was pump installed: ☐ Yes ☒ No

Was well disinfected upon completion? ☐ Yes ☒ No

**7. WATER LEVEL**

Static water level feet below surface

If flowing: closed-in pressure psi

GPM flow through inch pipe

Controlled by: ☐ Valve ☐ Reducers ☐ Other

If other, specify

**8. WELL TEST DATA**

☐ Pump ☐ Bailer ☐ Other

Pumping level below land surface:

ft. after hrs. pumping gpm

ft. after hrs. pumping gpm

ft. after hrs. pumping gpm

**9. WELL LOG**

| Formation | Depth (ft.) From | To |
|---|---|---|
| Topsoil, silty, black | 0 | 1 |
| Clay, silty, yellowish brown, bedrock | 1 | 12 |
| Clay, silty, medium gray | 12 | 15 |
| Clay, silty, yellowish brown | 15 | 23 |
| Clay, silty, medium gray | 23 | 28 |
| Sand, fine, bluish gray, about 20% clay | 28 | 40 |
| Clay, silty, brownish gray | 40 | 41 |
| Lignite & slack, taking lots of water | 41 | 43 |
| Clay, silty, medium gray | 43 | 74 |
| Lignite | 74 | 75.5 |
| Clay, silty, medium gray | 75.5 | 87 |
| Sand, fine, bluish gray, about 20% clay | 87 | 94 |
| Rock, sandstone | 94 | 97 |
| Sand, fine, bluish gray, about 10% clay | 97 | 185 |
| Lignite | 185 | 185.5 |

(Use separate sheet if necessary)

**10. DATE COMPLETED** 9/4/92

**11. WAS WELL PLUGGED OR ABANDONED?**

☐ Yes ☒ No

If so, how

**12. REMARKS:**

Drilled w/water, 2" cap on bottom of screen, backwashed through screen, 200# of #20-40 silica sand to 170', bentonite chips to 167', 1880# of cement grout to surface.

**13. DRILLER'S CERTIFICATION**

This well was drilled under my jurisdiction and this report is true to the best of my knowledge.

Water Supply, Inc. 46
Driller's or Firm's Name Certificate #

Box 1191 - Bismarck, ND 58502
Address

Signed by Lewis Knutson
Lewis Knutson

WHITE-DRILLER'S COPY YELLOW-BOARD'S COPY PINK CUSTOMER'S COPY

BOARD OF WATER WELL CONTRACTORS
900 E. BOULEVARD • BISMARCK, NORTH DAKOTA 58501

# WELL DRILLER'S REPORT

State law requires that this report be filed with the State Board of Water Well Contractors within 30 days after completion or abandonment of the well.

**1. WELL OWNER**

Name: Minnkota

Address: Center

**2. WELL LOCATION**

Sketch map location must agree with written location.

92-6A
G1 2012.9
TOC 2014.94
141-83-5DBC
508.189.9 N
1.819.481.3 E

NORTH

1 MILE

Sec. (1 mile)

County: Oliver

SW ¼ NW ¼ SE ¼ Sec. 5 Twp. 141 N. Rg 83 W.

El 1922

**3. PROPOSED USE**

☐ Domestic ☐ Stock ☐ Geothermal ☐ Irrigation ☐ Municipal ☒ Monitoring ☐ Industrial ☐ Test Hole

**4. METHOD DRILLED**

☐ Cable ☒ Forward Rotary ☐ Reverse Rotary ☐ Jetted ☐ Bored ☐ Auger

If other, specify:

**5. WATER QUALITY**

Was a water sample collected for:
Chemcial Analysis? ☐ Yes ☐ No
Bacteriological Analysis? ☐ Yes ☐ No
If so, to what laboratory was it sent?

**6. WELL CONSTRUCTION**

Diameter of hole 4.75 inches. Depth 155 feet.

Casing: ☐ Steel ☒ Plastic ☐ Concrete ☒ Threaded ☐ Welded ☐ Other

If other, specify:

| Pipe Weight: | Diameter: | From: | To: |
|---|---|---|---|
| SDR-21 lb/ft | 2 inches | +2.0 feet | 122.5 feet |
| lb/ft | inches | feet | feet |
| lb/ft | inches | feet | feet |

Was perforated pipe used? ☐ Yes ☒ No
Perforated pipe set from ft to feet
Was casing left open end? ☐ Yes ☒ No
Was a well screened installed? ☒ Yes ☐ No
Material PVC Diameter 2 inches
Slot Size 10 set from 122.5 feet to 152.5 feet
Slot Size set from feet to feet
Was packer or seal used? ☒ Yes ☐ No
If so, what material bentonite Depth 117.5 to 114 ft.
(stainless steel, bronze, etc.)
Type of well: Straight screen ☐ Gravel packed ☒
Depth grouted: From 114 To 0
Grouting Material: Cement X Other
If other explain:
Well head completion: Pitless unit
12" above grade X Other
If other, specify:
Was pump installed: ☐ Yes ☒ No
Was well disinfected upon completion? ☐ Yes ☒ No

**7. WATER LEVEL**

Static water level feet below surface
If flowing: closed-in pressure psi
GPM flow through inch pipe
Controlled by: ☐ Valve ☐ Reducers ☐ Other
If other, specify:

**8. WELL TEST DATA**

☐ Pump ☐ Bailer ☐ Other
Pumping level below land surface:
ft. after hrs. pumping gpm
ft. after hrs. pumping gpm
ft. after hrs. pumping gpm

**9. WELL LOG**

| Formation | Depth (ft.) From | To |
|---|---|---|
| Topsoil, silty, black | 0 | 2 |
| Clay, silty, medium gray, bedrock | 2 | 6 |
| Sand, fine, yellowish brown | 6 | 7.5 |
| Clay, silty, yellowish brown | 7.5 | 24 |
| Sand, fine, yellowish brown | 24 | 28 |
| Sand, fine, bluish gray | 28 | 31 |
| Clay, silty, medium gray | 31 | 34 |
| Lignite | 34 | 34.3 |
| Clay, silty, medium gray | 34.3 | 35 |
| Lignite | 35 | 37 |
| Clay, silty, medium gray | 37 | 39 |
| Sand, fine, bluish gray, water in sand | 39 | 53 |
| Clay, silty, medium gray | 53 | 91 |
| Sand, fine, bluish gray, about 10% clay | 91 | 149 |
| Clay, silty, medium gray | 149 | 151 |

(Use separate sheet if necessary) Over

**10. DATE COMPLETED** 8/31/92

**11. WAS WELL PLUGGED OR ABANDONED?**

☐ Yes ☒ No
If so, how:

**12. REMARKS:**

Drilled w/air, 2" cap on bottom of screen backwashed through screen, 360# of #20-40 silica sand to 117.5'. Bentonite chips to 114'. 1880# of cement grout to surface.

**13. DRILLER'S CERTIFICATION**

This well was drilled under my jurisdiction and this report is true to the best of my knowledge.

Water Supply, Inc. 46
Driller's or Firm's Name Certificate No.

Box 1191 - Bismarck, ND 58502
Address

Signed by Lewis Knutson 8/31/92
Date

WHITE-DRILLER'S COPY YELLOW-BOARD'S COPY PINK-CUSTOMER'S COPY

WATER SUPPLY, INC.

2501 Twin City Drive
Mandan, ND 58554

(701) 663-0877

P.O. Box 1191
Bismarck, ND 58502-1191

Minnkota
Center, ND

92-6A
GL 2012.9
TOC 2014.94
141-83-5DBC
508.189.9 N
1.819.481.3 E

9. WELL LOG (continued from page 1)

| Formation | (Depth Ft) From | To |
|---|---|---|
| Sand, fine, bluish gray, about 30% clay | 151 | 155 |
| Lignite | 155 | |

STATE OF NORTH DAKOTA
**BOARD OF WATER WELL CONTRACTORS**
900 E. BOULEVARD • BISMARCK, NORTH DAKOTA 58501

# WELL DRILLER'S REPORT

State law requires that this report be filed with the State Board of Water Well Contractors within 30 days after completion or abandonment of the well.

**1. WELL OWNER**

Name: MINNKOTA POWER COOPERATIVE

Address: YOUNG STATION, CENTER, ND

**2. WELL LOCATION**

Sketch map location must agree with written location.

95-4,
141-83-4BCC,
509,500N &
1,822,350E

NORTH

1 MILE

Sec. (1 mile)

ground - 1994.1

County: OLIVER

SW ¼ SW ¼ NW ¼ Sec. 4 Twp. 141 N. Rg 83 W.

**3. PROPOSED USE**

☐ Domestic ☐ Stock ☐ Geothermal ☐ Irrigation ☐ Municipal ☒ Monitoring ☐ Industrial ☐ Test Hole

**4. METHOD DRILLED**

☐ Cable ☒ Forward Rotary ☐ Reverse Rotary ☐ Jetted ☐ Bored ☐ Auger

If other, specify:

**5. WATER QUALITY**

Was a water sample collected for:
Chemcial Analysis? ☐ Yes ☐ No
Bacteriological Analysis? ☐ Yes ☐ No
If so, to what laboratory was it sent?

**6. WELL CONSTRUCTION**

Diameter of hole 5.25 inches. Depth 151 feet.

El1899

Casing: ☐ Steel ☒ Plastic ☐ Concrete ☒ Threaded ☐ Welded ☐ Other

If other, specify:

El 1850, so WTA only 49 ft thick if this is the bottom

| Pipe Weight: | Diameter: | From: | To: |
|---|---|---|---|
| SCH 40 lb/ft | 2 inches | +2 feet | 135 feet |
| lb/ft | inches | feet | feet |
| lb/ft | inches | feet | feet |

Was perforated pipe used? ☐ Yes ☒ No
Perforated pipe set from ft to feet
Was casing left open end? ☐ Yes ☒ No
Was a well screened installed? ☒ Yes ☐ No
Material PVC Diameter 2 inches
Slot Size 10 set from 135 feet to 145 feet
Slot Size set from feet to feet
Was packer or seal used? ☒ Yes ☐ No
If so, what material MED BENT CHIPS Depth 130/126 ft.
(stainless steel, bronze, etc.)
Type of well: Straight screen ☐ Gravel packed ☒
Depth grouted: From 126 To SURFACE
Grouting Material: Cement X Other
If other explain:
Well head completion: Pitless unit
12" above grade X Other
If other, specify 4" STEEL PIPE W/CAP
Was pump installed: ☐ Yes ☒ No
Was well disinfected upon completion? ☐ Yes ☒ No

**7. WATER LEVEL**

Static water level 91 feet below surface
If flowing: closed-in pressure psi
GPM flow through inch pipe
Controlled by: ☐ Valve ☐ Reducers ☐ Other
If other, specify:

**8. WELL TEST DATA**

☐ Pump ☐ Bailer ☐ Other
Pumping level below land surface:
ft. after hrs. pumping gpm
ft. after hrs. pumping gpm
ft. after hrs. pumping gpm

**9. WELL LOG**

| Formation | Depth (ft.) From | To |
|---|---|---|
| SILT, SANDY, DARK BROWN | 0 | 0.5 |
| CLAY, SILTY TO SANDY W/PEBBLES, MEDIUM BROWN | 0.5 | 10 |
| SAND, FINE, REDDISH BROWN | 10 | 14 |
| SANDSTONE, SOFT | 14 | 16 |
| CLAY, BLUISH GREY | 16 | 36 |
| LIGNITE | 36 | 36.5 |
| CLAY, SAND, LIGHT GREY | 36.5 | 40 |
| SANDSTONE | 40 | 41 |
| CLAY, LIGHT TO MEDIUM GREY | 41 | 57 |
| LIGNITE | 57 | 59.5 |
| CLAY, SILTY, MEDIUM GREY | 59.5 | 76 |
| CLAY, W/VERY FINE SAND, MEDIUM GREY | 76 | 94 |
| CLAY, MEDIUM GREY | 94 | 95 |
| SAND, TIGHT, MEDIUM GREY | 95 | 100 |
| SANDSTONE | 100 | 101 |
| SAND, BLUISH GREY | 101 | 116 |
| CLAY, SANDY, BLUISH GREY | 116 | 117 |
| SAND, BLUISH GREY | 117 | 144 |
| LIGNITE | 144 | 145 |
| CLAY | 145 | 147 |
| LIGNITE | 147 | 148 |
| CLAY | 148 | 151 |

(Use separate sheet if necessary)

upper confining

water table aquifer

lower confining? only 7 ft

**10. DATE COMPLETED** 8/1/95

**11. WAS WELL PLUGGED OR ABANDONED?**

☐ Yes ☒ No
If so, how:

**12. REMARKS:**

360# OF 20-40 SILICA SAND TO 130', 25# MEDIUM BENTONITE CHIPS TO 126', NEAT CEMENT GROUT TO SURFACE W/QUIKRETE CAP & 4" STEEL PIPE PROTECTIVE CASING W/LOCKABLE CAP.

**13. DRILLER'S CERTIFICATION**

This well was drilled under my jurisdiction and this report is true to the best of my knowledge.

Water Supply, Inc. 96
Driller's or Firm's Name Certificate No

Box 1191 - Bismarck, ND 58502
Address

Paul E. Reed 8/1/95
Signed by PAUL E. REED Date

WHITE-DRILLER'S COPY YELLOW-BOARD'S COPY PINK-CUSTOMER'S COPY

STATE OF NORTH DAKOTA
**BOARD OF WATER WELL CONTRACTORS**
900 E. BOULEVARD • BISMARCK, NORTH DAKOTA 58501

97-1

# WELL DRILLER'S REPORT

State law requires that this report be filed with the State Board of Water Well Contractors within 30 days after completion or abandonment of the well.

**1. WELL OWNER**
Name: Minnkota Power Coop
Address: Center, ND

**2. WELL LOCATION**
Sketch map location must agree with written location.

NORTH
1 MILE
Sec. (1 mile)

County: Oliver Co.
¼NE ¼SE ¼ Sec. 5 Twp. 141 N. Rg 83 W.

**3. PROPOSED USE**
☐ Domestic ☐ Stock ☐ Geothermal ☐ Irrigation ☐ Municipal ☑ Piezometer Monitoring ☐ Industrial ☐ Test Hole

**4. METHOD DRILLED**
☐ Cable ☑ Forward Rotary ☐ Reverse Rotary ☐ Jetted ☐ Bored ☐ Auger
If other, specify:

**5. WATER QUALITY**
Was a water sample collected for:
Chemical Analysis? ☐ Yes ☑ No
Bacteriological Analysis? ☐ Yes ☐ No
If so, to what laboratory was it sent?

**6. WELL CONSTRUCTION**
Diameter of hole 5 7/8 inches. Depth 67 feet.
Casing: ☐ Steel ☑ Plastic ☐ Concrete ☐ Threaded ☐ Welded ☐ Other
If other, specify:

| Pipe Weight: | Diameter: | From: | To: |
|---|---|---|---|
| Sch 40 lb/ft | 2 inches | 0 feet | 67 feet |
| lb/ft | inches | feet | feet |
| lb/ft | inches | feet | feet |

Was perforated pipe used? ☑ Yes ☐ No
Perforated pipe set from 57 ft to 67 feet
Was casing left open end? ☐ Yes ☑ No
Was a well screened installed? ☑ Yes ☐ No
Material PVC Diameter 2 inches
Slot Size 10 set from 57 feet to 67 feet
Slot Size ____ set from ____ feet to ____ feet
Was packer or seal used? ☐ Yes ☑ No
If so, what material ____ Depth ____ ft.
#10 slice (stainless steel, bronze, etc.)
Type of well: Straight screen ☐ Gravel packed ☐
Depth grouted: From 55.5 To 2.5
See remarks
Grouting Material: Cement ____ Other ✓
If other explain: Bentonite chips
Well head completion: Pitless unit ____
12" above grade ____ Other ____
If other, specify:
Was pump installed? ☐ Yes ☑ No
Was well disinfected upon completion? ☐ Yes ☑ No

**7. WATER LEVEL**
Static water level unknown feet below surface
If flowing: closed-in pressure ____ psi
GPM flow ____ through ____ inch pipe
Controlled by: ☐ Valve ☐ Reducers ☐ Other
If other, specify:

**8. WELL TEST DATA**
☐ Pump ☐ Bailer ☑ Other air
Pumping level below land surface:
67 ft. after 3 hrs. pumping 4oz. est. gpm
____ ft. after ____ hrs. pumping ____ gpm
____ ft. after ____ hrs. pumping ____ gpm

**9. WELL LOG**

| Formation | Depth (ft.) From | To |
|---|---|---|
| Sill / till | 0 | 22 |
| sandy yellow clay | 22 | 45 |
| rock ledge | 45 | 47 |
| sandy clay | 47 | 60 |
| coal | 60 | 67 |
| gray clay | 67 | 69 |

(Use separate sheet if necessary)

**10. DATE COMPLETED** 12/04/97

**11. WAS WELL PLUGGED OR ABANDONED?**
☐ Yes ☑ No
If so, how:

**12. REMARKS:**
2.5 to 0 cement (grouted)

**13. DRILLER'S CERTIFICATION**
This well was drilled under my jurisdiction and this report is true to the best of my knowledge.
Earth Energy & Water Systems 153
Driller's or Firm's Name Certificate No
New Salem ND
Address
Signed by 12-10-97 Date

WHITE-DRILLER'S COPY YELLOW-BOARD'S COPY PINK-CUSTOMER'S COPY

State of North Dakota

# BOARD OF WATER WELL CONTRACTORS

900 E. BOULEVARD • BISMARCK, NORTH DAKOTA 58505

## MONITORING WELL REPORT

State law requires that this report be filed with the State Board of Water Well Contractors within 30 days after completion or abandonment of the well.

2001-10 2001-01R

**1. WELL OWNER**

Name Minnkota Power

Address Center ND 58530

**2. WELL LOCATION**

Address (If in city) _____

County Oliver

NW 1/4 NW 1/4 SE 1/4 Sec. 5 Twp. 141 N. Rge. 83 W.

Lat.: _____ Long.: _____

Altitude: _____

**3. METHOD DRILLED**

☐ Auger Other Rotary

**4. WELL CONSTRUCTION**

Diameter of Hole 6 1/4 inches Depth 77 feet

Riser: ☒ PVC ☐ Other

☐ Threaded ☐ Solvent ☐ Other

Riser rating SDR _____ Schedule 40

Diameter 2 inches

From 0 ft. to 67 ft.

Was a well screen installed? ☒ Yes ☐ No

Material PVC Diameter 2 inches

Slot Size .010 set from 67 feet to 77 feet

Sand packed from 64 to 77

Depth grouted from 0 to 61

Grouting Material

Bentonite ✓ Other _____

If other explain: Volclay grout 0 - 61

Bentonite chips 61 - 64

Well head completion:

24" above grade _____ Other ✓

If other, specify 36"

Was protective casing installed? ☒ Yes ☐ No

Was well disinfected upon completion? ☐ Yes ☒ No

**5. WATER LEVEL**

Static water level 71 feet below surface

If flowing: closed-in pressure _____ psi or ft. above land surface

**6. WELL LOG**

| Formation | Depth (Ft.) From | To |
|---|---|---|
| Clay | 0 | 31 |
| Sand | 31 | 38 |
| Clay | 38 | 40 |
| Sand | 40 | 52 |
| Clay | 52 | 55 |
| Sand Stone | 55 | 55.5 |
| Sand | 55.5 | 68 |
| Sand Stone | 68 | 69 |
| Sand | 69 | 72 |
| lignite | 72 | 75 |
| (Use separate sheet if necessary) Clay | 75 | 77 |

**7. WAS THE HOLE PLUGGED OR ABANDONED?**

☐ Yes ☒ No

If so, how? _____

**8. REMARKS**

**9. DATE COMPLETED** 9/2/10

**10. CONTRACTOR CERTIFICATION**

This well was drilled under my jurisdiction and this report is true to the best of my knowledge.

Braun Intertec — Monitoring Well Contractor

405 — Certificate No.

1341 S 20th St Suite 5 Bis ND 58504 — Address

Signature

9/2/10 — Date

BORING LOG

PROJECT: Minnkota Power
DATE STARTED: 10/12/91
DATE COMPLETED: 10/14/91
FIELD INSPECTOR: M.C. Johnson (B.E.C.)
CREW CHIEF: H. Jacobson (T.C.T.)

BORING NO.: 91-34 South else
RISER PIPE ELEVATION:
GROUND SURFACE ELEVATION: 2109.5

| Depth (Feet) | Blows Per 6" | Sample Type | Recovery (Inches) | Water Content | Profile | DESCRIPTION OF MATERIALS AND REMARKS |
|---|---|---|---|---|---|---|
| 0 | 2 3 5 9 | SB | 18 | D | OL | ORGANIC SANDY SILT (OL)- About 70% fines, 30% fine to coarse sand; trace of fine gravel; numerous thin grass roots. Brown, dry, and friable. (Topsoil) |
| | | | | | | 0.7' |
| | | | | | ML | SANDY SILT (ML)- About 65% silt, 30% fine to coarse sand; 5% fine to coarse gravel; some cobbles. Clasts include granitic rocks, limestone and coal. Brown to pale brown, dry , and very hard. (Till) |
| 5 | | SB | 16 | | | |
| 10 | 7 11 12 12 | SB | 18 | | | |
| | | | | | | 13.0' |
| 15 | 7 15 19 23 | SB | 22 | D/M | CL/ ML | SANDY SILTY CLAY (CL/ML)- About 65% fines; 25% mostly fine sand; 10% fine to coarse, angular to subrounded gravel. Clasts are about 50% black, weathered coal. Brown, slightly moist, and very hard. (Till) |
| | | | | | | 18.0' |
| 20 | 12 18 23 32 | SB | 22 | M | SH | SHALE- Brown to gray silty shale with a little very fine sand. Laminated to massive, with stained plant fossils common. Shaley parting is generally poor to moderately developed. Interbedded with thin (1-2 cm) siltstone/very fine sandstone beds; and with 0.5-3mm peat laminations. (Sentinel Butte Formation) |
| | | | | | | 23.0' |
| | | | | | Clst | CLAYSTONE-Olive brown "fat clay"; massive ( no apparent bedding or parting tendency), plastic. |
| 25 | 20 26 45 55 | SB | 22 | D | lam. Mdst | 25.0' LAMINATED MUDSTONE- Interbedded brown silt,brown clay,and gray very fine-grained sand; in regularly-alternating laminations to thin beds (0.5mm-5cm). Parting tends to follow sand laminations. (Sentinel Butte Formation) |
| | | | | ? | Lgnt | -28-29': Probable coal seam indicated by drilling action. |
| 30 | 12 | SB | | D/M | lam Mdst | |

COMMENT: Drilled by : solid-stem auger, 0-9.5'; 3 7/8" rotary drilling with water, 9.5-109.5'. Sampled with 2" O.D. split-barrel (SB) or 2 1/2" O.D. ring-lined barrel sampler (RLB). Water content: D= dry; D/M=slightly moist; M=moist; M/W=very moist; W=wet; S=saturated. Borehole backfilled with tremied neat cement grout.

PROJECT: Minnkota Power

DATE STARTED: 10/12/91

DATE COMPLETED: 10/14/91

FIELD INSPECTOR: M.C. Johnson (B.E.C.)

CREW CHIEF: H. Jacobson (T.C.T.)

BORING NO.: 91-34

RISER PIPE ELEVATION: _____

GROUND SURFACE ELEVATION: _____

| Depth (Feet) | Blows Per 6" | Sample Type | Recovery (Inches) | Water Content | Profile | DESCRIPTION OF MATERIALS AND REMARKS |
|---|---|---|---|---|---|---|
| 30 | 17<br>28<br>40 | SB | 24 | | lam. Mdst | |
| | | | | | | 33.0' |
| 35 | 13<br>17<br>21<br>30 | SB | 16 | | Sh | SHALE-Brown silty shale; numerous plant imprints (mostly leaves); some low-angle (~30° from horizontal) fractures. Iron staining common around plant fossils and along fractures. Interbedded with a few laminations of black peat and light-brown to yellowish brown silt. (Sentinel Butte Formation) |
| | | | | | | 38.0' |
| 40 | 10<br>20<br>35<br>43 | SB | 24 | D/M | Clst | CLAYSTONE- Brown, changing to gray below 40'. Numerous plant fossils (leaves, stems bark) in 39.5-41.5' sample; sparsely fossiliferous in 44.5-46.5' sample. Some iron-staining around plant fossils. Bedding is not apparent; parting is generally only along fossil imprints-otherwise very tough to break. One 2 cm-thick, yellowish-brown, cemented siltstone bed at 40'. (Sentinel Butte Formation) |
| 45 | 10<br>20<br>28<br>38 | SB | 24 | | | |
| | | | | | | 48.0' |
| 50 | 12<br>24<br>31<br>38 | SB | 24 | | lam. Mdst | LAMINATED MUDSTONE- Interbedded gray silt, gray very-fine sand, and gray clay; in regularly-alternating 0.5-1mm laminations. Generally poor parting. Trace of plant imprints. One 2cm-thick, pale-yellow, cemented siltstone bed at 50.5'. (Sentinel Butte Formation) |
| | | | | | | 53.0' |
| 55 | 52<br>62<br>38<br>100 | SB | 6 | W | Lgnt | LIGNITE-Black, very hard and brittle, fissile. (Hagel Bed/Sentinel Butte Formation) |
| 60 | | SB | | | | 60.0' |

Well 91-34C

HAGEL BED

COMMENT: Drilled by : solid-stem auger, 0-9.5'; 3 7/8" rotary drilling with water, 9.5-109.5'. Sampled with 2" O.D. split-barrel (SB) or 2 1/2" O.D. ring-lined barrel sampler (RLB). Water content: D= dry; D/M=slightly moist; M=moist; M/W=very moist; W=wet; S=saturated. Borehole backfilled with tremied neat cement grout.

PROJECT: Minnkota Power
DATE STARTED: 10/12/91
DATE COMPLETED: 10/14/91
FIELD INSPECTOR: M.C. Johnson (B.E.C.)
CREW CHIEF: H. Jacobson (T.C.T.)

BORING NO.: 91-34
RISER PIPE ELEVATION: _____
GROUND SURFACE ELEVATION: _____

| Depth (Feet) | Blows Per 6" | Sample Type | Recovery (inches) | Water Content | Profile | DESCRIPTION OF MATERIALS AND REMARKS |
|---|---|---|---|---|---|---|
| 60 | | SB | 12 | D/M | Clst | CLAYSTONE-Greenish-gray, changing to bluish-gray, and then gray, with depth. Somewhat silty and sandy, with numerous woody plant fragments (bark, small stems)In 59.5-61.5' sample. No apparent bedding or parting tendency. A few laminations of gray silt in 62.0-64.0' sample.(Sentinel Butte Formation). |
| | | RLB | 18 | | | |
| 65 | 12<br>24<br>31<br>38 | SB | 24 | | | 64.8' |
| | | RLB | 18 | | Ss | SANDSTONE-About 60-85% very fine to fine, well sorted sand; 15-40% silty to clayey fines. Interbedded with thin laminations of gray clay in 64.5-66.5' sample; changing to homogenous (no apparent stratification)below. Gray to bluish-gray. (Sentinel Butte Formation) |
| 70 | 12<br>14<br>22<br>20 | SB | 24 | M | | |
| | | RLB | 18 | | | 72.3' |
| | | | | | Clst | CLAYSTONE-Gray clay, slightly silty, with a little very fine sand. Difficult to break; no parting tendency; no apparent bedding or laminations. (Sentinel Butte Formation) |
| 75 | 15<br>17<br>28<br>62 | SB | 24 | | | 74.0' |
| | | RLB | 18 | | lam. Mdst | LAMINATED MUDSTONE- Interbedded gray clay, gray silty shale, light gray silt, and ligh gray, very fine sand. Clay laminations are generally 1-10 mm; silt and sand laminations are thinner, 0.5-5mm. Parting ranges from poor to good. (Sentinel Butte Formation) |
| 80 | 13<br>22<br>31<br>37 | SB | 24 | | | |
| | | RLB | 18 | | | |
| 85 | 17<br>26<br>29<br>42 | SB | 24 | D/M | | –Some strong-brown clay laminations, repeating at approximately 50 cm intervals. |
| | | RLB | 18 | | | 86.5' |
| 90 | 29 | SB | | M | Sh | SHALE-Gray, good shaly cleavage; interbedded with a few very thin (<0.2mm) light gray silt laminations. (Sentinel Butte Formation) |

Well 91-34b

**COMMENT:** Drilled by : solid-stem auger, 0-9.5'; 3 7/8" rotary drilling with water, 9.5-109.5'. Sampled with 2" O.D. split-barrel (SB) or 2 1/2" O.D. ring-lined barrel sampler (RLB). Water content: D=dry; D/M=slightly moist; M=moist; M/W=very moist; W=wet; S=saturated. Borehole backfilled with tremied neat cement grout.

PROJECT: Minnkota Power
DATE STARTED: 10/12/91
DATE COMPLETED: 10/14/91
FIELD INSPECTOR: M.C. Johnson (B.E.C.)
CREW CHIEF: H. Jacobson (T.C.T.)

BORING NO.: 91-34
RISER PIPE ELEVATION:
GROUND SURFACE ELEVATION:

| Depth (Feet) | Blows Per 6" | Sample Type | Recovery (Inches) | Water Content | Profile | DESCRIPTION OF MATERIALS AND REMARKS |
|---|---|---|---|---|---|---|
| 90 | | | | | | |
| | 36<br>52<br>48 | SB | 24 | M | Sh | |
| | | RLB | 18 | | | |
| | | | | | | – 94.5': Color change to dark brown. |
| 95 | | | | | | 95.2' |
| | 30<br>52<br>48<br>100 | SB | 20 | D/M | Slst | SANDY SILTSTONE-About equal proportions of very fine sand, silt, and clay, Greenish-gray. Mostly homogeneous structure; a few thin laminations. (Sentinel Butte Formation) |
| | | RLB | 16 | | | 97.0' |
| | | | | | | SANDSTONE- Very fine-grained quartz sand, well sorted, well rounded. About 50-80% sand by volume, with the remainder silt and a little clay. Friable. Color is greenish-gray to blulsh-gray. Laminated, with some 15-20% cross-laminations evident. (Sentinel Butte Formation). |
| 100 | 100 | SB | 12 | | | |
| | | | | | SS | |
| 105 | 19<br>25<br>28<br>37 | SB | 24 | M | | |
| | | | | | | |
| 110 | 18<br>24<br>25<br>42 | SB | 24 | | | |
| | | | | | | 111.5'<br>E.O.B. |
| 115 | | | | | | |
| 120 | | | | | | |

COMMENT: Drilled by : solid-stem auger, 0-9.5'; 3 7/8" rotary drilling with water, 9.5-109.5'. Sampled with 2" O.D. split-barrel (SB) or 2 1/2" O.D. ring-lined barrel sampler (RLB). Water content: D= dry; D/M=slightly moist; M=moist; M/W=very moist; W=wet; S=saturated. Borehole backfilled with tremied neat cement grout.

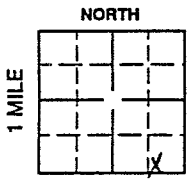
STATE OF NORTH DAKOTA
**BOARD OF WATER WELL CONTRACTORS**
900 E. BOULEVARD • BISMARCK, NORTH DAKOTA 58501

# WELL DRILLER'S REPORT

State law requires that this report be filed with the State Board of Water Well Contractors within 30 days after completion or abandonment of the well.

**1. WELL OWNER**
Name Minnkota Power Coop
Address Center, ND

**2. WELL LOCATION**
Sketch map location must agree with written location.




Sec. (1 mile) ____
County ____
SW ¼ SE ¼ SE ¼ Sec. 5 Twp. 141 N.Rg 83 W.

**3. PROPOSED USE**
☐ Domestic ☐ Geothermal ☒ Monitoring
☐ Stock ☐ Irrigation ☐ Industrial
☐ Municipal ☐ Test Hole

**4. METHOD DRILLED**
☐ Cable ☐ Reverse Rotary ☐ Bored
☒ Forward Rotary ☐ Jetted ☐ Auger
If other, specify ____

**5. WATER QUALITY**
Was a water sample collected for:
Chemcial Analysis? ☐ Yes ☒ No
Bacteriological Analysis? ☐ Yes ☒ No
If so, to what laboratory was it sent? ____

**6. WELL CONSTRUCTION**
Diameter of hole 5 1/8 inches. Depth 110 feet.
Casing: ☐ Steel ☒ Plastic ☐ Concrete
☐ Threaded ☐ Welded ☐ Other
If other, specify ____

| Pipe Weight: | Diameter: | From: | To: |
|---|---|---|---|
| ____ lb/ft | 2 inches | 0 feet | 100 feet |
| ____ lb/ft | ____ inches | ____ feet | ____ feet |
| ____ lb/ft | ____ inches | ____ feet | ____ feet |

Was perforated pipe used? ☐ Yes ☒ No
Perforated pipe set from ____ ft to ____ feet
Was casing left open end? ☐ Yes ☒ No
Was a well screened installed? ☒ Yes ☐ No
Material PVC Diameter 2 inches
Slot Size 10 set from 100 feet to 110 feet
Slot Size ____ set from ____ feet to ____ feet
Was packer or seal used? ☐ Yes ☒ No
If so, what material ____ Depth ____ ft.
(stainless steel, bronze, etc.)
Type of well: Straight screen ☐ Gravel packed ☒
Depth grouted: From 96' To surface
Grouting Material: Cement ✓ Other ____
If other explain: ____
Well head completion: Pitless unit ____
12" above grade ____ Other ____
If other, specify Protective steel casing
Was pump installed: ☐ Yes ☒ No
Was well disinfected upon completion? ☐ Yes ☒ No

**7. WATER LEVEL**
Static water level ____ feet below surface
If flowing: closed-in pressure ____ psi
GPM flow ____ through ____ inch pipe
Controlled by: ☐ Valve ☐ Reducers ☐ Other
If other, specify ____

**8. WELL TEST DATA**
☐ Pump ☐ Bailer ☒ Other
Pumping level below land surface:
____ ft. after ____ hrs. pumping ____ gpm
____ ft. after ____ hrs. pumping ____ gpm
____ ft. after ____ hrs. pumping ____ gpm

**9. WELL LOG**

| Formation | Depth (ft.) From | To |
|---|---|---|
| Clayey Till | 0 | 12 |
| Shale | 12 | 24 |
| Siltstone | 24 | 32 |
| Shale and Claystone (lost circ) | 32 | 48 |
| Siltstone | 48 | 53 |
| Coal, platey, Brittle (lost circ) | 53 | 60 |
| Claystone | 60 | 64 |
| Sandstone, Silty, clayey | 64 | 72 |
| Claystone and shale | 72 | 84 |
| Siltstone | 84 | 88 |
| Shale | 88 | 95 |
| Sandstone, variably mixed and laminated with silt and clay | 95 | 111.5 |

(Use separate sheet if necessary)

**10. DATE COMPLETED** Nov 21, 1991

**11. WAS WELL PLUGGED OR ABANDONED?**
☐ Yes ☒ No
If so, how ____

**12. REMARKS:** Well log from pilot hole 91-34.
- Packed w/ 160 lbs. #4 Silica Sand top of sand @ 96'
- Tremied grout from 93'

**13. DRILLER'S CERTIFICATION**
This well was drilled under my jurisdiction and this report is true to the best of my knowledge.

BNI COAL, Ltd. 415
Driller's or Firm's Name Certificate No.

HC2 Box 230 Center ND 58530
Address

Wm. Atkinson 11-25-91
Signed by Date

WHITE-DRILLER'S COPY YELLOW-BOARD'S COPY PINK-CUSTOMER'S COPY

91-34A

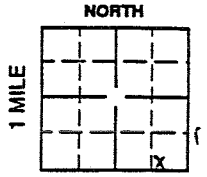
STATE OF NORTH DAKOTA
**BOARD OF WATER WELL CONTRACTORS**
900 E. BOULEVARD • BISMARCK, NORTH DAKOTA 58501

# WELL DRILLER'S REPORT

State law requires that this report be filed with the State Board of Water Well Contractors within 30 days after completion or abandonment of the well.

**1. WELL OWNER**
Name Minnkota Power Coop.
Address Center, ND

**2. WELL LOCATION**
Sketch map location must agree with written location.




County _____
SW ¼ SE ¼ SE ¼ Sec. 5 Twp. 141 N. Rg 83 W.

**3. PROPOSED USE**
☐ Domestic ☐ Stock ☐ Geothermal ☐ Irrigation ☐ Municipal ☒ Monitoring ☐ Industrial ☐ Test Hole

**4. METHOD DRILLED**
☐ Cable ☒ Forward Rotary ☐ Reverse Rotary ☐ Jetted ☐ Bored ☐ Auger
If other, specify _____

**5. WATER QUALITY**
Was a water sample collected for:
Chemcial Analysis? ☐ Yes ☒ No
Bacteriological Analysis? ☐ Yes ☒ No
If so, to what laboratory was it sent? _____

**6. WELL CONSTRUCTION**
Diameter of hole 5 7/8 inches. Depth 78.5 feet.
Casing: ☐ Steel ☒ Plastic ☐ Concrete ☐ Threaded ☐ Welded ☐ Other
If other, specify _____

| Pipe Weight | Diameter: | From: | To: |
|---|---|---|---|
| ____ lb/ft | 2 inches | 0 feet | 62.5 feet |
| ____ lb/ft | ____ inches | ____ feet | ____ feet |
| ____ lb/ft | ____ inches | ____ feet | ____ feet |

Was perforated pipe used? ☐ Yes ☒ No
Perforated pipe set from _____ ft to _____ feet
Was casing left open end? ☐ Yes ☒ No
Was a well screened installed? ☒ Yes ☐ No
Material PVC Diameter 2 inches
Slot Size 10 set from 62.5 feet to 78.5 feet
Slot Size _____ set from _____ feet to _____ feet
Was packer or seal used? ☐ Yes ☒ No
If so, what material _____ Depth _____ ft.
(stainless steel, bronze, etc.)
Type of well: Straight screen ☐ Gravel packed ☒
Depth grouted: From 66' To surface
Grouting Material: Cement ✓ Other _____
If other explain: _____
Well head completion: Pitless unit _____
12" above grade _____ Other _____
If other, specify Protective steel casing
Was pump installed: ☐ Yes ☒ No
Was well disinfected upon completion? ☐ Yes ☒ No

**7. WATER LEVEL**
Static water level _____ feet below surface
If flowing: closed-in pressure _____ psi
GPM flow _____ through _____ inch pipe
Controlled by: ☐ Valve ☐ Reducers ☐ Other
If other, specify _____

**8. WELL TEST DATA**
☐ Pump ☐ Bailer ☐ Other
Pumping level below land surface:
_____ ft. after _____ hrs. pumping _____ gpm
_____ ft. after _____ hrs. pumping _____ gpm
_____ ft. after _____ hrs. pumping _____ gpm

**9. WELL LOG**

| Formation | Depth (ft.) From | To |
|---|---|---|
| Clayey till | 0 | 12 |
| Shale | 12 | 24 |
| Siltstone | 24 | 32 |
| Shale and claystone (lost circ.) | 32 | 48 |
| Siltstone | 48 | 53 |
| Coal, fiery, brittle (lost circ) | 53 | 60 |
| Claystone | 60 | 64 |
| Sandstone, silty, clayey | 64 | 72 |
| Claystone and shale | 72 | 78.5 |

(Use separate sheet if necessary)

**10. DATE COMPLETED** Nov. 22, 1991

**11. WAS WELL PLUGGED OR ABANDONED?**
☐ Yes ☒ No
If so, how _____

**12. REMARKS:**
- Well log from pilot hole 91-34
- Packed w/ 160 lbs. No. 4 silica sand top of sand @ 66'
- Grout tremied from 60'

**13. DRILLER'S CERTIFICATION**
This well was drilled under my jurisdiction and this report is true to the best of my knowledge.

| Driller's or Firm's Name | Certificate No. |
|---|---|
| BNI Coal LTD | 415 |
| Address | |
| Center ND 58530 | |
| Signed by | Date |
| Wm. Peterson | 11-25-91 |

WHITE-DRILLER'S COPY YELLOW-BOARD'S COPY PINK-CUSTOMER'S COPY

91-34B

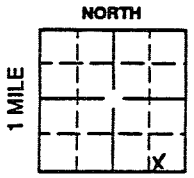
STATE OF NORTH DAKOTA
**BOARD OF WATER WELL CONTRACTORS**
900 E. BOULEVARD • BISMARCK, NORTH DAKOTA 58501

# WELL DRILLER'S REPORT

State law requires that this report be filed with the State Board of Water Well Contractors within 30 days after completion or abandonment of the well.

**1. WELL OWNER**
Name: Minnkota Power Coop
Address: Center, ND 58530

**2. WELL LOCATION**
Sketch map location must agree with written location.




Sec. (1 mile) ____
County ____
SW¼SE¼SE¼ Sec. 5 Twp. 141 N.Rg 83 W.

**3. PROPOSED USE**
☐ Domestic ☐ Stock ☐ Geothermal ☐ Irrigation ☐ Municipal ☒ Monitoring ☐ Industrial ☐ Test Hole

**4. METHOD DRILLED**
☐ Cable ☒ Forward Rotary ☐ Reverse Rotary ☐ Jetted ☐ Bored ☐ Auger
If other, specify ____

**5. WATER QUALITY**
Was a water sample collected for:
Chemcial Analysis? ☐ Yes ☒ No
Bacteriological Analysis? ☐ Yes ☒ No
If so, to what laboratory was it sent? ____

**6. WELL CONSTRUCTION**
Diameter of hole 5 7/8 inches. Depth 60 feet.
Casing: ☐ Steel ☒ Plastic ☐ Concrete ☐ Threaded ☐ Welded ☐ Other
If other, specify ____

| Pipe Weight | Diameter: | From: | To: |
|---|---|---|---|
| ____ lb/ft | 2 inches | 0 feet | 50 feet |
| ____ lb/ft | ____ inches | ____ feet | ____ feet |
| ____ lb/ft | ____ inches | ____ feet | ____ feet |

Was perforated pipe used? ☐ Yes ☒ No
Perforated pipe set from ____ ft to ____ feet
Was casing left open end? ☐ Yes ☒ No
Was a well screened installed? ☒ Yes ☐ No
Material PVC Diameter 2 inches
Slot Size 10 set from 50 feet to 60 feet
Slot Size ____ set from ____ feet to ____ feet
Was packer or seal used? ☐ Yes ☒ No
If so, what material ____ Depth ____ ft.
(stainless steel, bronze, etc.)
Type of well: Straight screen ☐ Gravel packed ☒
Depth grouted: From 50 To surface
Grouting Material: Cement ✓ Other ____
If other explain: ____
Well head completion: Pitless unit ____
12" above grade ____ Other ____
If other, specify Protective Steel casing
Was pump installed: ☐ Yes ☒ No
Was well disinfected upon completion? ☐ Yes ☒ No

**7. WATER LEVEL**
Static water level ____ feet below surface
If flowing: closed-in pressure ____ psi
GPM flow ____ through ____ inch pipe
Controlled by: ☐ Valve ☐ Reducers ☐ Other
If other, specify ____

**8. WELL TEST DATA**
☐ Pump ☐ Bailer ☐ Other
Pumping level below land surface:
____ ft. after ____ hrs. pumping ____ gpm
____ ft. after ____ hrs. pumping ____ gpm
____ ft. after ____ hrs. pumping ____ gpm

**9. WELL LOG**

| Formation | Depth (ft.) From | Depth (ft.) To |
|---|---|---|
| Clayey till | 0 | 12 |
| Shale | 12 | 24 |
| Siltstone | 24 | 32 |
| Shale and Claystone | 32 | 48 |
| (lost circ) | | |
| Siltstone | 48 | 53 |
| Coal, Platy, Brittle | 53 | 60 |
| (lost circ.) | | |

(Use separate sheet if necessary)

**10. DATE COMPLETED** Nov 22, 1991

**11. WAS WELL PLUGGED OR ABANDONED?**
☐ Yes ☒ No
If so, how ____

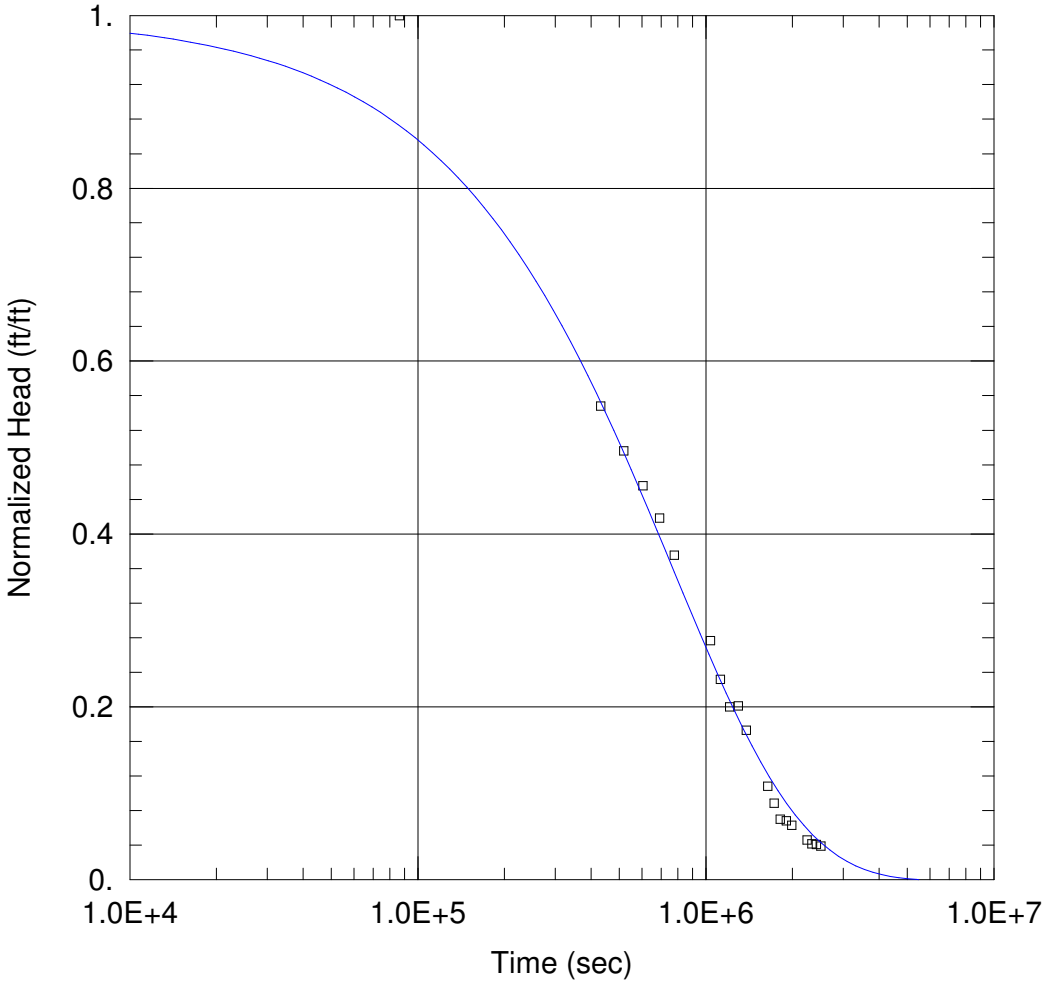
**12. REMARKS:**
- Well log from pilot hole 91-34
- Sand pack a 160 lbs #4 silica sand top of sand at 47.5 ft.
- Grout tremied from 40 ft

**13. DRILLER'S CERTIFICATION**
This well was drilled under my jurisdiction and this report is true to the best of my knowledge.

BNI Coal, Ltd — 415
Driller's or Firm's Name — Certificate No.
HC 2 Box 230, Center, ND 58530
Address
Wm Peterson — 11-25-91
Signed by — Date

WHITE DRILLER'S COPY YELLOW BOARD'S COPY PINK CUSTOMER'S COPY

91-34c




## WELL 91-34B

Data Set: P:\...\Well_91-34B_baildown_analysis.aqt
Date: 08/24/12 Time: 10:25:46

## PROJECT INFORMATION

Company: Barr Engineering
Project: 34/33-0014.18
Test Well: Well 91-34B
Test Date: 7/25/2012 - 8/23/2012

## AQUIFER DATA

Saturated Thickness: 10. ft

## WELL DATA (Well 91-34B)

Initial Displacement: 9.052 ft
Total Well Penetration Depth: 78.5 ft
Casing Radius: 0.1666 ft
Static Water Column Height: 9.62 ft
Screen Length: 10. ft
Well Radius: 0.427 ft

## SOLUTION

Aquifer Model: Unconfined
Solution Method: KGS Model

Kr = 0.001009 ft/day
Kz/Kr = 0.01
Ss = 1.0E-6 $ft^{-1}$

Data Set: P:\Mpls\34 ND\33\34330014 Long Term Ash Permit Modificat\WorkFiles\HydroGeotech-Geotech\Well_91
Title: Well 91-34B
Date: 08/24/12
Time: 10:26:18

## PROJECT INFORMATION

Company: Barr Engineering
Project: 34/33-0014.18
Test Date: 7/25/2012 - 8/23/2012
Test Well: Well 91-34B

## AQUIFER DATA

Saturated Thickness: 10. ft
Anisotropy Ratio (Kz/Kr): 0.01

## SLUG TEST WELL DATA

### Test Well: Well 91-34B

X Location: 0. ft
Y Location: 0. ft

Initial Displacement: 9.052 ft
Static Water Column Height: 9.62 ft
Casing Radius: 0.1666 ft
Well Radius: 0.427 ft
Well Skin Radius: 0.427 ft
Screen Length: 10. ft
Total Well Penetration Depth: 78.5 ft

No. of Observations: 20

Observation Data

| Time (sec) | Displacement (ft) | Time (sec) | Displacement (ft) |
|---|---|---|---|
| 8.64E+4 | 9.052 | 1.382E+6 | 1.562 |
| 4.32E+5 | 4.96 | 1.642E+6 | 0.9786 |
| 5.184E+5 | 4.492 | 1.728E+6 | 0.8006 |
| 6.048E+5 | 4.124 | 1.814E+6 | 0.6326 |
| 6.912E+5 | 3.786 | 1.901E+6 | 0.6146 |
| 7.776E+5 | 3.398 | 1.987E+6 | 0.5667 |
| 1.037E+6 | 2.504 | 2.246E+6 | 0.4128 |
| 1.123E+6 | 2.096 | 2.333E+6 | 0.3748 |
| 1.21E+6 | 1.808 | 2.419E+6 | 0.3668 |
| 1.296E+6 | 1.82 | 2.506E+6 | 0.3488 |

## SOLUTION

Slug Test
Aquifer Model: Unconfined
Solution Method: KGS Model

## VISUAL ESTIMATION RESULTS

### Estimated Parameters

| Parameter | Estimate | |
|---|---|---|
| Kr | 0.001009 | ft/day |
| Ss | 1.0E-6 | $ft^{-1}$ |
| Kz/Kr | 0.01 | |

K = 3.558E-7 cm/sec
T = K*b = 0.01009 $ft^2$/day (0.0001084 sq. cm/sec)

## NOTES

Test is data recorded after a bail down test. Data corrected for an apparent regional trend.

~~2006-08-01~~ ~~2008-01~~

State of North Dakota

# BOARD OF WATER WELL CONTRACTORS 2006-08-01R

900 E. BOULEVARD • BISMARCK, NORTH DAKOTA 58505

## MONITORING WELL REPORT ~~2006-02~~

State law requires that this report be filed with the State Board of Water Well Contractors within 30 days after completion or abandonment of the well.

**1. WELL OWNER**

Name Minkota Power

Address 3401 24th St. SW

Center ND 58530-0127

**2. WELL LOCATION**

Address (if in city) _____

County Oliver

NE 1/4 NW 1/4 SE 1/4 SE 1/4 Sec. 5 Twp. 141 N. Rge. 82 W.

Lat.: _____ Long.: _____

Altitude: _____

**3. METHOD DRILLED**

☒ Auger ☐ Other _____

**4. WELL CONSTRUCTION**

Diameter of Hole 7.5 inches Depth 56 feet

Riser: ☐ PVC ☐ Other
☒ Threaded ☐ Solvent ☐ Other

Riser rating SDR _____ Schedule 40

Diameter 2 inches

From 0 ft. to 46 ft.

Was a well screen installed? ☒ Yes ☐ No

Material PVC Diameter 2 inches

Slot Size .010 set from 46 feet to 56 feet

Sand packed from 46 to 44

Depth grouted from 44 to 2

Grouting Material

Bentonite X Other X

If other explain: Bentonite chips from 44 to 42 then hydrated chips then Volclay Grout from 42' to 2' - Sakcrete from 2' to 0' then installed 6" inch steel protective casing was installed.

Well head completion: Steel 3 SW corner of cell

24" above grade Locking well protector Other _____

If other, specify TOC 2095.91

Was protective casing installed? ☒ Yes ☐ No

Was well disinfected upon completion? ☐ Yes ☒ No

**5. WATER LEVEL**

Static water level 0 feet below surface

If flowing: closed-in pressure N/A psi or ft. above land surface

**6. WELL LOG**

| Formation | Depth (Ft.) From | To |
|---|---|---|
| Silty Sandy Clay | 0 | 12 |
| Fine Sand | 12 | 49 |
| Lignite | 49 | 56 |

(Use separate sheet if necessary)

**7. WAS THE HOLE PLUGGED OR ABANDONED?**

☐ Yes ☒ No

If so, how? _____

**8. REMARKS**

Dry - No Water

**9. DATE COMPLETED** 9-16-08

**10. CONTRACTOR CERTIFICATION**

This well was drilled under my jurisdiction and this report is true to the best of my knowledge.

Brain Interface

Monitoring Well Contractor

405

Certificate No.

820 South 18th St.

Address Bismarck ND

Signature

9-16-08

Date

~~2008-02~~
2006-0804KR

State of North Dakota

# BOARD OF WATER WELL CONTRACTORS

900 E. BOULEVARD • BISMARCK, NORTH DAKOTA 58505

## MONITORING WELL REPORT

State law requires that this report be filed with the State Board of Water Well Contractors within 30 days after completion or abandonment of the well.

**1. WELL OWNER**

Name Minnkota Power

Address 3401 24th St. SW

Center ND 58530 - 0127

**2. WELL LOCATION**

Address (if in city) _____

_____

County Oliver

NE 1/4 SW 1/4 SE 1/4 Sec. 5 Twp. 141 N. Rge. 83 W.

Lat.: _____ _____ _____ Long.: _____ _____ _____

Altitude: _____

**3. METHOD DRILLED**

☒ Auger Other _____

**4. WELL CONSTRUCTION**

Diameter of Hole 7.5 inches Depth 53 feet

Riser: ☒ PVC ☐ Other

☒ Threaded ☐ Solvent ☐ Other

Riser rating SDR _____ Schedule 40

Diameter 2 inches

From 0 ft. to 43 ft.

Was a well screen installed? ☒ Yes ☐ No

Material PVC Diameter 2 inches

Slot Size .010 set from 43 feet to 53 feet

Sand packed from 41 to 53

Depth grouted from 41 to 2

Grouting Material

Bentonite X Other X

If other explain: Bentonite Chips From 41 to 39

then Hydrated then rotating grout from 39

to 2ft. - Sack crete from 2 to 0 Mixed 1

Protective Casing was installed

Well head completion:

SE Corner of Cell St. #2

24" above grade Check well Protector Other _____

If other, specify TOC 2095.99

Was protective casing installed? ☒ Yes ☐ No

Was well disinfected upon completion? ☐ Yes ☐ No

**5. WATER LEVEL**

Static water level 0 feet below surface

If flowing: closed-in pressure N/A psi or ft. above land surface

**6. WELL LOG**

| Formation | Depth (Ft.) From | To |
|---|---|---|
| Sandy/Clay | 0 | 10 |
| Brown Sand | 10 | 43 |
| Lignite | 43 - | 53 |

(Use separate sheet if necessary)

**7. WAS THE HOLE PLUGGED OR ABANDONED?**

☐ Yes ☒ No

If so, how? _____

**8. REMARKS**

No water

**9. DATE COMPLETED** 9-16-08

**10. CONTRACTOR CERTIFICATION**

This well was drilled under my jurisdiction and this report is true to the best of my knowledge.

Brown Interior

Rick Haas — Monitoring Well Contractor

405 — Certificate No.

1820 South 18th St. S

Address Bismarck N.D

Rick Haas — Signature

9-25-08 — Date

# Appendix B

## Information on Area Wells

**D&L ENTERPRISES**
**3017 MANCHESTER STREET**
**BISMARCK ND 58504**
**Phone – (701) 224-0213  Fax – (701) 221-2118**

## *WELL CERTIFICATION*

Date of certification: **8-26-11**
Project No: **BNI-11-051**

## *LOCATION*

Owner/Operator: Danita Deichert
Address: 3009 Bayside Drive, Mandan, ND 58554
Well Identification: **D. Diechert Well #1.**
Well Location: 141-83-8DAD (Lat. 47-2-36 N Lon. 101-12-15 W)
Relative Landmarks and/or Buildings: Messer Farm, old farm site.
Ground Elevation: 2140 feet estimated from USGS Nelson Lake 7.5 min. Quadrangle.
Use of Water: Not in use at this time.
Owner/Operator Comments:

## *WELL CONSTRUCTION*

Depth: No access for levels.
Casing Depth/Type: NA
Diameter/Finish: NA
Date Drilled: NA
Drillers Name: NA
Drillers Address: NA
Comments: Well in poor condition.

## *PUMP SPECIFICATIONS*

Type: Windmill.
Pump Intake Depth: NA
Power (type): Wind
Horsepower: NA
Comments:

**D&L ENTERPRISES**
**3017 MANCHESTER STREET**
**BISMARCK ND 58504**
**Phone – (701) 224-0213  Fax – (701) 221-2118**

## *WELL CERTIFICATION*

Date of certification: **8-26-11**
Project No: **BNI-11-053**

## *LOCATION*

Owner/Operator: Danita Deichert
Address: 3009 Bayside Drive, Mandan, ND 58554
Well Identification: **D. Diechert Well #3.**
Well Location: 141-83-8CDB (Lat. 47-2-29 N, Lon. 101-13-41 W).
Relative Landmarks and/or Buildings: Old windmill base, south of house foundation.
Ground Elevation: 2120 feet estimated from USGS Nelson Lake 7.5 min. Quadrangle.
Use of Water: Abandoned.
Owner/Operator Comments:

## *WELL CONSTRUCTION*

Depth: No access for levels.
Casing Depth/Type: NA
Diameter/Finish: NA
Date Drilled: NA
Drillers Name: NA
Drillers Address: NA
Comments: Unable to locate.

## *PUMP SPECIFICATIONS*

Type: NA
Pump Intake Depth: NA
Power (type): NA
Horsepower: NA
Comments:

**D&L ENTERPRISES**
**3017 MANCHESTER STREET**
**BISMARCK ND 58504**
**Phone – (701) 224-0213  Fax – (701) 221-2118**

## *WELL CERTIFICATION*

Date of certification: **8-26-11**
Project No: **BNI-11-054**

## *LOCATION*

Owner/Operator: Danita Deichert
Address: 3009 Bayside Drive, Mandan, ND 58554
Well Identification: **D. Diechert Well #4.**
Well Location: 141-83-8CDB (Lat. 47-2-29 N, Lon. 101-13-43 W).
Relative Landmarks and/or Buildings: Uphill from house foundation.
Ground Elevation: 2130 feet estimated from USGS Nelson Lake 7.5 min. Quadrangle.
Use of Water: Destroyed.
Owner/Operator Comments:

## *WELL CONSTRUCTION*

Depth: No access for levels.
Casing Depth/Type: NA
Diameter/Finish: NA
Date Drilled: NA
Drillers Name: NA
Drillers Address: NA
Comments: Unable to locate.

## *PUMP SPECIFICATIONS*

Type: NA
Pump Intake Depth: NA
Power (type): NA
Horsepower: NA
Comments:

| LOCAL WELL NUMBER | OWNER | DRILLED DEPTH (FT.) | DEPTH TO FIRST PERFOR-ATION (FT.) | WELL DEPTH (FT.) | CASING DIAM-ETER (IN.) | DATE DRILLED (YEAR) | WATER LEVEL (FT.) | DATE WATER LEVEL MEAS. | WATER USE | WATER BEARING MATERIAL | AQUIFER | SPE-CIFIC CON-DUCT ANCE | TEM-PER-ATURE (°C) | ELE-VATION OF LSD (FT.) | LOG AVAIL-ABLE | FREQUENCY OF WATER-LEVEL MEASURE-MENTS | QW TYPE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 140N085W03DDD | W.RUSCH | 1040 | -- | 980 | 4 | 1967 | 278 | -- | K | S | PS | 2630 | -- | 2100 | DE | N | C |
| 141N081W11DC | T.PRICE | | -- | 74 | 4 | 1967 | -- | -- | S | S | OE | <500 | -- | -- | -- | N | K |
| 141N081W11DD | T.PRICE | | -- | 30 | -- | 1959 | -- | -- | S | -- | OE | 1100 | -- | -- | -- | N | K |
| 141N081W12CD | T.PRICE | | -- | 44 | -- | 1959 | 10 | 4-67 | S | -- | 31 | 1320 | -- | -- | -- | O | K |
| 141N081W13CCC | NDGS | 84 | 51 | 54 | 1 | 1967 | 9 | 8-67 | U | S | 31 | 900 | 9.5 | 1650 | G | O | C |
| 141N081W13DBB | J.WACHTER | | -- | -- | 2 | -- | +23 | 5-68 | S | -- | OL | 2770 | 11.0 | 1645 | -- | O | C |
| 141N081W14CCA | A.MUSFLOEN | | -- | 54 | -- | 1942 | -- | -- | K | S | -- | 920 | -- | -- | -- | N | K |
| 141N081W14CDA | A.MUSFLOEN | | -- | 60 | 4 | -- | -- | -- | S | -- | -- | 2100 | -- | 1650 | -- | N | K |
| 141N081W22BAC | O.MUSFLOEN | | -- | 126 | 2 | 1937 | -- | -- | U | -- | -- | -- | -- | 1770 | -- | N | -- |
| 141N081W23CA | F.WETZSTEIN | | -- | -- | -- | -- | -- | -- | S | -- | 31 | 1850 | 7.5 | -- | -- | N | K |
| 141N081W24CC | F.WETZSTEIN | | -- | 42 | 6 | -- | -- | -- | S | -- | 31 | 1580 | 10.0 | -- | -- | N | K |
| 141N081W26AC | F.WETZSTEIN | | -- | 44 | 6 | -- | -- | -- | S | -- | 31 | 1375 | 12.0 | -- | -- | N | K |
| 141N081W27DDB | F.WETZSTEIN | | -- | 46 | 4 | -- | -- | -- | S | -- | 31 | 1450 | -- | -- | -- | N | K |
| 141N082W02CBB1 | M.GEIGER | | -- | 180 | 2 | 1950 | 155 | -- | H | S | OD | 1800 | -- | -- | -- | N | K |
| 141N082W02CBB2 | M.GEIGER | | -- | 70 | 24 | 1961 | 58 | -- | S | HP | OD | 1050 | -- | -- | -- | N | K |
| 141N082W04ADD | M.EMINETH | | -- | 180 | 2 | -- | -- | -- | K | S | OD | 4550 | -- | -- | -- | N | K |
| 141N082W06CB | K.NAGEL | 82 | -- | -- | 4 | 1963 | -- | -- | K | G | -- | 1810 | -- | -- | -- | N | K |
| 141N082W07ACA1 | S.ORGAARD | | -- | 18 | 24 | 1946 | 16 | -- | S | G | -- | 1050 | -- | -- | -- | N | K |
| 141N082W07ACA2 | S.ORGAARD | | -- | 35 | 2 | 1960 | 14 | -- | H | S | -- | 1270 | -- | -- | -- | N | K |
| 141N082W08DDD1 | E.ORGAARD | | -- | 30 | 36 | -- | 12 | 10-66 | S | S | -- | 3350 | 7.0 | -- | -- | O | K |
| 141N082W08DDD2 | E.ORGAARD | | -- | 20 | 36 | 1956 | 10 | -- | H | S | -- | 3690 | -- | -- | -- | N | K |
| 141N082W08DDD3 | E.ORGAARD | | -- | 28 | 16 | 1966 | 12 | -- | H | S | -- | 2000 | -- | -- | -- | N | K |
| 141N082W09DDD | NDSWC 3649 | 440 | 431 | 437 | 2 | 1968 | 280 | 1-69 | U | S | OI | 2450 | 9.5 | 1969 | DE | O | C |
| 141N082W10BA | O.TYE | | -- | 21 | 48 | -- | 14 | 4-67 | S | S | OD | -- | -- | -- | -- | O | -- |
| 141N082W12CBA | O.GAREN | | -- | 28 | 24 | 1904 | 20 | -- | H | Z | OD | 2950 | 8.5 | -- | -- | N | K |
| 141N082W20BDC | S.SCHMIDT | | -- | 253 | 4 | 1966 | 193 | -- | K | S | OH | 2210 | -- | -- | -- | N | K |
| 141N082W20DDDD | J.AMAN | | -- | 67 | 24 | 1930 | 53 | -- | K | Z | OH | 2550 | 8.5 | -- | -- | N | K |
| 141N082W22CCB | V.KOCH | | -- | 220 | 4 | 1966 | 140 | -- | K | S | -- | 2320 | -- | -- | -- | N | K |
| 141N082W22CD | NDSWC 3723 | 60 | -- | -- | -- | 1969 | -- | -- | U | -- | -- | -- | -- | 1743 | GE | N | -- |
| 141N082W22CDA | NDSWC 3725 | 60 | 28 | 34 | 1 | 1969 | 5 | 7-69 | U | 9S | 31 | 1190 | 8.5 | 1746 | GE | O | C |
| 141N082W26CCA1 | N.JACOBSON | | -- | 156 | 2 | 1915 | 140 | -- | S | S | -- | 2300 | 8.5 | -- | -- | N | K |
| 141N082W26CCA2 | N.JACOBSON | | -- | 186 | 2 | 1956 | 160 | -- | H | S | -- | 2300 | -- | -- | -- | N | K |
| 141N082W27BAB | NDSWC 3724 | 60 | -- | -- | -- | 1969 | -- | -- | U | -- | -- | -- | -- | 1743 | G | N | -- |
| 141N082W34BAA | V.KOCH | | -- | 165 | 4 | 1962 | 80 | -- | K | S | -- | 2190 | -- | -- | -- | N | K |
| 141N083N02DDB1 | F.SCHWALBE | | -- | 30 | 36 | 1930 | 10 | 5-67 | S | -- | OD | 2900 | -- | -- | -- | O | K |
| 141N083W02DDB2 | F.SCHWALBE | | -- | 160 | 6 | 1966 | 17 | -- | H | -- | OH | 2450 | -- | -- | -- | N | K |
| 141N083W04ADD | NDGS | 80 | 63 | 66 | 1 | 1967 | 14 | 8-67 | U | S | 31 | 1040 | -- | 1886 | G | N | C |
| 141N083W04BAD | NDGS | 80 | 45 | 48 | 1 | 1967 | 41 | 8-67 | U | S | 31 | -- | -- | 1902 | G | O | -- |
| 141N083W04BC | USGS | 340 | 310 | 316 | 2 | 1967 | 135 | 5-67 | U | S | OD | 2490 | 9.5 | 2015 | Y | M | C |
| 141N083W04BDA | NDGS | 70 | 45 | 48 | 1 | 1967 | 18 | 8-67 | U | S | 31 | 1070 | 9.5 | 1888 | G | O | C |

| LOCAL WELL NUMBER | OWNER | DRILLED DEPTH (FT.) | DEPTH TO FIRST PERFOR-ATION (FT.) | WELL DEPTH (FT.) | CASING DIAM-ETER (IN.) | DATE DRILLED (YEAR) | WATER LEVEL (FT.) | DATE WATER LEVEL MEAS. | WATER USE | WATER BEARING MATERIAL | AQUIFER | SPE-CIFIC CON-DUCT ANCE | TEM-PER-ATURE (°C) | ELE-VATION OF LSD (FT.) | LOG AVAIL-ABLE | FREQUENCY OF WATER-LEVEL MEASURE-MENTS | QW TYPE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 141N083W04BDB | NDGS | 76 | 73 | 76 | 1 | 1967 | 41 | 8-67 | U | S | 31 | 1050 | 8.5 | 1908 | G | O | C |
| 141N083W04DAD | J.MANNY | 35 | 28 | -- | 4 | 1965 | -- | -- | K | -- | -- | 2350 | -- | -- | -- | N | K |
| 141N083W05BBD | G.BARMHARDT | | -- | -- | 24 | -- | 21 | 5-67 | S | -- | -- | 680 | -- | -- | -- | O | K |
| 141N083W08CDB | B.BARHARDT | | 100 | 106 | -- | 1954 | 75 | -- | K | Z | OD | 1290 | -- | -- | -- | N | K |
| 141N083W12AAC1 | A.SCHWALBE | 60 | 56 | -- | 4 | 1964 | -- | -- | H | -- | OD | 1060 | -- | -- | -- | N | K |
| 141N083W12AAC2 | A.SCHWALBE | 40 | 39 | -- | 4 | 1965 | -- | -- | S | -- | OD | 720 | -- | -- | -- | N | K |
| 141N083W14BCD1 | W.SCHWALBE | | 180 | 189 | 4 | 1962 | -- | -- | H | S | -- | 2250 | -- | -- | -- | N | K |
| 141N083W14BCD2 | W.SCHWALBE | 180 | 177 | -- | 4 | 1965 | 100 | -- | S | S | OD | 2250 | 8.5 | -- | -- | N | K |
| 141N083W20AAA | A.LANDEIS | | -- | 360 | 2 | -- | -- | -- | K | -- | OH | 2070 | -- | -- | -- | N | K |
| 141N083W30ADD | P.KRAFT | | 60 | 70 | 2 | 1959 | -- | -- | K | -- | OD | 680 | -- | -- | -- | N | K |
| 141N084W04DDD | S.HENDERSCHEID | | -- | 86 | 18 | -- | -- | -- | H | Z | OD | -- | -- | -- | -- | N | -- |
| 141N084W05CAB1 | E.MOSBRUCKER | | | | 24 | 1963 | 20 | -- | S | Z | OD | -- | -- | -- | -- | N | -- |
| 141N084W05CAB2 | E.MOSBRUCKER | | | | 24 | 1963 | 20 | -- | H | Z | OD | 1500 | -- | -- | -- | N | K |
| 141N084W09AAB | S.HENDERSCHEID | | | | 4 | 1956 | -- | -- | H | SP | OD | -- | -- | -- | -- | N | -- |
| | W.REINKE | | -- | 36 | 24 | 1928 | 16 | -- | S | -- | -- | 1490 | 7.0 | -- | -- | N | K |
| | W.REINKE | | -- | 169 | 4 | 1962 | 90 | -- | H | Z | OC | 2120 | -- | -- | -- | N | K |
| 141N084W11AAB1 | N.BERGER | | -- | 75 | 24 | 1962 | 40 | -- | K | -- | OD | >7000 | -- | -- | -- | N | K |
| 141N084W11AAB2 | N.BERGER | | -- | 185 | 2 | -- | -- | -- | U | S | -- | -- | -- | -- | -- | N | -- |
| 141N084W11ACB | N.BERGER | | 168 | 170 | 4 | 1959 | 120 | -- | U | S | OD | 1600 | 8.5 | -- | -- | N | K |
| 141N084W14DAA | M.SCHMIDT | | -- | 240 | 2 | 1949 | 100 | -- | K | S | OD | -- | -- | -- | -- | N | -- |
| 141N084W18DDC1 | C.HEID | | -- | 35 | 24 | -- | 16 | -- | S | Z | OJ | 1900 | -- | -- | -- | N | K |
| 141N084W18DDC2 | C.HEID | | -- | 30 | 24 | 1947 | 16 | -- | H | Z | OJ | 2420 | -- | -- | -- | N | K |
| 141N084W18DDC3 | C.HEID | | -- | 28 | 24 | 1964 | 16 | -- | S | Z | OJ | 2580 | 6.5 | -- | -- | N | K |
| 141N084W19CCC | M.BETHKE | | -- | 160 | 4 | 1961 | 60 | -- | K | Z | OD | 1280 | -- | -- | -- | N | K |
| 141N084W20CBB | L.LESCH | | -- | 72 | 24 | 1965 | 38 | -- | S | P | -- | -- | -- | -- | -- | N | -- |
| 141N084W22CCA | F.MOSBRUCKER | | -- | 120 | 4 | 1947 | -- | -- | K | Z | OD | 1510 | -- | -- | -- | N | K |
| 141N084W24BBC1 | L.PORSBORG | | -- | 320 | 4 | 1950 | 100 | -- | K | Z | OH | 2200 | -- | -- | -- | N | K |
| 141N084W24BBC2 | L.PORSBORG | | -- | 50 | 24 | 1961 | -- | -- | S | Z | OD | 1820 | 9.0 | -- | -- | N | K |
| 141N084W26BDD | P.MOSBRUCKER | | -- | 140 | 4 | 1961 | -- | -- | K | Z | OD | 1490 | -- | -- | -- | N | K |
| 141N084W26DDD1 | R.PFLEGER | | -- | 290 | 2 | 1926 | 170 | -- | S | Z | OH | 2100 | 6.5 | -- | -- | N | K |
| 141N084W26DDD2 | R.PFLEGER | 120 | 111 | 120 | 2 | 1961 | 110 | -- | H | Z | OD | 1410 | -- | -- | -- | N | K |
| 141N084W30DDD1 | F.KUCH | | -- | 52 | 18 | 1941 | 40 | -- | U | S | OD | -- | -- | -- | -- | N | -- |
| 141N084W30DDD2 | F.KUCH | | -- | 232 | 2 | 1943 | 200 | -- | S | Z | OH | 2180 | 8.5 | -- | -- | N | K |
| 141N084W30DDD3 | F.KUCH | 230 | 222 | -- | 4 | 1952 | 200 | -- | H | -- | OH | 2180 | -- | -- | -- | N | K |
| 141N085W02BAD | W.HENKE | 132 | -- | 132 | 4 | 1960 | 50 | -- | S | S | OK | 1620 | -- | -- | -- | N | K |
| 141N085W03CCC | E.KITZMAN | 397 | -- | -- | 4 | 1964 | -- | -- | K | P | OD | 2375 | -- | -- | D | N | K |
| 141N085W06ADD1 | J.MEYER | | 250 | 300 | -- | -- | -- | -- | S | Z | OD | 1180 | 12.5 | -- | -- | N | K |
| 141N085W06ADD2 | J.MEYER | 120 | 81 | 103 | 4 | 1954 | -- | -- | S | S | -- | 620 | 7.0 | -- | D | N | K |
| 141N085W08DAA | A.MAIER | 362 | 349 | -- | 4 | 1964 | 90 | -- | K | Z | -- | 2300 | -- | -- | D | N | K |
| 141N085W10DDA | R.MAIER | | 89 | 89 | 24 | 1965 | -- | -- | K | -- | OJ | 2500 | -- | -- | -- | N | K |

diechert

now Pazdernick

| LOCAL WELL NUMBER | OWNER | DRILLED DEPTH (FT.) | DEPTH TO FIRST PERFOR-ATION (FT.) | WELL DEPTH (FT.) | CASING DIAM-ETER (IN.) | DATE DRILLED (YEAR) | WATER LEVEL (FT.) | DATE WATER LEVEL MEAS. | WATER USE | WATER BEARING MATERIAL | AQUIFER | SPE-CIFIC CON-DUCT ANCE | TEM-PER-ATURE (°C) | ELE-VATION OF LSD (FT.) | LOG AVAIL-ABLE | FREQUENCY OF WATER-LEVEL MEASURE-MENTS | QW TYPE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 142N082W17CAA1 | W.HICKLE | | -- | 56 | 24 | 1919 | 46 | -- | S | Z | OD | 4175 | 6.5 | -- | -- | N | K |
| 142N082W17CAA2 | W.HICKLE | | 170 | 240 | 2 | 1944 | 80 | -- | K | S | OD | 2800 | 5.5 | -- | -- | N | K |
| 142N082W20DDD | P.BAUER | | -- | 325 | 2 | 1963 | -- | -- | S | R | -- | -- | -- | -- | -- | N | -- |
| 142N082W21BDD | R.STEFFENSON | 200 | 180 | 200 | 4 | 1966 | -- | -- | S | S | OD | 1450 | 10.0 | -- | D | N | K |
| 142N082W22DAA1 | G.SCHMIDT | | -- | 35 | 6 | 1946 | 23 | -- | H | S | OD | 520 | -- | -- | -- | N | K |
| 142N082W22DAA2 | G.SCHMIDT | | -- | 35 | 30 | -- | 18 | -- | S | S | OD | 850 | 5.5 | -- | -- | N | K |
| 142N082W24CAA | F.HOESEL | | -- | 32 | 24 | 1945 | 20 | -- | H | Z | OD | 1000 | -- | -- | -- | N | K |
| 142N082W25ACD | F.HOESEL | | -- | 32 | 24 | 1966 | 16 | 8-67 | S | Z | OD | 500 | 5.0 | -- | -- | O | K |
| 142N082W28BCD1 | P.BAUER | | -- | 240 | 2 | 1924 | -- | -- | S | S | -- | 1300 | -- | -- | -- | N | K |
| 142N082W28BCD2 | P.BAUER | 320 | 294 | -- | 2 | 1964 | -- | -- | K | S | -- | 1075 | -- | -- | -- | N | K |
| 142N082W30ADD1 | J.WEBBER | | -- | 95 | 2 | 1946 | 70 | -- | K | Z | OD | 1700 | 5.0 | -- | -- | N | K |
| 142N082W30ADD2 | J.WEBBER | | 273 | 305 | 2 | 1964 | 200 | -- | S | G | -- | 1510 | -- | -- | -- | N | K |
| 142N082W32BCD1 | K.JOHNSON | | -- | 18 | 20 | 1900 | 13 | -- | S | -- | -- | 900 | -- | -- | -- | N | K |
| 142N082W32BCD2 | K.JOHNSON | | -- | 18 | 24 | 1954 | 13 | -- | H | -- | -- | 1450 | -- | -- | -- | N | K |
| 142N082W33CCA | P.BAUER | | -- | 200 | 2 | 1943 | 170 | -- | S | S | -- | 950 | 6.5 | -- | -- | N | K |
| 142N083W01DAA1 | J.HATZENBIHLER | | -- | 32 | 24 | 1943 | 16 | -- | H | Z | OD | 2500 | -- | -- | -- | N | K |
| 142N083W01DAA2 | J.HATZENBIHLER | | -- | 28 | 24 | -- | 7 | 8-67 | S | Z | OD | 1700 | 7.0 | -- | -- | O | K |
| 142N083W02CCA | E.GULLICKSON | | -- | 77 | 24 | -- | 70 | 8-67 | K | -- | -- | 2000 | -- | -- | -- | O | K |
| 142N083W07CDA | T.MOON | | -- | 39 | 24 | 1965 | 10 | 8-67 | S | G | -- | 900 | -- | -- | -- | O | K |
| 142N083W07CDB1 | T.MOON | | -- | 15 | 24 | -- | -- | -- | S | -- | -- | 1350 | 9.5 | -- | -- | N | K |
| 142N083W07CDB2 | T.MOON | 123 | 115 | 121 | 4 | 1946 | 34 | 8-67 | K | -- | OD | 1000 | -- | -- | D | O | K |
| 142N083W09AAD | J.VITEK | | -- | 11 | 24 | 1961 | 13 | 8-67 | K | Z | OJ | 2550 | -- | -- | -- | O | K |
| 142N083W12ADA | F.WEISS | | -- | 90 | -- | 1961 | -- | -- | H | -- | -- | 1500 | -- | -- | -- | N | K |
| 142N083W14BCA | T.STARCK | | -- | 30 | 24 | 1902 | 15 | 8-67 | K | -- | -- | 510 | 8.5 | -- | -- | O | K |
| 142N083W14BCC | T.STARCK | | -- | 150 | 2 | -- | -- | -- | U | S | OD | 2000 | 9.5 | -- | -- | N | K |
| 142N083W14BDC | T.STARCK | | -- | 70 | 24 | 1949 | 42 | 8-67 | S | Z | OJ | 4800 | 12.5 | -- | -- | O | K |
| 142N083W14DBD | A.STARCK | | 152 | 185 | 2 | -- | -- | -- | S | -- | OD | 1700 | 9.5 | -- | -- | N | K |
| 142N083W19AC8 | M.ERHARDT | | -- | 32 | 24 | 1956 | 22 | 8-67 | U | -- | -- | 1550 | 8.5 | -- | -- | O | K |
| 142N083W19CCD1 | J.SCHMIDT | | -- | 16 | -- | 1946 | 16 | -- | S | S | -- | 950 | 9.0 | -- | -- | N | K |
| 142N083W19CCD2 | J.SCHMIDT | | -- | 16 | -- | 1950 | 16 | -- | H | S | -- | 1500 | -- | -- | -- | N | K |
| 142N083W20CBB | M.ERHARDT | | -- | 200 | 2 | 1929 | -- | -- | K | -- | OD | 1900 | -- | -- | -- | N | K |
| 142N083W21ACC | E.FERDERER | | -- | 80 | 30 | 1951 | 70 | -- | K | Z | OD | 1260 | -- | -- | -- | N | K |
| 142N083W25BBB1 | M.HATZENBIHLER | | -- | 29 | 24 | 1948 | 13 | 8-67 | S | -- | -- | 920 | 7.0 | -- | -- | O | K |
| 142N083W25BBB2 | M.HATZENBIHLER | | -- | 18 | 24 | 1957 | 12 | 8-67 | H | -- | -- | 720 | -- | -- | -- | O | K |
| 142N083W26CCC | J.FRIEDIG | | -- | 68 | 24 | -- | 62 | -- | K | Z | OD | 1225 | 7.0 | -- | -- | N | K |
| 142N083W29BCC | M.SCHENK | | -- | 100 | 4 | 1935 | 50 | -- | K | Z | OD | 2250 | -- | -- | -- | N | K |
| 142N083W30BAA | J.HAAG | | -- | 16 | -- | 1933 | 16 | -- | K | S | -- | 820 | -- | -- | -- | N | K |
| 142N083W30DAD | H.DUHR | 104 | -- | 104 | 6 | 1946 | 20 | -- | K | -- | OD | 850 | 10.0 | -- | -- | N | K |
| 142N083W32CCD | MINNKOTA POWER | 43 | 40 | -- | 3 | 1958 | 20 | -- | H | G | 31 | 1000 | -- | -- | -- | N | K |
| 142N083W34CDB | C.CHRISTMAN | | -- | 145 | 6 | 1957 | 135 | -- | K | -- | OD | 1650 | -- | -- | -- | N | K |

MINNKOTA POWER COOPERATIVE
WATER WELLS

Plant Well C

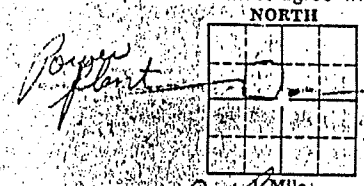
STATE OF NORTH DAKOTA
BOARD OF WATER WELL CONTRACTORS
900 E. BOULEVARD • BISMARCK, NORTH DAKOTA 58501

# WELL DRILLER'S REPORT

State law requires that this report be filled with the State Board of Water Well Contractors within 30 days after completion or abandonment of the well.

**1. WELL OWNER**
Name Sanderson & Porter
Address Center N. Dak.

**2. WELL LOCATION**
Sketch map location must agree with written location.




County Oliver
¼ ¼ NE¼ Sec. 4 Twp. 141 N. Rg. 83 W.

**3. PROPOSED USE**
☒ Domestic ☐ Irrigation ☐ Industrial
☐ Stock ☐ Municipal ☐ Test Hole

**4. METHOD DRILLED**
☒ Cable ☐ Reverse Rotary ☐ Bored
☐ Forward Rotary ☐ Jetted ☐ Other
If other, specify

**5. WATER QUALITY**
Was a water sample collected for chemical analysis?
☒ Yes ☐ No
If so, to what laboratory was it sent State Lab.

**6. WELL CONSTRUCTION**
Diameter of hole 12 inches. Depth 95 feet.
Casing: ☒ Steel ☐ Plastic ☐ Concrete
☐ Threaded ☐ Welded ☐ Other
If other, specify

| Pipe Weight: | Diameter: | From: | To: |
|---|---|---|---|
| 12 lb/ft. | 8 inches | 0 feet | 95 feet |
| lb/ft. | inches | feet | feet |
| lb/ft. | inches | feet | feet |
| lb/ft. | inches | feet | feet |

Was perforated pipe used? ☐ Yes ☒ No
Length of pipe perforated feet
Was casing left open end? ☒ Yes ☐ No
Was a well screened installed? ☐ Yes ☒ No
Material Diameter inches
(stainless steel, bronze, etc.)
Slot size set from feet to feet
Slot size set from feet to feet
Slot size set from feet to feet
Slot size set from feet to feet
Was a packer or seal used? ☐ Yes ☒ No
If so, what material
Type of well: Straight screen ☐ Gravel packed ☐
Was the well grouted? Yes ☒ No ☐
To what depth? 5 feet
Material used in grouting Neat Cement
Well head completion: Pitless adapter
12" above grade ✓ Other
If other, specify
Was well disinfected upon completion? ☒ Yes ☐ No

**7. WATER LEVEL**
Static water level 45 feet below land surface
If flowing: closed-in pressure psi
GPM flow through Inch pipe
Controlled by: ☐ Valve ☐ Reducers ☐ Other
If other, specify

**8. WELL TEST DATA**
☐ Pump ☒ Baller ☐ Other
Pumping level below land surface:
45 ft. after 4 hrs. pumping 12 gpm
ft. after hrs. pumping gpm
ft. after hrs. pumping gpm

**9. WELL LOG**

| Formation | Depth (ft.) From | To |
|---|---|---|
| Top soil | 0 | 2 |
| Yellow clay | 2 | 50 |
| Blue shale | 50 | 60 |
| Rock | 60 | 63 |
| Blue sand | 63 | 90 |
| Water | 90 | 95 |
| Well to be | | |
| used for | | |
| Bath Rooms | | |

(Use separate sheet if necessary.)

**10. DATE COMPLETED** June - 17 - 1975

**11. WAS WELL PLUGGED OR ABANDONED?**
☐ Yes ☒ No
If so, how

**12. REMARKS:**

**13. DRILLER'S CERTIFICATION**
This well was drilled under my jurisdiction and this report is true to the best of my knowledge.
Erickson Well Drilling
Driller's or Firm's Name Certificate No.
Bismarck N. Dak.
Address
Signed by Date

CATE to BOARD'S COPY

Plant Well D

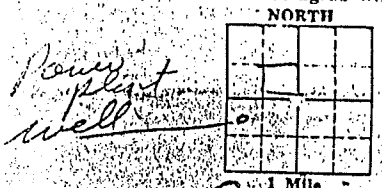
STATE OF NORTH DAKOTA
BOARD OF WATER WELL CONTRACTORS
900 E. BOULEVARD • BISMARCK, NORTH DAKOTA 58501

# WELL DRILLER'S REPORT

State law requires that this report be filed with the State Board of Water Well Contractors within 30 days after completion or abandonment of the well.

**1. WELL OWNER**
Name Central States
Address Coal Dir. Wilton

**2. WELL LOCATION**
Sketch map location must agree with written location.




County Oliver
¼ ¼ ¼ Sec. 4 Twp. 141 N. Rg. 83 W.

**3. PROPOSED USE**
☐ Domestic ☐ Irrigation ☒ Industrial
☐ Stock ☐ Municipal ☐ Test Hole

**4. METHOD DRILLED**
☒ Cable ☐ Reverse Rotary ☐ Bored
☐ Forward Rotary ☐ Jetted ☐ Other
If other, specify

**5. WATER QUALITY**
Was a water sample collected for chemical analysis?
☐ Yes ☒ No
If so, to what laboratory was it sent?

**6. WELL CONSTRUCTION**
Diameter of hole 6" inches Depth 190 feet
Casing: ☒ Steel ☐ Plastic ☐ Concrete
☐ Threaded ☐ Welded ☐ Other
If other, specify

| Pipe Weight: | Diameter: | From: | To: |
|---|---|---|---|
| 12 lb/ft. | 4 inches | 0 feet | 190 feet |
| lb/ft. | inches | feet | feet |
| lb/ft. | inches | feet | feet |
| lb/ft. | inches | feet | feet |

Was perforated pipe used? ☐ Yes ☒ No
Length of pipe perforated feet
Was casing left open end? ☐ Yes ☐ No
Was a well screened installed? ☐ Yes ☒ No
Material (stainless steel, bronze, etc.) Diameter inches
Slot size set from feet to feet
Slot size set from feet to feet
Slot size set from feet to feet
Slot size set from feet to feet
Was a packer or seal used? ☐ Yes ☒ No
If so, what material

Type of well: Straight screen ☐ Gravel packed ☐
Was the well grouted? Yes ☐ No ☐
To what depth? feet
Material used in grouting
Well head completion: Pitless adapter
12" above grade ✓ Other
If other, specify
Was well disinfected upon completion? ☐ Yes ☐ No

**7. WATER LEVEL**
Static water level 160 feet below land surface
If flowing: closed-in pressure psi
GPM flow through inch pipe
Controlled by: ☐ Valve ☐ Reducers ☐ Other
If other, specify

**8. WELL TEST DATA**
☐ Pump ☒ Bailer ☐ Other
Pumping level below land surface:
160 ft. after 5 hrs. pumping 12 gpm
ft. after hrs. pumping gpm
ft. after hrs. pumping gpm

**9. WELL LOG**

| Formation | Depth (ft.) From | To |
|---|---|---|
| Top soil | 0 | 2 |
| Clay | 2 | 50 |
| Coal | 50 | 51 |
| Sandy shale | 75 | 110 |
| Sandy shale | 110 | 120 |
| Blue shale | 120 | 175 |
| Rock | 175 | 177 |
| Coal | 177 | 180 |
| Sandy | 180 | 190 |
| Water | 190 | |
| Well drilled for Ready Mix Plant | | |

(Use separate sheet if necessary.)

**10. DATE COMPLETED** June 9 1975

**11. WAS WELL PLUGGED OR ABANDONED?**
☐ Yes ☐ No
If so, how

**12. REMARKS:**

**13. DRILLER'S CERTIFICATION**
This well was drilled under my jurisdiction and this report is true to the best of my knowledge.
Erickson Well Drilling
Driller's or Firm's Name Certificate No.
Bismarck, N. Dak.
Address
Thomas E. Erickson
Signed by Date

STATE – BOARD'S COPY

Plant Well E

STATE OF NORTH DAKOTA
BOARD OF WATER WELL CONTRACTORS
900 E. BOULEVARD • BISMARCK, NORTH DAKOTA 58501

# WELL DRILLER'S REPORT

State law requires that this report be filed with the State Board of Water Well Contractors within 30 days after completion or abandonment of the well.

**1. WELL OWNER**
Name: Power Consort Corp
Address: Hazen, North Dakota

**2. WELL LOCATION**
Sketch map location must agree with written location.

NORTH

Mike's Power Plant well

1 Mile

County: Oliver
NE¼ NW¼ NW¼ Sec. 4 Twp. 141 N. Rg. 83 W.

**3. PROPOSED USE**
[X] Domestic [ ] Irrigation [ ] Industrial
[ ] Stock [ ] Municipal [ ] Test Hole

**4. METHOD DRILLED**
[X] Cable [ ] Reverse Rotary [ ] Bored
[ ] Forward Rotary [ ] Jetted [ ] Other
If other, specify:

**5. WATER QUALITY**
Was a water sample collected for chemical analysis?
[X] Yes [ ] No
If so, to what laboratory was it sent?

**6. WELL CONSTRUCTION**
Diameter of hole: inches Depth 168 feet
Casing: [X] Steel [ ] Plastic [ ] Concrete
[ ] Threaded [ ] Welded [ ] Other
If other, specify:

| Pipe Weight: | Diameter: | From: | To: |
|---|---|---|---|
| 12 lb/ft. | 4 inches | 0 feet | 168 feet |
| lb/ft. | inches | feet | feet |
| lb/ft. | inches | feet | feet |
| lb/ft. | inches | feet | feet |

Was perforated pipe used? [ ] Yes [X] No
Length of pipe perforated: feet
Was casing left open end? [X] Yes [ ] No
Was a well screened installed? [ ] Yes [X] No
Material: Diameter: inches
(stainless steel, bronze, etc.)
Slot size: set from feet to feet
Slot size: set from feet to feet
Slot size: set from feet to feet
Slot size: set from feet to feet
Was a packer or seal used? [ ] Yes [X] No
If so, what material:
Type of well: Straight screen [ ] Gravel packed [X]
Was the well grouted? Yes [X] No [ ]
To what depth? 20 feet
Material used in grouting: Cement
Well head completion: Pitless adapter
12" above grade: [X] Other:
If other, specify:
Was well disinfected upon completion? [ ] Yes [ ] No

**7. WATER LEVEL**
Static water level: 145 feet below land surface
If flowing: closed-in pressure psi
GPM flow through inch pipe
Controlled by: [ ] Valve [ ] Reducers [ ] Other
If other, specify:

**8. WELL TEST DATA**
[ ] Pump [X] Bailer [ ] Other
Pumping level below land surface:
140 ft. after 4 hrs. pumping 12 gpm
ft. after hrs. pumping gpm
ft. after hrs. pumping gpm

**9. WELL LOG**

| Formation | Depth (ft.) From | To |
|---|---|---|
| Top soil | 0 | 2 |
| Blue shale | 2 | 45 |
| Coal | 45 | 47 |
| Blue shale | 125 | 150 |
| Sandy | 150 | 160 |
| Sand & Water | 160 | 168 |
| Well was used for Power Consort Plant | | |

(Use separate sheet if necessary.)

**10. DATE COMPLETED** May 25 1995

**11. WAS WELL PLUGGED OR ABANDONED?**
[ ] Yes [X] No
If so, how:

**12. REMARKS:**

**13. DRILLER'S CERTIFICATION**
This well was drilled under my jurisdiction and this report is true to the best of my knowledge.
Erickson Well Drilling
Driller's or Firm's Name
Certificate No. 357
Address: Kenmare, N. D.
Signed by
Date

BOARD'S COPY

Plant Well B

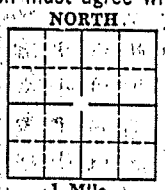
STATE OF NORTH DAKOTA
BOARD OF WATER WELL CONTRACTORS
900 E. BOULEVARD • BISMARCK, NORTH DAKOTA 58501

# WELL DRILLER'S REPORT

State law requires that this report be filed with the State Board of Water Well Contractors within 30 days after completion or abandonment of the well.

**1. WELL OWNER**
Name: Haley Bros Inc
Address: Center N. Dak.

**2. WELL LOCATION**
Sketch map location must agree with written location.




Located about 3 Blks S.W of Minn Kota Power Plant.

County: Mercer Oliver
¼ ¼ NE¼ Sec. 5 Twp. 141 N. Rg. 83 W.

**3. PROPOSED USE**
☐ Domestic ☐ Irrigation ☑ Industrial
☐ Stock ☐ Municipal ☐ Test Hole

**4. METHOD DRILLED**
☐ Cable ☐ Reverse Rotary ☐ Bored
☑ Forward Rotary ☐ Jetted ☐ Other
If other, specify:

**5. WATER QUALITY**
Was a water sample collected for chemical analysis?
☑ Yes ☐ No
If so, to what laboratory was it sent:

**6. WELL CONSTRUCTION**
Diameter of hole: 9 7/8 inches. Depth: 172 feet.
Casing: ☑ Steel ☐ Plastic ☐ Concrete
☑ Threaded ☐ Welded ☐ Other:
If other, specify:

| Pipe Weight: | Diameter: | From: | To: |
|---|---|---|---|
| lb/ft. | 6 inches | 0 feet | 152 feet |
| lb/ft. | Standard inches | Pipe feet | feet |
| lb/ft. | inches | feet | feet |
| lb/ft. | inches | feet | feet |

Was perforated pipe used? ☐ Yes ☑ No
Length of pipe perforated: feet
Was casing left open end? ☐ Yes ☑ No
Was a well screened installed? ☑ Yes ☐ No
Material: Low Carbon Steel Diameter: 6 inches
(stainless steel, bronze, etc.) Johnson Screen
Slot size: 30 set from: 152 feet to 172 feet
Slot size: set from: feet to: feet
Slot size: set from: feet to: feet
Slot size: set from: feet to: feet
Was a packer or seal used? ☐ Yes ☑ No
If so, what material:
Type of well: Straight screen ☐ Gravel packed ☑
Was the well grouted? Yes ☐ No ☑
To what depth? feet
Material used in grouting:
Well head completion: Pitless adapter:
12" above grade: Yes Other:
If other, specify: Concrete Base cut on top
Was well disinfected upon completion? ☑ Yes ☐ No

**7. WATER LEVEL**
Static water level: 125 feet below land surface
If flowing: closed-in pressure: psi
GPM flow: through: inch pipe
Controlled by: ☐ Valve ☐ Reducers ☐ Other
If other, specify:

**8. WELL TEST DATA**
☑ Pump ☐ Bailer ☐ Other
Pumping level below land surface:
158 ft. after 4 hrs. pumping 12 gpm
ft. after hrs. pumping gpm
ft. after hrs. pumping gpm

**9. WELL LOG**

| Formation | Depth (ft.) From | To |
|---|---|---|
| Assorted clays | 0 | 63 |
| Different Colors | | |
| Grey clays - drilled hard | 63 | 123 |
| Grey sands w/ some clays | 123 | 150 |
| Grey sands w/ small coal layers | 150 | 172 |

(Use separate sheet if necessary.)

**10. DATE COMPLETED** Feb 25 - 1975

**11. WAS WELL PLUGGED OR ABANDONED?**
☐ Yes ☑ No
If so, how:

**12. REMARKS:**

**13. DRILLER'S CERTIFICATION**
This well was drilled under my jurisdiction and this report is true to the best of my knowledge.
Farmers Supply Co 40
Driller's or Firm's Name Certificate No.
Rte 3 - Bismarck, N. Dak.
Address
Harley E. Tilson -2-25-75
Signed by Date

PLICATE — BOARD'S COPY

Plant well F

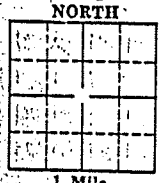
STATE OF NORTH DAKOTA
BOARD OF WATER WELL CONTRACTORS
900 E. BOULEVARD • BISMARCK, NORTH DAKOTA 58501

# WELL DRILLER'S REPORT

State law requires that this report be filed with the State Board of Water Well Contractors within 30 days after completion or abandonment of the well.

**1. WELL OWNER**
Name: Lonesome Johnson Const
Address: Logo N Dak.

**2. WELL LOCATION**
Sketch map location must agree with written location.




50 ft from S. of main plot to const plot

County: OLIVER
¼ ¼ NW¼ Sec. 4 Twp. 141 N. Rg. 83 W.

**3. PROPOSED USE**
☐ Domestic ☐ Irrigation ☒ Industrial
☐ Stock ☐ Municipal ☐ Test Hole

**4. METHOD DRILLED**
☐ Cable ☐ Reverse Rotary ☐ Bored
☒ Forward Rotary ☐ Jetted ☐ Other
If other, specify:

**5. WATER QUALITY**
Was a water sample collected for chemical analysis?
☐ Yes ☒ No
If so, to what laboratory was it sent:

**6. WELL CONSTRUCTION**
Diameter of hole: 10¾ inches. Depth: 160 feet.
Casing: ☒ Steel ☐ Plastic ☐ Concrete
☐ Threaded ☐ Welded ☐ Other
If other, specify:

| Pipe Weight: | Diameter: | From: | To: |
|---|---|---|---|
| 11 lb/ft. | inches | 4 feet | 160 feet |
| lb/ft. | inches | feet | feet |
| lb/ft. | inches | feet | feet |
| lb/ft. | inches | feet | feet |

Was perforated pipe used? 4 ☒ Yes 11 ☐ No
Length of pipe perforated: 20 feet
Was casing left open end? ☐ Yes ☐ No
Was a well screened installed? ☐ Yes ☒ No
Material: Cutting Torch Diameter: inches
(stainless steel, bronze, etc.)
Slot size: set from: feet to: feet
Slot size: set from: feet to: feet
Slot size: set from: feet to: feet
Slot size: set from: feet to: feet
Was a packer or seal used? ☐ Yes ☐ No
If so, what material:
Type of well: Straight screen ☐ Gravel packed ☒
Was the well grouted? ☐ Yes ☐ No ☒
To what depth? feet
Material used in grouting:
Well head completion: Pitless adapter:
12" above grade: X Other:
If other, specify:
Was well disinfected upon completion? ☐ Yes ☐ No

**7. WATER LEVEL**
Static water level: 100 feet below land surface
If flowing: closed-in pressure: psi
GPM: flow through: inch pipe
Controlled by: ☐ Valve ☐ Reducers ☒ Other
If other, specify:

**8. WELL TEST DATA**
☐ Pump ☐ Bailer ☒ Other air
Pumping level below land surface:
160 ft. after 2 hrs. pumping 50 gpm
ft. after hrs. pumping gpm
ft. after hrs. pumping gpm

**9. WELL LOG**

| Formation | Depth (ft.) From | To |
|---|---|---|
| Clay, fine cut down. | 0 | 30 |
| Coal | 30 | 32 |
| Clay | 32 | 100 |
| fine grey sand | 100 | 132 |
| & Coal | | |
| Clay | 132 | 140 |
| fine grey sand | 140 | 160 |
| & lots of coal | | |

(Use separate sheet if necessary.)

**10. DATE COMPLETED** 7-1974

**11. WAS WELL PLUGGED OR ABANDONED?**
☐ Yes ☒ No
If so, how:

**12. REMARKS:** This well to be pulled after job completed.

**13. DRILLER'S CERTIFICATION**
This well was drilled under my jurisdiction and this report is true to the best of my knowledge.
Driller's or Firm's Name: Wick Drilling Certificate No.:
Address: Box 472 Ga. 7110
Signed by: Date:

PLICATE — BOARD'S COPY

**D&L ENTERPRISES**
**3017 MANCHESTER STREET**
**BISMARCK ND 58504**
**Phone – (701) 224-0213  Fax – (701) 221-2118**

## *WELL CERTIFICATION*

Date of certification: **7-29-11**
Project No. **BNI-11-009**

## *LOCATION*

Owner/Operator: Allen Opp
Address: 1266 Signal Butte Unit No. 32, Dickinson, ND 58601
Well Identification: **A. Opp Well #1**.
Well Location: 141-83-18BAA (Lat. 47-2-19 N, Lon 101-14-52 W)
Relative Landmarks and/or Buildings: Located in pasture west of Larry Schmidt.
Ground Elevation: 2070 feet estimated from USGS Nelson Lake 7.5 min. Quadrangle.
Use of Water: Livestock, not in use at this time.
Owner/Operator Comments:

## *WELL CONSTRUCTION*

Depth: 22.70 feet (measured)
Casing Depth/Type: 22.70 feet/cement
Diameter/Finish: 6 feet
Date Drilled: NA
Drillers Name: NA
Drillers Address: NA
Comments:

## *PUMP SPECIFICATIONS*

Type: Hand pump.
Pump Intake Depth: NA
Power (type):
Horsepower:
Comments: Hand pump is operational.

**D&L ENTERPRISES**
**3017 MANCHESTER STREET**
**BISMARCK ND 58504**
**Phone – (701) 224-0213  Fax – (701) 221-2118**

## *WELL CERTIFICATION*

Date of certification: **7-26-11**
Project No: **BNI-11-001**

## *LOCATION*

Owner/Operator: Mr. Larry Schmidt
Address: 2631 35th Ave. SW, Center, ND  58530
Well Identification: **L. Schmidt Well #1**.
Well Location: 141-83-18 ABC (Lat. 47-2-13 N Lon. 101-14-31 W)
Relative Landmarks and/or Buildings:  In pasture west/northwest of farm stead.
Ground Elevation: 2085 feet estimated from USGS Nelson Lake 7.5 min. Quadrangle.
Use of Water: Livestock
Owner/Operator Comments:

## *WELL CONSTRUCTION*

Depth: 27 feet (Drillers record)
Casing Depth/Type: 27 feet/Concrete
Diameter/Finish: 24 inches
Date Drilled: 11-9-1973
Drillers Name: Opp Well Drilling
Drillers Address: Glen Ullin, ND
Comments:

## *PUMP SPECIFICATIONS*

Type: Submersible
Pump Intake Depth: NA
Power (type): Electric
Horsepower: ½ hp
Comments:

**D&L ENTERPRISES**
**3017 MANCHESTER STREET**
**BISMARCK ND 58504**
**Phone – (701) 224-0213  Fax – (701) 221-2118**

## *WELL CERTIFICATION*

Date of certification: **7-26-11**
Project No. **BNI-11-002**

## *LOCATION*

Owner/Operator: Mr. Larry Schmidt
Address: 2631 35th Ave. SW, Center, ND  58530
Well Identification: **L. Schmidt Well # 2**.
Well Location: 141-83-18 ABD  (Lat. 47-2-7 N Lon. 101-14-17 W)
Relative Landmarks and/or Buildings:  West of house approximately 45 feet.
Ground Elevation: 2060 feet estimated from USGS Nelson Lake 7.5 min. Quadrangle.
Use of Water: Household
Owner/Operator Comments: If pumped to long, well will run dry. That is why he is using pump jack.

## *WELL CONSTRUCTION*

Depth: 200 feet (Owner)
Casing Depth/Type: NA/Steel.
Diameter/Finish: 4 inch
Date Drilled: 1953/54
Drillers Name: NA
Drillers Address: NA
Comments:

## *PUMP SPECIFICATIONS*

Type: Pump jack
Pump Intake Depth: NA
Power (type): Electric
Horsepower: ½ hp
Comments:

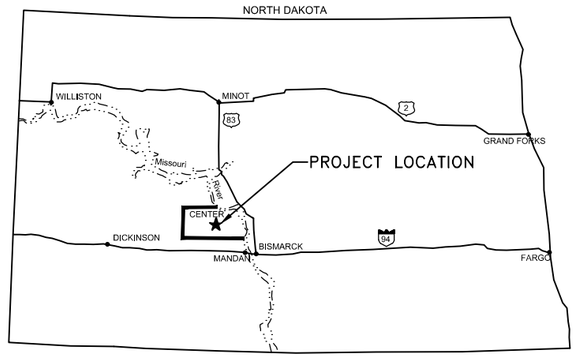
# Appendix B

## Construction Drawings – Phase 1A

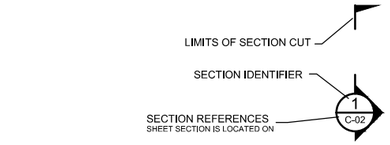
## Construction Drawings – Phase 1B

# Construction Drawings – Phase 1A

# CONSTRUCTION DRAWINGS
# MINNKOTA POWER COOPERATIVE, INC.
# CELL 5 - PHASE 1A
# COAL COMBUSTION WASTE DISPOSAL FACILITY
# CENTER, NORTH DAKOTA




LOCATION MAP

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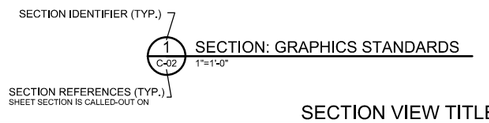


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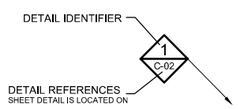
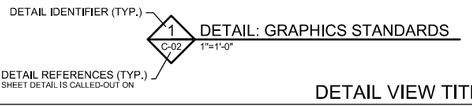



DETAIL VIEW CALL OUT




DETAIL VIEW TITLE

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VICINITY MAP

## DRAWING INDEX


| DWG NO. | TITLE |
|---|---|
| G-01 | INDEX, LOCATION MAP, AND VICINITY MAP |
| C-01 | EXISTING CONDITIONS - PLAN |
| C-02 | PROJECT LAYOUT - PLAN |
| C-03 | SOIL BORINGS - PLAN AND CROSS SECTIONS |
| C-04 | SPGM STRIPPING - PLAN |
| C-05 | EXCAVATION TO HAGEL - PLAN |
| C-06 | EXCAVATION BELOW HAGEL - PLAN |
| C-07 | CELL 5 EXCAVATION AND EMBANKMENT FILL - OVERALL SECTIONS |
| C-08 | CELL 5 EXCAVATION AND EMBANKMENT FILL - SECTIONS 1 OF 2 |
| C-09 | CELL 5 EXCAVATION AND EMBANKMENT FILL - SECTIONS 2 OF 2 |
| C-10 | HAGEL BED OUTCROP - PLAN, SECTION AND DETAILS |
| C-11 | ELEVATION AND COORDINATES - PLAN |



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| BID | | | | | | | | |
| CONSTRUCTION | | | | 04/07/22 | | | | |
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MINNKOTA FGD POND CELL 5 - PHASE 1A
CENTER, NORTH DAKOTA

INDEX, LOCATION MAP, AND VICINITY MAP

| BARR PROJECT No. | |
|---|---|
| 34331014.51 | |
| CLIENT PROJECT No. | |
| DWG. No. | REV. No. |
| G-01 | 0 |


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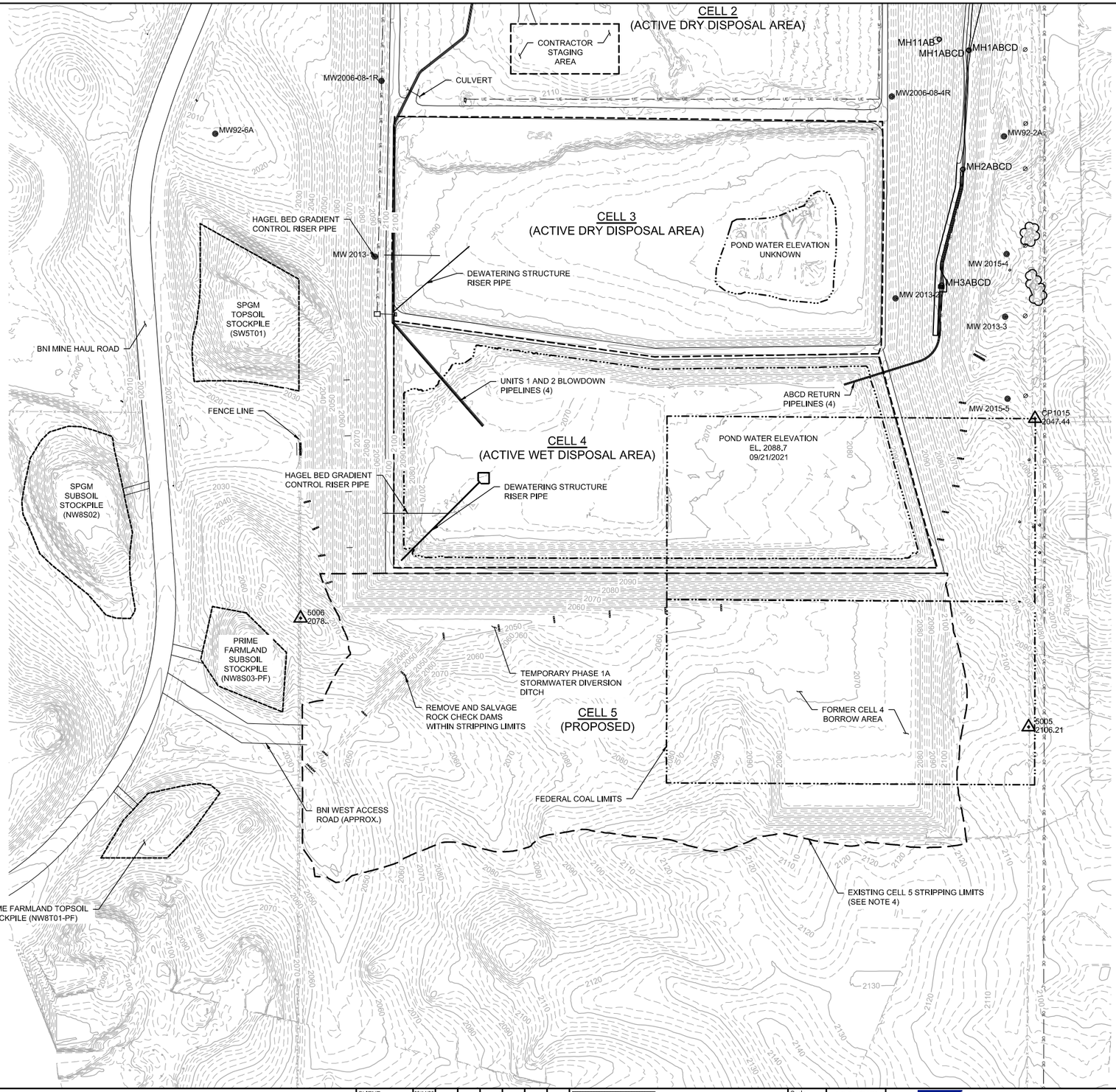


1 PLAN: EXISTING CONDITIONS

0 200 400

SCALE IN FEET

LEGEND

- EXISTING 10' MAJOR CONTOUR
- EXISTING 2' MINOR CONTOUR
- EXISTING ROAD
- EXISTING PIPE
- EXISTING GEOMEMBRANE LINER LIMITS
- FENCE LINE
- FIELD LINE
- UNDERGROUND ELECTRIC
- OVERHEAD ELECTRIC
- STORM SEWER
- EXISTING CELL 5 STRIPPING LIMITS
- STOCKPILE EXTENTS
- WATERLINE
- SHRUB EDGE
- FEDERAL COAL TRACT LIMITS
- CULVERT
- BUILDING
- SINGLE TREES
- UTILITY POLE
- MH7AB — EXISTING MANHOLE, CATCH BASIN
- MW97-2 — MONITORING WELL
- CP10 2109.27 — CONTROL POINT

| CONTROL POINTS | | | |
|---|---|---|---|
| CONTROL POINT | NORTHING | EASTING | ELEVATION |
| CP13 | 508,526.39 | 1,821,517.66 | 2,092.74 |
| CP1015 | 506,603.78 | 1,822,015.47 | 2,047.44 |
| 5005 | 505,499.46 | 1,821,992.35 | 2,106.21 |
| 5006 | 505,889.21 | 1,819,384.17 | 2,078.56 |

NOTE:

CONTROL POINT CP13 IS OUTSIDE OF VIEWPORT EXTENTS. LOCATION SHOWN ON G-01.

NOTES:

1. PROTECT ALL WELLS WITHIN THE CONSTRUCTION LIMITS, UNLESS OTHERWISE DIRECTED.
2. EXISTING GROUND TOPOGRAPHY SHOWN IS A COMBINATION OF THE FOLLOWING DRONE SURVEYS PROVIDED TO BARR AND COMBINED BY BARR:
   -JUNE 2021 PERFORMED BY BNI
   -OCTOBER 5, 2021 PERFORMED BY BNI
   -DECEMBER 8, 2021 PERFORMED BY BNI (PERFORMED OVER STRIPPING AREA)
3. COORDINATE SYSTEM IS NORTH DAKOTA STATE PLANE SOUTH ZONE, NAD 27 - US SURVEY FEET (HORIZONTAL): NVGD 1929 (VERTICAL).
4. CELL 5 STRIPPING WAS COMPLETED BY OTHERS IN FALL 2021. CONTOURS SHOWN REPRESENT POST-STRIPPING CONDITIONS. ADDITIONAL STRIPPING WILL BE REQUIRED AND WILL BE COMPLETED BY OTHERS.

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MINNKOTA FGD POND CELL 5 - PHASE 1A
CENTER, NORTH DAKOTA

EXISTING CONDITIONS PLAN

| BARR PROJECT No. | |
|---|---|
| 34331014.51 | |
| CLIENT PROJECT No. | |
| DWG. No. | REV. No. |
| C-01 | 0 |

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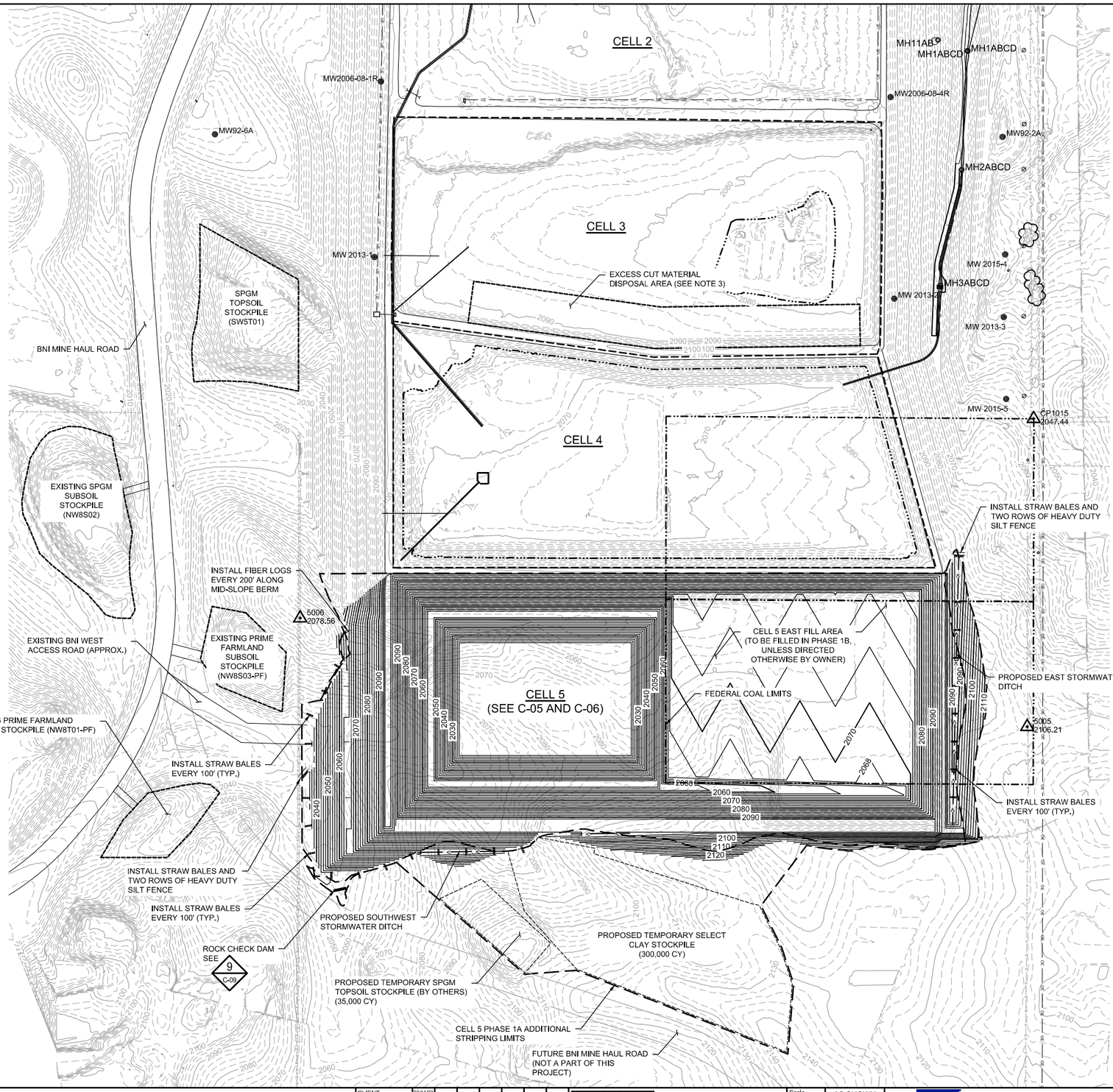


1 PLAN: CELL 5 - PHASE 1

0 200 400

SCALE IN FEET

N

## LEGEND

- EXISTING 10' MAJOR CONTOUR
- EXISTING 2' MINOR CONTOUR
- PROPOSED 10' MAJOR CONTOUR
- PROPOSED 2' MINOR CONTOUR
- EXISTING ROAD
- EXISTING PIPE
- EXISTING GEOMEMBRANE LINER LIMITS
- FENCE LINE
- FIELD LINE
- UNDERGROUND ELECTRIC
- OVERHEAD ELECTRIC
- STORM SEWER
- EXISTING CELL 5 PHASE 1A STRIPPING LIMITS
- CELL 5 PHASE 1A ADDITIONAL STRIPPING LIMITS
- STOCKPILE EXTENTS
- WATERLINE
- SHRUB EDGE
- FEDERAL COAL TRACT LIMITS
- CULVERT
- BUILDING
- SINGLE TREES
- UTILITY POLE
- MH7AB — EXISTING MANHOLE, CATCH BASIN
- MW97-2 — MONITORING WELL
- CP10 2109.27 — CONTROL POINT
- PROPOSED STRAW BALES
- PROPOSED FIBER LOG
- PROPOSED STRAW BALES WITH SILT FENCE

NOTES:

1. BNI COAL LTD. WILL PROVIDE ACCESS TO ALL SOIL STOCKPILES.
2. PROPOSED CONTOURS SHOWN REPRESENT TOP OF RANDOM FILL.
3. EXACT DISPOSAL AREA LIMITS TO BE DETERMINED BY AND COORDINATED WITH OWNER.
4. COORDINATE INSTALLATION OF EROSION CONTROL FEATURES WITH OWNER. ACTUAL LOCATION AND FREQUENCY OF EROSION CONTROL FEATURES MAY VARY DEPENDING ON CONSTRUCTION TIMING AND SLOPE RESTORATION ACTIVITIES.

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MINNKOTA FGD POND CELL 5 - PHASE 1A
CENTER, NORTH DAKOTA

PROJECT LAYOUT
PLAN

| | |
|---|---|
| BARR PROJECT No. | 34331014.51 |
| CLIENT PROJECT No. | |
| DWG. No. | C-02 |
| REV. No. | 0 |

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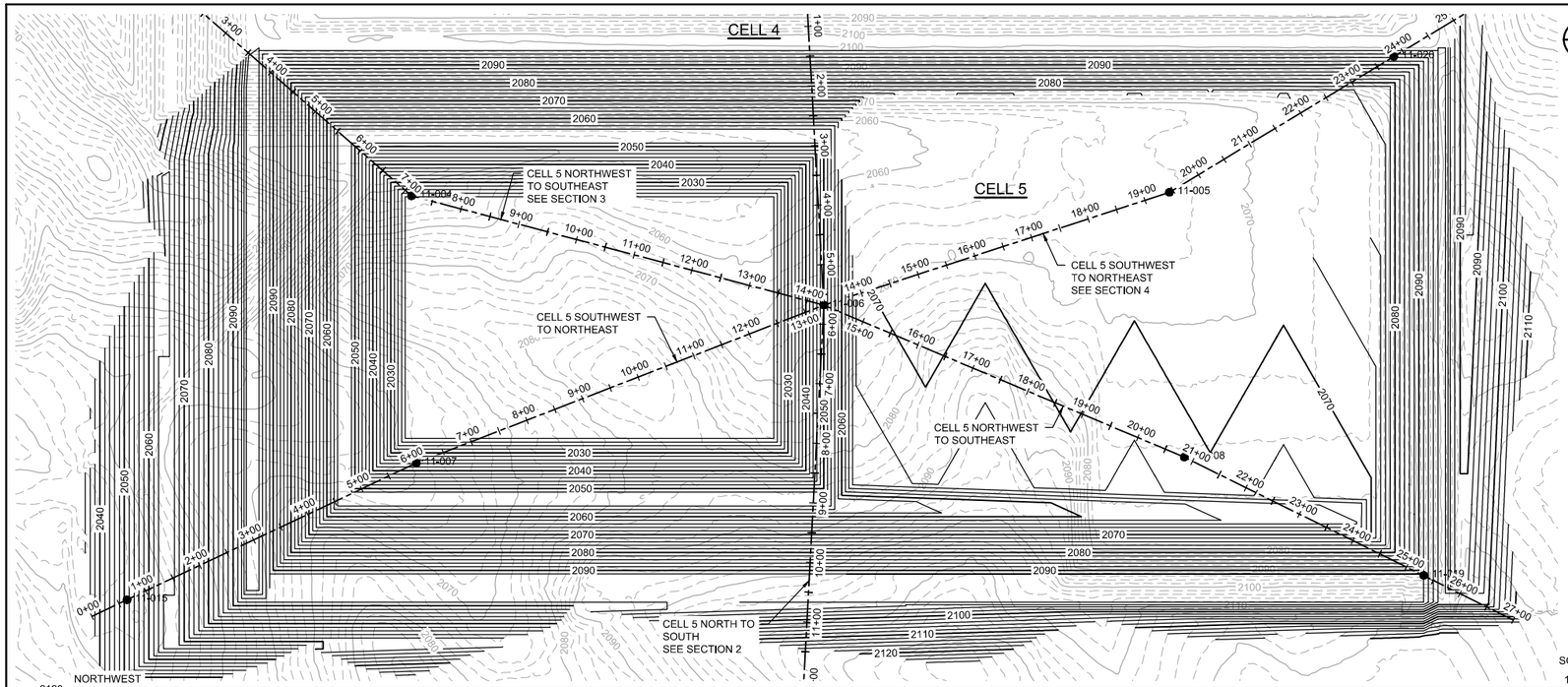



## 1 PLAN: 2011 BORING LOCATIONS

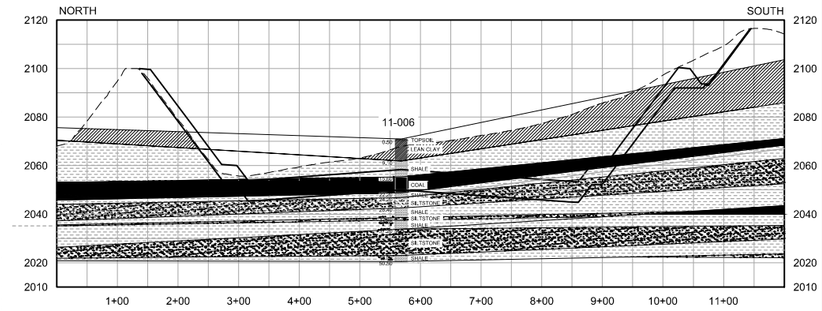
0 125 250
SCALE IN FEET

### LEGEND

- EXISTING 10' MAJOR CONTOUR
- EXISTING 2' MINOR CONTOUR
- PROPOSED 10' MAJOR CONTOUR
- PROPOSED 2' MINOR CONTOUR
- CROSS SECTION ALIGNMENT
- SOIL BORING

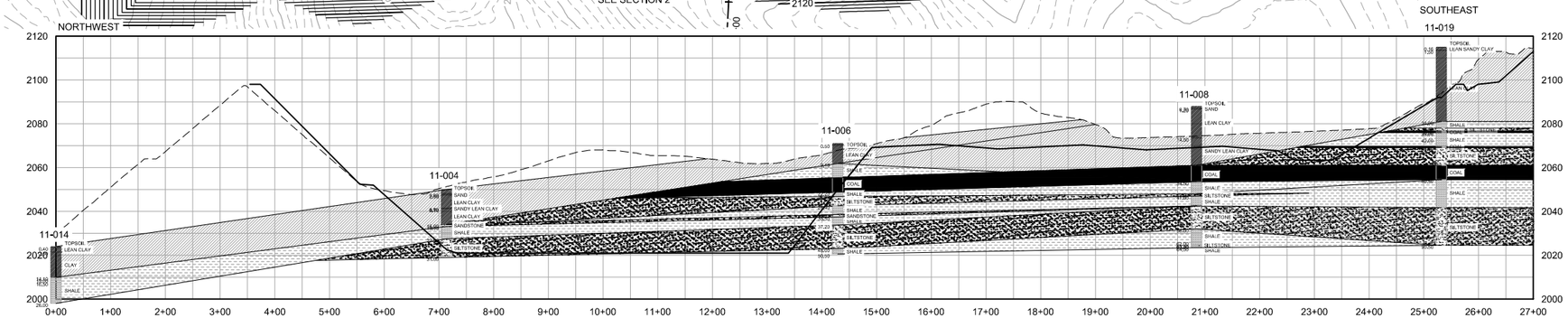
### NOTES:

1. ALL EXCAVATED MATERIALS ARE ESTIMATED BASED ON THE SOIL INVESTIGATION WORK COMPLETED IN 2011. CONTRACTOR MUST FIELD VERIFY EACH MATERIAL PRIOR TO USE AS CONSTRUCTION MATERIAL. A COPY OF THE INFORMATION OBTAINED AS PART OF THE 2011 INVESTIGATION IS AVAILABLE UPON REQUEST.
2. INFORMATION ON THIS SHEET IS PROVIDED TO CONTRACTOR FOR INFORMATIONAL PURPOSES ONLY. CONTRACTOR SHALL MAKE ITS OWN DETERMINATION OF THE SUBSURFACE CONDITIONS BASED ON SOIL BORINGS PROVIDED.
3. MATERIAL SURFACES ARE INTERPOLATED BETWEEN BORING LOCATIONS.
4. PROPOSED CONTOURS SHOWN REPRESENT TOP OF RANDOM FILL.



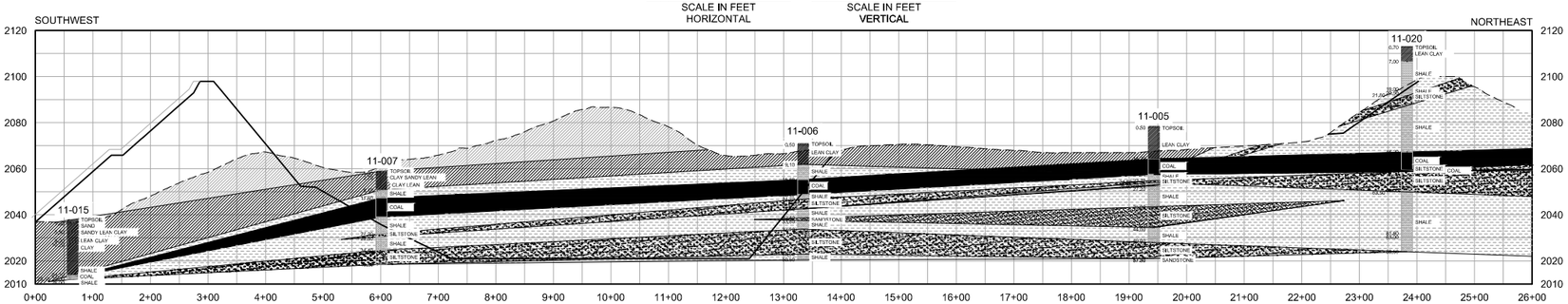

## 2 CROSS SECTION: CELL 5 - NORTH TO SOUTH

0 125 250 (SCALE IN FEET HORIZONTAL)
0 31.25 62.5 (SCALE IN FEET VERTICAL)




## 3 CROSS SECTION: CELL 5 - NORTHWEST TO SOUTHEAST

0 125 250 (SCALE IN FEET HORIZONTAL)
0 31.25 62.5 (SCALE IN FEET VERTICAL)




## 4 CROSS SECTION: CELL 5 - SOUTHWEST TO NORTHEAST

0 125 250 (SCALE IN FEET HORIZONTAL)
0 31.25 62.5 (SCALE IN FEET VERTICAL)

### EXCAVATED MATERIAL DESCRIPTION

| HATCH | LABEL | DESCRIPTION |
|---|---|---|
| | TILL | SANDY GRAVELLY CLAY. |
| | SHALE | UPPER SHALES - VERY WEAK TO WEAK IN STRENGTH, GENERALLY LIGHT YELLOWISH, BROWN TO LIGHT BROWN, OR GRAY IN COLOR, SLIGHTLY WEATHERED TO HIGHLY WEATHERED, FINE GRAINED, MEDIUM TO CLOSE FRACTURE SPACING, DRY OR DAMP.<br>LOWER SHALES - STRONG TO WEAK STRENGTH, GENERALLY GRAY TO LIGHT GRAY IN COLOR, HIGHLY TO MODERATELY WEATHERED, FINE GRAINED, THICK TO MEDIUM BEDDED, MEDIUM TO UNFRACTURED FRACTURE SPACING, DRY OR DAMP. OBSERVED WHITE LAMINATIONS IN SOME SAMPLES. |
| | HAGEL/COAL | LIGNITE COAL, CARBONACEOUS, BLACK IN COLOR. |
| | SILTSTONE | STRONG TO VERY WEAK STRENGTH, GENERALLY GRAY TO LIGHT GRAY IN COLOR, SLIGHTLY TO MODERATELY WEATHERED, FINE GRAINED, THINLY BEDDED, WIDE TO CLOSE FRACTURE SPACING, DAMP, SOMETIMES WITH NON SILTY/SANDY SHALE INTERBEDDED THROUGHOUT. |
| | SANDSTONE | SANDSTONE WITH SAND AND FINE CONTENT VARIABLE, GRAY IN COLOR |

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MINNKOTA FGD POND CELL 5 - PHASE 1A
CENTER, NORTH DAKOTA

SOIL BORINGS
PLAN AND CROSS SECTIONS

BARR PROJECT No. 34331014.51
CLIENT PROJECT No.
DWG. No. C-03
REV. No. 0

CADD USER: Jerna E. Koenig FILE: M:\DESIGN\34331014.51\34331014451_PHASE 1A_C-03.DWG PLOT SCALE: 1:2.0001 PLOT DATE: 4/7/2022 4:18 PM
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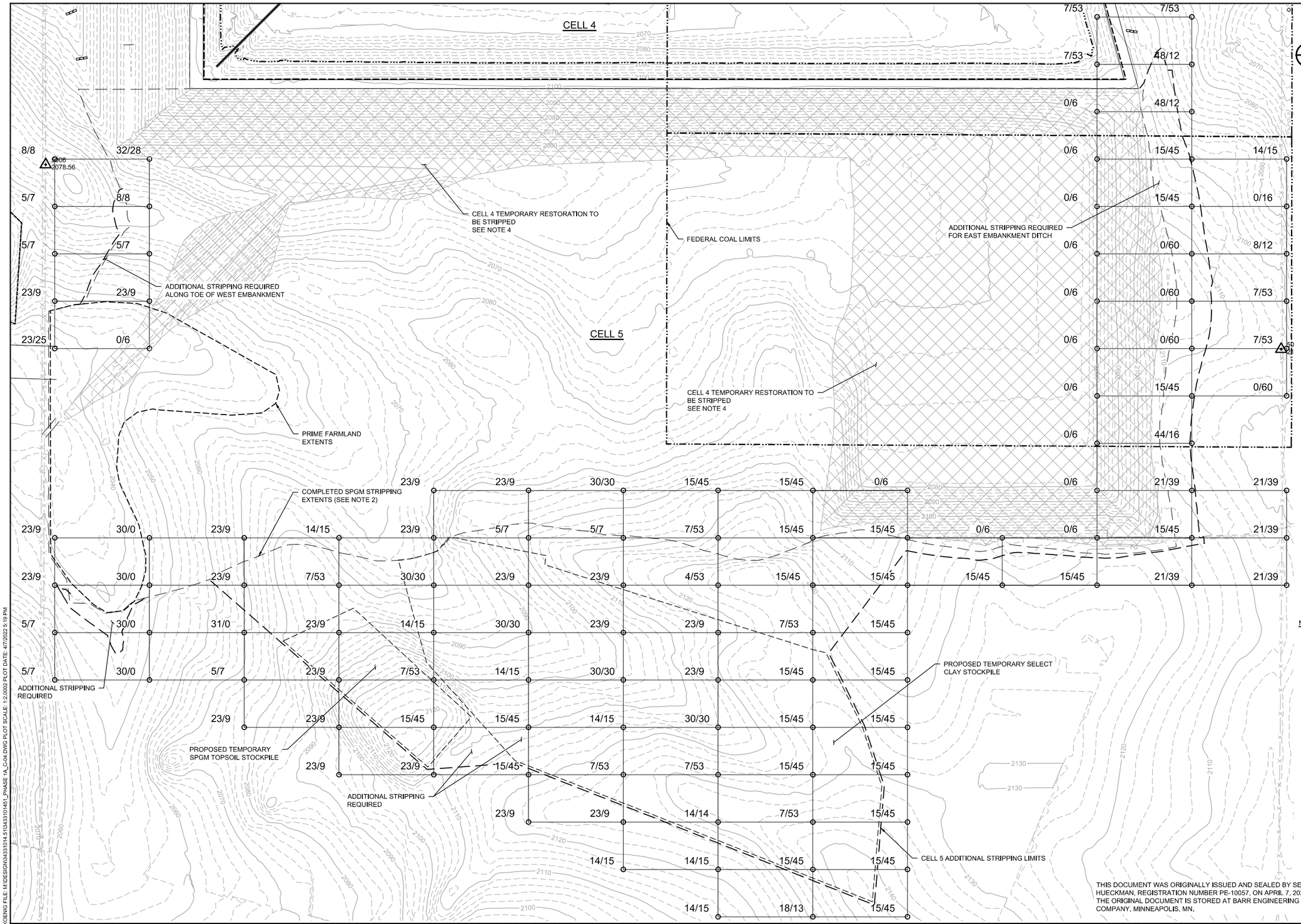


1 PLAN: SPGM STRIPPING LIMITS

0 100 200

SCALE IN FEET

N

LEGEND

- EXISTING 10' MAJOR CONTOUR (2000)
- EXISTING 2' MINOR CONTOUR
- EXISTING ROAD
- EXISTING ACCESS ROAD
- EXISTING PIPELINE
- FEDERAL COAL LIMITS
- FENCE LINE (X — X — X)
- UNDERGROUND ELECTRIC (UE — UE)
- OVERHEAD ELECTRIC (OE — OE)
- SPGM GRID
- X/Y — X = X-ESTIMATED THICKNESS (IN.) OF SPGM TOPSOIL; Y = Y-ESTIMATED THICKNESS (IN.) OF SPGM SUBSOIL
- COMPLETED SPGM STRIPPING LIMITS (SEE NOTE 2)
- CELL 5 PHASE 1A ADDITIONAL SPGM STRIPPING LIMITS
- STOCKPILE EXTENTS
- WATERLINE
- SHRUB EDGE
- PRIME FARMLAND LIMITS (SEE NOTE 3)
- TEMPORARY RESTORATION FROM CELL 4 CONSTRUCTION (SEE NOTE 4)
- BUILDING
- SINGLE TREES
- UTILITY POLE
- LIGHT POLE
- MH7AB — EXISTING MANHOLE
- MW97-2 — MONITORING WELL
- CP10 2109.27 — CONTROL POINT

NOTES:

1. PRIOR TO STRIPPING TOPSOIL, CONTRACTOR SHALL HAVE STORM WATER CONTROLS IN PLACE TO PREVENT STORM WATER RUNOFF FROM DISTURBED AREAS FROM LEAVING THE SITE UNTREATED. ACCEPTABLE STORM WATER CONTROL MEASURES INCLUDE SILT FENCE, FILTER LOGS, OR OTHER APPROVED METHODS TO PREVENT SEDIMENT TRANSPORT OUTSIDE OF THE WORK AREAS. OWNER'S ONSITE REPRESENTATIVE WILL REVIEW AND APPROVE CONTRACTOR'S STORM WATER CONTROL METHODS.
2. MOST OF SPGM STRIPPING IN CELL 5 EXTENTS WERE COMPLETED DURING CELL 4 CONSTRUCTION AND IN THE FALL OF 2021 BY BNI. ADDITIONAL STRIPPING AREAS SHOWN WILL BE PERFORMED BY BNI PRIOR TO CELL 5 PHASE 1A CONSTRUCTION UNLESS OTHERWISE DIRECTED BY OWNER.
3. SOIL STRIPPED WITHIN PRIME FARMLAND LIMITS SHALL BE PLACED IN THE PROPOSED PRIME FARMLAND SPGM TOPSOIL STOCKPILES AS SHOWN ON DWG C-02. ALL OTHER STRIPPED SOILS SHALL BE PLACED IN THEIR CORRESPONDING STOCKPILES.
4. STRIP AND STOCKPILE 6" SUBSOIL FROM AREA RESTORED DURING CELL 4 CONSTRUCTION.

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| CLIENT | 03/14/22 | | | | | | |
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Ph: 1-800-632-2277

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| Date | 02/25/22 |
| Drawn | JEK2 |
| Checked | JKH2 |
| Designed | SWH |
| Approved | SWH |

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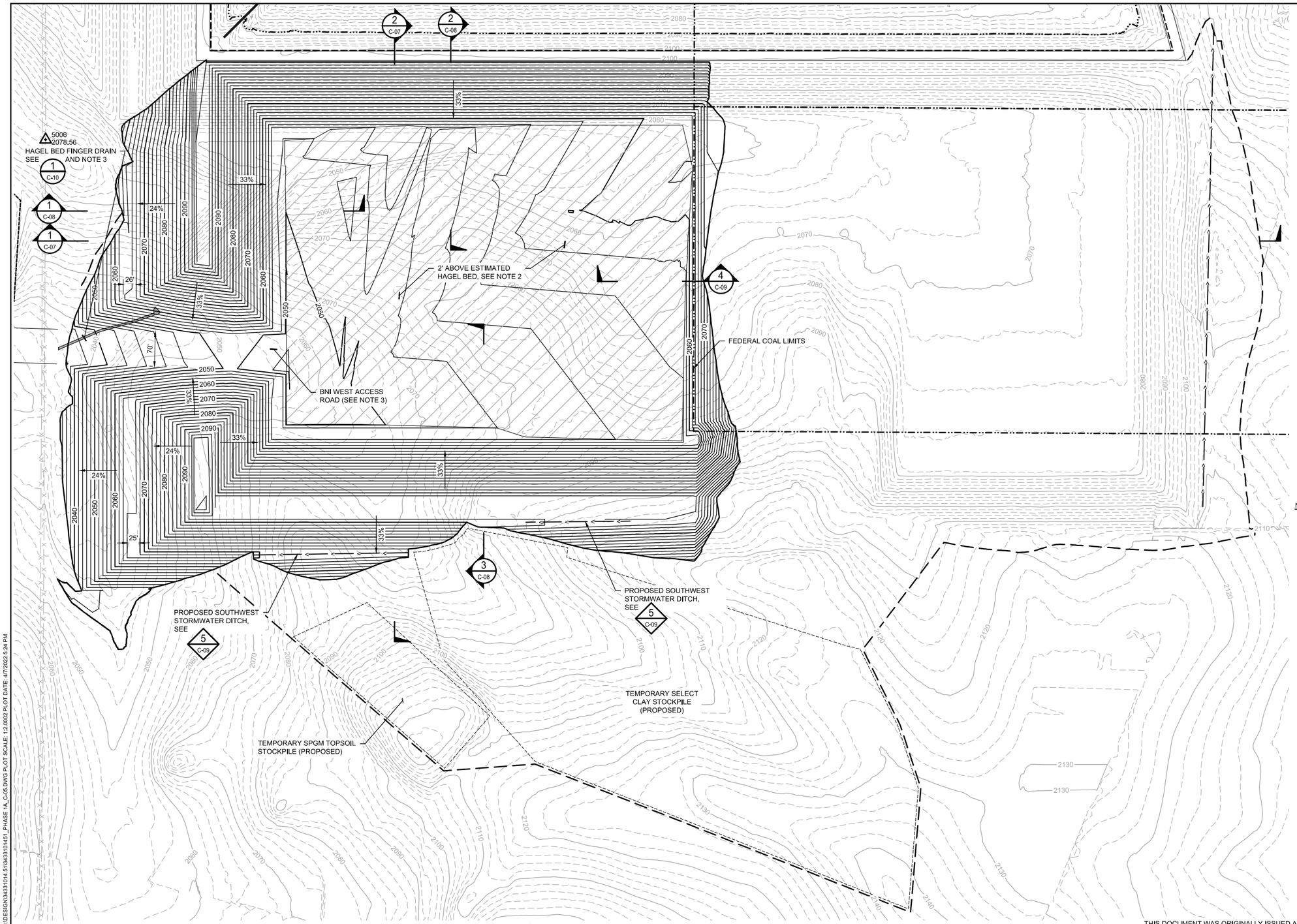
MINNKOTA FGD POND CELL 5 - PHASE 1A
CENTER, NORTH DAKOTA

SPGM STRIPPING PLAN

| BARR PROJECT No. | |
|---|---|
| 34331014.51 | |
| CLIENT PROJECT No. | |
| DWG. No. | REV. No. |
| C-04 | 0 |

CADD USER: JENNA E. KOENIG FILE: M:\DESIGN\34331014.51\34331014511_PHASE 1A_C-04.DWG PLOT SCALE: 1:2.0002 PLOT DATE: 4/7/2022 5:19 PM




## LEGEND

- EXISTING 10' MAJOR CONTOUR
- EXISTING 2' MINOR CONTOUR
- PROPOSED 10' MAJOR CONTOUR
- PROPOSED 2' MINOR CONTOUR
- EXISTING ROAD
- EXISTING PIPE
- EXISTING GEOMEMBRANE LINER LIMITS
- FENCE LINE
- FIELD LINE
- UNDERGROUND ELECTRIC
- OVERHEAD ELECTRIC
- STORM SEWER
- PROPOSED CELL 5 STRIPPING LIMITS
- STOCKPILE EXTENTS
- STORMWATER DRAINAGE DITCH
- WATERLINE
- SHRUB EDGE
- FEDERAL COAL TRACT LIMITS
- CULVERT
- BUILDING
- SINGLE TREES
- UTILITY POLE
- MH7AB — EXISTING MANHOLE, CATCH BASIN
- MW97-2 — MONITORING WELL
- CP10 2109.27 — CONTROL POINT
- 2' ABOVE ESTIMATED TOP OF HAGEL BED (SEE NOTE 2)
- HAGEL BED DRAIN

NOTES:

1. PROTECT ALL WELLS WITHIN THE CONSTRUCTION LIMITS, UNLESS OTHERWISE DIRECTED.
2. PROPOSED CONTOURS SHOWN REPRESENT TOP OF RANDOM FILL. CONTOURS WITHIN THE HATCHED BOUNDARY REPRESENT 2 FEET ABOVE TOP OF HAGEL BED. CONTOURS ARE APPROXIMATE AND SHALL BE VERIFIED DURING CONSTRUCTION. DO NOT EXCAVATE HAGEL BED MATERIAL.
3. DETERMINE FINAL EXTENTS OF HAGEL BED DRAIN IN THE FIELD BASED ON LOCATION OF THE HAGEL BED OUTCROP (LOCATIONS ON DRAWINGS ARE ESTIMATED), PLACE DRAIN MATERIAL DIRECTLY AGAINST THE EXPOSED HAGEL BED ON THE WEST SLOPE AT A MINIMUM WIDTH OF 5-FEET. PLACE FINGER DRAINS 4' BY 4' IN NATURAL DRAINAGE AREAS AS SHOWN ON THE DRAWINGS. DO NOT INSTALL FINGER DRAIN BELOW BNI WEST ACCESS ROAD UNTIL AFTER HAGEL BED REMOVAL.

**CELL 5 PHASE 1A EXCAVATION TO HAGEL NEATLINE EARTHWORK QUANTITIES**

| MATERIAL | ESTIMATED QUANTITIES (CY) |
|---|---|
| SPGM STRIPPING | |
| SPGM TOPSOIL | 38,000 |
| SPGM SUBSOIL | 68,000 |
| 6" TEMPORARY SPGM SUBSOIL | 18,000 |
| EARTHWORK | |
| WEST FLOOR CUT ABOVE HAGEL BED | 316,000 |
| EMBANKMENT FILL | 261,000 |
| EXCESS MATERIAL TO BE STOCKPILED AS SELECT CLAY OR WASTED IN CELL 2 OR CELL 3 | 55,000 |

NOTE: NEATLINE QUANTITIES ARE ROUNDED TO THE NEAREST ONE-THOUSAND CUBIC YARDS. NO WASTE, SHRINKAGE, OR SWELL IS ASSUMED.

1 PLAN: CELL 5 - PHASE 1A EXCAVATION TO HAGEL

0 100 200
SCALE IN FEET

N

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| Approved | SWH |

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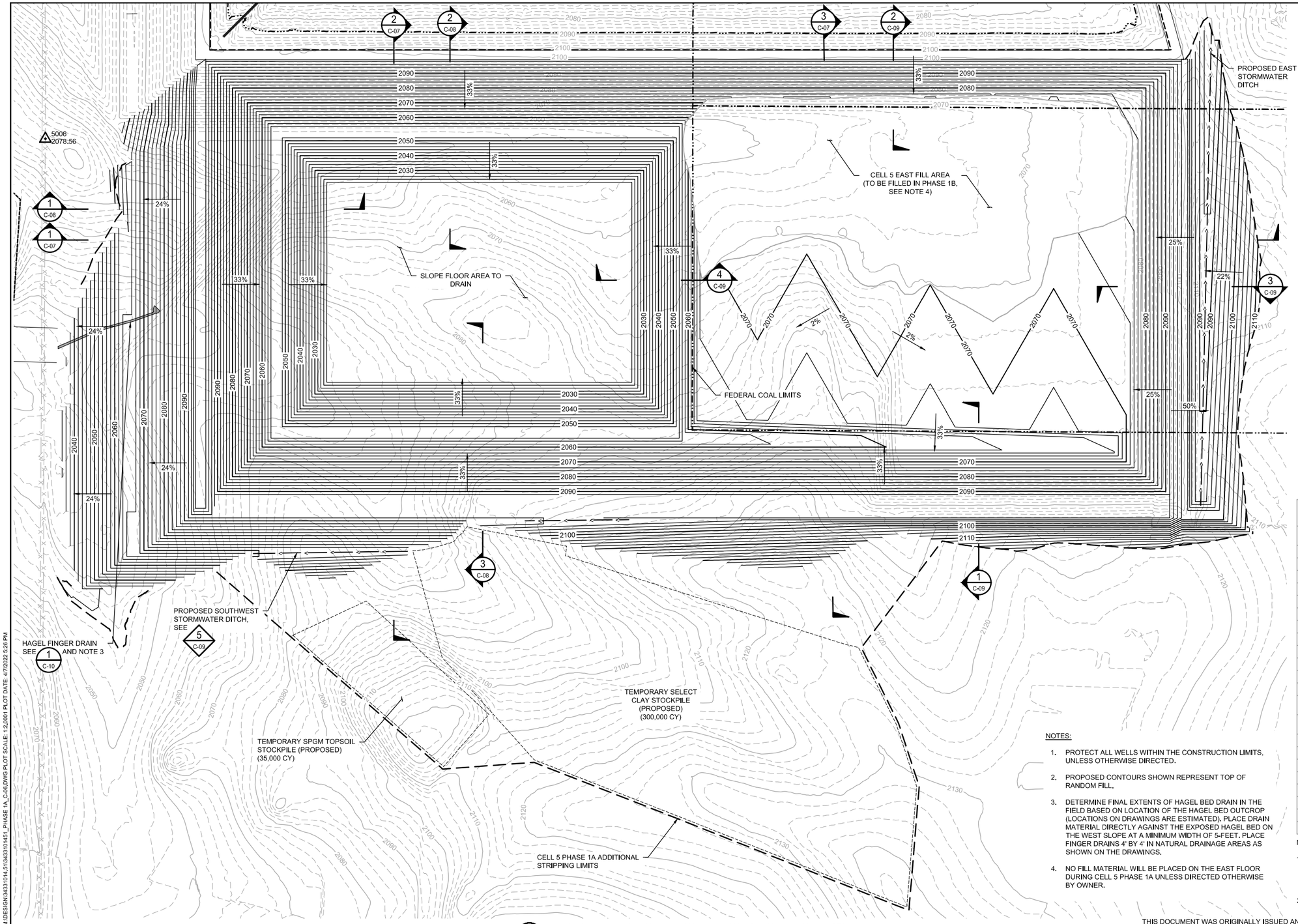
MINNKOTA FGD POND CELL 5 - PHASE 1A
CENTER, NORTH DAKOTA

EXCAVATION TO HAGEL
PLAN

BARR PROJECT No. 34331014.51
CLIENT PROJECT No.
DWG. No. C-05
REV. No. 0

CADD USER: JENNA E. KOENIG FILE: M:\DESIGN\34331014.51\34331014511_PHASE 1A_C-05.DWG PLOT SCALE: 1:2.0002 PLOT DATE: 4/7/2022 5:24 PM




## LEGEND

- EXISTING 10' MAJOR CONTOUR
- EXISTING 2' MINOR CONTOUR
- PROPOSED 10' MAJOR CONTOUR
- PROPOSED 2' MINOR CONTOUR
- EXISTING ROAD
- EXISTING PIPE
- EXISTING GEOMEMBRANE LINER LIMITS
- FENCE LINE
- FIELD LINE
- UNDERGROUND ELECTRIC
- OVERHEAD ELECTRIC
- STORM SEWER
- PROPOSED CELL 5 STRIPPING LIMITS
- STOCKPILE EXTENTS
- STORMWATER DRAINAGE DITCH
- WATERLINE
- SHRUB EDGE
- FEDERAL COAL TRACT LIMITS
- CULVERT
- BUILDING
- SINGLE TREES
- UTILITY POLE
- MH7AB — EXISTING MANHOLE, CATCH BASIN
- MW97-2 — MONITORING WELL
- CP10 2109.27 — CONTROL POINT
- HAGEL BED DRAIN

## CELL 5 PHASE 1A EXCAVATION NEATLINE EARTHWORK QUANTITIES

| MATERIAL | ESTIMATED QUANTITIES (CY) |
|---|---|
| EARTHWORK | |
| 2' BUFFER AND HAGEL REMOVAL | 149,000 |
| WEST FLOOR CUT BELOW HAGEL | 283,000 |
| WASTE (ROCK AND COAL) | 15,000 |
| RANDOM FILL | 50,000 |
| SELECT CLAY | 220,000 |
| | |
| MATERIAL REMAINING IN WEST FLOOR | 61,000 |
| EAST FLOOR CUT ABOVE HAGEL | 276,000 |
| | |
| EMBANKMENT FILL | 44,000 |
| SELECT CLAY TO BE STOCKPILED | 220,000 |
| RANDOM FILL TO BE STOCKPILED FOR PH1B - EAST FLOOR FILL | 54,000 |
| EXCESS MATERIAL TO CELL 2 OR CELL 3 | 228,000 |
| | |
| RESTORATION | |
| WEST EMBANKMENT SPGM TOPSOIL | 11,000 |
| WEST EMBANKMENT SPGM SUBSIOL | 21,000 |
| EAST EMBANKMENT SPGM TOPSOIL | 4,000 |
| EAST EMBANKMENT SPGM SUBSOIL | 10,000 |
| SOUTH EMBANKMENT TOPSOIL | 0 |
| SOUTH EMBANKMENT SUBSOIL | 5,000 |

NOTES:

1. NEATLINE QUANTITIES ARE ROUNDED TO THE NEAREST ONE-THOUSAND CUBIC YARDS. NO WASTE, SHRINKAGE, OR SWELL IS ASSUMED. EXCAVATION BELOW HAGEL ASSUMED TO BE 5% WASTE, 11.5% RANDOM FILL, 77.5% SELECT CLAY.
2. THE NEATLINE QUANTITY OF REQUIRED CLAY FOR CELL 5 PHASE 1B IS 271,000 CY.

NOTES:

1. PROTECT ALL WELLS WITHIN THE CONSTRUCTION LIMITS, UNLESS OTHERWISE DIRECTED.
2. PROPOSED CONTOURS SHOWN REPRESENT TOP OF RANDOM FILL.
3. DETERMINE FINAL EXTENTS OF HAGEL BED DRAIN IN THE FIELD BASED ON LOCATION OF THE HAGEL BED OUTCROP (LOCATIONS ON DRAWINGS ARE ESTIMATED). PLACE DRAIN MATERIAL DIRECTLY AGAINST THE EXPOSED HAGEL BED ON THE WEST SLOPE AT A MINIMUM WIDTH OF 5-FEET. PLACE FINGER DRAINS 4' BY 4' IN NATURAL DRAINAGE AREAS AS SHOWN ON THE DRAWINGS.
4. NO FILL MATERIAL WILL BE PLACED ON THE EAST FLOOR DURING CELL 5 PHASE 1A UNLESS DIRECTED OTHERWISE BY OWNER.

1 C-10 PLAN: CELL 5 - PHASE 1A EXCAVATION BELOW HAGEL

0 100 200
SCALE IN FEET

N

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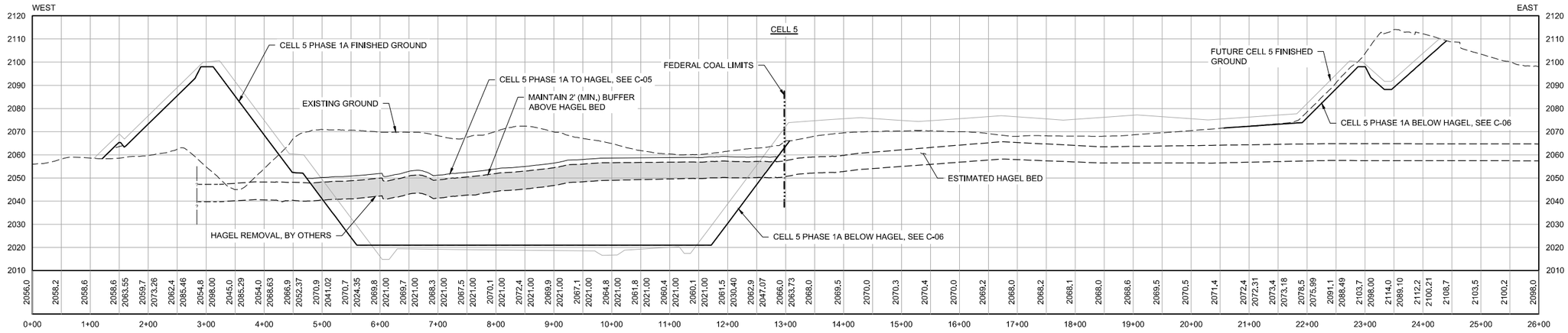
MINNKOTA FGD POND CELL 5 - PHASE 1A
CENTER, NORTH DAKOTA

EXCAVATION BELOW HAGEL
PLAN

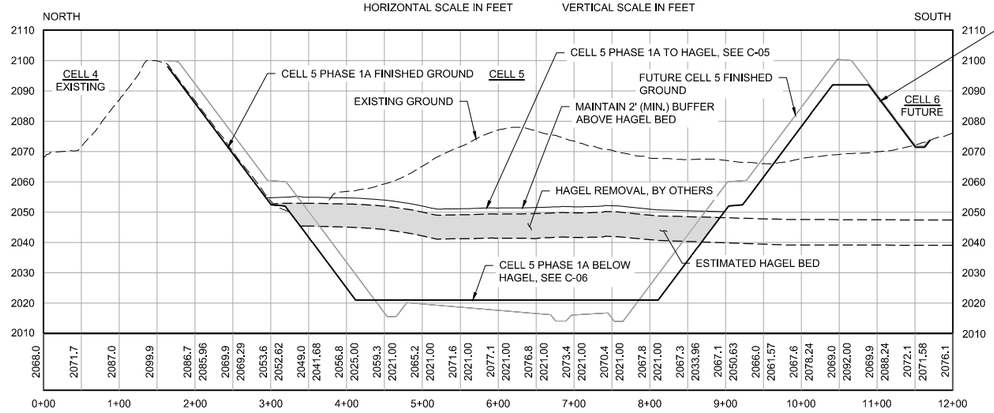
BARR PROJECT No. 34331014.51
CLIENT PROJECT No.
DWG. No. C-06
REV. No. 0

CADD USER: JENNA E. KOENING FILE: M:\DESIGN\34331014.51\34331014S1_PHASE 1A_C-06.DWG PLOT SCALE: 1:2,0001 PLOT DATE: 4/7/2022 5:26 PM



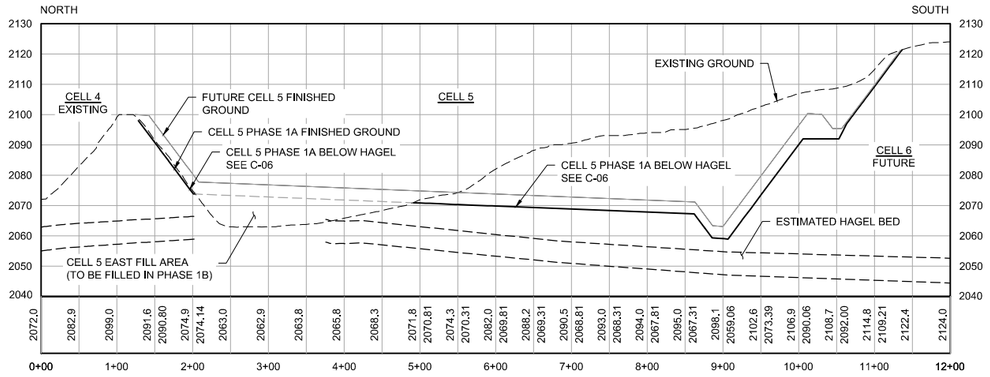

1 C-05, C-06 SECTION: OVERALL WEST - EAST

HORIZONTAL SCALE IN FEET 0 20 40 — VERTICAL SCALE IN FEET 0 5 10




2 C-05, C-06 SECTION: OVERALL NORTH - SOUTH - WEST SIDE

HORIZONTAL SCALE IN FEET 0 20 40 — VERTICAL SCALE IN FEET 0 5 10




3 C-06 SECTION: OVERALL NORTH - SOUTH - EAST SIDE

HORIZONTAL SCALE IN FEET 0 20 40 — VERTICAL SCALE IN FEET 0 5 10

LEGEND

- EXISTING GROUND
- CELL 5 PHASE 1A FINISHED GROUND
- TOP/BOTTOM HAGEL
- 2' ABOVE HAGEL BED
- CELL 5 PHASE 1A BELOW HAGEL
- HAGEL BED

2080.6 EXISTING GROUND — 2079.71 EXCAVATION BELOW HAGEL FINISHED GROUND

NOTES:

1. HAGEL EXCAVATION TO BE COMPLETED BY BNI, COORDINATE SCHEDULE WITH OWNER. EXCAVATION BELOW HAGEL TO BE COMPLETED AFTER REMOVAL OF HAGEL BED MATERIAL.
2. NO FILL MATERIAL WILL BE PLACED ON THE EAST FLOOR DURING CELL 5 PHASE 1A UNLESS OTHERWISE DIRECTED BY OWNER.

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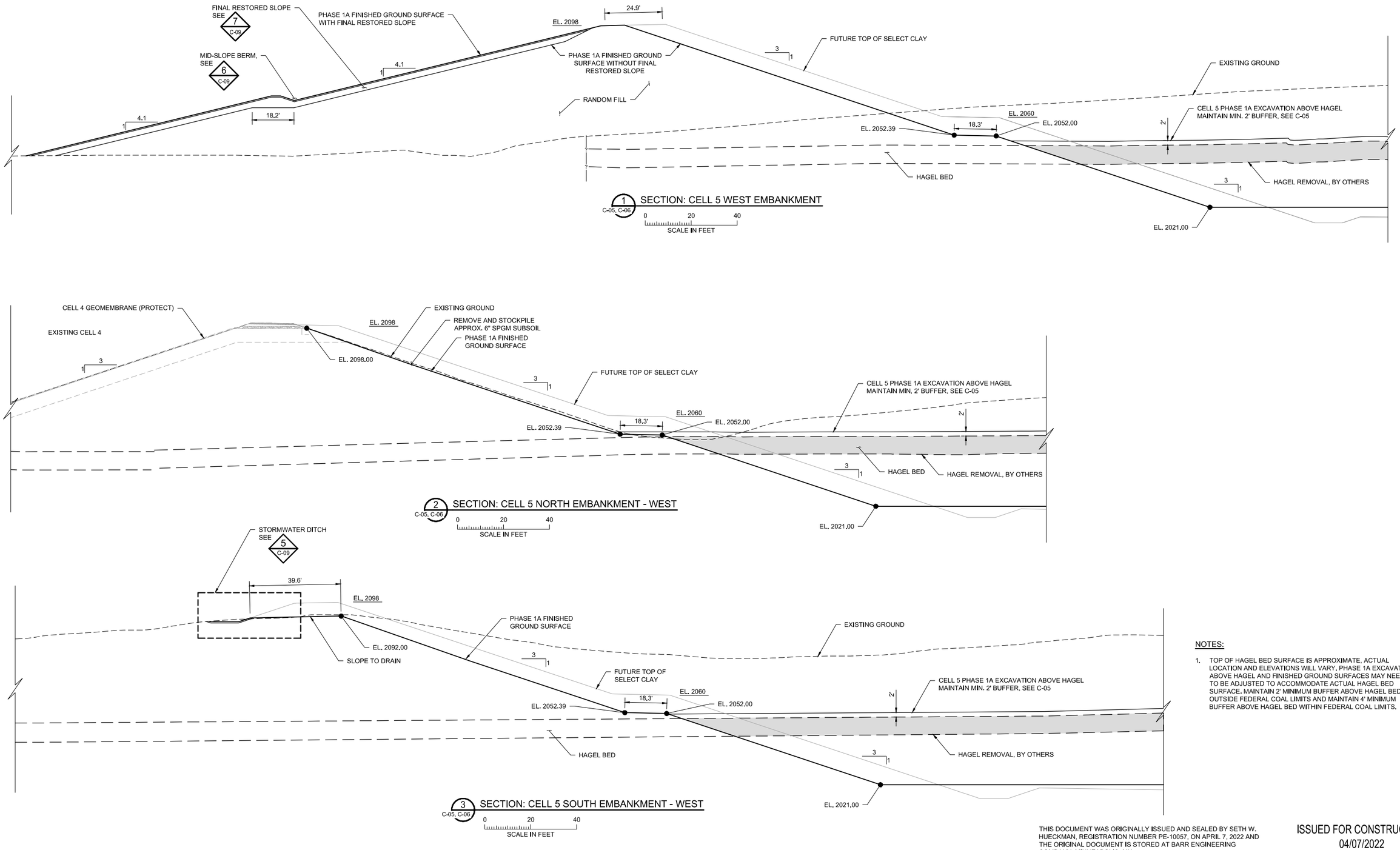
MINNKOTA FGD POND CELL 5 - PHASE 1A
CENTER, NORTH DAKOTA

CELL 5 EXCAVATION AND EMBANKMENT FILL
OVERALL SECTIONS

| BARR PROJECT No. | |
|---|---|
| 34331014.51 | |
| CLIENT PROJECT No. | |
| DWG. No. | REV. No. |
| C-07 | 0 |

CADD USER: JENNA E. KOENIG FILE: M:\DESIGN\34331014.51\34331014.51_PHASE 1A_C-07.DWG PLOT SCALE: 1:2.0001 PLOT DATE: 4/7/2022 4:37 PM




NOTES:

1. TOP OF HAGEL BED SURFACE IS APPROXIMATE. ACTUAL LOCATION AND ELEVATIONS WILL VARY. PHASE 1A EXCAVATION ABOVE HAGEL AND FINISHED GROUND SURFACES MAY NEED TO BE ADJUSTED TO ACCOMMODATE ACTUAL HAGEL BED SURFACE. MAINTAIN 2' MINIMUM BUFFER ABOVE HAGEL BED OUTSIDE FEDERAL COAL LIMITS AND MAINTAIN 4' MINIMUM BUFFER ABOVE HAGEL BED WITHIN FEDERAL COAL LIMITS.

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MINNKOTA FGD POND CELL 5 - PHASE 1A
CENTER, NORTH DAKOTA

CELL 5 EXCAVATION AND EMBANKMENT FILL SECTIONS 1 OF 2

| | |
|---|---|
| BARR PROJECT No. | 34331014.51 |
| CLIENT PROJECT No. | |
| DWG. No. | C-08 |
| REV. No. | 0 |

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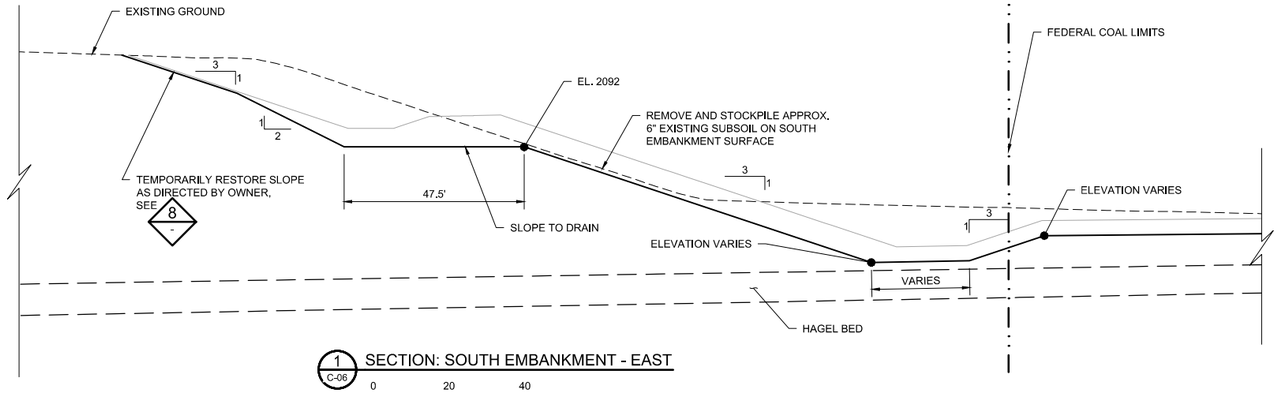
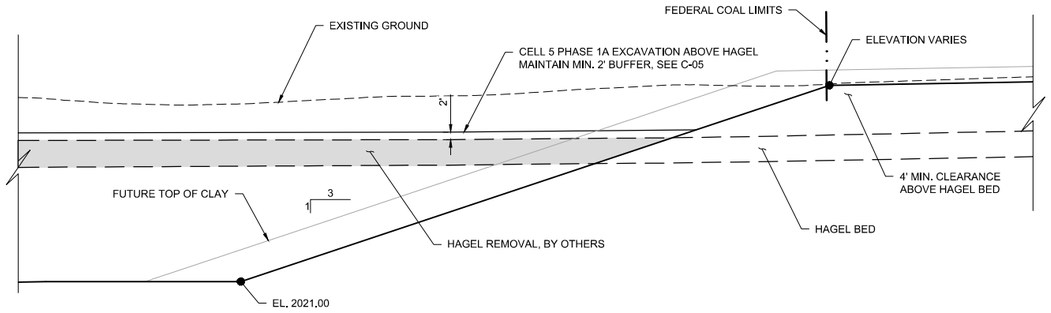


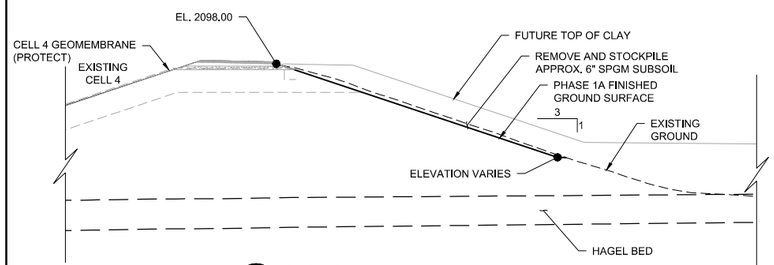

1 C-06 SECTION: SOUTH EMBANKMENT - EAST

0 20 40
SCALE IN FEET



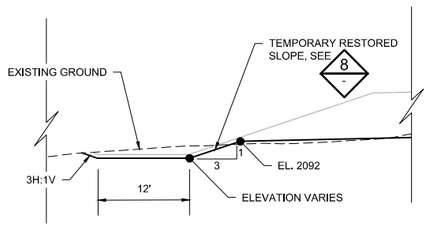

4 C-05,C-06 SECTION: EAST - WEST EMBANKMENT TRANSITION

0 20 40
SCALE IN FEET



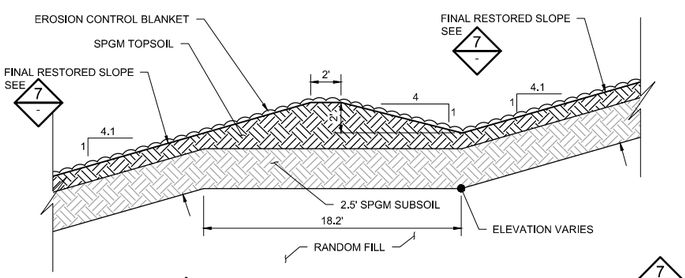

2 C-06 SECTION: NORTH EMBANKMENT - EAST

0 20 40
SCALE IN FEET



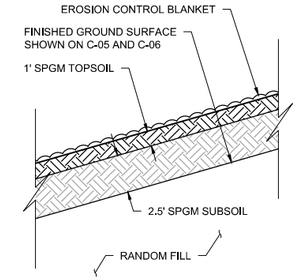

5 C-05, C-06, C-08, - DETAIL: STORMWATER DITCH - SOUTHWEST

0 10 20
SCALE IN FEET




6 C-08 DETAIL: WEST EMBANKMENT DRAINAGE SWALE

0 5 10
SCALE IN FEET

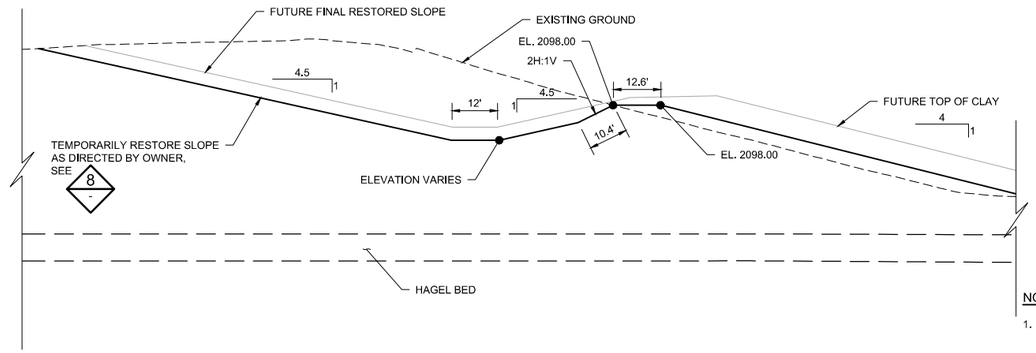



7 C-08, C-10, - DETAIL: FINAL RESTORED SLOPE (TYP.)

0 5 10
SCALE IN FEET

NOTE:

PLACE EROSION CONTROL BLANKET ON ENTIRE WEST EMBANKMENT OUTER SLOPE.

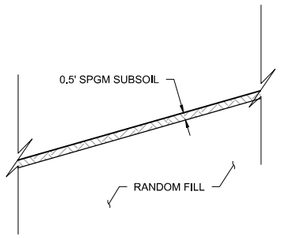



3 C-05,C-06 SECTION: EAST EMBANKMENT

0 20 40
SCALE IN FEET

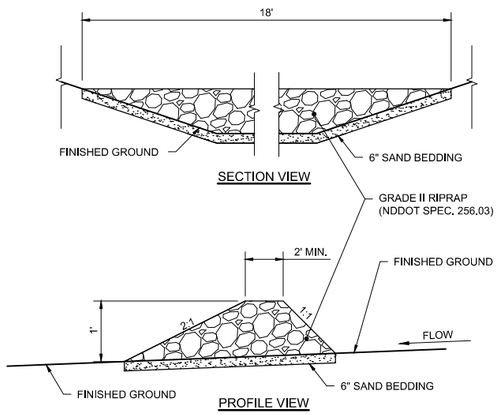
NOTES:

1. RESTORE SLOPES, SEED AND INSTALL EROSION CONTROL BLANKET AS DIRECTED BY OWNER.




8 C-07, DETAIL: TEMPORARY RESTORED SLOPE (TYP.)

0 5 10
SCALE IN FEET




NOTE:

AGGREGATE USED SHOULD BE RELATIVELY FREE OF SEDIMENT PRIOR TO INSTALLATION.

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9 C-02 DETAIL: ROCK CHECK DAM
NOT TO SCALE

ISSUED FOR CONSTRUCTION
04/07/2022

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| CLIENT | 03/14/22 | | | | | | | |
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| CONSTRUCTION | | | | 04/07/22 | | | | |
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| Date | 02/25/22 |
| Drawn | JEK2 |
| Checked | JKH2 |
| Designed | SWH |
| Approved | SWH |

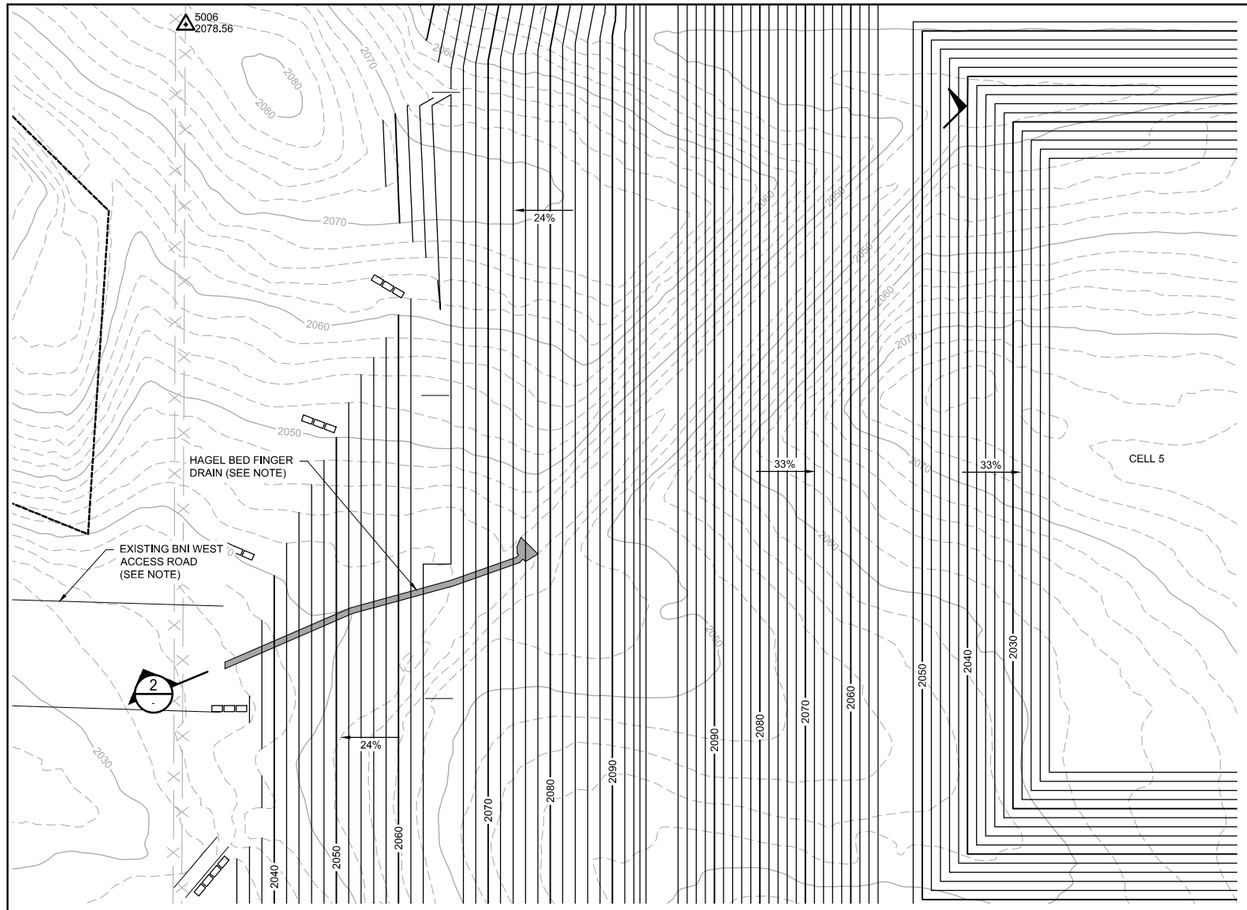
Minnkota Power COOPERATIVE
A Touchstone Energy® Cooperative

MINNKOTA FGD POND CELL 5 - PHASE 1A
CENTER, NORTH DAKOTA

CELL 5 EXCAVATION AND EMBANKMENT FILL
SECTIONS 2 OF 2

| BARR PROJECT No. | |
|---|---|
| 34331014.51 | |
| CLIENT PROJECT No. | |
| DWG. No. | REV. No. |
| C-09 | 0 |

CADD USER: JENNA E. KOENIG FILE: M:\DESIGN\34331014.51\34331014.51_PHASE 1A_C-09.DWG PLOT SCALE: 1:2.0001 PLOT DATE: 4/7/2022 4:45 PM

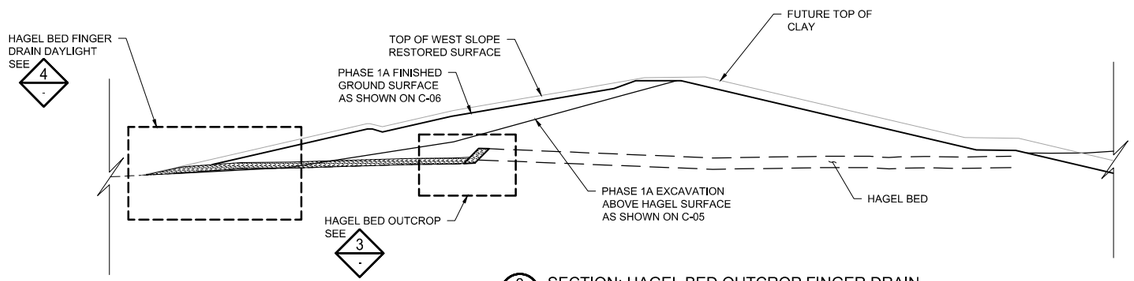



NOTE:

1. DETERMINE FINAL EXTENTS OF HAGEL BED DRAIN IN THE FIELD BASED ON LOCATION OF THE HAGEL BED OUTCROP (LOCATIONS ON DRAWINGS ARE ESTIMATED), PLACE DRAIN MATERIAL DIRECTLY AGAINST THE EXPOSED HAGEL BED ON THE WEST SLOPE AT A MINIMUM WIDTH OF 5-FEET. PLACE FINGER DRAINS 4' BY 4' IN NATURAL DRAINAGE AREAS AS SHOWN ON THE DRAWINGS, DO NOT INSTALL FINGER DRAIN BELOW BNI WEST ACCESS ROAD UNTIL AFTER HAGEL BED REMOVAL.

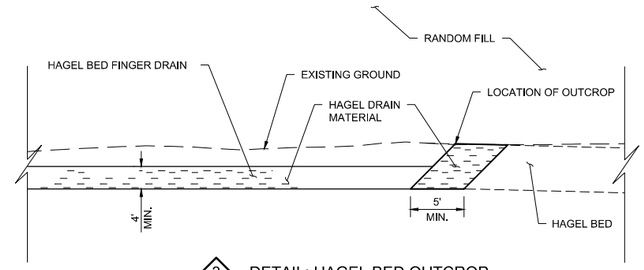
1 C-05,C-06 PLAN: HAGEL BED OUTCROP FINGER DRAIN

0 50 100
SCALE IN FEET



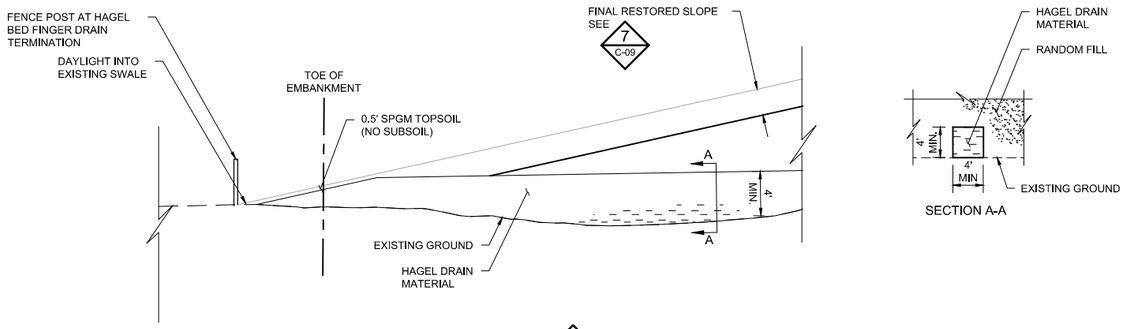

2 SECTION: HAGEL BED OUTCROP FINGER DRAIN

0 50 100
SCALE IN FEET




3 DETAIL: HAGEL BED OUTCROP

0 10 20
SCALE IN FEET




4 DETAIL: HAGEL BED FINGER DRAIN

0 10 20
SCALE IN FEET

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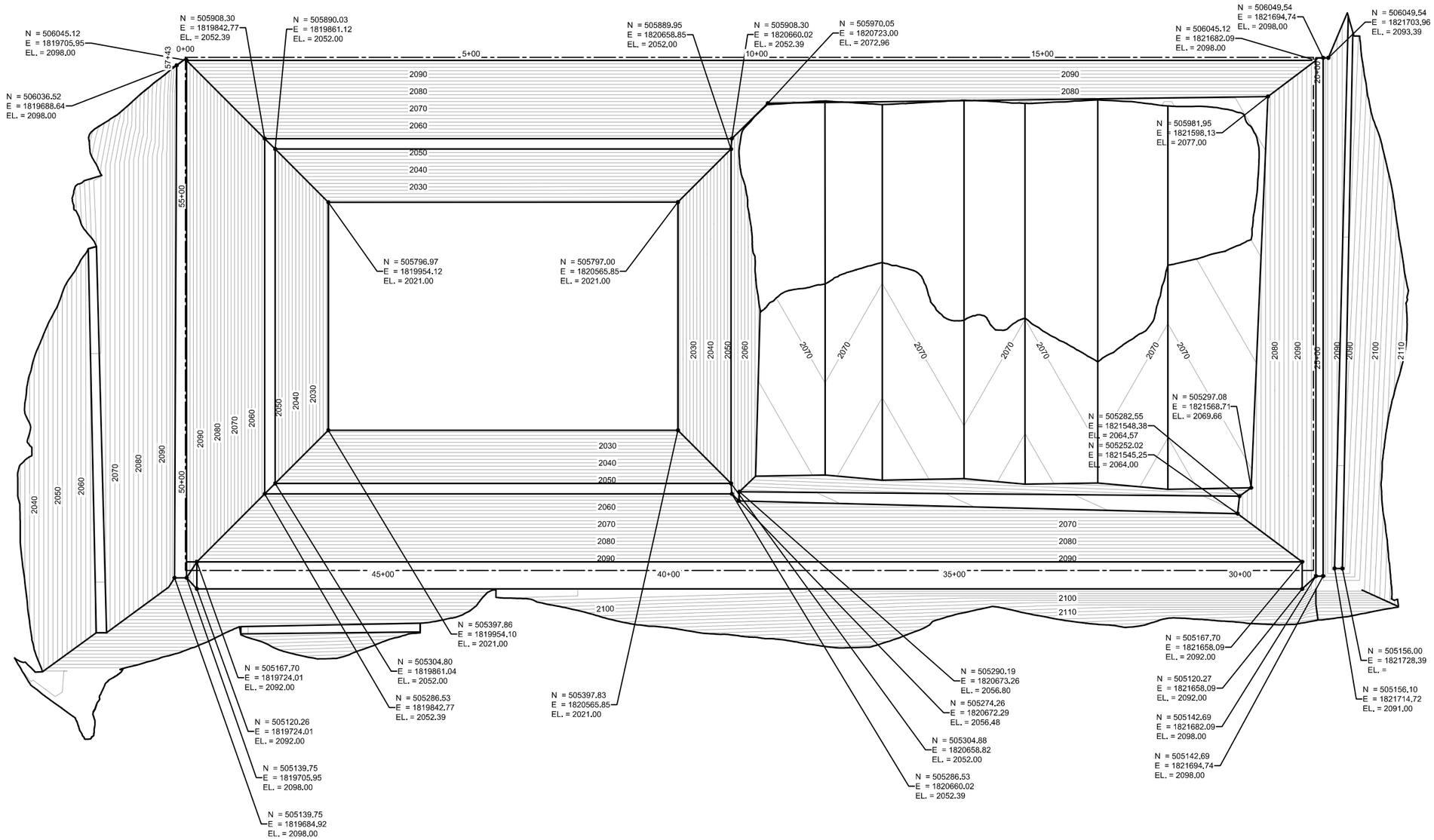
Minnkota Power COOPERATIVE
A Touchstone Energy® Cooperative

MINNKOTA FGD POND CELL 5 - PHASE 1A
CENTER, NORTH DAKOTA

HAGEL BED OUTCROP
PLAN, SECTION AND DETAILS

BARR PROJECT No. 34331014.51
CLIENT PROJECT No.
DWG. No. C-10
REV. No. 0

CADD USER: JENNA E. KOENIG FILE: M:\DESIGN\34331014.51\34331014.51_PHASE 1A_C-10.DWG PLOT SCALE: 1:2.0002 PLOT DATE: 4/7/2022 4:47 PM




1 PLAN: CELL 5 - PHASE 1A EXCAVATION BELOW HAGEL

0 100 200

SCALE IN FEET

N

LEGEND

2000 PROPOSED 10' MAJOR CONTOUR

PROPOSED 2' MINOR CONTOUR

BREAKLINE

BASELINE ALIGNMENT

NOTE:

1. PROPOSED CONTOURS REPRESENT TOP OF RANDOM FILL.

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MINNKOTA FGD POND CELL 5 - PHASE 1A
CENTER, NORTH DAKOTA

ELEVATION AND COORDINATES
PLAN

| BARR PROJECT No. | |
|---|---|
| 34331014.51 | |
| CLIENT PROJECT No. | |
| DWG. No. | REV. No. |
| C-11 | 0 |

CADD USER: JENNA E. KOENIG FILE: M:\DESIGN\34331014.51\34331014.51_PHASE 1A_C-11.DWG PLOT SCALE: 1:2 PLOT DATE: 4/7/2022 4:59 PM

LEGEND

2000 — PROPOSED 10' MAJOR CONTOUR

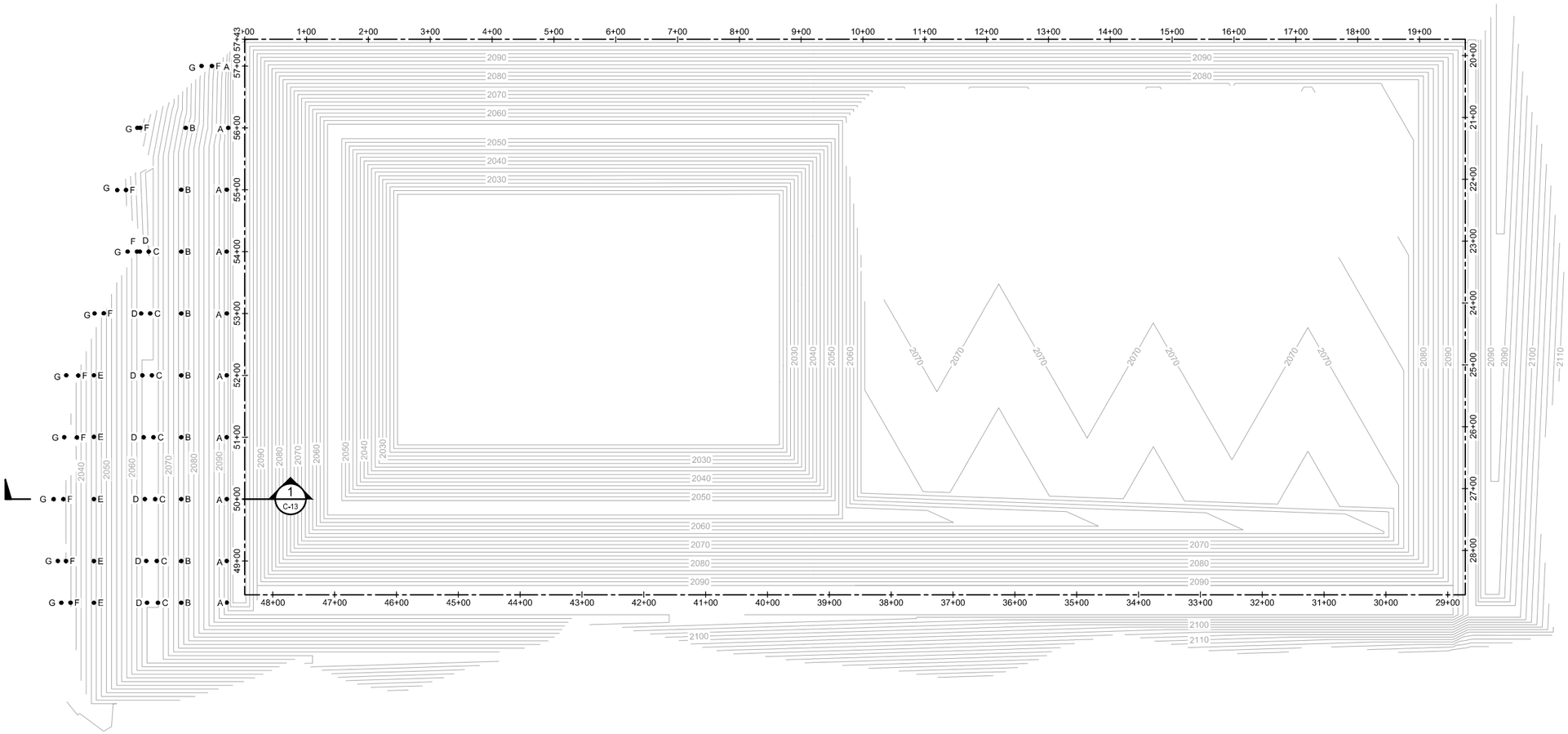
PROPOSED 2' MINOR CONTOUR

BASELINE ALIGNMENT

● A SURVEY VERIFICATION SHOT

NOTE:

1. PROPOSED CONTOURS REPRESENT TOP OF RANDOM FILL.




1 PLAN: CELL 5 - EMBANKMENT SURVEY VERIFICATION

0 100 200

SCALE IN FEET

N

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Minnkota Power COOPERATIVE
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MINNKOTA FGD POND CELL 5 - PHASE 1A
CENTER, NORTH DAKOTA

SURVEY VERIFICATION
WEST EMBANKMENT

| BARR PROJECT No. | |
|---|---|
| 34331014.51 | |
| CLIENT PROJECT No. | |
| DWG. No. | REV. No. |
| C-12 | 0 |

CADD USER: JENNA E, KOENIG FILE: M:\DESIGN\34331014.51\34331014S1_PHASE 1A_C-12.DWG PLOT SCALE: 1:2,0001 PLOT DATE: 7/21/2022 12:39 PM

## ABBREVIATIONS

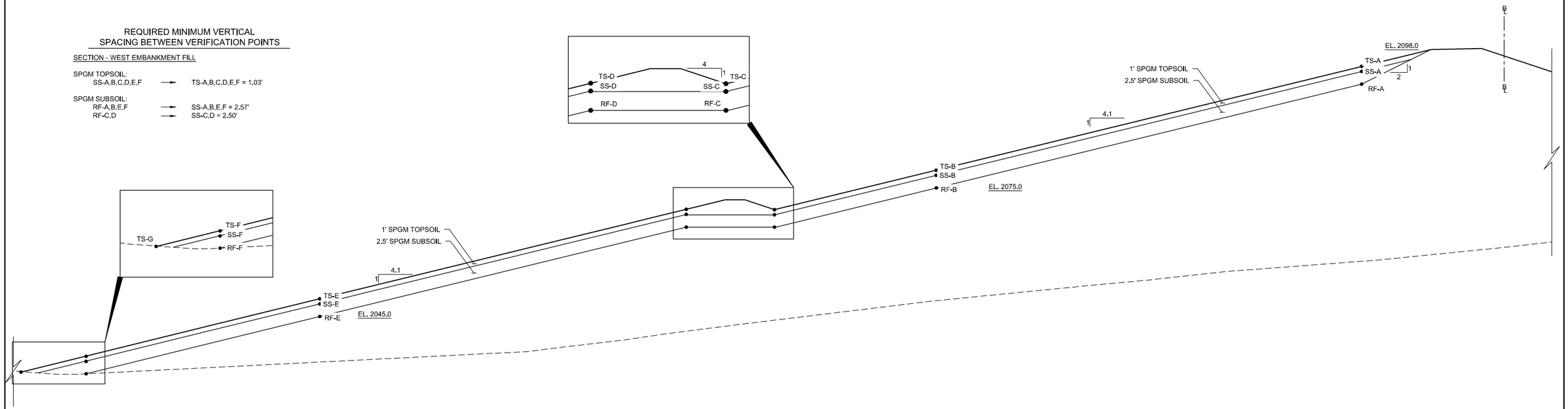
| | |
|---|---|
| RF-A | RANDOM FILL POINT A |
| TS-A | TOPSOIL POINT A |
| SS-A | SUBSOIL POINT A |
| ℄ | BASELINE |

## REQUIRED MINIMUM VERTICAL SPACING BETWEEN VERIFICATION POINTS

SECTION - WEST EMBANKMENT FILL

SPGM TOPSOIL:
SS-A,B,C,D,E,F → TS-A,B,C,D,E,F = 1.03'

SPGM SUBSOIL:
RF-A,B,E,F → SS-A,B,E,F = 2.57'
RF-C,D → SS-C,D = 2.50'




1 C-12 SECTION: PHASE 1A WEST EMBANKMENT - GRADE VERIFICATION (TYP.)

0 10 20
SCALE IN FEET

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Minnkota Power COOPERATIVE
A Touchstone Energy® Cooperative

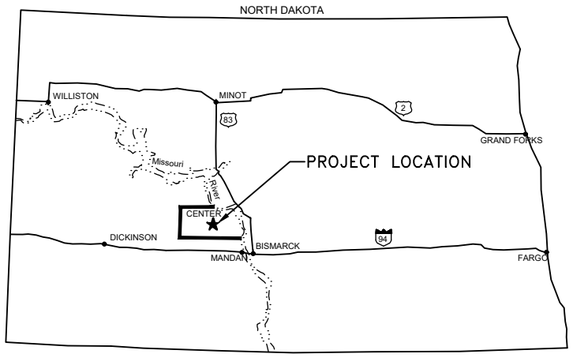
MINNKOTA FGD POND CELL 5 - PHASE 1A
CENTER, NORTH DAKOTA

SURVEY VERIFICATION
EMBANKMENT SECTION

| | |
|---|---|
| BARR PROJECT No. | 34331014.51 |
| CLIENT PROJECT No. | |
| DWG. No. | C-13 |
| REV. No. | 0 |

# Construction Drawings – Phase 1B

# CONSTRUCTION DRAWINGS
# MINNKOTA POWER COOPERATIVE, INC.
# CELL 5 - PHASE 1B - WITH FEDERAL COAL REMOVED
# COAL COMBUSTION WASTE DISPOSAL FACILITY
# CENTER, NORTH DAKOTA




LOCATION MAP

LIMITS OF SECTION CUT

SECTION IDENTIFIER

SECTION REFERENCES
SHEET SECTION IS LOCATED ON

1 / C-02

SECTION VIEW CALL OUT

SECTION IDENTIFIER (TYP.)

1 / C-02 SECTION: GRAPHICS STANDARDS 1"=1'-0"

SECTION REFERENCES (TYP.)
SHEET SECTION IS CALLED-OUT ON

SECTION VIEW TITLE

DETAIL IDENTIFIER

1 / C-02

DETAIL REFERENCES
SHEET DETAIL IS LOCATED ON

DETAIL VIEW CALL OUT

DETAIL IDENTIFIER (TYP.)

1 / C-02 DETAIL: GRAPHICS STANDARDS 1"=1'-0"

DETAIL REFERENCES (TYP.)
SHEET DETAIL IS CALLED-OUT ON

DETAIL VIEW TITLE

Minnkota Power COOPERATIVE
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VICINITY MAP

## DRAWING INDEX


| DWG NO. | TITLE |
|---|---|
| G-01 | INDEX, LOCATION MAP, AND VICINITY MAP |
| C-01 | EXISTING CONDITIONS - PLAN |
| C-02 | CELL 5 - PHASE 1B - PROJECT PLAN |
| C-03 | SOIL BORINGS - PLAN AND CROSS SECTIONS |
| C-04 | EXCAVATION BELOW HAGEL - PLAN |
| C-05 | CELL 5 LAYOUT - PLAN |
| C-06 | CELL 5 LAYOUT - OVERALL SECTIONS |
| C-07 | CELL 5 WEST/EAST EMBANKMENT - SECTIONS |
| C-08 | CELL 5 NORTH/SOUTH EMBANKMENT - SECTIONS |
| C-09 | NOT USED |
| C-10 | CELL 5 EMBANKMENT AND LINER - DETAILS |
| C-11 | SANDBAG LAYOUT - PLAN AND DETAILS |
| C-12 | HAGEL BED GRADIENT CONTROL SYSTEM - PLAN AND PROFILE |
| C-13 | HAGEL BED GRADIENT CONTROL SYSTEM - SECTIONS AND DETAIL |
| C-14 | DEWATERING SUMP AND SIDEWALL RISER - SECTIONS AND DETAILS |
| C-15 | DEWATERING SYSTEM SUMP PLAN - AND DEWATERING TRENCH SECTIONS |
| C-16 | DEWATERING SUMP - SECTIONS AND DETAILS |
| C-17 | DEWATERING TRENCH - PLAN, SECTIONS AND DETAILS |
| C-18 | BLOWDOWN PIPELINES - PLAN AND PROFILE |
| C-19 | BLOWDOWN PIPELINES - SECTIONS |
| C-20 | BLOWDOWN PIPELINES - SECTIONS AND DETAIL |
| C-21 | RETURN PIPELINES - WEST ALTERNATIVE - PLAN AND PROFILE |
| C-22 | NOT USED |
| C-23 | RETURN PIPELINES SIPHON - SECTIONS AND DETAILS |
| C-24 | RETURN PIPELINES - SECTIONS AND DETAILS |
| C-25 | COORDINATE AND ELEVATIONS - SUBGRADE |
| C-26 | COORDINATE AND ELEVATIONS - TOP OF CLAY LINER AND FINISHED GROUND |
| C-27 | SURVEY VERIFICATION AND DENSITY TESTING - CELL 5 LINER LIMITS |
| C-28 | SURVEY VERIFICATION - EAST EMBANKMENT |
| C-29 | SURVEY VERIFICATION - SECTIONS 1 OF 2 |
| C-30 | SURVEY VERIFICATION - SECTIONS 2 OF 2 |
| C-31 | SURVEY VERIFICATION - EMBANKMENT SECTION |


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Minnkota Power COOPERATIVE
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MINNKOTA FGD POND CELL 5 - PHASE 1B
CENTER, NORTH DAKOTA

INDEX, LOCATION MAP, AND VICINITY MAP

| | |
|---|---|
| BARR PROJECT No. | 34331014.59 |
| CLIENT PROJECT No. | |
| DWG. No. | G-01 |
| REV. No. | 0 |


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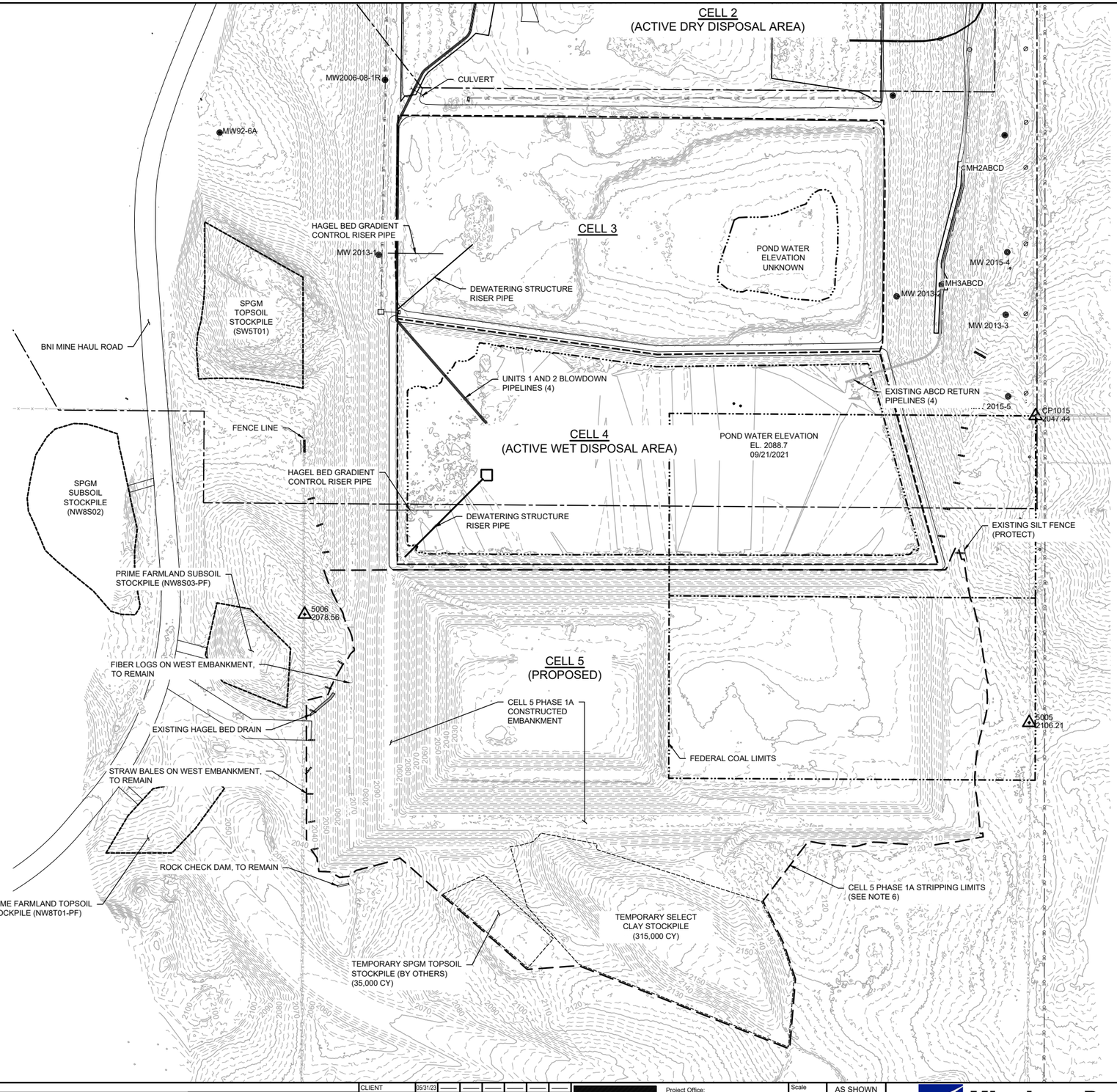


## 1 PLAN: EXISTING CONDITIONS

0 200 400

SCALE IN FEET

### LEGEND

- EXISTING 10' MAJOR CONTOUR
- EXISTING 2' MINOR CONTOUR
- EXISTING ROAD
- EXISTING PIPE
- FENCE LINE
- FIELD LINE
- UNDERGROUND ELECTRIC
- OVERHEAD ELECTRIC
- STORM SEWER
- CELL BOUNDARY
- CELL 5 STRIPPING LIMITS
- STOCKPILE EXTENTS
- WATERLINE
- SHRUB EDGE
- FEDERAL COAL TRACT LIMITS
- HAGEL BED DRAIN
- STRAW BALE
- CULVERT
- BUILDING
- SINGLE TREES
- UTILITY POLE
- MH7AB — EXISTING MANHOLE, CATCH BASIN
- MW97-2 — MONITORING WELL
- CP10 2109.27 — CONTROL POINT

| CONTROL POINTS | | | |
|---|---|---|---|
| CONTROL POINT | NORTHING | EASTING | ELEVATION |
| CP13 | 508,526.39 | 1,821,517.66 | 2,092.74 |
| CP1015 | 506,603.78 | 1,822,015.47 | 2,047.44 |
| 5005 | 505,499.46 | 1,821,992.35 | 2,106.21 |
| 5006 | 505,889.21 | 1,819,384.71 | 2,078.56 |

NOTE:

CONTROL POINT CP13 OUTSIDE OF VIEWPORT EXTENTS. LOCATION SHOWN ON G-01.

NOTES:

1. INDEX CONTOURS OF EXISTING GROUND SURFACE SHOWN AT 10' INTERVALS, INTERMEDIATE CONTOURS SHOWN AT 2' INTERVALS
2. PROTECT ALL WELLS WITHIN THE CONSTRUCTION LIMITS, UNLESS OTHERWISE DIRECTED.
3. EXISTING GROUND TOPOGRAPHY SHOWN IS A COMBINATION OF THE FOLLOWING SURVEYS PROVIDED TO BARR AND COMBINED BY BARR:
   -NOVEMBER 2022 PERFORMED BY INTERSTATE ENGINEERING
4. COORDINATE SYSTEM IS NORTH DAKOTA STATE PLANE SOUTH ZONE, NAD 27 - US SURVEY FEET (HORIZONTAL): NVGD 1929 (VERTICAL)
5. MOVE AND REPLACE CONTROL POINTS AS DIRECTED BY OWNER.
6. AREA INSIDE CELL 5 PHASE 1A STRIPPING LIMITS WAS STRIPPED DURING PHASE 1A CONSTRUCTION.
7. COORDINATE CONTRACTOR STAGING AREA WITH OWNER.

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| B | | | 06/09/23 | |
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Minnkota Power COOPERATIVE
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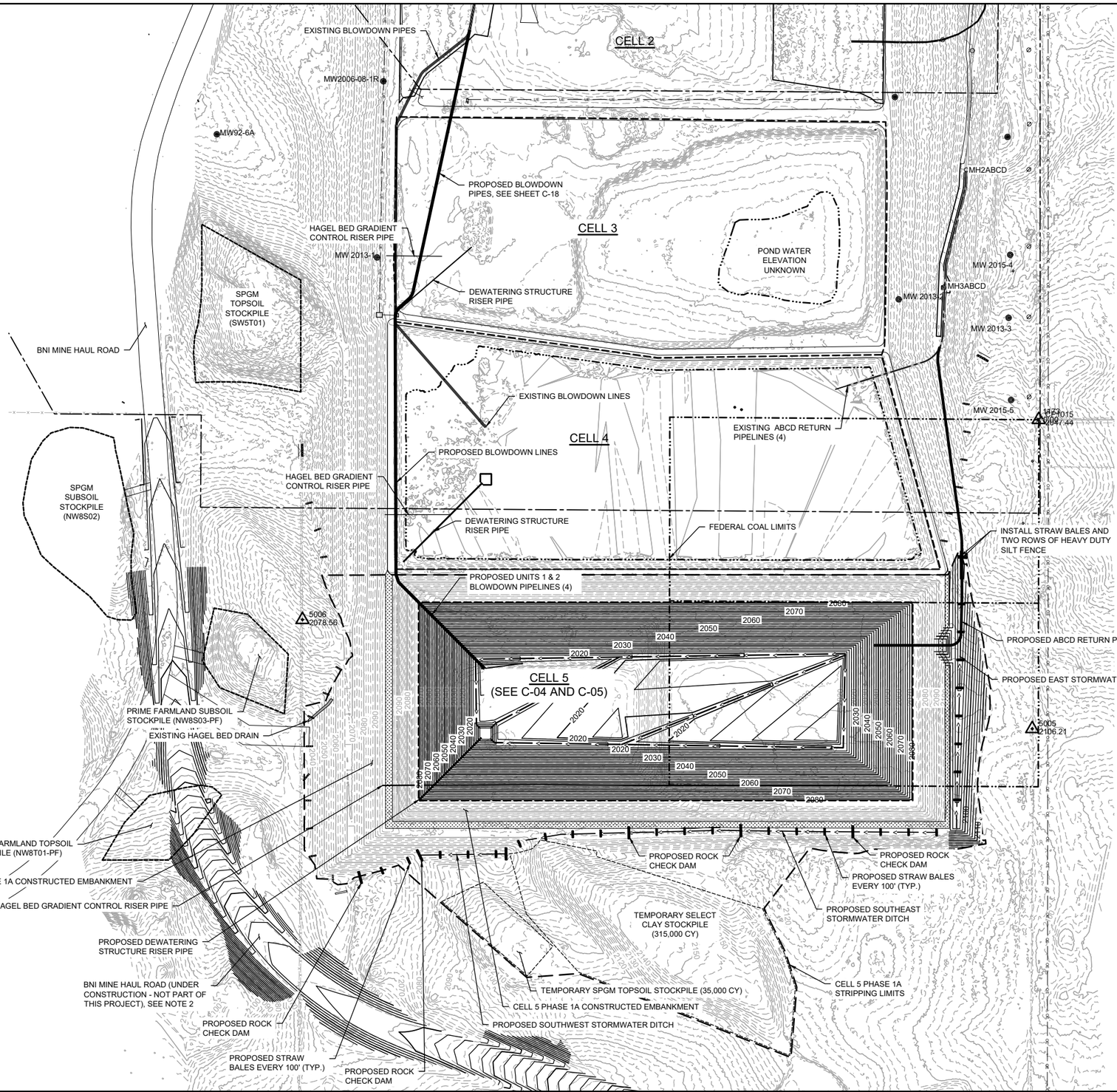
MINNKOTA FGD POND CELL 5 - PHASE 1B
CENTER, NORTH DAKOTA

EXISTING CONDITIONS PLAN

BARR PROJECT No. 34331014.59
CLIENT PROJECT No.
DWG. No. C-01
REV. No. 0

CADD USER: RACHEL L. BATEMAN FILE: M:\DESIGN\34331014.59\34331014590_C-01.DWG PLOT SCALE: 1:2 PLOT DATE: 6/8/2023 2:50 PM




1 PLAN: CELL 5 - PHASE 1B

0 200 400

SCALE IN FEET

N

LEGEND

- EXISTING 10' MAJOR CONTOUR
- EXISTING 2' MINOR CONTOUR
- PROPOSED 10' MAJOR CONTOUR
- PROPOSED 2' MINOR CONTOUR
- EXISTING ROAD
- EXISTING PIPE
- FENCE LINE
- FIELD LINE
- UNDERGROUND ELECTRIC
- OVERHEAD ELECTRIC
- STORM SEWER
- CELL 5 PHASE 1A STRIPPING LIMITS
- SILT FENCE
- STOCKPILE EXTENTS
- WATERLINE
- SHRUB EDGE
- FEDERAL COAL TRACT LIMITS
- STRAW BALE
- CULVERT
- BUILDING
- SINGLE TREES
- UTILITY POLE
- MH7AB — EXISTING MANHOLE, CATCH BASIN
- MW97-2 — MONITORING WELL
- CP10 2109.27 — CONTROL POINT

NOTES:

1. CONTOURS INSIDE CELL 5 BELOW ELEVATION 2080 SHOW THE SELECT CLAY LINER SURFACE. OUTER EMBANKMENT SHOWS TOP OF FINISHED GROUND.
2. BNI HAUL ROAD SHOWN PROVIDED BY BNI IN Haul Road Section 9 Design Contours.dwg, DATED OCT. 31, 2022.
3. EXCESS CUT TO BE PLACED IN CELL 2 AND 3 OR AS AGREED UPON BY OWNER.

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| CLIENT | 05/31/23 | | | | | | |
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| Designed | JAM6 |
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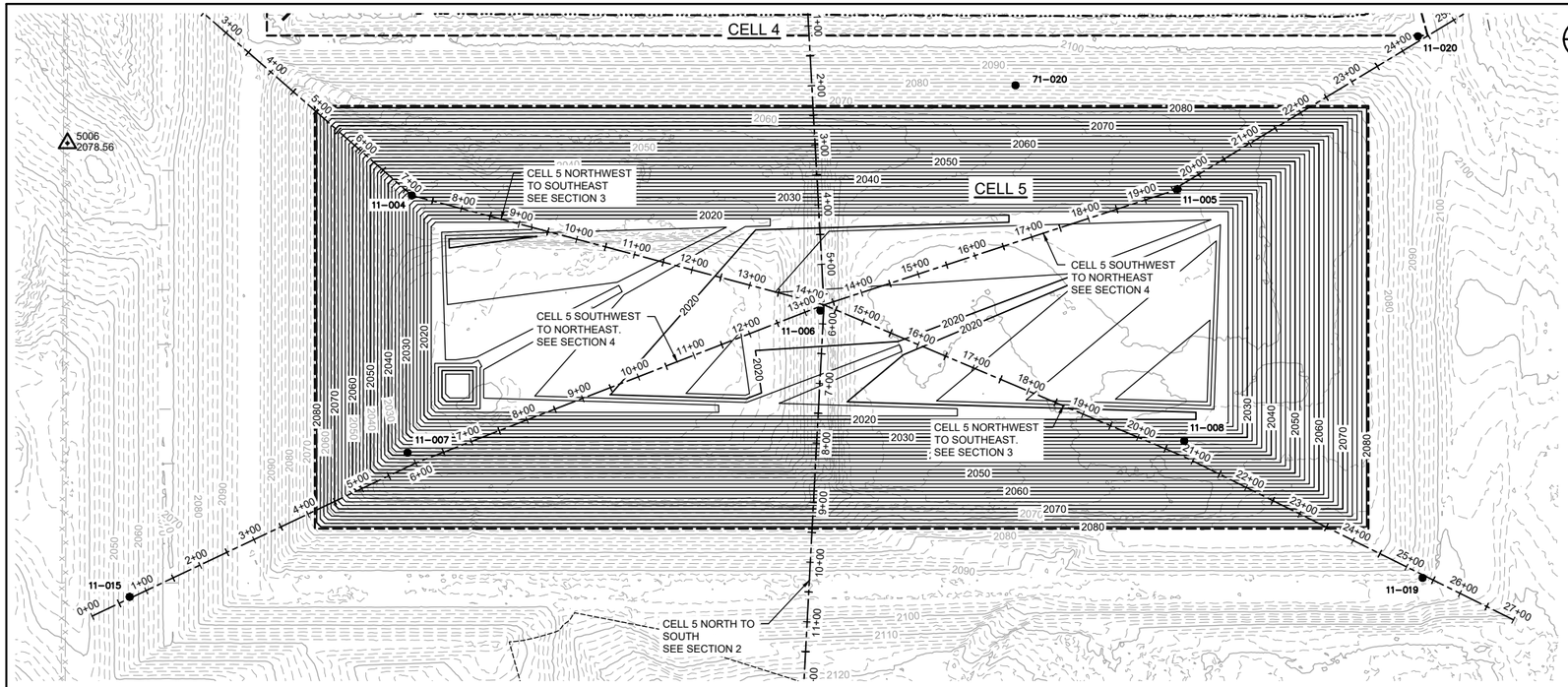
Minnkota Power COOPERATIVE
A Touchstone Energy® Cooperative

MINNKOTA FGD POND CELL 5 - PHASE 1B
CENTER, NORTH DAKOTA

CELL 5 - PHASE 1B
PROJECT PLAN

| | |
|---|---|
| BARR PROJECT No. | 34331014.59 |
| CLIENT PROJECT No. | |
| DWG. No. | C-02 |
| REV. No. | 0 |

CADD USER: RACHEL L. BATEMAN FILE: M:\DESIGN\34331014.59\34331014.59_C-02.DWG PLOT SCALE: 1:2 PLOT DATE: 6/8/2023 3:42 PM




## 1 PLAN: 2011 BORING LOCATIONS

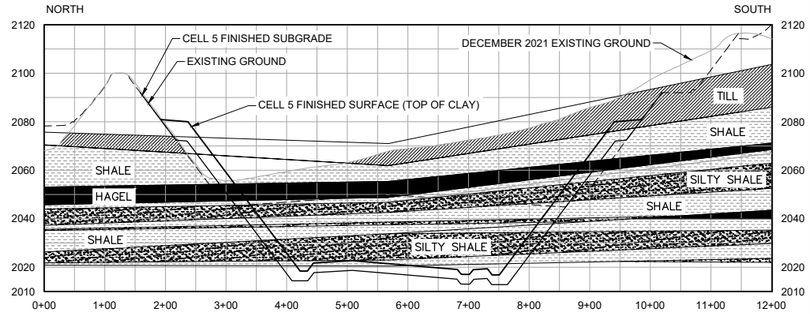
0 125 250
SCALE IN FEET

### LEGEND

- EXISTING 10' MAJOR CONTOUR
- EXISTING 2' MINOR CONTOUR
- PROPOSED 10' MAJOR CONTOUR
- PROPOSED 2' MINOR CONTOUR
- CROSS SECTION ALIGNMENT
- SOIL BORING

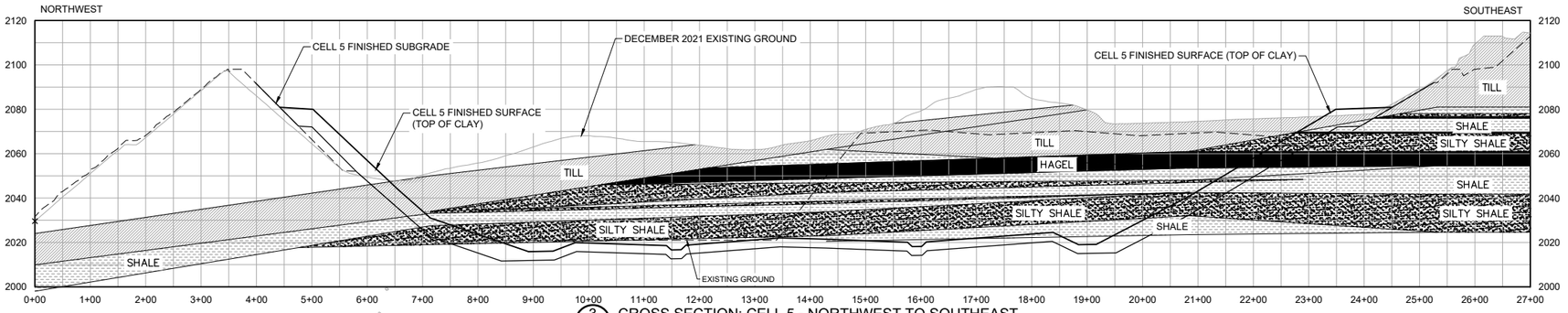
### NOTES:

1. ALL EXCAVATED MATERIALS ARE ESTIMATED BASED ON THE SOIL INVESTIGATION WORK COMPLETED IN 2011. CONTRACTOR MUST FIELD VERIFY EACH MATERIAL PRIOR TO USE AS CONSTRUCTION MATERIAL. A COPY OF THE INFORMATION OBTAINED AS PART OF THE 2011 INVESTIGATION IS AVAILABLE UPON REQUEST.
2. INFORMATION ON THIS SHEET IS PROVIDED TO CONTRACTOR FOR INFORMATIONAL PURPOSES ONLY. CONTRACTOR SHALL MAKE ITS OWN DETERMINATION OF THE SUBSURFACE CONDITIONS BASED ON SOIL BORINGS PROVIDED.
3. MATERIAL SURFACES ARE INTERPOLATED BETWEEN BORING LOCATIONS.
4. PROPOSED CONTOURS INSIDE OF CELL 5 BELOW ELEVATION 2080 SHOW THE SELECT CLAY LINER SURFACE. OUTER EMBANKMENT SHOWS TOP OF FINISHED GROUND.
5. THE "DECEMBER 2021 EXISTING GROUND" SURFACE REPRESENTS THE GROUND PRIOR TO CELL 5 PHASE 1A CONSTRUCTION. THE "EXISTING GROUND" SURFACE REPRESENTS THE EXISTING GROUND SURFACE WITH THE CELL 5 PHASE 1A DESIGN.



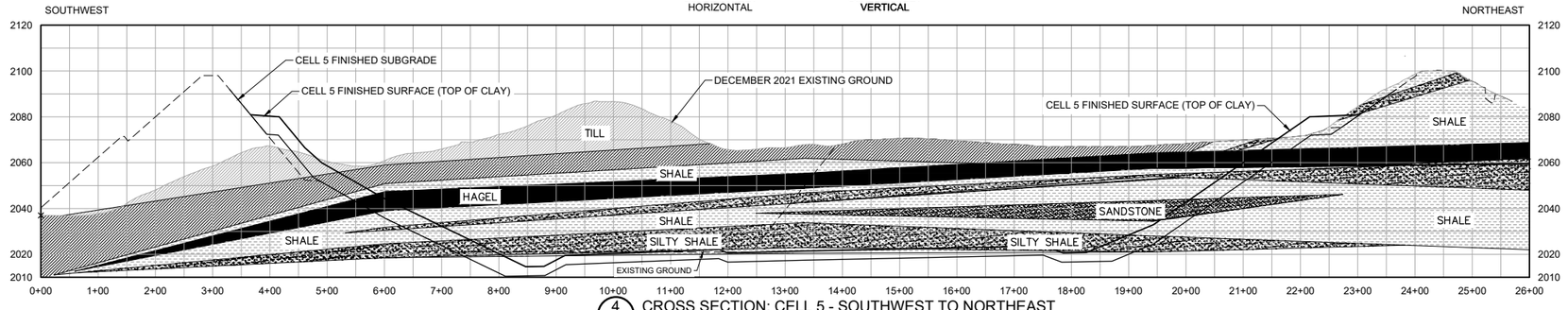

## 2 CROSS SECTION: CELL 5 - NORTH TO SOUTH

0 125 250 — SCALE IN FEET HORIZONTAL
0 31.25 62.5 — SCALE IN FEET **VERTICAL**




## 3 CROSS SECTION: CELL 5 - NORTHWEST TO SOUTHEAST

0 125 250 — SCALE IN FEET HORIZONTAL
0 31.25 62.5 — SCALE IN FEET **VERTICAL**




## 4 CROSS SECTION: CELL 5 - SOUTHWEST TO NORTHEAST

0 125 250 — SCALE IN FEET HORIZONTAL
0 31.25 62.5 — SCALE IN FEET VERTICAL

### EXCAVATED MATERIAL DESCRIPTION

| HATCH | LABEL | DESCRIPTION |
|---|---|---|
| | TILL | SANDY GRAVELLY CLAY. |
| | SHALE | UPPER SHALES - VERY WEAK TO WEAK IN STRENGTH, GENERALLY LIGHT YELLOWISH, BROWN TO LIGHT BROWN, OR GRAY IN COLOR, SLIGHTLY WEATHERED TO HIGHLY WEATHERED, FINE GRAINED, MEDIUM TO CLOSE FRACTURE SPACING, DRY OR DAMP.<br>LOWER SHALES - STRONG TO WEAK STRENGTH, GENERALLY GRAY TO LIGHT GRAY IN COLOR, HIGHLY TO MODERATELY WEATHERED, FINE GRAINED, THICK TO MEDIUM BEDDED, MEDIUM TO UNFRACTURED FRACTURE SPACING, DRY OR DAMP. OBSERVED WHITE LAMINATIONS IN SOME SAMPLES. |
| | HAGEL/COAL | LIGNITE COAL, CARBONACEOUS, BLACK IN COLOR. |
| | SILTSTONE | STRONG TO VERY WEAK STRENGTH, GENERALLY GRAY TO LIGHT GRAY IN COLOR, SLIGHTLY TO MODERATELY WEATHERED, FINE GRAINED, THINLY BEDDED, WIDE TO CLOSE FRACTURE SPACING, DAMP. SOMETIMES WITH NON SILTY/SANDY SHALE INTERBEDDED THROUGHOUT. |
| | SANDSTONE | SANDSTONE WITH SAND AND FINE CONTENT VARIABLE, GRAY IN COLOR |

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| CONSTRUCTION | | | | 06/09/23 | | | | |
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| Checked | BDP |
| Designed | JAM6 |
| Approved | SWH |

Minnkota Power COOPERATIVE
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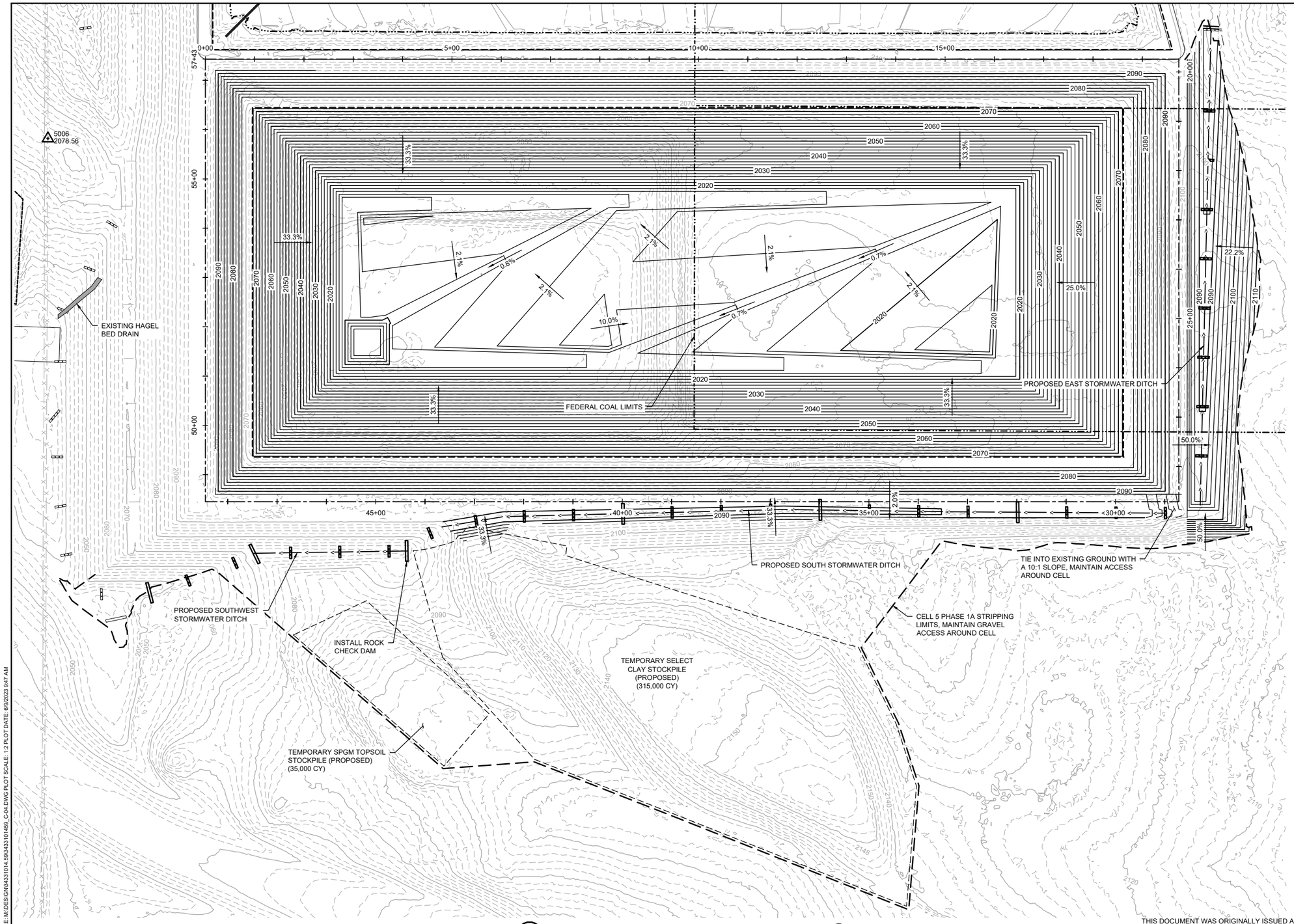
MINNKOTA FGD POND CELL 5 - PHASE 1B
CENTER, NORTH DAKOTA

SOIL BORINGS
PLAN AND CROSS SECTIONS

| BARR PROJECT No. | |
|---|---|
| 34331014.59 | |
| CLIENT PROJECT No. | |
| DWG. No. | REV. No. |
| C-03 | 0 |


CADD USER: RACHEL L. BATEMAN FILE: M:\DESIGN\34331014.59\34331014.59_C-03.DWG PLOT SCALE: 1:2 PLOT DATE: 6/8/2023 2:53 PM




1. PLAN: CELL 5 - PHASE 1B EXCAVATION BELOW HAGEL

0 100 200

SCALE IN FEET

## LEGEND

- EXISTING 10' MAJOR CONTOUR
- EXISTING 2' MINOR CONTOUR
- PROPOSED 10' MAJOR CONTOUR
- PROPOSED 2' MINOR CONTOUR
- EXISTING ROAD
- EXISTING PIPE
- EXISTING GEOMEMBRANE LINER LIMITS
- FENCE LINE
- FIELD LINE
- UNDERGROUND ELECTRIC
- OVERHEAD ELECTRIC
- STORM SEWER
- PROPOSED CELL 5 STRIPPING LIMITS
- PROPOSED GRADING EXTENTS
- MINE STOCKPILE EXTENTS
- PROPOSED STOCKPILE EXTENTS
- STORMWATER DRAINAGE DITCH
- WATERLINE
- SHRUB EDGE
- FEDERAL COAL TRACT LIMITS
- MINE BOUNDARY
- STRAW BALE
- CULVERT
- BUILDING
- SINGLE TREES
- UTILITY POLE
- MH7AB — EXISTING MANHOLE, CATCH BASIN
- MW97-2 — MONITORING WELL
- CP10 2109.27 — CONTROL POINT

NOTES:

1. PROPOSED CONTOURS SHOWN REPRESENT TOP OF RANDOM FILL.
2. SEE SHEET C-25 FOR TOP OF SUBGRADE SURFACE COORDINATE AND ELEVATION DATA

| CELL 5 PHASE 1B SUBGRADE NEATLINE EARTHWORK QUANTITIES | |
|---|---|
| MATERIAL | ESTIMATED QUANTITIES (CY) |
| CUT | 998,000 |
| FILL | 43,000 |

NOTE: THE NEATLINE SUBGRADE EARTHWORK QUANTITIES ARE CALCULATED BASED ON A COMPARISON OF THE CELL 5 PHASE 1B DESIGN SURFACE TO THE NOVEMBER 2022 TOPOGRAPHIC SURVEY PERFORMED BY INTERSTATE ENGINEERING FOLLOWING CELL 5 PHASE 1A CONSTRUCTION. NEATLINE QUANTITIES ARE ROUNDED TO THE NEAREST ONE-THOUSAND CUBIC YARDS. NO WASTE, SHRINKAGE, OR SWELL IS ASSUMED.

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| Designed | JAM6 |
| Approved | SWH |

Minnkota Power COOPERATIVE
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MINNKOTA FGD POND CELL 5 - PHASE 1B
CENTER, NORTH DAKOTA

EXCAVATION BELOW HAGEL
PLAN

| | |
|---|---|
| BARR PROJECT No. | 34331014.59 |
| CLIENT PROJECT No. | |
| DWG. No. | C-04 |
| REV. No. | 0 |

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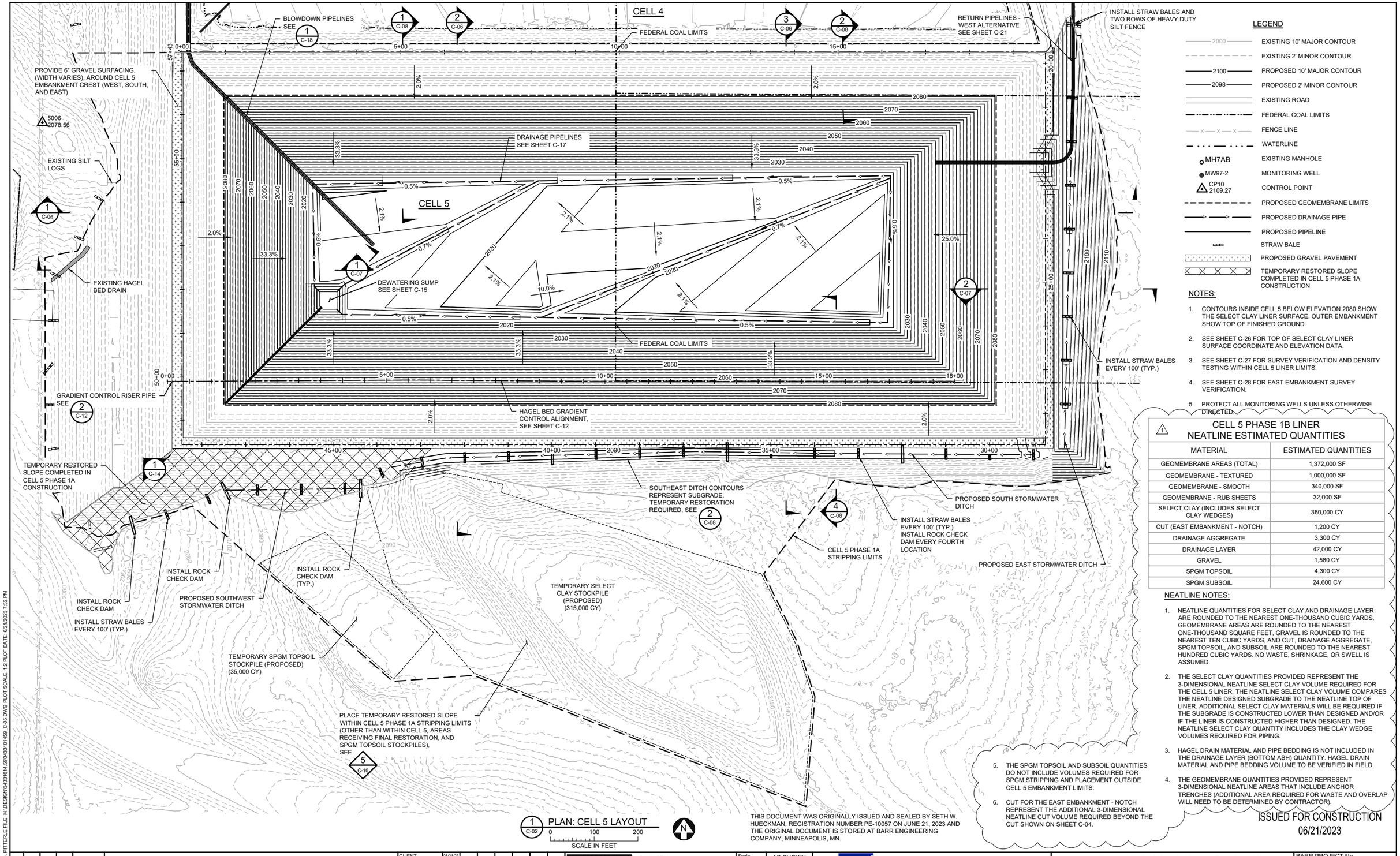


1 C-02 PLAN: CELL 5 LAYOUT
0 100 200
SCALE IN FEET

N

## LEGEND

- 2000 — EXISTING 10' MAJOR CONTOUR
- EXISTING 2' MINOR CONTOUR
- 2100 — PROPOSED 10' MAJOR CONTOUR
- 2098 — PROPOSED 2' MINOR CONTOUR
- EXISTING ROAD
- FEDERAL COAL LIMITS
- FENCE LINE
- WATERLINE
- MH7AB — EXISTING MANHOLE
- MW97-2 — MONITORING WELL
- CP10 2109.27 — CONTROL POINT
- PROPOSED GEOMEMBRANE LIMITS
- PROPOSED DRAINAGE PIPE
- PROPOSED PIPELINE
- STRAW BALE
- PROPOSED GRAVEL PAVEMENT
- TEMPORARY RESTORED SLOPE COMPLETED IN CELL 5 PHASE 1A CONSTRUCTION

## NOTES:

1. CONTOURS INSIDE CELL 5 BELOW ELEVATION 2080 SHOW THE SELECT CLAY LINER SURFACE. OUTER EMBANKMENT SHOW TOP OF FINISHED GROUND.
2. SEE SHEET C-26 FOR TOP OF SELECT CLAY LINER SURFACE COORDINATE AND ELEVATION DATA.
3. SEE SHEET C-27 FOR SURVEY VERIFICATION AND DENSITY TESTING WITHIN CELL 5 LINER LIMITS.
4. SEE SHEET C-28 FOR EAST EMBANKMENT SURVEY VERIFICATION.
5. PROTECT ALL MONITORING WELLS UNLESS OTHERWISE DIRECTED.

### 1 CELL 5 PHASE 1B LINER NEATLINE ESTIMATED QUANTITIES

| MATERIAL | ESTIMATED QUANTITIES |
|---|---|
| GEOMEMBRANE AREAS (TOTAL) | 1,372,000 SF |
| GEOMEMBRANE - TEXTURED | 1,000,000 SF |
| GEOMEMBRANE - SMOOTH | 340,000 SF |
| GEOMEMBRANE - RUB SHEETS | 32,000 SF |
| SELECT CLAY (INCLUDES SELECT CLAY WEDGES) | 360,000 CY |
| CUT (EAST EMBANKMENT - NOTCH) | 1,200 CY |
| DRAINAGE AGGREGATE | 3,300 CY |
| DRAINAGE LAYER | 42,000 CY |
| GRAVEL | 1,580 CY |
| SPGM TOPSOIL | 4,300 CY |
| SPGM SUBSOIL | 24,600 CY |

## NEATLINE NOTES:

1. NEATLINE QUANTITIES FOR SELECT CLAY AND DRAINAGE LAYER ARE ROUNDED TO THE NEAREST ONE-THOUSAND CUBIC YARDS, GEOMEMBRANE AREAS ARE ROUNDED TO THE NEAREST ONE-THOUSAND SQUARE FEET, GRAVEL IS ROUNDED TO THE NEAREST TEN CUBIC YARDS, AND CUT, DRAINAGE AGGREGATE, SPGM TOPSOIL, AND SUBSOIL ARE ROUNDED TO THE NEAREST HUNDRED CUBIC YARDS. NO WASTE, SHRINKAGE, OR SWELL IS ASSUMED.
2. THE SELECT CLAY QUANTITIES PROVIDED REPRESENT THE 3-DIMENSIONAL NEATLINE SELECT CLAY VOLUME REQUIRED FOR THE CELL 5 LINER. THE NEATLINE SELECT CLAY VOLUME COMPARES THE NEATLINE DESIGNED SUBGRADE TO THE NEATLINE TOP OF LINER. ADDITIONAL SELECT CLAY MATERIALS WILL BE REQUIRED IF THE SUBGRADE IS CONSTRUCTED LOWER THAN DESIGNED AND/OR IF THE LINER IS CONSTRUCTED HIGHER THAN DESIGNED. THE NEATLINE SELECT CLAY QUANTITY INCLUDES THE CLAY WEDGE VOLUMES REQUIRED FOR PIPING.
3. HAGEL DRAIN MATERIAL AND PIPE BEDDING IS NOT INCLUDED IN THE DRAINAGE LAYER (BOTTOM ASH) QUANTITY. HAGEL DRAIN MATERIAL AND PIPE BEDDING VOLUME TO BE VERIFIED IN FIELD.
4. THE GEOMEMBRANE QUANTITIES PROVIDED REPRESENT 3-DIMENSIONAL NEATLINE AREAS THAT INCLUDE ANCHOR TRENCHES (ADDITIONAL AREA REQUIRED FOR WASTE AND OVERLAP WILL NEED TO BE DETERMINED BY CONTRACTOR).
5. THE SPGM TOPSOIL AND SUBSOIL QUANTITIES DO NOT INCLUDE VOLUMES REQUIRED FOR SPGM STRIPPING AND PLACEMENT OUTSIDE CELL 5 EMBANKMENT LIMITS.
6. CUT FOR THE EAST EMBANKMENT - NOTCH REPRESENT THE ADDITIONAL 3-DIMENSIONAL NEATLINE CUT VOLUME REQUIRED BEYOND THE CUT SHOWN ON SHEET C-04.

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| 1 | BDP | SWH | SWH | 06/21/23 | QUANTITIES |

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| Designed | JAM6 |
| Approved | SWH |

Minnkota Power COOPERATIVE
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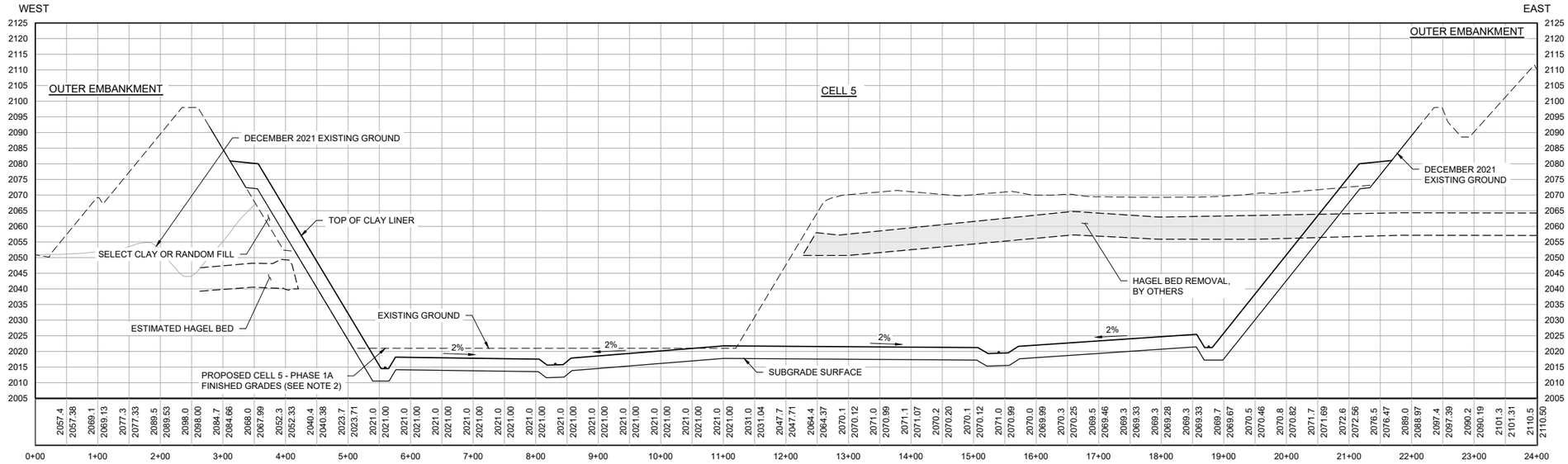
MINNKOTA FGD POND CELL 5 - PHASE 1B
CENTER, NORTH DAKOTA

CELL 5 LAYOUT
PLAN

BARR PROJECT No. 34331014.59
CLIENT PROJECT No.
DWG. No. C-05
REV. No. 1

CADD USER: BRYAN D. PITTERLE FILE: M:\DESIGN\34331014.59\34331014.59_C-05.DWG PLOT SCALE: 1:2 PLOT DATE: 6/21/2023 7:52 PM




1 C-05 SECTION: OVERALL WEST - EAST

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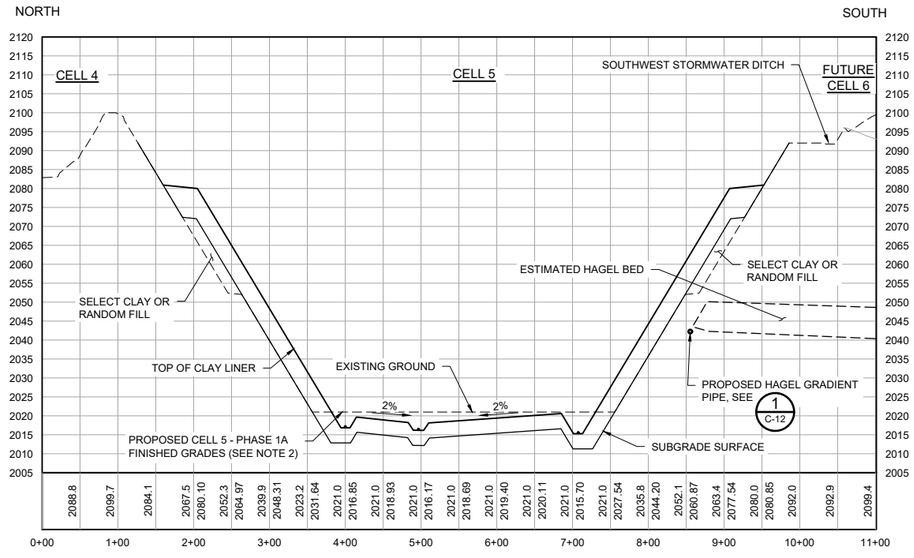
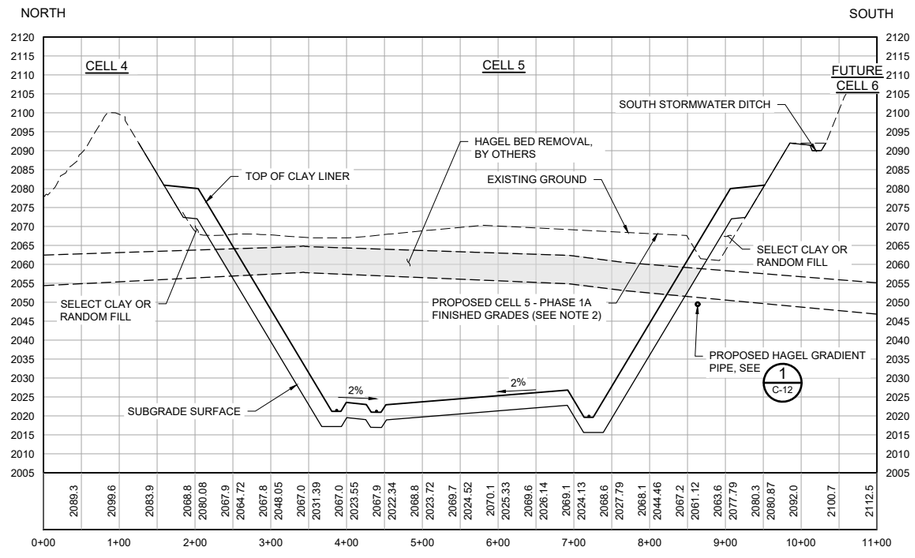
SCALE IN FEET VERTICAL: 0 20 40



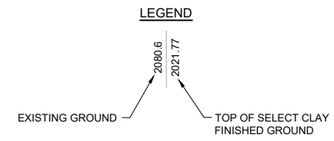

2 C-05 SECTION: OVERALL NORTH - SOUTH: WEST

SCALE IN FEET HORIZONTAL: 0 100 200
SCALE IN FEET VERTICAL: 0 20 40




3 C-05 SECTION: OVERALL NORTH - SOUTH: EAST

SCALE IN FEET HORIZONTAL: 0 100 200
SCALE IN FEET VERTICAL: 0 20 40




NOTES:

1. THE AVAILABLE SOIL BORING LOGS AND SOIL TEST RESULTS FOR CELL 5 ARE AVAILABLE UPON REQUEST.
2. ACTUAL CELL 5 PHASE 1A DESIGN FINISHED GRADES COMPLETED IN 2022 WILL VARY.
3. HAGEL EXCAVATION TO BE COMPLETED BY BNI. COORDINATE SCHEDULE WITH OWNER. EXCAVATION BELOW HAGEL TO BE COMPLETED AFTER REMOVAL OF HAGEL BED MATERIAL.

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| Approved | SWH |

Minnkota Power COOPERATIVE
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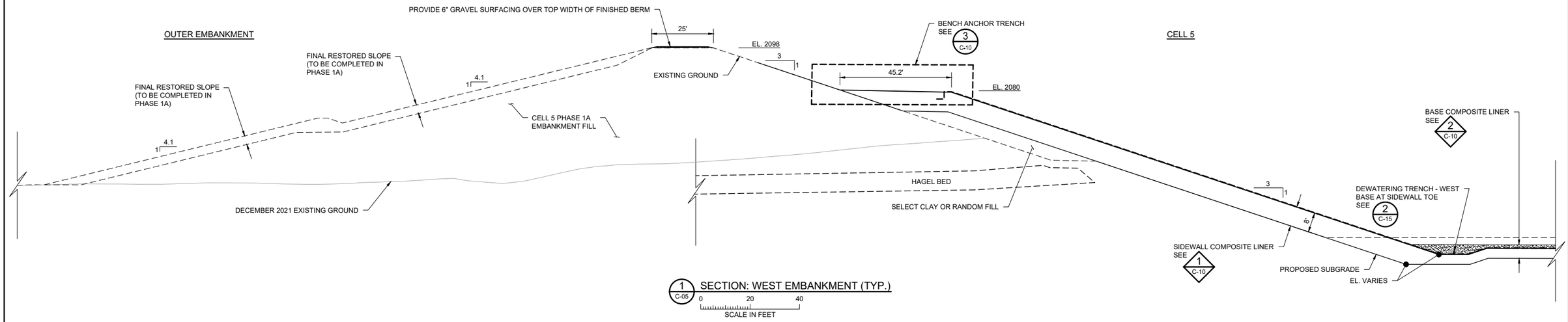
MINNKOTA FGD POND CELL 5 - PHASE 1B
CENTER, NORTH DAKOTA

CELL 5 LAYOUT
OVERALL SECTIONS

BARR PROJECT No. 34331014.59
CLIENT PROJECT No.
DWG. No. C-06
REV. No. 0

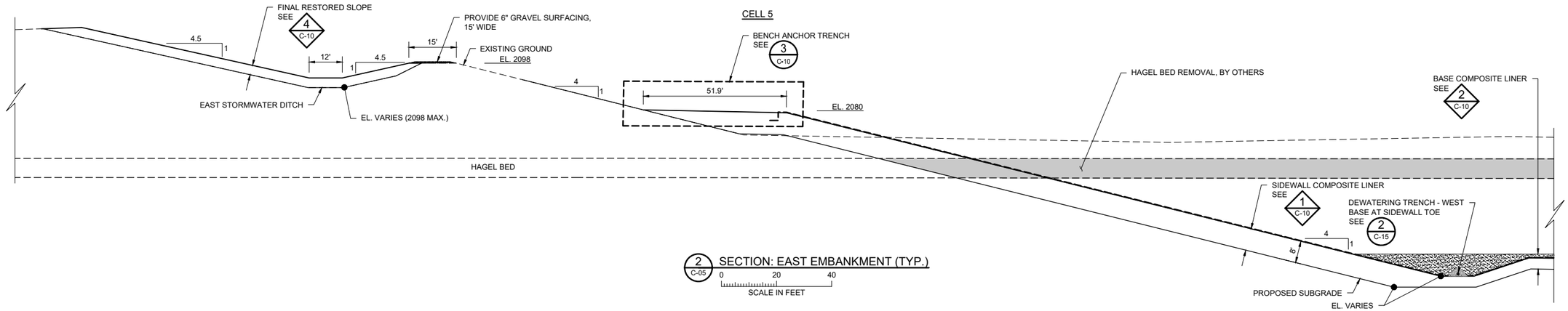
CADD USER: RACHEL L. BATEMAN FILE: M:\DESIGN\34331014.59\34331014.59_C-06.DWG PLOT SCALE: 1:2 PLOT DATE: 6/8/2023 3:19 PM




1 C-05 SECTION: WEST EMBANKMENT (TYP.)

0 20 40

SCALE IN FEET




2 C-05 SECTION: EAST EMBANKMENT (TYP.)

0 20 40

SCALE IN FEET

NOTES:

1. HAGEL EXCAVATION TO BE COMPLETED BY BNI. COORDINATE SCHEDULE WITH OWNER. EXCAVATION BELOW HAGEL TO BE COMPLETED AFTER REMOVAL OF HAGEL BED MATERIAL.

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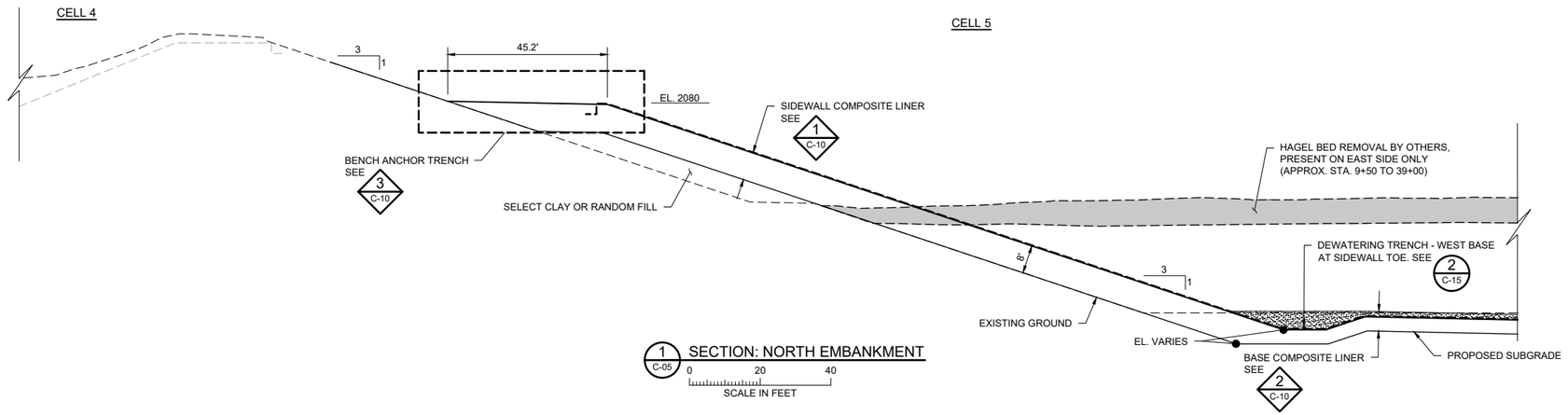
MINNKOTA FGD POND CELL 5 - PHASE 1B
CENTER, NORTH DAKOTA

CELL 5 WEST/EAST EMBANKMENT SECTIONS

| | |
|---|---|
| BARR PROJECT No. | 34331014.59 |
| CLIENT PROJECT No. | |
| DWG. No. | C-07 |
| REV. No. | 0 |

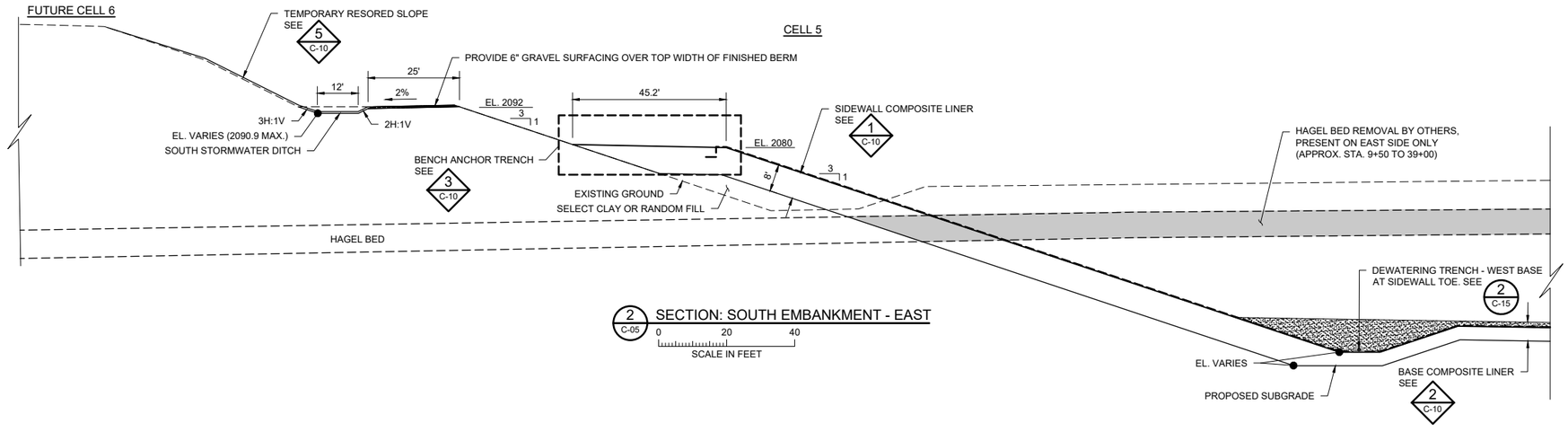
CADD USER: RACHEL L. BATEMAN FILE: M:\DESIGN\34331014.59\34331014.59_C-07.DWG PLOT SCALE: 1:2 PLOT DATE: 8/8/2023 3:21 PM




1 C-05 SECTION: NORTH EMBANKMENT

0 20 40

SCALE IN FEET




2 C-05 SECTION: SOUTH EMBANKMENT - EAST

0 20 40

SCALE IN FEET

NOTES:

1. HAGEL EXCAVATION TO BE COMPLETED BY BNI. COORDINATE SCHEDULE WITH OWNER. EXCAVATION BELOW HAGEL TO BE COMPLETED AFTER REMOVAL OF HAGEL BED MATERIAL.

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| CLIENT | 05/31/23 | | | | | | | |
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MINNKOTA FGD POND CELL 5 - PHASE 1B
CENTER, NORTH DAKOTA

CELL 5 NORTH/SOUTH EMBANKMENT SECTIONS

| | |
|---|---|
| BARR PROJECT No. | 34331014.59 |
| CLIENT PROJECT No. | |
| DWG. No. | C-08 |
| REV. No. | 0 |


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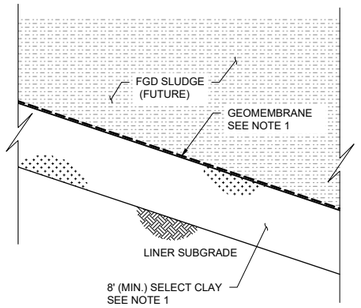


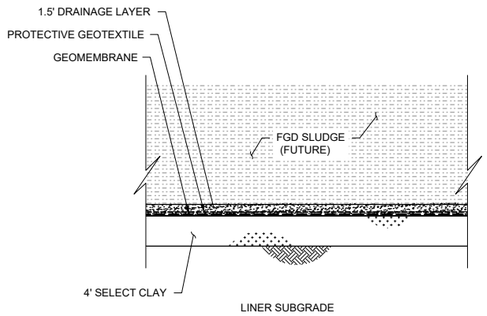

1 DETAIL: SIDEWALL COMPOSITE LINER (TYP.)

C-07,C-08,C-09,C-13,C-14,C-15, C-16,C-17,C-19,C-23

0 10 20
SCALE IN FEET

NOTES:

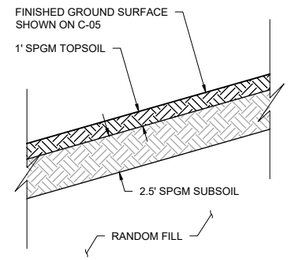
1. GEOMEMBRANE TO HAVE ONE SMOOTH SIDE AND ONE TEXTURED SIDE. INSTALL TEXTURED SIDE DIRECTLY AGAINST CLAY LINER.




2 DETAIL: BASE COMPOSITE LINER (TYP.)

C-07,C-08,C-15,C-16,C-17, C-19,C-23

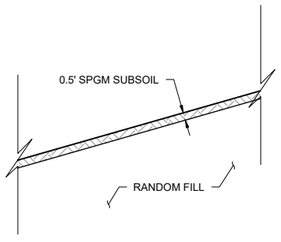
0 10 20
SCALE IN FEET




4 DETAIL: FINAL RESTORED SLOPE (TYP.)

C-07,C-09,C-21,C-22,C-23

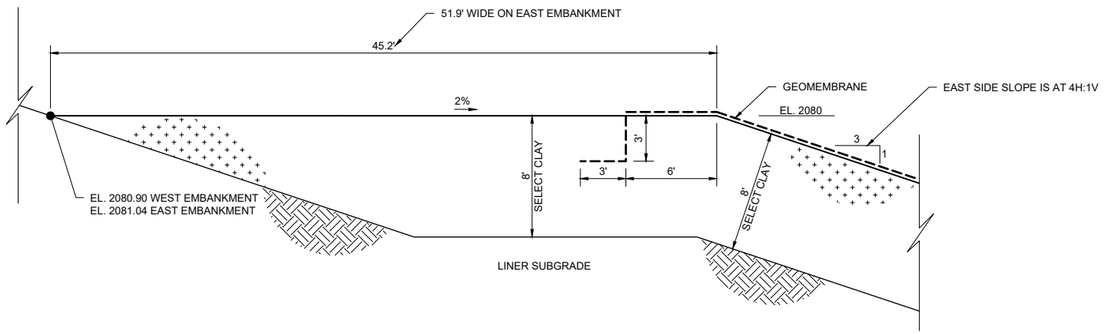
0 5 10
SCALE IN FEET




5 DETAIL: TEMPORARY RESTORED SLOPE (TYP.)

C-05, C-08,C-09,C-28

0 5 10
SCALE IN FEET




3 DETAIL: BENCH ANCHOR TRENCH

C-07, C-08

0 5 10
SCALE IN FEET

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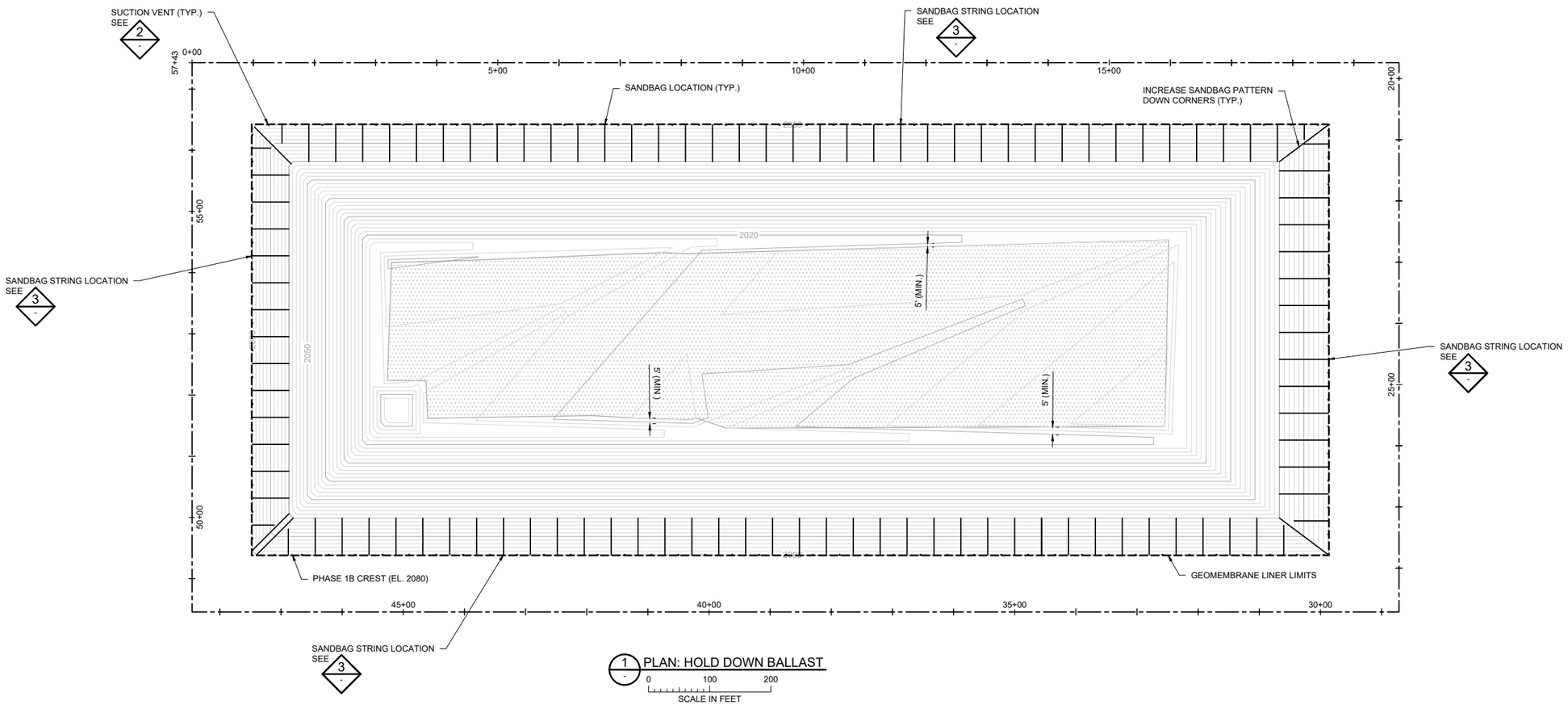
MINNKOTA FGD POND CELL 5 - PHASE 1B
CENTER, NORTH DAKOTA

CELL 5 EMBANKMENT AND LINER DETAILS

| | |
|---|---|
| BARR PROJECT No. | 34331014.59 |
| CLIENT PROJECT No. | |
| DWG. No. | C-10 |
| REV. No. | 0 |

CADD USER: RACHEL L. BATEMAN FILE: M:\DESIGN\34331014.59\34331014.59_C-10.DWG PLOT SCALE: 1:2 PLOT DATE: 6/8/2023 3:25 PM



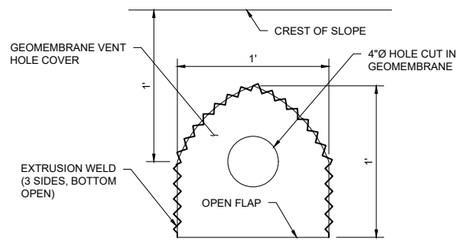

LEGEND

- 2000 — PROPOSED 10' MAJOR CONTOUR
- PROPOSED 2' MINOR CONTOUR
- PROPOSED SANDBAG
- PROPOSED GEOMEMBRANE LIMITS
- ALLOWABLE SMOOTH GEOMEMBRANE AREA

1 - PLAN: HOLD DOWN BALLAST

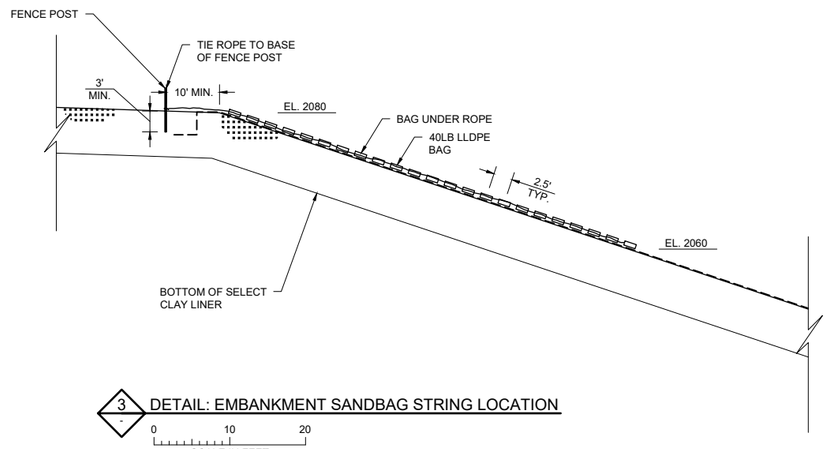
0 100 200

SCALE IN FEET




2 - DETAIL: SUCTION VENT

N.T.S.




3 - DETAIL: EMBANKMENT SANDBAG STRING LOCATION

0 10 20

SCALE IN FEET

NOTES:

1. PLACE SANDBAGS FROM AN ELEVATION OF 2080 TO 2060.
2. A MINIMUM 40LB LLDPE BAG, OR APPROVED EQUAL SPACED AT 44' INTERVALS ALONG A 3 STRAND 3/4" DIAMETER POLYPROPYLENE ROPE LAIN ALONG THE SLOPE.
3. ATTACH EACH BAG TO THE ROPE WITH A ULINE 120 LB BLACK UV STABILIZED NYLON CABLE TIE OR APPROVED EQUAL. SHORTEN ROPES AND REDUCE NUMBER OF SANDBAGS NEAR CORNERS AS NECESSARY.
4. DRIVE 1.33 LB/FT FRANKLIN INDUSTRIES STEEL FENCE POST OR APPROVED EQUAL INTO THE GROUND A MINIMUM OF 3' AND TIE (BOWLINE KNOT) EACH ROPE WITH BAGS TO EACH POST.

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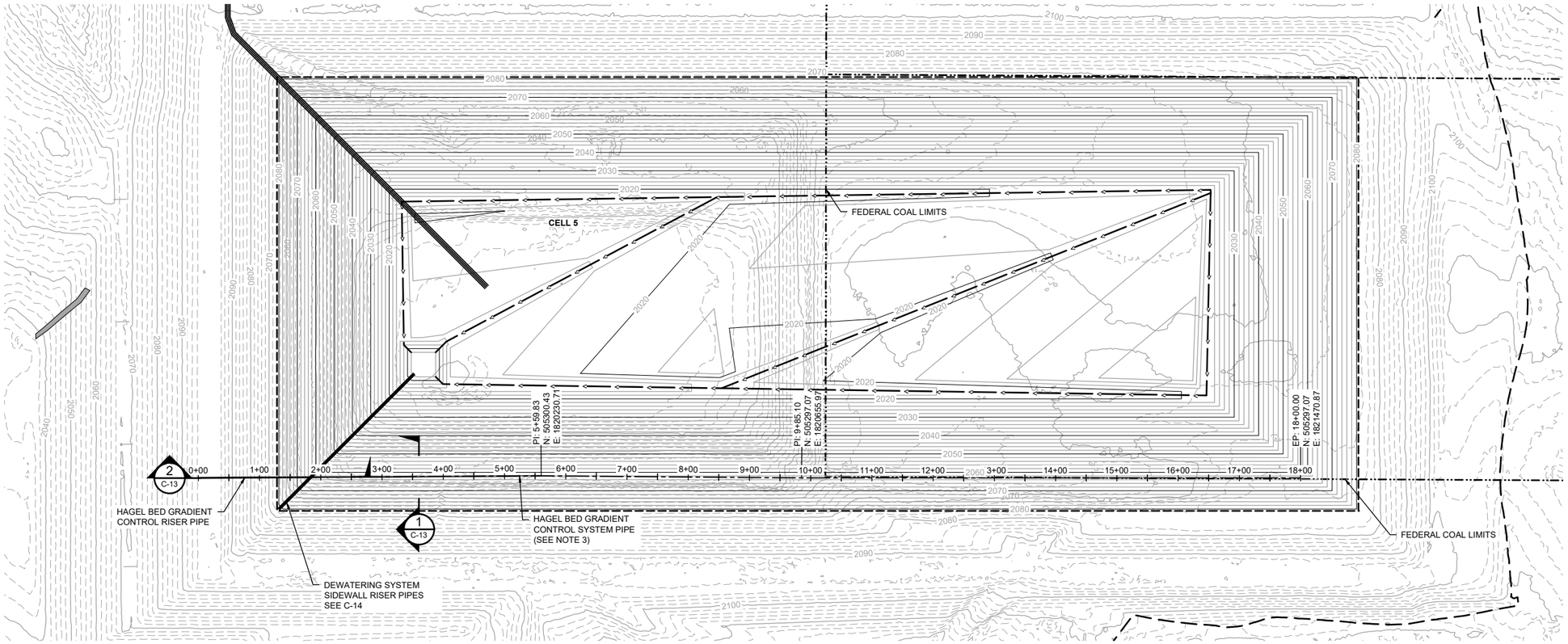
MINNKOTA FGD POND CELL 5 - PHASE 1B
CENTER, NORTH DAKOTA

SANDBAG LAYOUT
PLAN AND DETAILS

| | |
|---|---|
| BARR PROJECT No. | 34331014.59 |
| CLIENT PROJECT No. | |
| DWG. No. | C-11 |
| REV. No. | 0 |

CADD USER: RACHEL L. BATEMAN FILE: M:\DESIGN\34331014.59\34331014.59_C-11.DWG PLOT SCALE: 1:2 PLOT DATE: 6/8/2023 3:26 PM

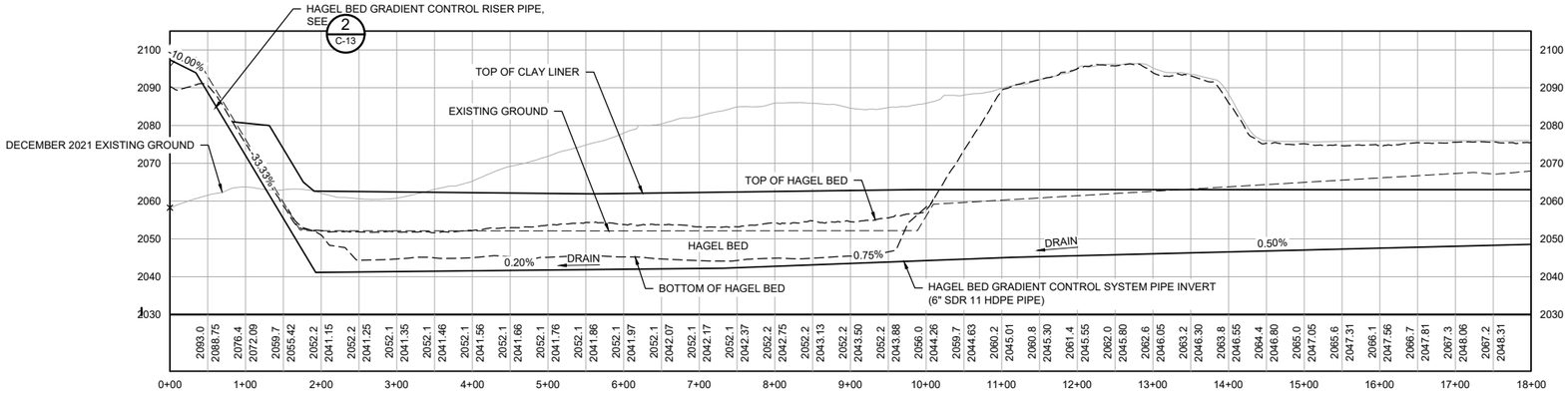



LEGEND

- EXISTING 10' MAJOR CONTOUR (2000)
- EXISTING 2' MINOR CONTOUR
- PROPOSED 10' MAJOR CONTOUR (2100)
- PROPOSED 2' MINOR CONTOUR
- FEDERAL COAL LIMITS
- FENCE LINE
- PROPOSED DRAINAGE COLLECTION PIPES
- PROPOSED GEOMEMBRANE LIMITS

## 1 C-05 PLAN: HAGEL BED GRADIENT CONTROL SYSTEM

0 100 200
SCALE IN FEET




LEGEND

2080.6 EXISTING GROUND
2021.77 HAGEL BED GRADIENT CONTROL SYSTEM PIPE INVERT

NOTES:

1. GRADIENT CONTROL PIPE IS TO BE PLACED IN ACCORDANCE WITH DETAIL 3 C-13
2. PIPE INVERT SHALL BE SET A MINIMUM OF 16" BELOW BOTTOM OF HAGEL BED. SOME REACHES WILL BE LOWER TO ENSURE POSITIVE DRAINAGE TO GRADIENT CONTROL RISER PIPE.
3. GRADIENT CONTROL SYSTEM PIPE LOCATION MAY BE ADJUSTED BY CONTRACTOR TO FIT SITE CONDITIONS AS APPROVED BY OWNER'S ONSITE REPRESENTATIVE.

## 2 - PROFILE: HAGEL BED GRADIENT CONTROL SYSTEM

0 100 200
SCALE IN FEET HORIZONTAL

0 20 40
SCALE IN FEET VERTICAL

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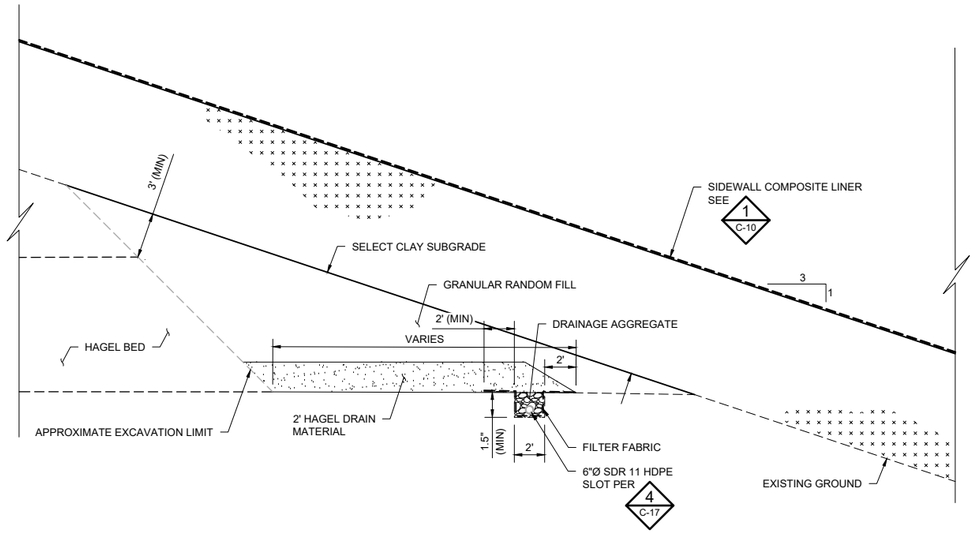
MINNKOTA FGD POND CELL 5 - PHASE 1B
CENTER, NORTH DAKOTA

HAGEL BED GRADIENT CONTROL SYSTEM
PLAN AND PROFILE

| | |
|---|---|
| BARR PROJECT No. | 34331014.59 |
| CLIENT PROJECT No. | |
| DWG. No. | C-12 |
| REV. No. | 0 |

CADD USER: RACHEL L. BATEMAN FILE: M:\DESIGN\34331014.59\34331014.59_C-12.DWG PLOT SCALE: 1:2 PLOT DATE: 6/8/2023 3:36 PM

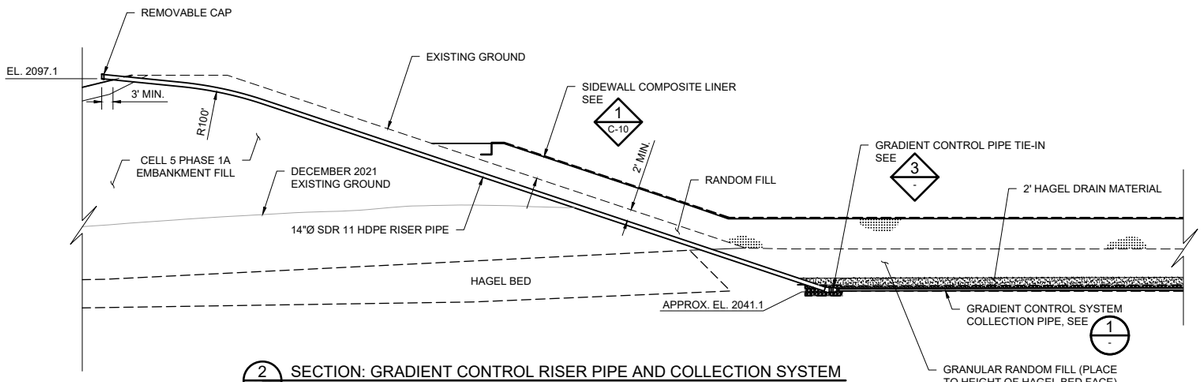



1 C-12 SECTION: GRADIENT CONTROL SYSTEM COLLECTION PIPE

0 5 10
SCALE IN FEET

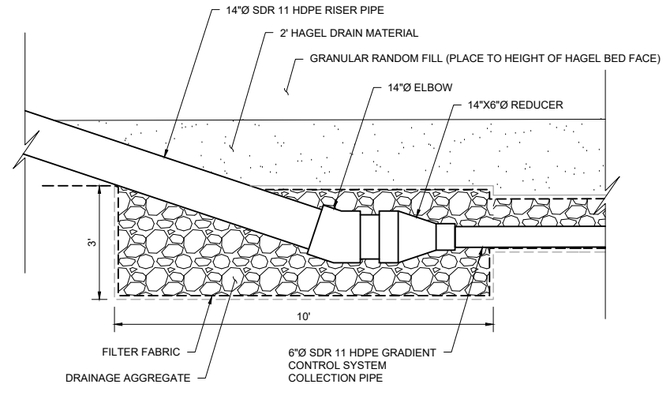
NOTES:

1. PLACE AT LEAST 2" OF DRAINAGE AGGREGATE BELOW PIPE.
2. SEE PROFILE ON SHEET C-12 FOR PIPE GRADE INFORMATION.
3. WASTE COAL TO BE PLACED IN CELL 2 OR CELL 3 AS DIRECTED BY OWNER.




2 C-12 SECTION: GRADIENT CONTROL RISER PIPE AND COLLECTION SYSTEM

0 20 40
SCALE IN FEET




3 C-12,- DETAIL: GRADIENT CONTROL PIPE TIE-IN

0 1 2 3 4
SCALE IN FEET

NOTE:

ADJUST COLLECTION PIPE ALIGNMENT AS NECESSARY TO MAKE TIE-IN TO RISER PIPE.

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MINNKOTA FGD POND CELL 5 - PHASE 1B
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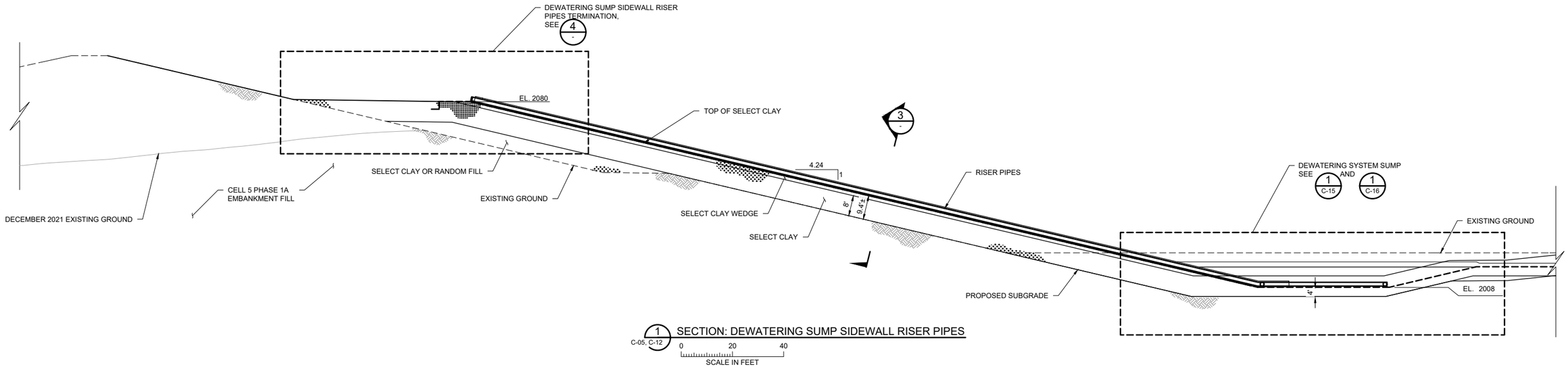
HAGEL BED GRADIENT CONTROL SYSTEM
SECTION AND DETAIL

| BARR PROJECT No. | |
|---|---|
| 34331014.59 | |
| CLIENT PROJECT No. | |
| DWG. No. | REV. No. |
| C-13 | 0 |

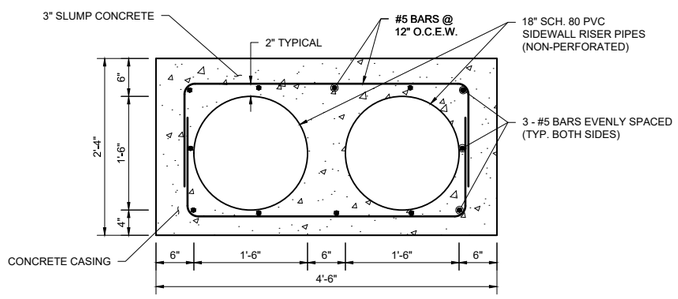

CADD USER: RACHEL L. BATEMAN FILE: M:\DESIGN\34331014.59\34331014590_C-13.DWG PLOT SCALE: 1:2 PLOT DATE: 6/8/2023 3:28 PM




1 C-05, C-12 SECTION: DEWATERING SUMP SIDEWALL RISER PIPES

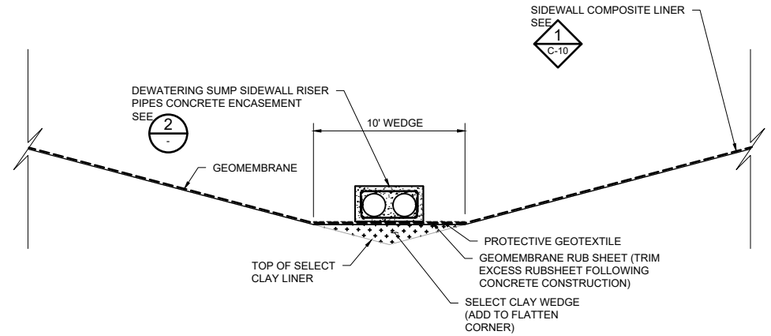
0 20 40

SCALE IN FEET




NOTES:

1. FORM CONCRETE BY MEANS AND METHODS THAT WILL NOT DAMAGE THE COMPOSITE LINER SYSTEM. CONCRETE FORMING SHALL BE APPROVED BY ENGINEER PRIOR TO CONSTRUCTION.
2. PROVIDE MIN. 3" CLEAR COVER FOR ALL REINFORCING STEEL.
3. ALL REINFORCING SHALL BE EPOXY COATED.
4. ALL CONCRETE SHALL BE SULFATE RESISTANT TYPE V.
5. DEWATERING SYSTEM SIDEWALL RISER PIPES CAN LIE DIRECTLY ON BOTTOM MAT OF REINFORCEMENT.
6. CONTRACTOR TO SUBMIT CONCRETE MIX DESIGN (4,000 PSI MIN.) FOR REVIEW AND APPROVAL.




2 - SECTION: DEWATERING SUMP SIDEWALL RISER PIPES CONCRETE ENCASEMENT

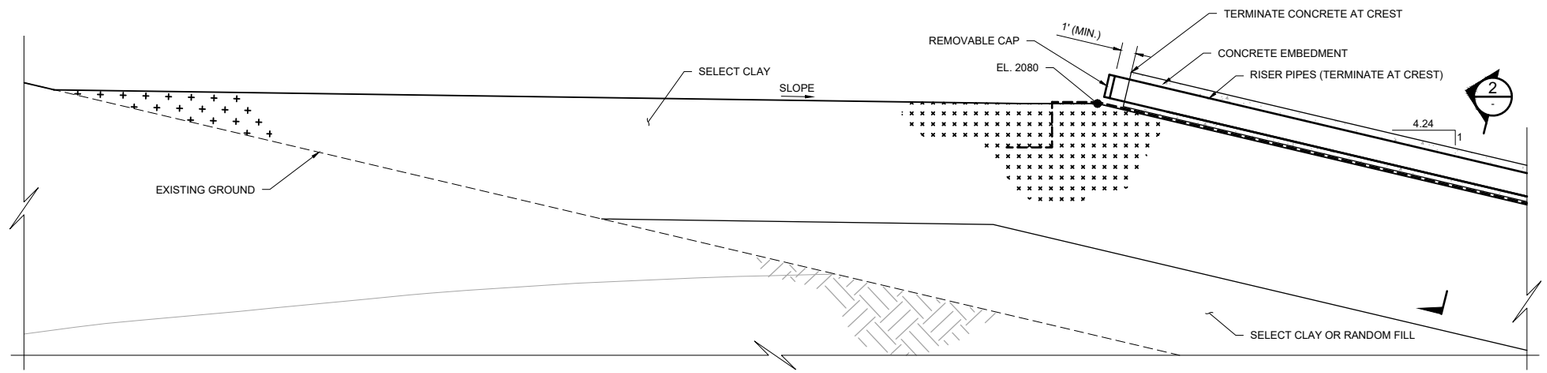
0 1 2

SCALE IN FEET

3 C-16,- SECTION: DEWATERING SUMP SIDEWALL RISER PIPES BELOW BENCH

0 5 10

SCALE IN FEET




4 - SECTION: DEWATERING SUMP SIDEWALL RISER PIPES TERMINATION

0 5 10

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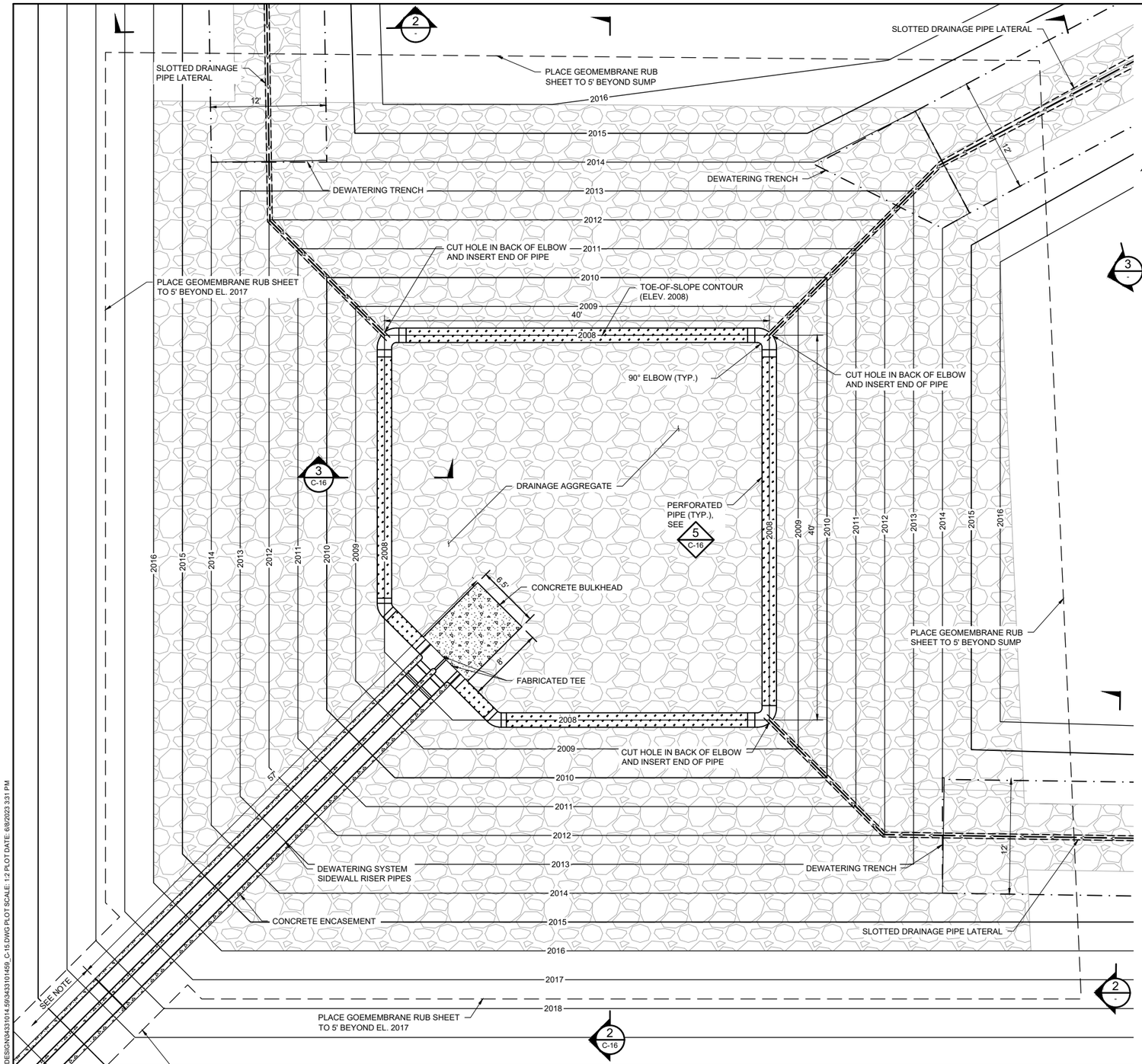
MINNKOTA FGD POND CELL 5 - PHASE 1B
CENTER, NORTH DAKOTA

DEWATERING SUMP AND SIDEWALL RISER SECTIONS

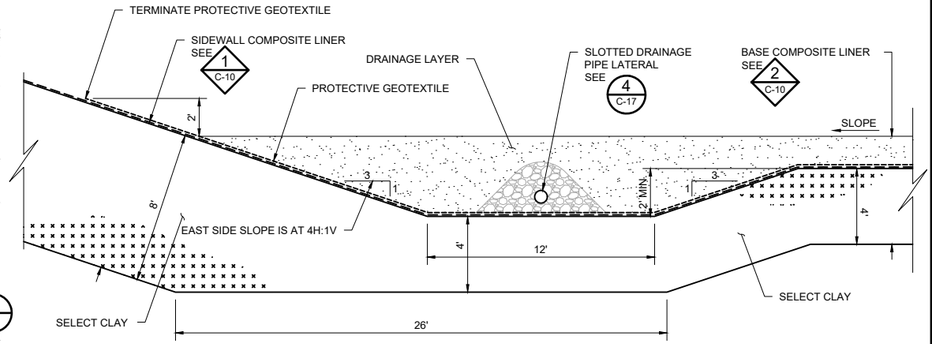
| | |
|---|---|
| BARR PROJECT No. | 34331014.59 |
| CLIENT PROJECT No. | |
| DWG. No. | C-14 |
| REV. No. | 0 |




1 C-14 PLAN: DEWATERING SYSTEM SUMP

0 3 6 9 12

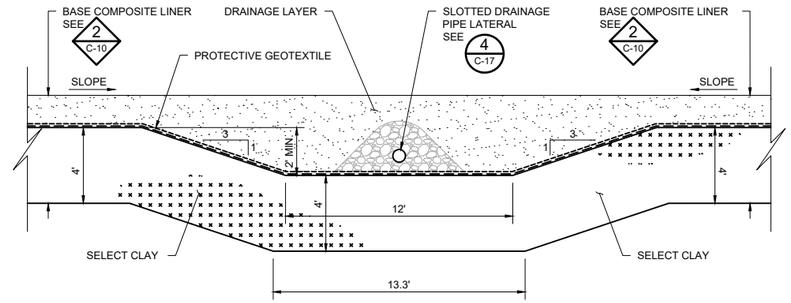
SCALE IN FEET




2 C-07,C-08,C-17 SECTION: DEWATERING TRENCH - WEST BASE AT SIDEWALL TOE (TYP.)

0 2 4 6 8

SCALE IN FEET




3 C-16,C-17 SECTION: DEWATERING TRENCH - WEST BASE ALONG CENTER (TYP.)

0 2 4 6 8

SCALE IN FEET

NOTE:

FILL SUMP WITH DRAINAGE AGGREGATE PRIOR TO CONSTRUCTING REMAINING DEWATERING SYSTEM SIDEWALL RISER PIPES.

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| | |
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| Checked | BDP |
| Designed | JAM6 |
| Approved | SWH |

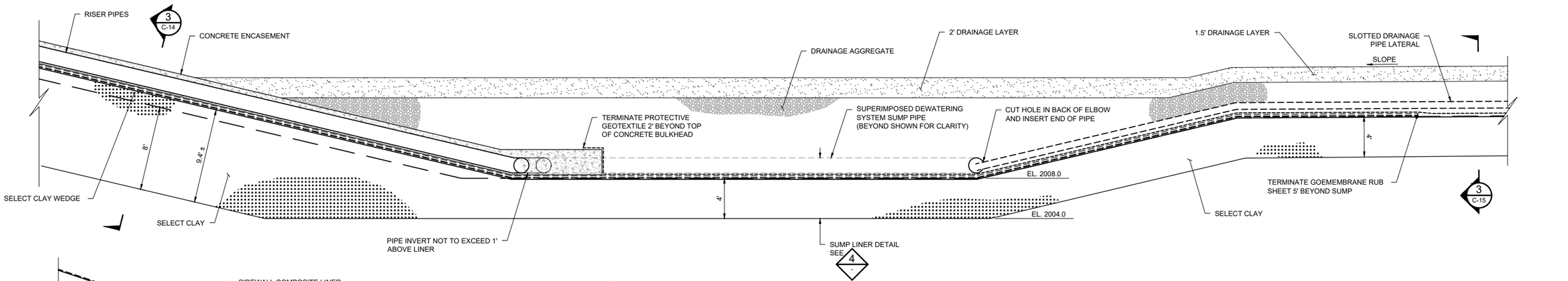
Minnkota Power COOPERATIVE
A Touchstone Energy® Cooperative

MINNKOTA FGD POND CELL 5 - PHASE 1B
CENTER, NORTH DAKOTA

DEWATERING SYSTEM SUMP PLAN AND DEWATERING TRENCH SECTIONS

| | |
|---|---|
| BARR PROJECT No. | 34331014.59 |
| CLIENT PROJECT No. | |
| DWG. No. | C-15 |
| REV. No. | 0 |

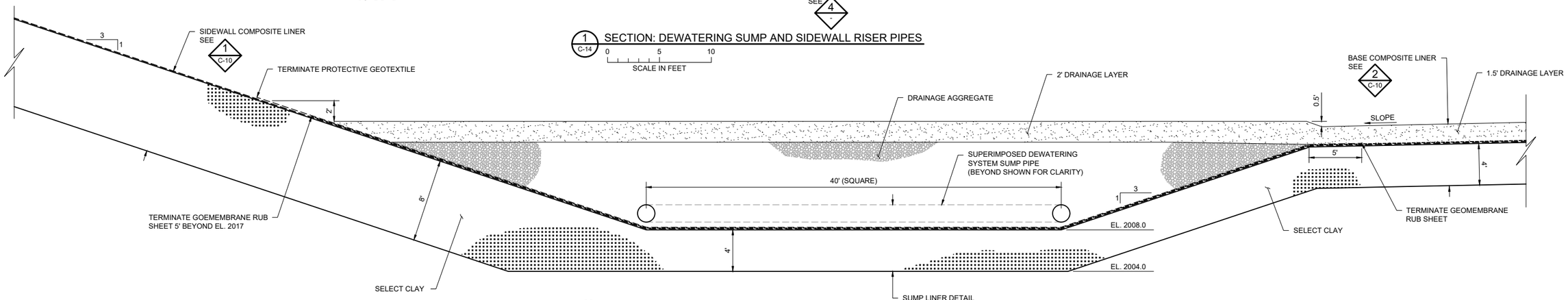
CADD USER: RACHEL L. BATEMAN FILE: M:\DESIGN\34331014.59\34331014.59_C-15.DWG PLOT SCALE: 1:2 PLOT DATE: 6/8/2023 3:31 PM




1 C-14 SECTION: DEWATERING SUMP AND SIDEWALL RISER PIPES

0 5 10

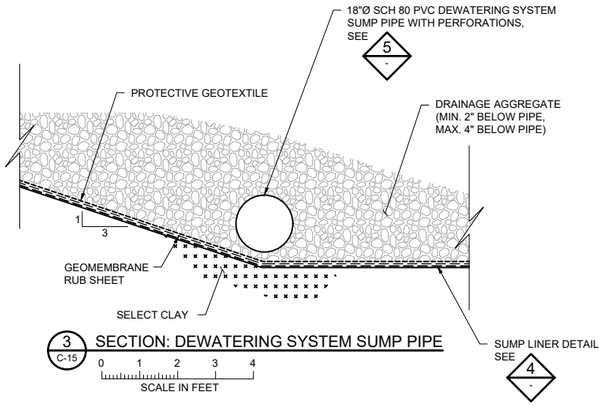
SCALE IN FEET




2 C-15 SECTION: DEWATERING SUMP AND INTAKE PIPE

0 5 10

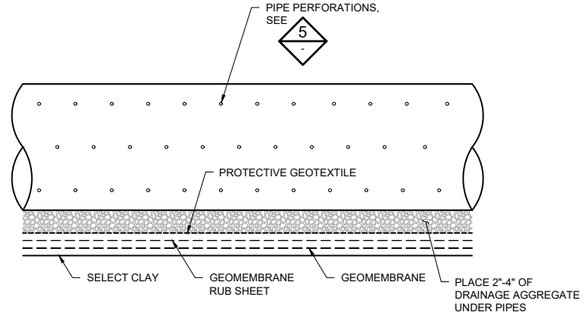
SCALE IN FEET




3 C-15 SECTION: DEWATERING SYSTEM SUMP PIPE

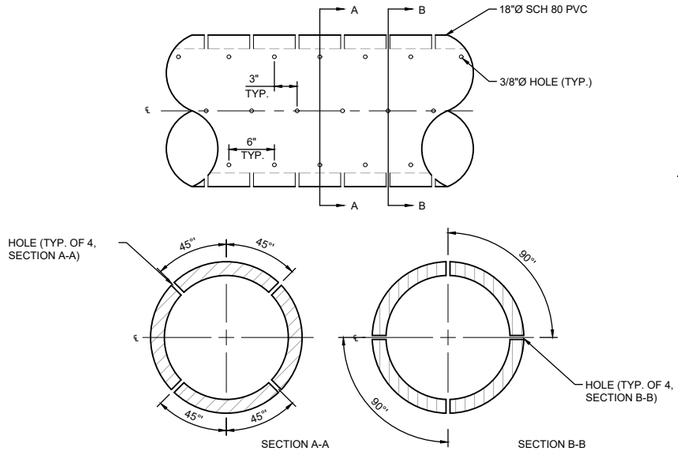
0 1 2 3 4

SCALE IN FEET




4 - DETAIL: SUMP LINER DETAIL

NOT TO SCALE




NOTES:

1. PLACE GEOMEMBRANE RUB SHEET AND PROTECTIVE GEOTEXTILE LAYER OVER SIDEWALL COMPOSITE LINER SYSTEM IN SUMP AREA.

5 C-15, - DETAIL: SUMP PIPE PERFORATION

NOT TO SCALE

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Minnkota Power COOPERATIVE
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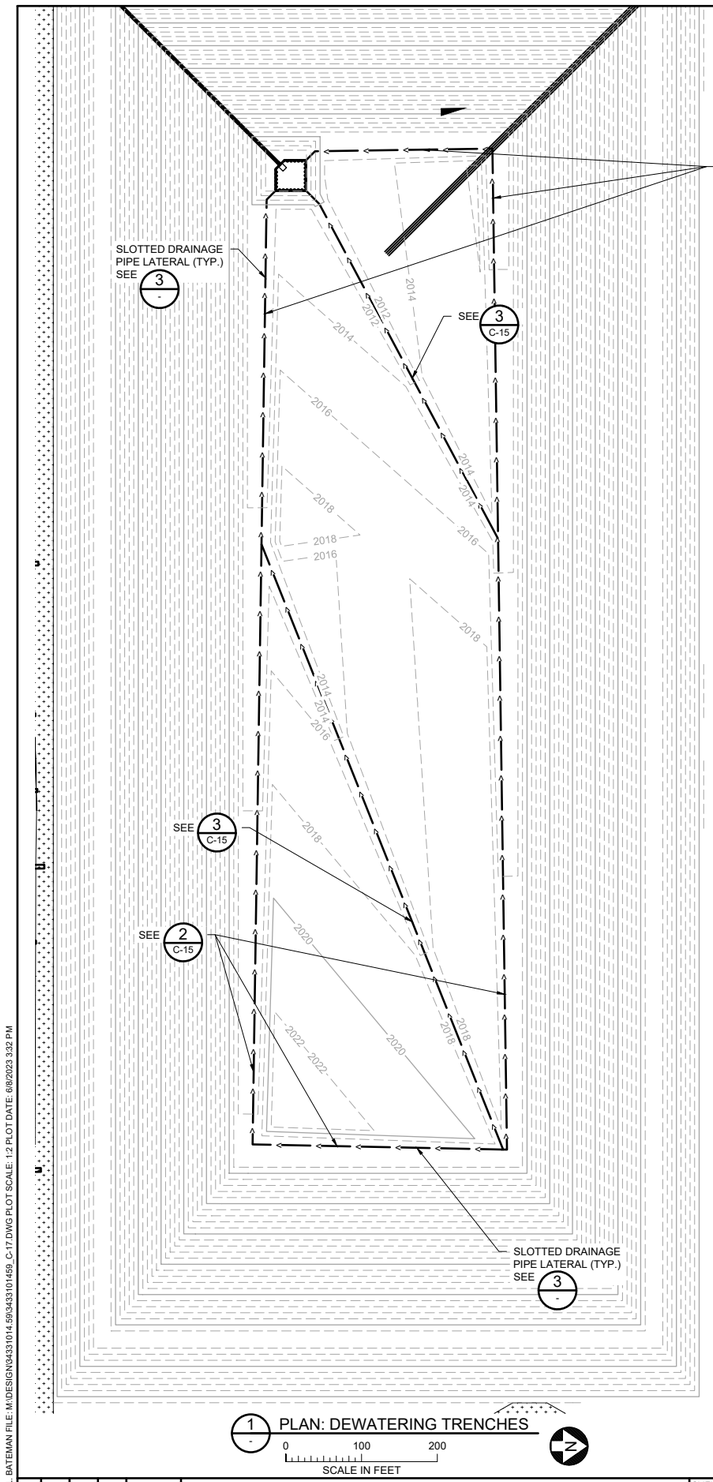
MINNKOTA FGD POND CELL 5 - PHASE 1B
CENTER, NORTH DAKOTA

DEWATERING SUMP
SECTIONS AND DETAILS

| BARR PROJECT No. | |
|---|---|
| 34331014.59 | |
| CLIENT PROJECT No. | |
| DWG. No. | REV. No. |
| C-16 | 0 |

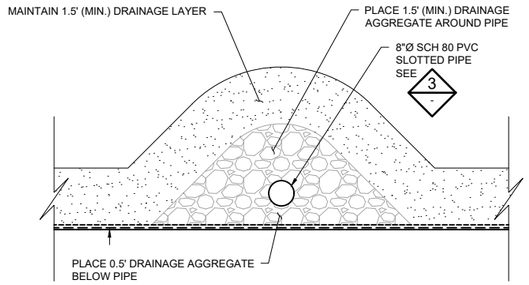
CADD USER: RACHEL L. BATEMAN FILE: M:\DESIGN\34331014.59\34331014.59_C-16.DWG PLOT SCALE: 1:2 PLOT DATE: 6/8/2023 3:31 PM




1 - PLAN: DEWATERING TRENCHES

0 100 200

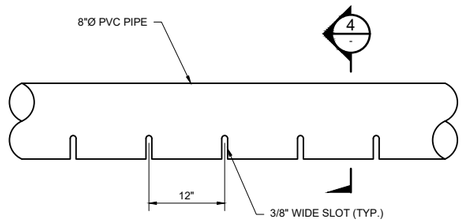
SCALE IN FEET



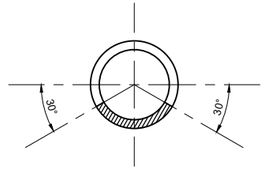

2 C-15.- SECTION: PERFORATED DRAINAGE PIPE LATERAL

0 1 2 3 4

SCALE IN FEET




3 C-13.- DETAIL: PIPE SLOTS (DRAINAGE PIPE LATERAL AND GRADIENT CONTROL PIPES) N.T.S.




4 - SECTION: PIPE SLOTS N.T.S.

NOTE:

HAGEL BED GRADIENT CONTROL SYSTEM COLLECTION PIPE IS 6"Ø SDR 11 HDPE.

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Minnkota Power COOPERATIVE
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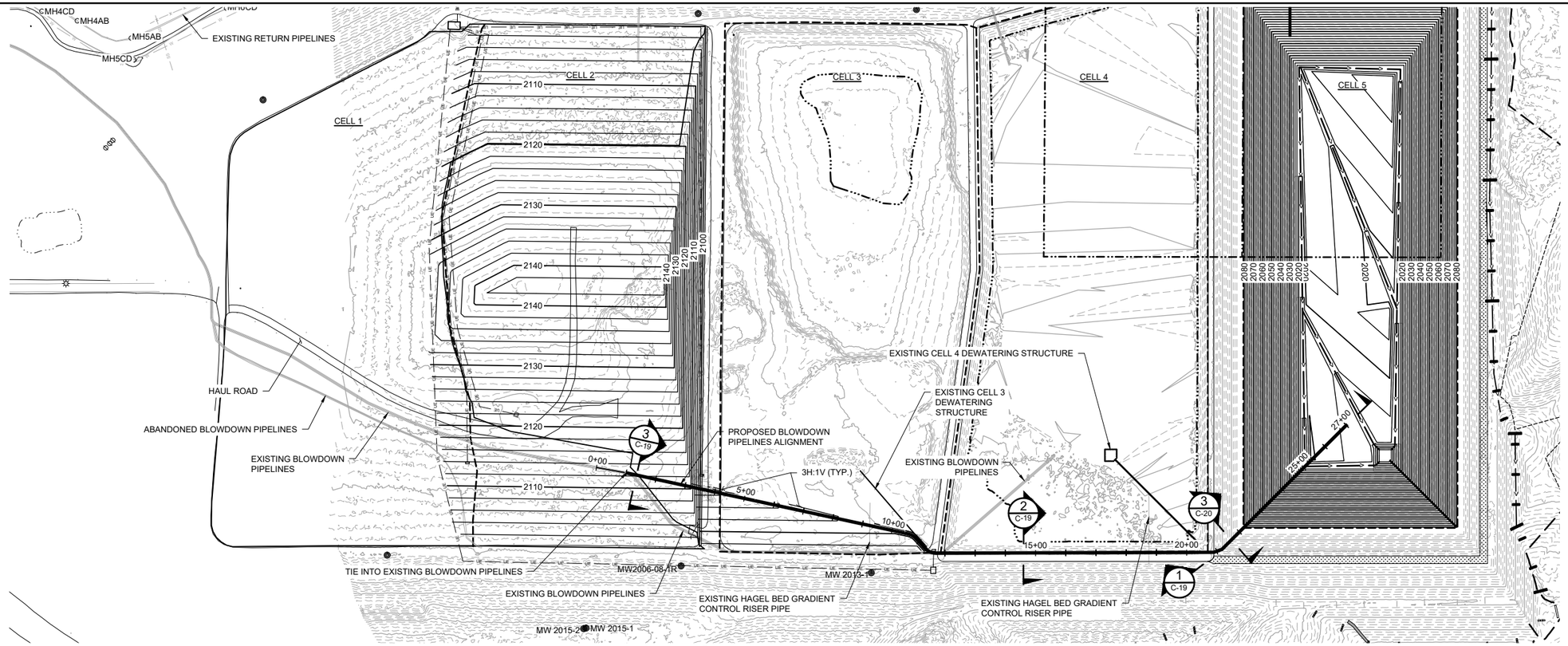
MINNKOTA FGD POND CELL 5 - PHASE 1B
CENTER, NORTH DAKOTA

DEWATERING TRENCH
PLAN, SECTIONS, AND DETAILS

| | |
|---|---|
| BARR PROJECT No. | 34331014.59 |
| CLIENT PROJECT No. | |
| DWG. No. | C-17 |
| REV. No. | 0 |

CADD USER: RACHEL L. BATEMAN FILE: M:\DESIGN\34331014.59\34331014.59_C-17.DWG PLOT SCALE: 1:2 PLOT DATE: 6/8/2023 3:32 PM




## LEGEND

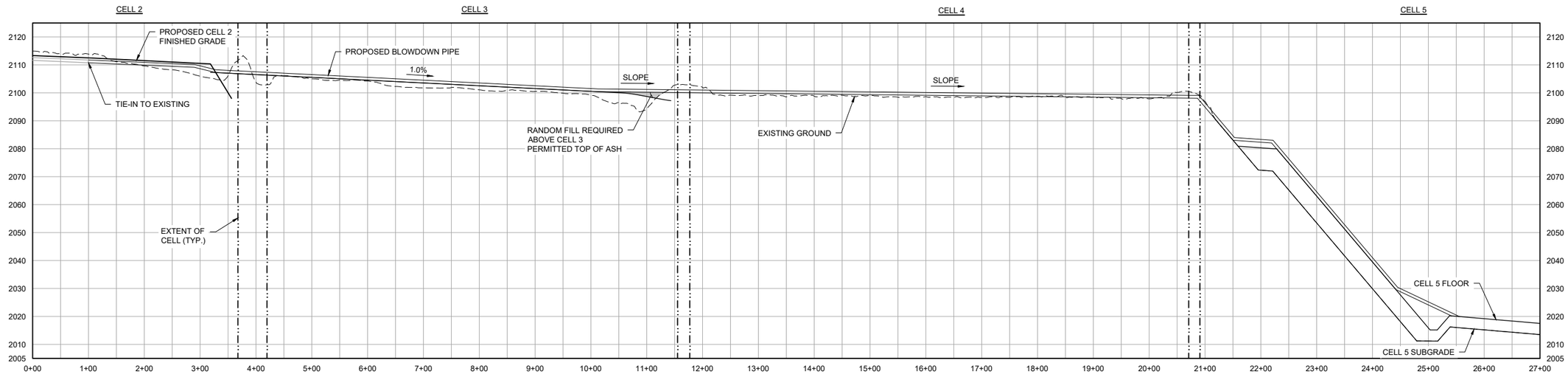
- EXISTING 10' MAJOR CONTOUR
- EXISTING 2' MINOR CONTOUR
- PROPOSED 10' MAJOR CONTOUR
- PROPOSED 2' MINOR CONTOUR
- PROPOSED PIPE
- EXISTING BLOWDOWN LINES
- EXISTING ROAD
- EXISTING PIPELINE
- STRIPPING LIMITS
- FENCE LINE
- WATERLINE
- MW97-2 MONITORING WELL

NOTES:

NET TOTAL FILL MATERIAL REQUIRED FOR BLOWDOWN PIPELINE IN CELL 3: 2,200 CY (WITH 100 CY ABOVE PERMITTED TOP OF ASH - RANDOM FILL ONLY)

TOTAL RANDOM FILL REQUIRED FOR ROAD RAISE IN CELL 4 EMBANKMENT: 1,500 CY

1 C-05 PLAN: BLOWDOWN PIPELINES
0 200 400
SCALE IN FEET




2 - PROFILE: BLOWDOWN PIPELINES
0 100 200
SCALE IN FEET

NOTES:

1. CELL 4 BLOWDOWN PIPELINES WILL BE ACTIVE UNTIL TRANSITION TO CELL 5. COORDINATE BLOWDOWN PIPELINES TRANSITION WITH OWNER PRIOR TO COMMENCING THE WORK.

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Minnkota Power COOPERATIVE
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MINNKOTA FGD POND CELL 5 - PHASE 1B
CENTER, NORTH DAKOTA

BLOWDOWN PIPELINES
PLAN AND PROFILE

| | |
|---|---|
| BARR PROJECT No. | 34331014.59 |
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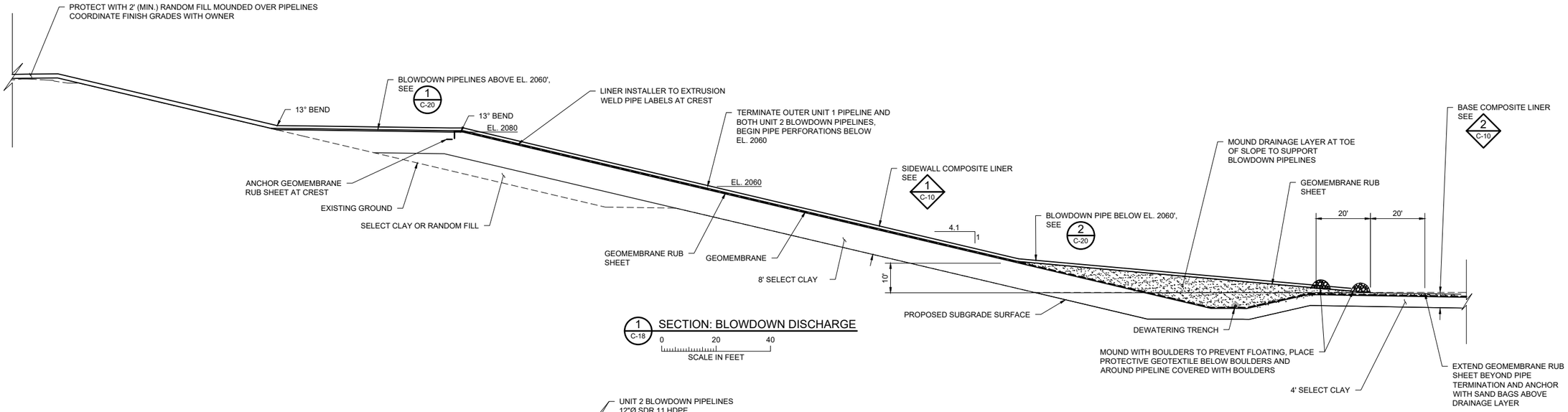
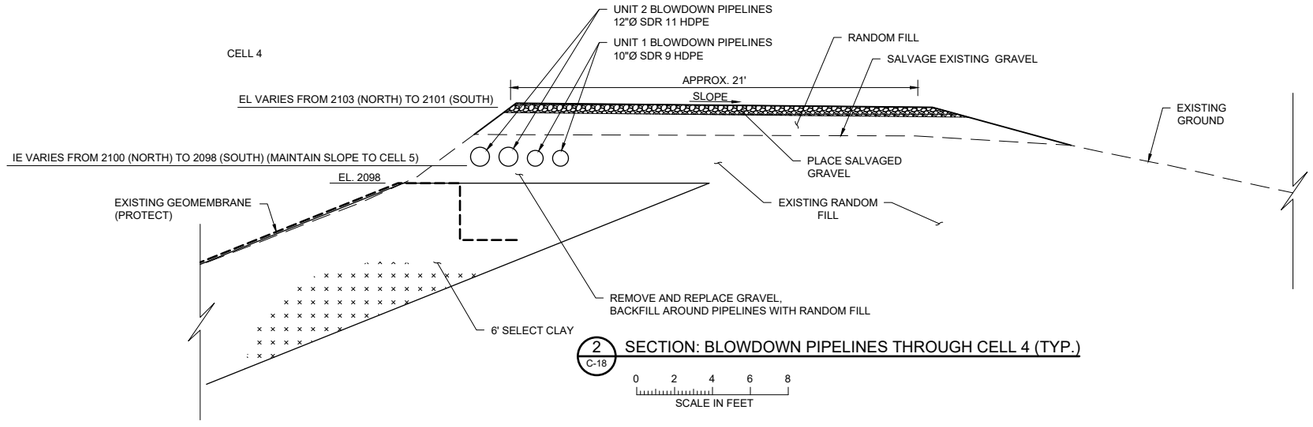
| REV. No. | 0 |

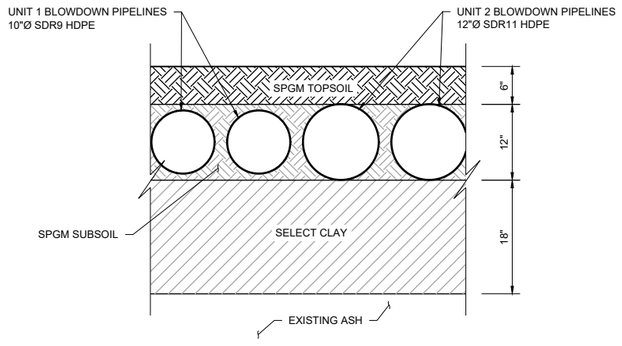

CADD USER: RACHEL L. BATEMAN FILE: M:\DESIGN\34331014.59\34331014.59_C-18.DWG PLOT SCALE: 1:2 PLOT DATE: 6/8/2023 3:35 PM




1 C-18 SECTION: BLOWDOWN DISCHARGE




2 C-18 SECTION: BLOWDOWN PIPELINES THROUGH CELL 4 (TYP.)




3 C-18 SECTION: CELL 2 FINAL COVER

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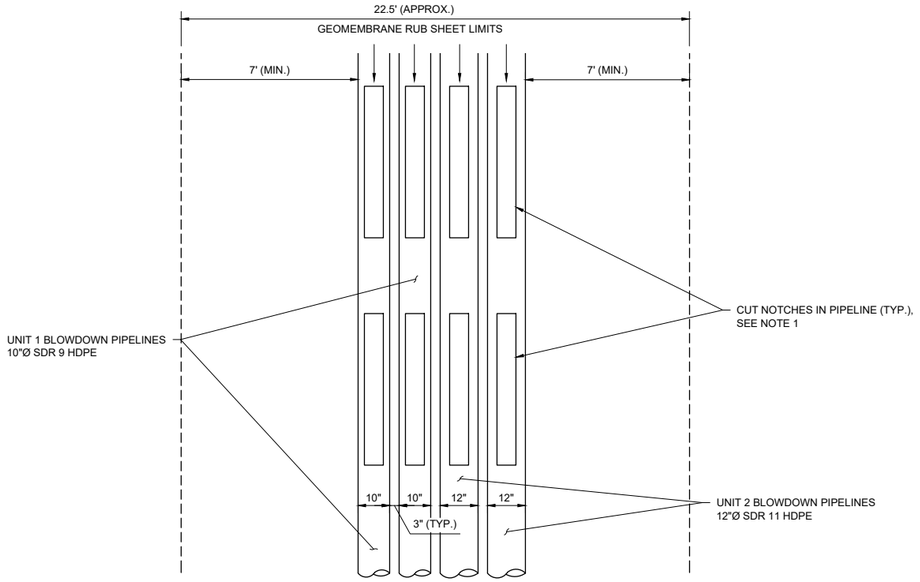
MINNKOTA FGD POND CELL 5 - PHASE 1B
CENTER, NORTH DAKOTA

BLOWDOWN PIPELINES
SECTIONS

| | |
|---|---|
| BARR PROJECT No. | 34331014.59 |
| CLIENT PROJECT No. | |
| DWG. No. | C-19 |
| REV. No. | 0 |

CADD USER: RACHEL L. BATEMAN FILE: M:\DESIGN\34331014.59\34331014599_C-19.DWG PLOT SCALE: 1:2 PLOT DATE: 6/8/2023 3:22 PM

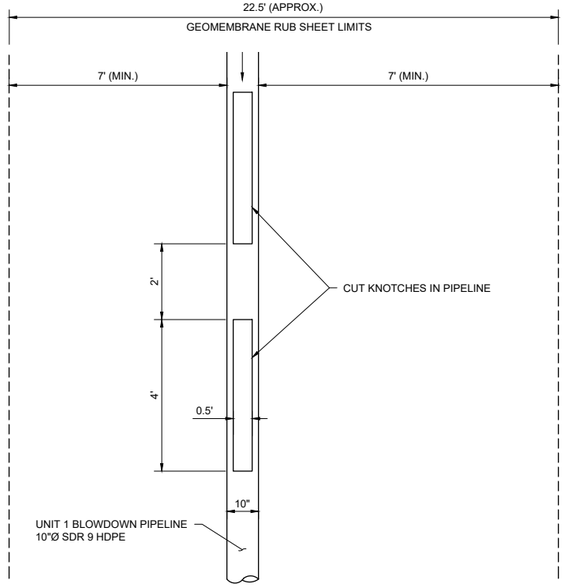



1 C-19 PLAN: BLOWDOWN PIPELINES DOWN SLOPE ABOVE EL. 2060

0 2 4
SCALE IN FEET

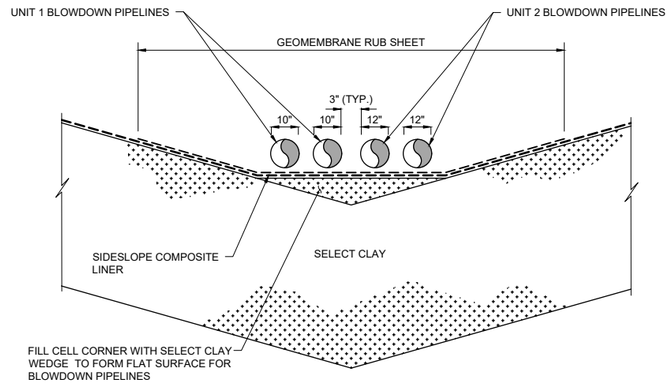
NOTE:

1. NOTCHED PIPE SHALL EXTEND UP TO EL. 2070'




2 C-19 PLAN: BLOWDOWN PIPELINES DOWN SLOPE BELOW EL. 2060

0 2 4
SCALE IN FEET




3 C-18 SECTION: BLOWDOWN PIPELINES

0 2 4 6 8
SCALE IN FEET

NOTE:

ONLY ONE UNIT 1 BLOWDOWN PIPE PRESENT BELOW BENCH.

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CENTER, NORTH DAKOTA

BLOWDOWN PIPELINES
SECTIONS AND DETAILS

| BARR PROJECT No. | |
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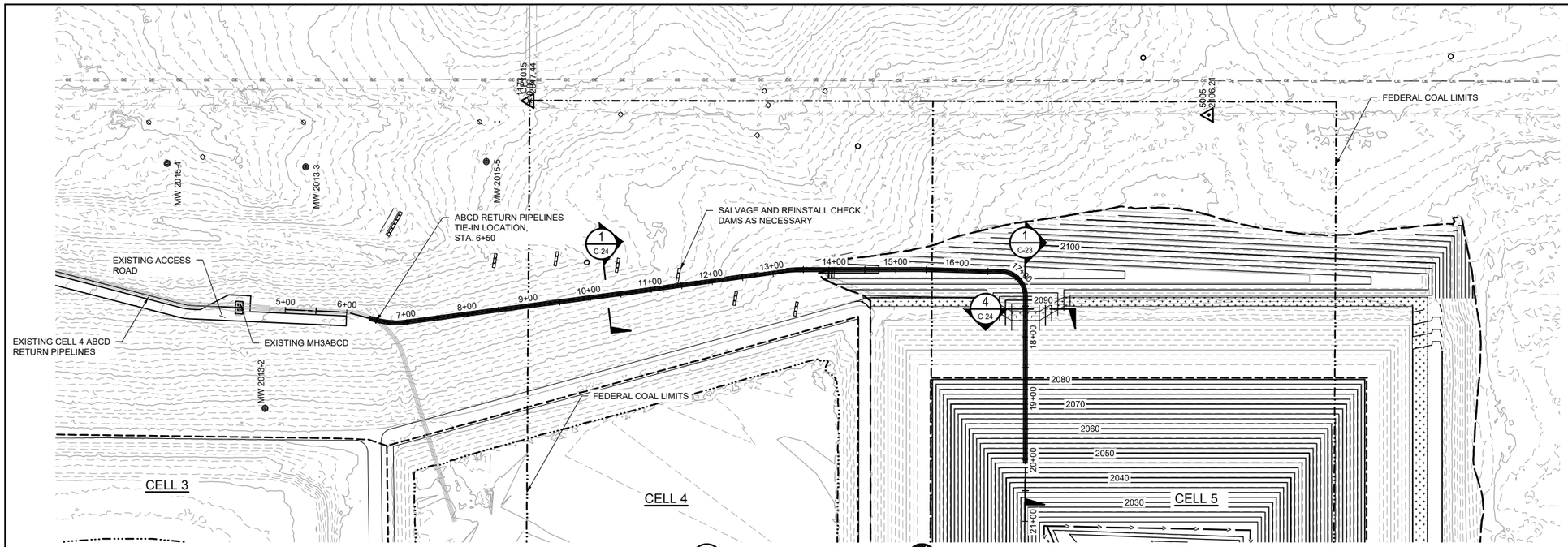
| CLIENT PROJECT No. | |
| DWG. No. | REV. No. |
| C-20 | 0 |

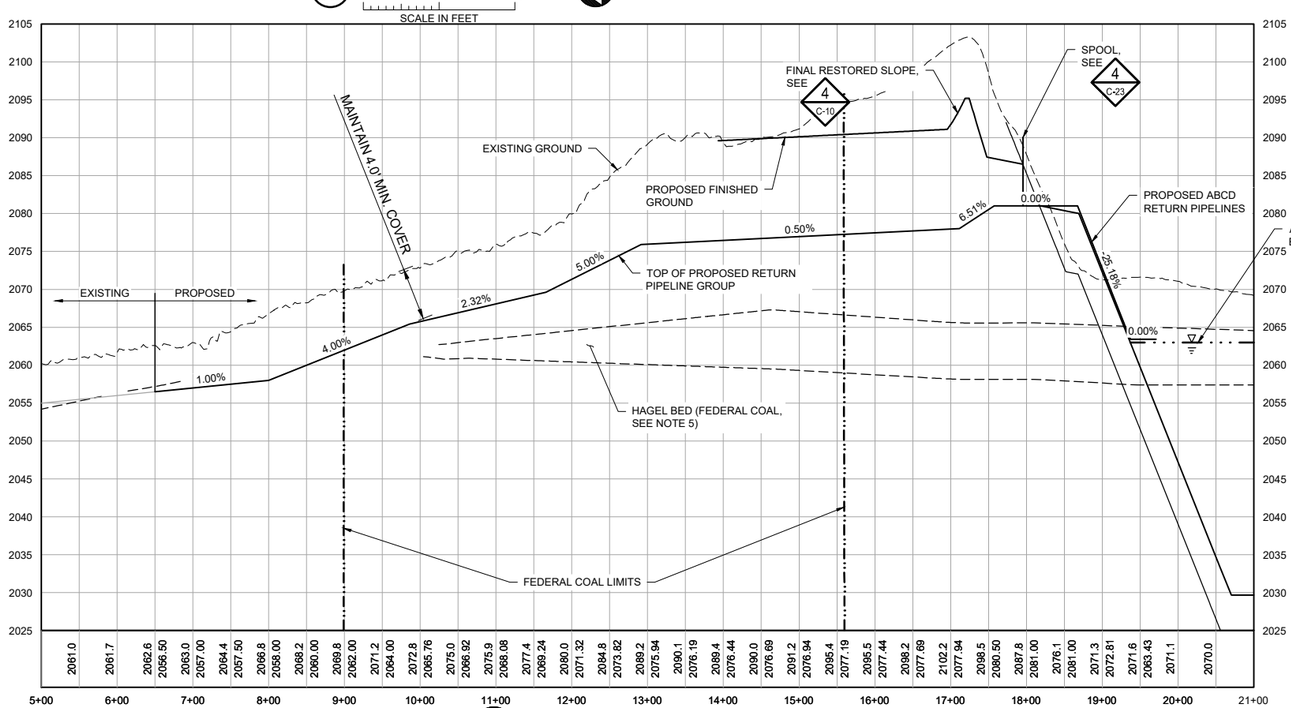
CADD USER: RACHEL L. BATEMAN FILE: M:\DESIGN\34331014.59\34331014.59_C-20.DWG PLOT SCALE: 1:2 PLOT DATE: 6/8/2023 2:49 PM




1 C-05 PLAN: RETURN PIPELINES

0 100 200

SCALE IN FEET




2 PROFILE: RETURN PIPELINES

0 100 200 0 10 20

HORIZONTAL SCALE IN FEET VERTICAL SCALE IN FEET

LEGEND

- EXISTING 10' MAJOR CONTOUR (2000)
- EXISTING 2' MINOR CONTOUR
- PROPOSED 10' MAJOR CONTOUR (2100)
- PROPOSED 2' MINOR CONTOUR
- FEDERAL COAL LIMITS
- EXISTING OVERHEAD ELECTRIC
- EXISTING FENCE LINE
- EXISTING ROAD
- EXISTING PIPELINE
- WATERLINE
- MW 2013-2 MONITORING WELL

NOTES:

1. FIELD VERIFY EXISTING UTILITIES BEFORE CONSTRUCTION.
2. MAINTAIN 4.0' COVER (MIN.) OVER PIPELINES.
3. RESTORE DISTURBED ROAD SURFACES TO PRE-CONSTRUCTION CONDITIONS.
4. COORDINATE WITH OWNER FOR TRANSFER OF RETURN PIPELINES FROM CELL 4 TO CELL 5.
5. REMOVAL OF FEDERAL COAL IS STRICTLY PROHIBITED.

LEGEND

2099.9 2083.00

EXISTING GROUND — TOP OF RETURN PIPELINE GROUP

NOTES:

1. SPOOL MUST BE AT HIGHEST ELEVATION IN PIPELINES.

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Minnkota Power COOPERATIVE
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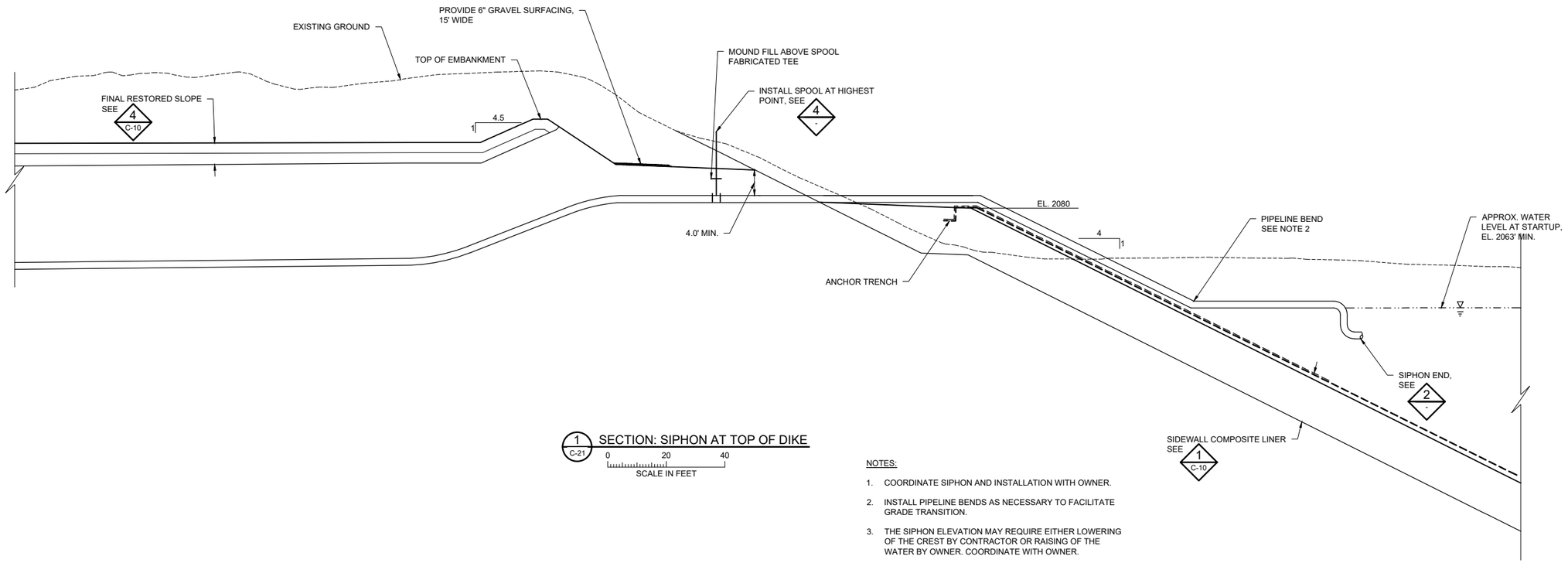
MINNKOTA FGD POND CELL 5 - PHASE 1B
CENTER, NORTH DAKOTA

RETURN PIPELINES - WEST ALTERNATIVE
PLAN AND PROFILE

| BARR PROJECT No. | |
|---|---|
| 34331014.59 | |
| CLIENT PROJECT No. | |
| DWG. No. | REV. No. |
| C-21 | 0 |

CADD USER: BRYAN D. FITTERLE FILE: M:\DESIGN\34331014.59\34331014.59_C-21.DWG PLOT SCALE: 1:2 PLOT DATE: 6/21/2023 7:55 PM



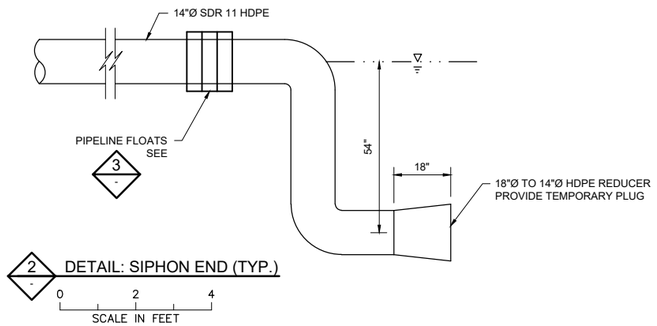

1 C-21 SECTION: SIPHON AT TOP OF DIKE

0 20 40

SCALE IN FEET

NOTES:

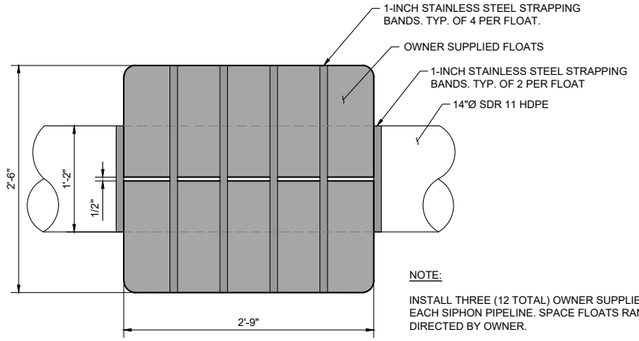
1. COORDINATE SIPHON AND INSTALLATION WITH OWNER.
2. INSTALL PIPELINE BENDS AS NECESSARY TO FACILITATE GRADE TRANSITION.
3. THE SIPHON ELEVATION MAY REQUIRE EITHER LOWERING OF THE CREST BY CONTRACTOR OR RAISING OF THE WATER BY OWNER. COORDINATE WITH OWNER.
4. INSTALL GEOMEMBRANE RUB SHEET BENEATH SIPHON RETURN PIPELINES.




2 - DETAIL: SIPHON END (TYP.)

0 2 4

SCALE IN FEET

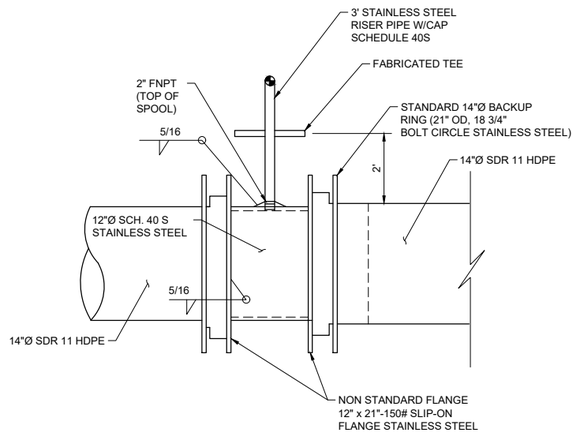



3 - DETAIL: FLOATS

N.T.S.

NOTE:

INSTALL THREE (12 TOTAL) OWNER SUPPLIED FLOATS ON EACH SIPHON PIPELINE. SPACE FLOATS RANDOMLY AS DIRECTED BY OWNER.




4 C-21, - DETAIL: SPOOL

N.T.S.

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Minnkota Power COOPERATIVE
A Touchstone Energy® Cooperative

MINNKOTA FGD POND CELL 5 - PHASE 1B
CENTER, NORTH DAKOTA

RETURN PIPELINES SIPHON SECTION AND DETAILS

| | |
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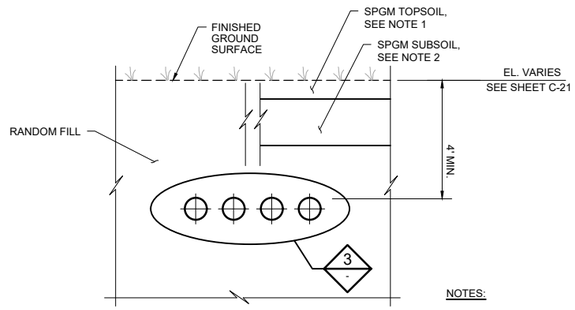
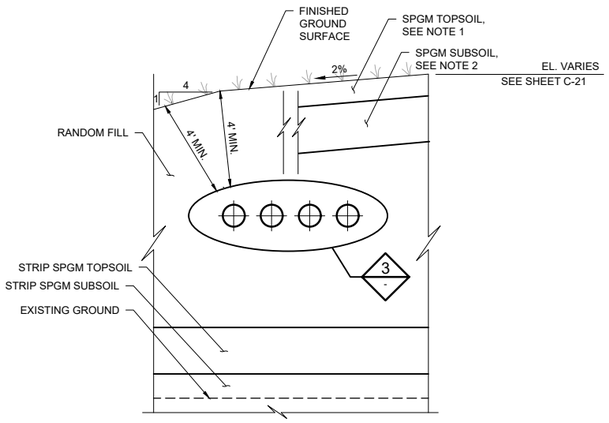
| BARR PROJECT No. | 34331014.59 |
| CLIENT PROJECT No. | |
| DWG. No. | C-23 |
| REV. No. | 0 |



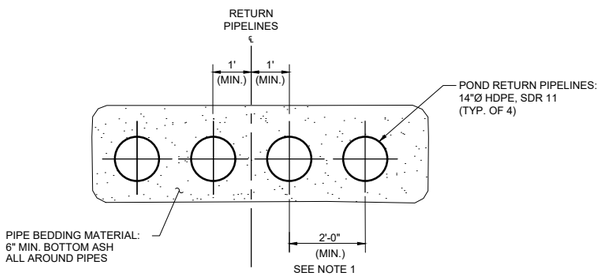

1 C-21 SECTION: RETURN PIPELINES
NOT TO SCALE

NOTES:

1. ON CELL EMBANKMENTS, SPGM TOPSOIL THICKNESS TO BE 1.0'. ELSEWHERE, SPGM TOPSOIL THICKNESS TO MATCH EXISTING REMOVAL THICKNESS.
2. ON CELL EMBANKMENTS, SPGM SUBSOIL THICKNESS TO BE 2.5'. ELSEWHERE, SPGM SUBSOIL THICKNESS TO MATCH EXISTING REMOVAL THICKNESS.



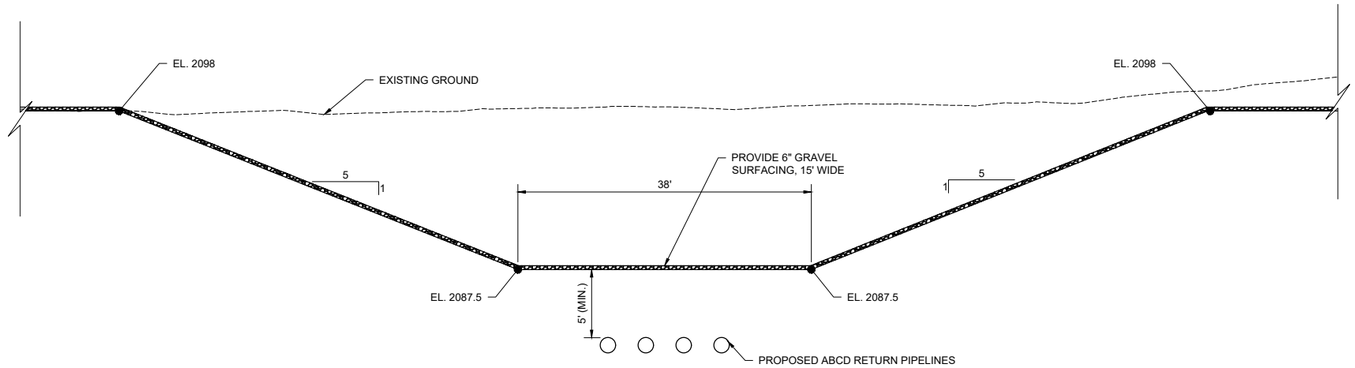

2 C-21 SECTION: RETURN PIPELINES IN FILL
NOT TO SCALE




NOTES:

1. SEE SPECIFICATION SECTION 31 23 00 FOR BEDDING AND COMPACTION REQUIREMENTS.

3 - DETAIL: RETURN/WATER SUPPLY PIPELINES
NOT TO SCALE




4 C-21 SECTION: PIPE COVER - RETURN LINES
NOT TO SCALE

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Minnkota Power COOPERATIVE
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MINNKOTA FGD POND CELL 5 - PHASE 1B
CENTER, NORTH DAKOTA

RETURN PIPELINES
SECTION AND DETAILS

| | |
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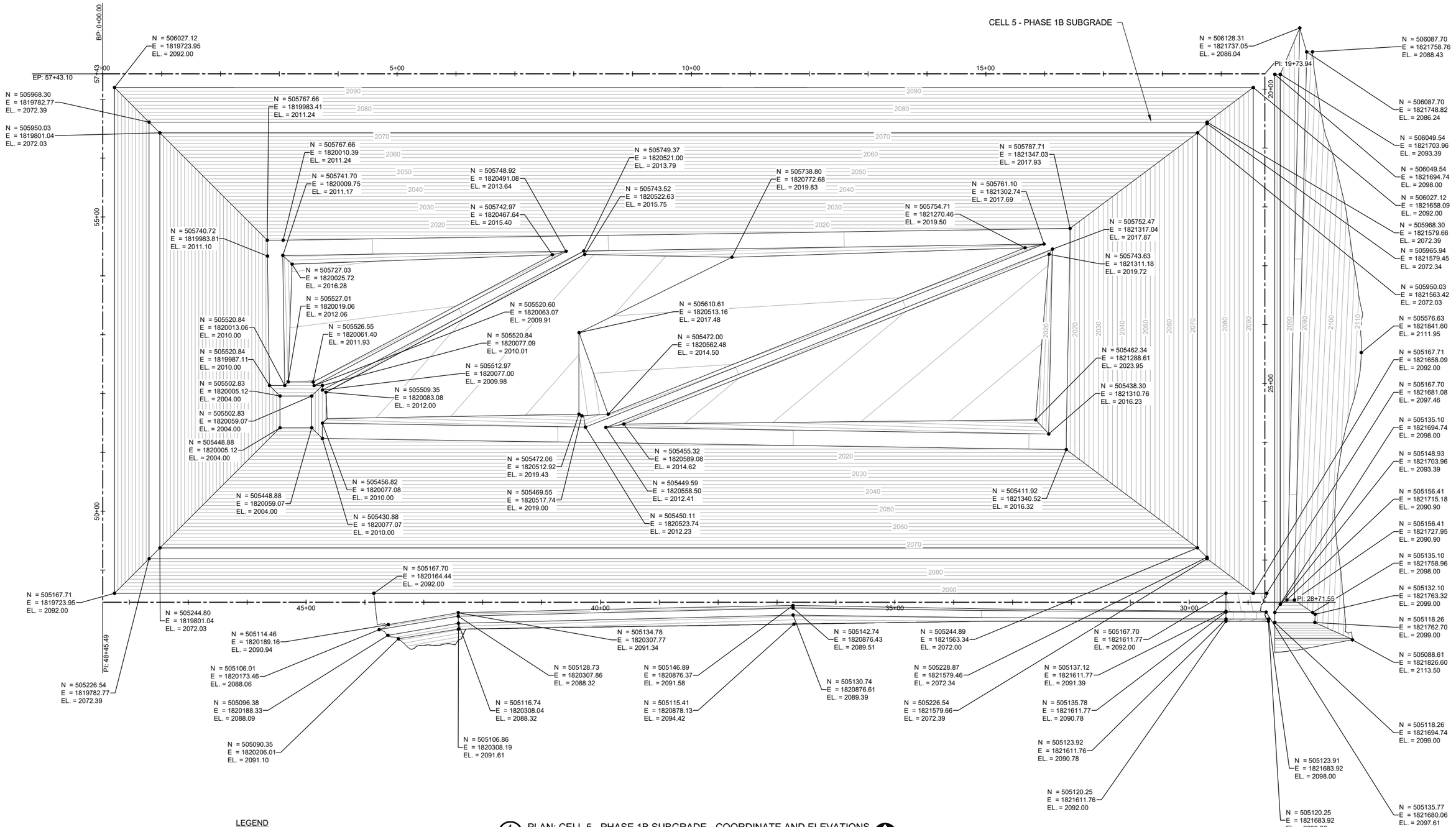


LEGEND

- 2000 — PROPOSED 10' MAJOR CONTOUR
- PROPOSED 2' MINOR CONTOUR
- BREAKLINE
- BASELINE ALIGNMENT

1 - PLAN: CELL 5 - PHASE 1B SUBGRADE - COORDINATE AND ELEVATIONS

0 80 160

SCALE IN FEET

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NOTE:

1. PROPOSED CONTOURS REPRESENT TOP OF RANDOM FILL.

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MINNKOTA FGD POND CELL 5 - PHASE 1B
CENTER, NORTH DAKOTA

COORDINATE AND ELEVATIONS
SUBGRADE

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| DWG. No. | C-25 |
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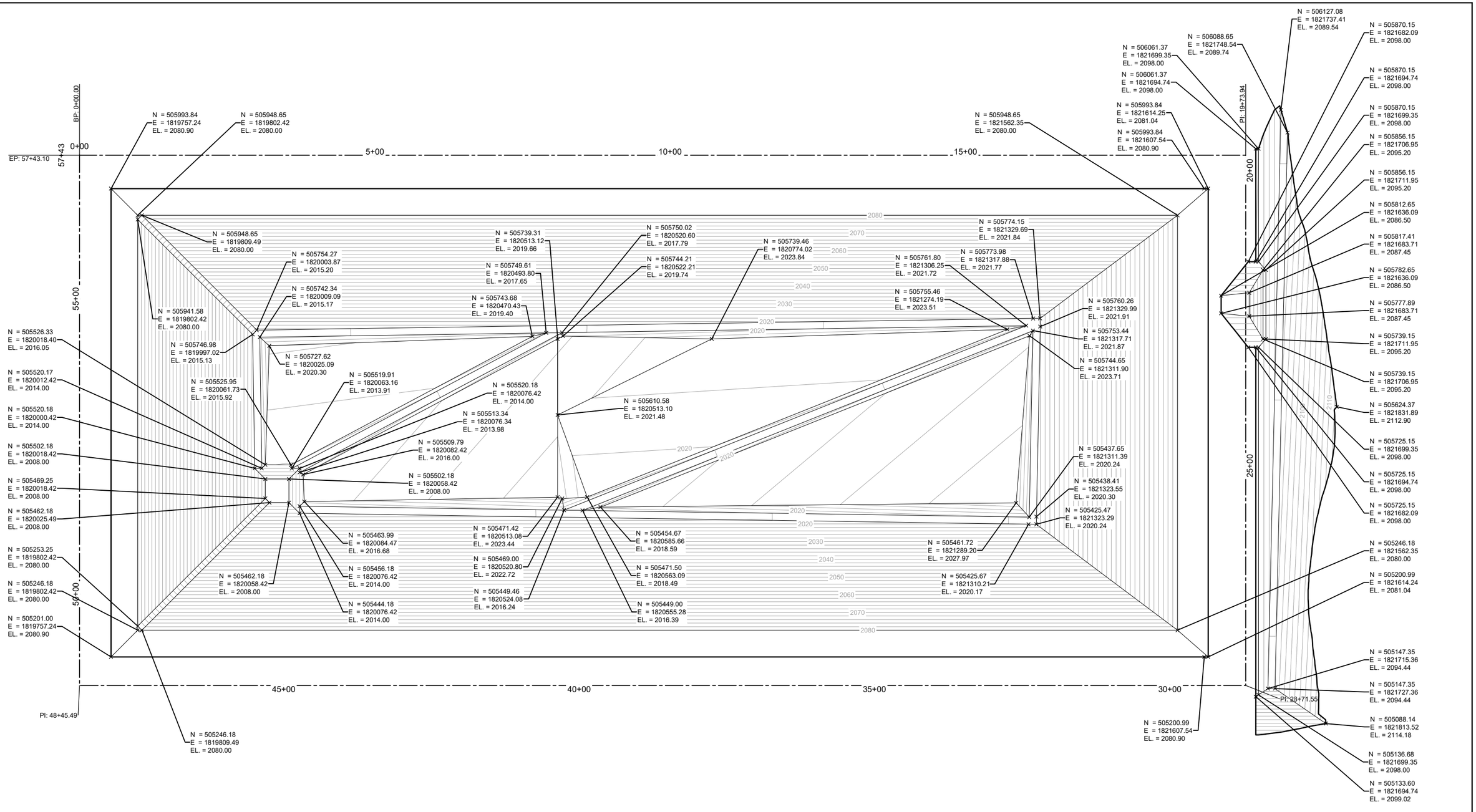


LEGEND

2000 — PROPOSED 10' MAJOR CONTOUR

PROPOSED 2' MINOR CONTOUR

BREAKLINE

BASELINE ALIGNMENT

1 . PLAN: CELL 5 - PHASE 1B TOP OF CLAY LINER AND FINISHED GROUND COORDINATE AND ELEVATIONS

0 80 160

SCALE IN FEET

N

NOTE:

1. CONTOURS INSIDE CELL 5 BELOW ELEVATION 2080 SHOW THE SELECT CLAY LINER SURFACE. OUTER EMBANKMENT SHOWS TOP OF FINISHED GROUND.

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MINNKOTA FGD POND CELL 5 - PHASE 1B
CENTER, NORTH DAKOTA

COORDINATE AND ELEVATIONS
TOP OF CLAY LINER AND FINISHED GROUND

| BARR PROJECT No. | |
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| 34331014.59 | |
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| DWG. No. | REV. No. |
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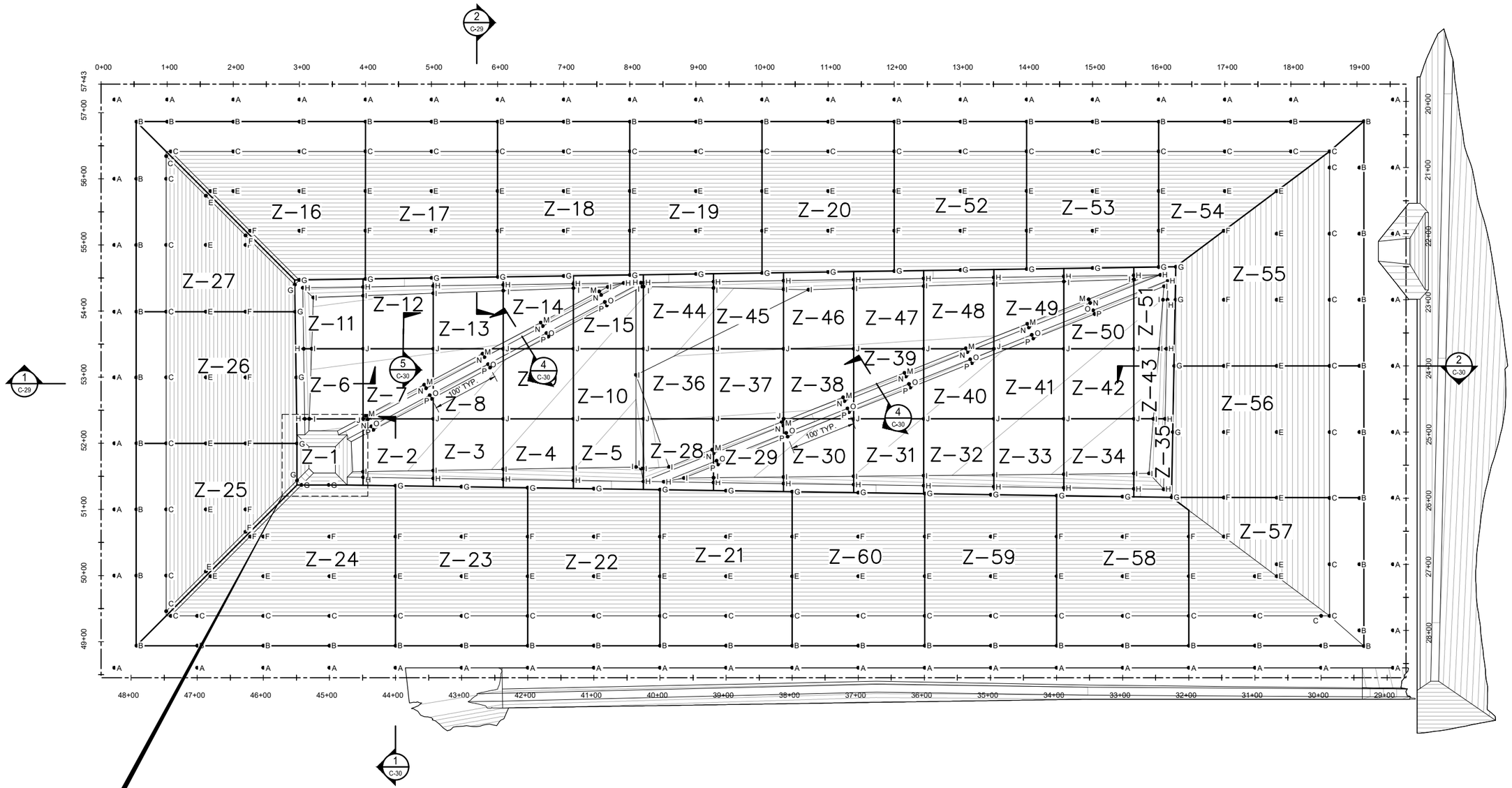


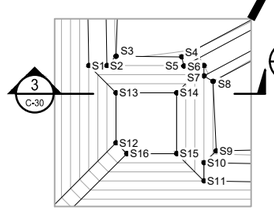


1 - PLAN: LINER SURVEY VERIFICATION AND DENSITY TESTING GRID

0 80 160
SCALE IN FEET

LEGEND

- 2000 — PROPOSED 10' MAJOR CONTOUR
- PROPOSED 2' MINOR CONTOUR
- BREAKLINE
- SURVEY ZONE BOUNDARY
- BASELINE ALIGNMENT
- GEOMEMBRANE EXTENTS
- ● A — SURVEY VERIFICATION SHOT
- ● COR. X — CORNER NUMBER X

NOTES:

1. CONTOURS SHOWN INSIDE OF GEOMEMBRANE LIMITS DEPICT FINAL SELECT CLAY SURFACE FOR PHASE 1B.
2. SET ALIGNMENT AND STATIONING AS SHOWN ABOVE.
3. DO NOT PLACE ANY LIFTS GREATER THAN 6 INCHES AFTER COMPACTION.
4. THE WORK AREA IN CELL 5 IS DIVIDED INTO 60 ZONES. OWNER WILL TEST CONTRACTOR'S WORK IN EACH ZONE. CONTRACTOR IS RESPONSIBLE FOR PASSING ALL TESTS AND WILL BE REQUIRED TO RE-WORK THE ZONES WHERE FAILED TESTS OCCUR. REFER TO THE TECHNICAL SPECIFICATIONS FOR TESTING THAT WILL TAKE PLACE IN EACH OF THE ZONES.
5. VERIFY ELEVATIONS AND MATERIAL THICKNESS AS CALLED OUT FOR ON THE PLANS AND SPECIFICATIONS. AT THE END OF EACH DAY AND THE END OF EACH PHASE OF CONSTRUCTION, THE CONTRACTOR IS REQUIRED TO SUBMIT DOCUMENTATION SHOWING ELEVATIONS AND MATERIAL THICKNESS AS DESCRIBED IN THE SPECIFICATIONS.

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MINNKOTA FGD POND CELL 5 - PHASE 1B
CENTER, NORTH DAKOTA

SURVEY VERIFICATION AND DENSITY TESTING
CELL 5 LINER LIMITS

| BARR PROJECT No. | |
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| DWG. No. | REV. No. |
| C-27 | 0 |

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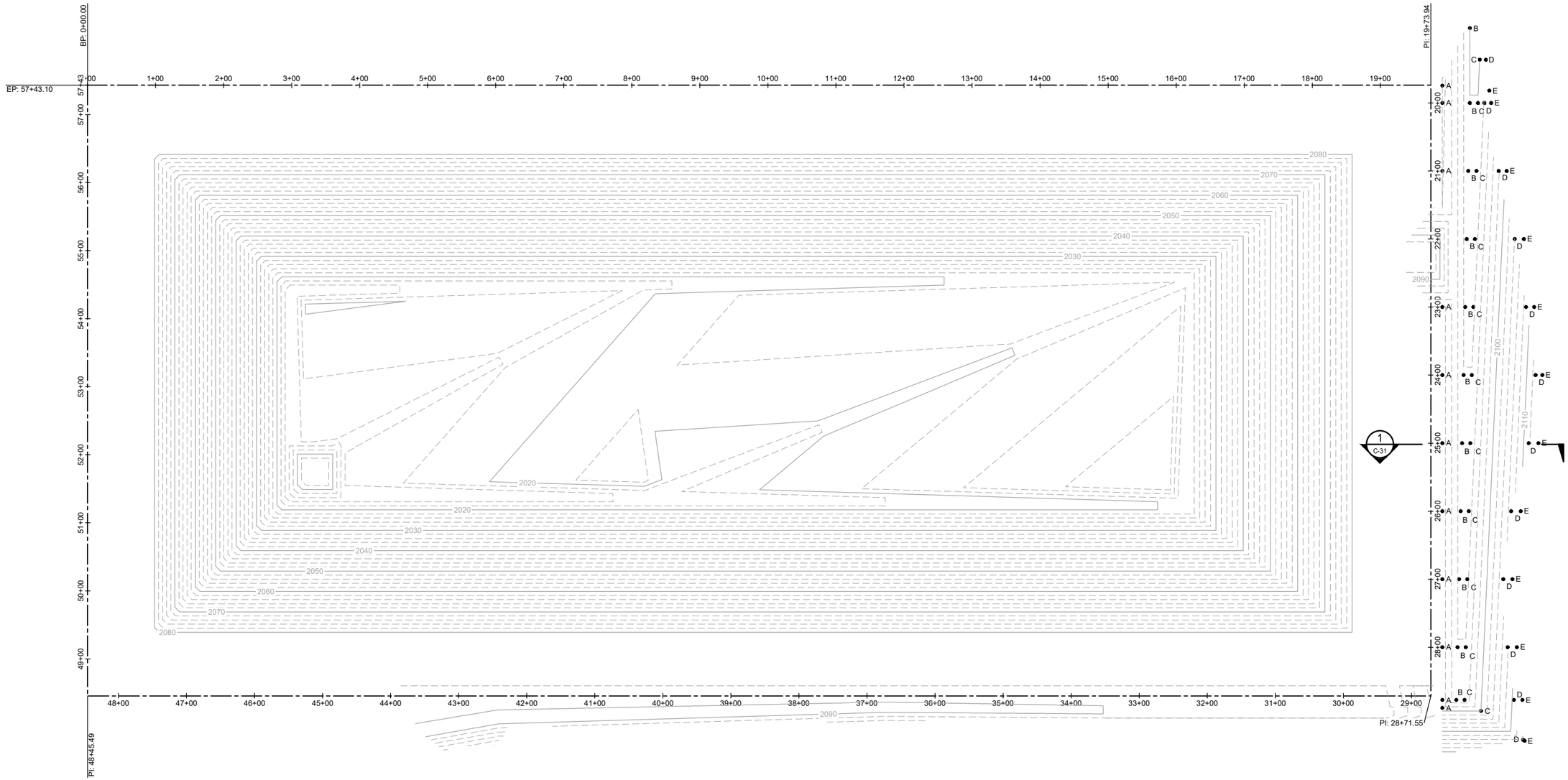


LEGEND

- 2000 — PROPOSED 10' MAJOR CONTOUR
- PROPOSED 2' MINOR CONTOUR
- BASELINE ALIGNMENT
- ● A — SURVEY VERIFICATION SHOT

1 / - PLAN: CELL 5 - EMBANKMENT SURVEY VERIFICATION

0 80 160
SCALE IN FEET

N

NOTE:

1. PROPOSED CONTOURS REPRESENT TOP OF RANDOM FILL.

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A Touchstone Energy® Cooperative

MINNKOTA FGD POND CELL 5 - PHASE 1B
CENTER, NORTH DAKOTA

SURVEY VERIFICATION
EAST EMBANKMENT

| | |
|---|---|
| BARR PROJECT No. | 34331014.59 |
| CLIENT PROJECT No. | |
| DWG. No. | C-28 |
| REV. No. | 0 |


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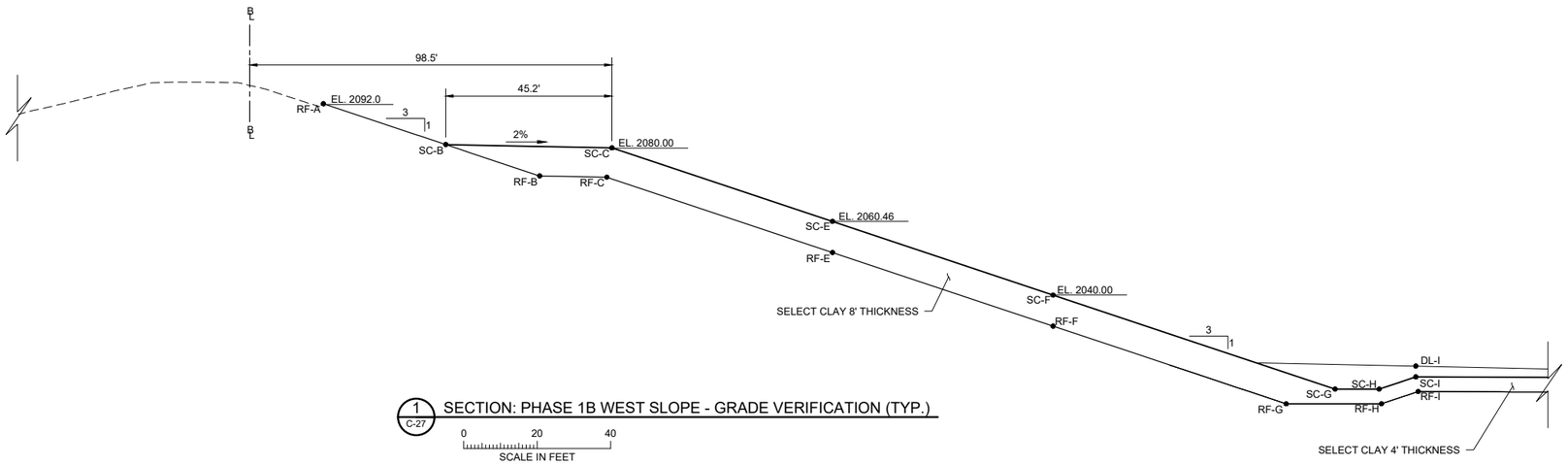


1 C-27 SECTION: PHASE 1B WEST SLOPE - GRADE VERIFICATION (TYP.)

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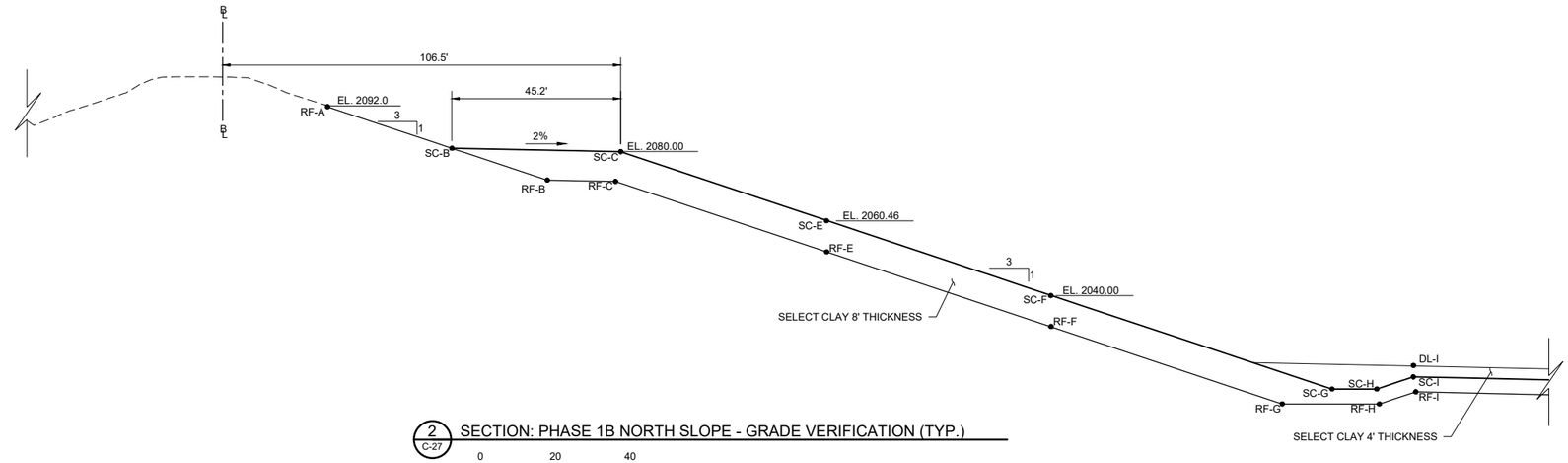


2 C-27 SECTION: PHASE 1B NORTH SLOPE - GRADE VERIFICATION (TYP.)

0 20 40
SCALE IN FEET

## ABBREVIATIONS

| | |
|---|---|
| RF-A | RANDOM FILL POINT A |
| T-RF-A | TOP OF RANDOM FILL POINT A |
| SC-A | SELECT CLAY POINT A |
| DL-A | DRAINAGE LAYER POINT A |
| BL | BASELINE |

## REQUIRED MINIMUM VERTICAL SPACING BETWEEN VERIFICATION POINTS

SECTION - WEST SLOPES

SELECT CLAY:
- RF-B → SC-B = 8.51'
- RF-C → SC-C = 7.97'
- RF-E,F → SC-E,F = 8.43'
- RF-G,H,I → SC-G,H,I = 4.00'

DRAINAGE LAYER:
- SC-I → DL-I = 1.50'

SECTION - NORTH SLOPE

SELECT CLAY:
- RF-B → SC-B = 8.51'
- RF-C → SC-C = 7.97'
- RF-E,F → SC-E,F = 8.43'
- RF-G,H,I → SC-G,H,I = 4.00'

DRAINAGE LAYER:
- SC-I → DL-I = 1.50'

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MINNKOTA FGD POND CELL 5 - PHASE 1B
CENTER, NORTH DAKOTA

SURVEY VERIFICATION SECTIONS

| | |
|---|---|
| BARR PROJECT No. | 34331014.59 |
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| DWG. No. | C-29 |
| REV. No. | 0 |


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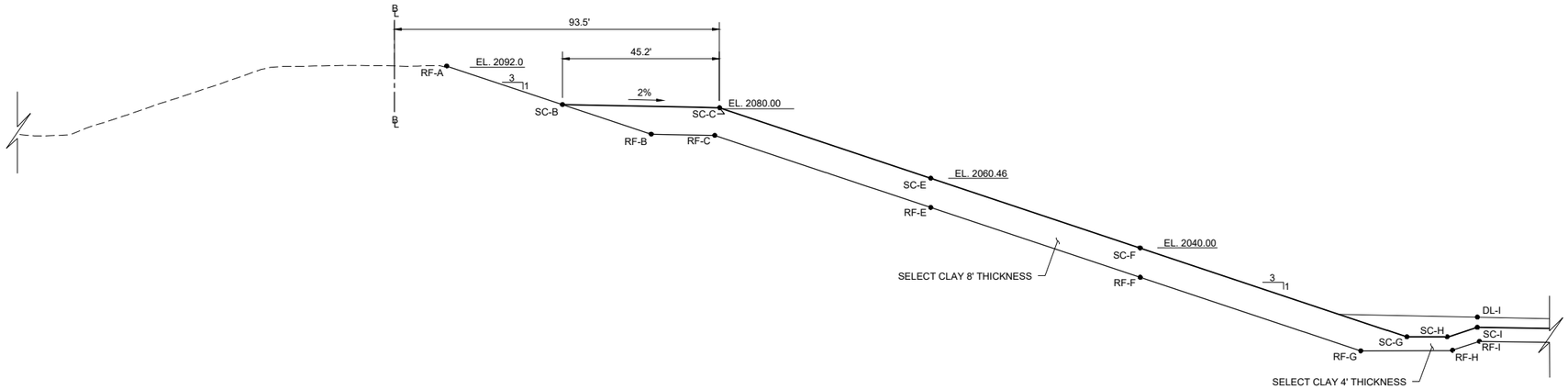


1 C-27 SECTION: PHASE 1B SOUTH SLOPE - GRADE VERIFICATION (TYP.)

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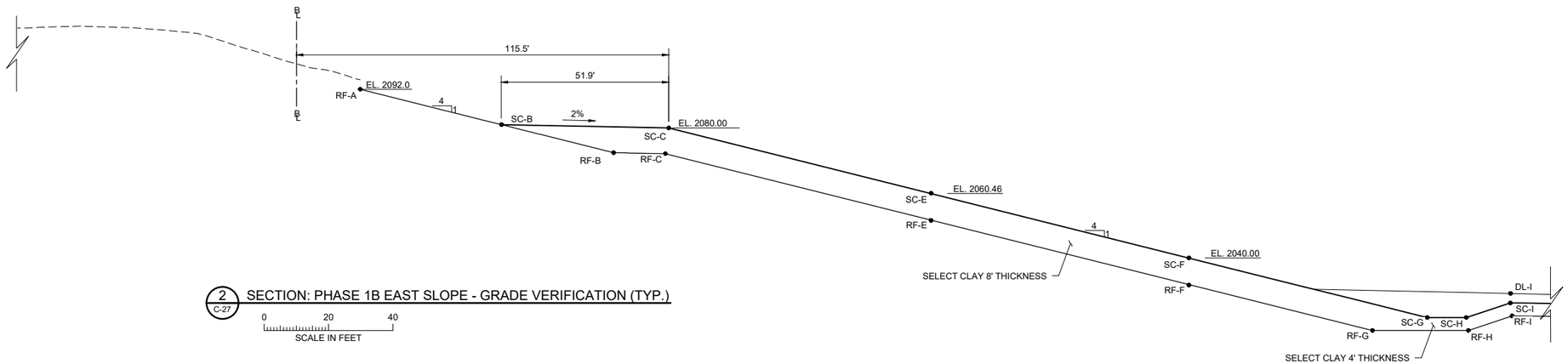


2 C-27 SECTION: PHASE 1B EAST SLOPE - GRADE VERIFICATION (TYP.)

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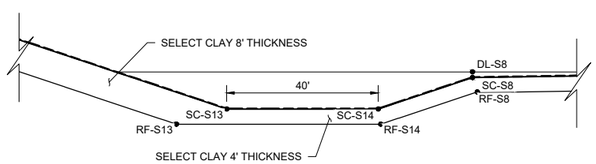


3 C-27 SECTION: PHASE 1B SUMP - GRADE VERIFICATION (TYP.)

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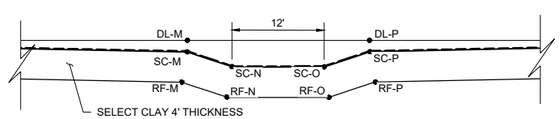


4 C-27 SECTION: PHASE 1B WEST BASE INTERIOR DRAINAGE DITCH - GRADE VERIFICATION (TYP.)

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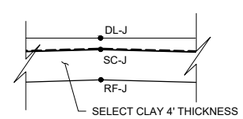


5 C-27 SECTION: PHASE 1B CELL 4 FLOOR - GRADE VERIFICATION (TYP.)

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## ABBREVIATIONS

| | |
|---|---|
| RF-A | RANDOM FILL POINT A |
| T-RF-A | TOP OF RANDOM FILL POINT A |
| SC-A | SELECT CLAY POINT A |
| DL-A | DRAINAGE LAYER POINT A |
| B L | BASELINE |

## REQUIRED MINIMUM VERTICAL SPACING BETWEEN VERIFICATION POINTS

SECTION - SOUTH SLOPE

SELECT CLAY:
- RF-B → SC-B = 8.51'
- RF-C → SC-C = 7.97'
- RF-E,F → SC-E,F = 8.43'
- RF-G,H,I → SC-G,H,I = 4.00'

DRAINAGE LAYER:
- SC-I → DL-I = 1.50'

SECTION - EAST SLOPE

SELECT CLAY:
- RF-B → SC-B = 8.70'
- RF-C → SC-C = 7.99'
- RF-E,F → SC-E,F = 8.43'
- RF-G,H,I → SC-G,H,I = 4.00'

DRAINAGE LAYER:
- SC-I → DL-I = 1.50'

SECTION - CELL SUMP

SELECT CLAY:
- RF-S# → SC-S# = 4.00'

DRAINAGE LAYER:
- SC-S8 → DL-S8 = 1.50"

SECTION - WEST BASE INTERIOR DRAINAGE DITCH

SELECT CLAY:
- RF-M,N,O,P → SC-M,N,O,P = 4.00'

DRAINAGE LAYER:
- SC-M,P → DL-M,P = 1.50'

SECTION - CELL FLOOR

SELECT CLAY:
- RF-J → SC-J = 4.01'

DRAINAGE LAYER:
- SC-J → DL-J = 1.50'

THIS DOCUMENT WAS ORIGINALLY ISSUED AND SEALED BY SETH W. HUECKMAN, REGISTRATION NUMBER PE-10057 ON JUNE 21, 2023 AND THE ORIGINAL DOCUMENT IS STORED AT BARR ENGINEERING COMPANY, MINNEAPOLIS, MN.

ISSUED FOR CONSTRUCTION
06/21/2023

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| CLIENT | | | | | | | |
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| DATE RELEASED | | | | | | | |

BARR
Corporate Headquarters: Minneapolis, Minnesota
Ph: 1-800-632-2277

Project Office:
BARR ENGINEERING CO.
4300 MARKETPOINTE DRIVE
Suite 200
MINNEAPOLIS, MN 55435
Ph: 1-800-632-2277
Fax: (952) 832-2601
www.barr.com

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|---|---|
| Scale | AS SHOWN |
| Date | 08/04/2022 |
| Drawn | RLB2 |
| Checked | BDP |
| Designed | JEK2 |
| Approved | SWH |

Minnkota Power COOPERATIVE
A Touchstone Energy® Cooperative

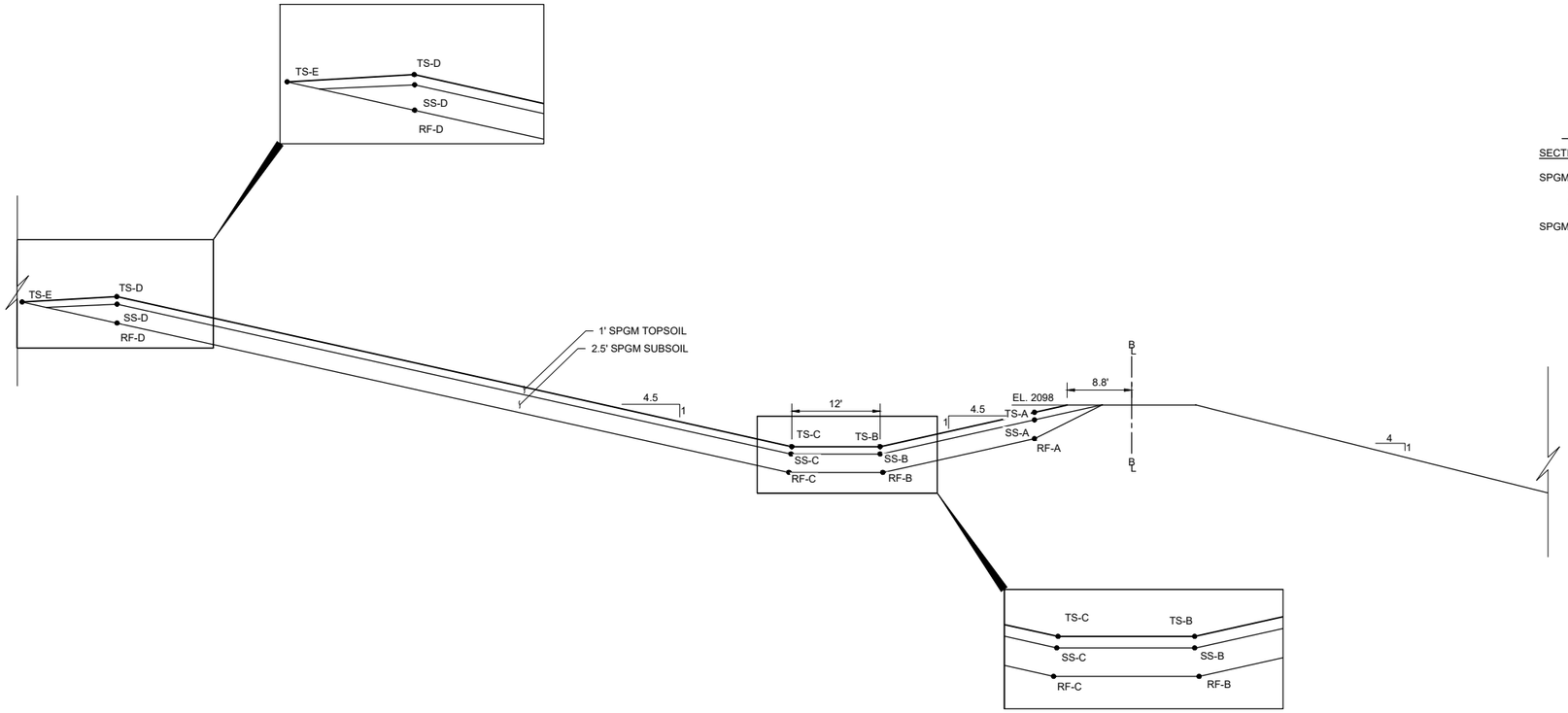
MINNKOTA FGD POND CELL 5 - PHASE 1B
CENTER, NORTH DAKOTA

SURVEY VERIFICATION SECTIONS

| | |
|---|---|
| BARR PROJECT No. | 34331014.59 |
| CLIENT PROJECT No. | |
| DWG. No. | C-30 |
| REV. No. | 0 |

## ABBREVIATIONS

| | |
|---|---|
| RF-A | RANDOM FILL POINT A |
| TS-A | TOPSOIL POINT A |
| SS-A | SUBSOIL POINT A |
| ℄ | BASELINE |




### REQUIRED MINIMUM VERTICAL SPACING BETWEEN VERIFICATION POINTS

SECTION - WEST EMBANKMENT FILL

SPGM TOPSOIL:
- SS-A,D → TS-A,D = 1.02'
- SS-B,C → TS-B,C = 1.00'

SPGM SUBSOIL:
- RF-A,D → SS-A,D = 2.56'
- RF-B,C → SS-B,C = 2.50'

1 / C-28 SECTION: PHASE 1B EAST EMBANKMENT - GRADE VERIFICATION (TYP.)

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THIS DOCUMENT WAS ORIGINALLY ISSUED AND SEALED BY SETH W. HUECKMAN, REGISTRATION NUMBER PE-10057 ON JUNE 21, 2023 AND THE ORIGINAL DOCUMENT IS STORED AT BARR ENGINEERING COMPANY, MINNEAPOLIS, MN.

ISSUED FOR CONSTRUCTION
06/21/2023

| NO. | BY | CHK. | APP. | DATE | REVISION DESCRIPTION |
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| DATE RELEASED | | | | | | | |


BARR
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Minneapolis, Minnesota
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| Scale | AS SHOWN |
| Date | 09/07/2022 |
| Drawn | JEK2 |
| Checked | BDP |
| Designed | JEK2 |
| Approved | SWH |

Minnkota Power COOPERATIVE
A Touchstone Energy® Cooperative

MINNKOTA FGD POND CELL 5 - PHASE 1B
CENTER, NORTH DAKOTA

SURVEY VERIFICATION
EMBANKMENT SECTION

| | |
|---|---|
| BARR PROJECT No. | 34331014.59 |
| CLIENT PROJECT No. | |
| DWG. No. | C-31 |
| REV. No. | 0 |


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# Appendix C

## Construction Specifications – Phase 1A

## Construction Specifications – Phase 1B

# Construction Specifications – Phase 1A

# Technical Specifications

## *Coal Combustion Waste Disposal Facility*
## *Cell 5 Phase 1A*

## *Milton R. Yong Station*
## *Center, North Dakota*

Prepared for
Minnkota Power Cooperative, Inc.

April 2022 (Rev 0)

4300 MarketPointe Drive, Suite 200
Minneapolis, MN 55435
952.832.2600
www.barr.com

# Technical Specifications for
# Cell 5 Phase 1A
# Coal Combustion Waste Disposal Facility

## Minnkota Power Cooperative, Inc.
## Milton R. Young Station
## Center, North Dakota

## Table of Contents


| Section | Title |
|---|---|
| **Division 01** | **General Requirements** |
| 01 11 00 | Summary of Work |
| 01 31 00 | Meetings |
| 01 33 00 | Submittals |
| 01 45 00 | Quality Control |
| 01 51 00 | Temporary Utilities |
| 01 56 00 | Temporary Controls |
| **Division 31** | **Earthwork** |
| 31 01 00 | Site Preparation and Restoration |
| 31 23 00 | Excavation, Backfilling, and Compacting |
| 31 23 19 | Dewatering and Diversion |
| **Division 32** | **Exterior Improvements** |
| 32 92 00 | Turf Establishment |

**SECTION 01 11 00**

**SUMMARY OF WORK**

## PART 1: GENERAL

1.01 SPECIFICATIONS

A. The format of these Specifications is based upon the CSI MASTERFORMAT, however differences in format and subject matter location do exist. These Specifications are written in imperative and streamlined form. This imperative language is directed to Contractor, unless specifically noted otherwise. It is solely Contractor's responsibility to thoroughly read and understand these Specifications and request written clarification of those portions which are unclear.

B. Division of the Work as made in these Specifications is for the purpose of specifying and describing work which is to be completed. There has been no attempt to make a classification according to trade or agreements which may exist between Contractor, Subcontractors, trade unions or other organizations. Such division and classification of the Work shall be solely Contractor's responsibility.

1.02 EXISTING SITE CONDITIONS AND USES

A. The Site is located south of the power plant and immediately south of and adjacent to Cell 1, Cell 2, Cell 3, and Cell 4 of the Coal Combustion Waste Disposal Facility.

B. Contractor shall enter the Site from the main gate on the east side of the plant or as otherwise directed by Owner.

C. Cell 2 and Cell 3 dry filling activities along with Cell 4 and its related piping systems are and will remain in service for waste disposal during the Work. Contractor shall perform work as not to impact the current operations of Cell 2, Cell 3, and Cell 4.

D. Groundwater monitoring wells are present at the Site and are sampled regularly. Contractor shall cooperate with others and allow samples from the wells to be taken as necessary.

E. Slope monitoring points are present on the south embankment of Cell 4 and will be surveyed regularly by Owner.

F. There are no potable water supplies or sanitary facilities at the Site. Owner will provide electrical service and connection to Contractor's office location as shown on the Drawings.

G. Cell 5 soil boring locations and cross sections are shown on the Drawings. Cell 5 soil boring logs and test data is available from Owner to Contractor upon request. Contractor shall have full responsibility for interpretation of the data.

H. Construction activities performed by Contractor are subject to the requirements of the mining permit issued to BNI Coal, Ltd. by the North Dakota Public Service Commission (PSC), and to the

requirements of the permit issued to Minnkota Power Cooperative, Inc. by the North Dakota Department of Environmental Quality (NDDEQ), which are described within these Specifications.

I. Mining and hazard training are required for Contractor's on-site personnel.

J. All contractors and subcontractors must adhere to the Energy Coalition for Contractor Safety (ECCS) guidelines.

1.03 WORK COVERED BY SPECIFICATIONS

A. The overall scope of the Work which is more fully described in these Specifications includes, but is not necessarily limited to, furnishing all labor, coordination, supervision, management, tools, equipment, and materials necessary to perform the Work described below:

1. Cell 5 excavation area Suitable Plant Growth Material (SPGM) stripping **(Work anticipated by others).**

a. Strip SPGM Topsoil from the area shown on the Drawings. Stockpile stripped SPGM Topsoil at the designated location shown on the Drawings.

b. Strip SPGM Subsoil from the area shown on the Drawings. Stockpile stripped SPGM Subsoil at the designated location shown on the Drawings.

c. Remove and stockpile field stone encountered during SPGM stripping.

2. Cell 5 subgrade excavation

a. Excavate all soil materials as shown on the Drawings.

b. Excavate Random Fill and place in perimeter embankment as shown on the Drawings.

c. Segregate, load, haul, and stockpile Sandstone in Cell 2.

d. Segregate, load, haul, and place waste coal and excess soil materials in Cell 2 and Cell 3 as directed by Owner.

e. Segregate, load, haul, and stockpile Select Clay as needed for future clay liner construction.

f. Segregate, load, haul, and stockpile Granular Random Fill as needed for future Phase 1B construction.

g. Segregate, load, haul, and stockpile Random Fill as needed for future Phase 1B construction.

h. Notify Owner that Hagel Lignite Bed has been prepared for removal (**Hagel Lignite Bed removal by others).**

i. Continue with Cell 5 subgrade excavation after Hagel Lignite Bed removal is complete.

3. Perimeter embankment construction

a. Place and compact Random Fill from excavations in location shown on the Drawings.

b. As directed by Owner, restore outer slope of embankments (SPGM Subsoil, SPGM Topsoil, and turf establishment).

4. South and East drainage ditch construction

a. Excavate drainage ditches as shown on the Drawings.

b. As directed by Owner, temporarily restore ditch grading (SPGM Subsoil and turf establishment).

5. As directed by Owner, installation and maintenance of stormwater erosion controls

a. Furnish and install silt fence.

b. Furnish and install erosion control blanket.

c. Furnish and install fiber rolls.

d. Furnish and install straw bales.

e. Install rock check dams.

6. Submit construction documentation as specified.

B. It is the intent of the Specifications to cover all aspects of the Project. Should there be some item or items not shown on the Drawings or not described in these Specifications which are required for the Work, those items and the furnishing of all labor, coordination, supervision, management, materials, and equipment shall be considered incidental to the Work and no additional compensation will be provided.

C. The Work includes the furnishing of all labor, coordination, supervision, management, equipment, tools, machinery, materials, and other items required for the construction of a complete project as specified and shown on the Drawings. Furnish equipment in safe operating condition and of adequate size, capacity, and condition for the performance of the Work. Obtain all measurements necessary for the Work and establish all dimensions, levels, and layout of the Work.

D. Contractor shall be solely responsible for the coordination of its activities with regard to the Project and the activities of Subcontractors and Owner.

1.04 WORK BY OWNER

A. Owner will provide bench mark and site coordinate information necessary for construction of the Work. Once provided, it is the Contractor's responsibility to protect the bench marks. Contractor shall request benchmark and site coordinate information from Owner a minimum of five days prior to the time when such information is needed.

B. Owner will provide electrical service and connection to Contractor's trailer at the location shown on the Drawings.

1.05 WORK BY OTHERS

A. Operation and maintenance of site perimeter sedimentation basins and diversions will be performed by BNI Coal Ltd.

B. Stripping of SPGM Topsoil and SPGM Subsoil anticipated to be performed by BNI Coal Ltd.

C. Hagel Lignite Bed removal will be performed by BNI Coal Ltd.

1.06 CONTRACTOR USE OF PREMISES

A. Definition of Site: The Site is defined as the area within the construction limits shown on the Drawings, plus a nearby material and equipment storage and staging area, the location of which will be designated by Owner. Limit operations, including material and equipment storage, to within those boundaries. Work or travel directly on SPGM Topsoil is prohibited.

B. Hours of Operation: Limited to the hours of 7:00 am to 7:00 pm (Central Time), Monday through Saturday, unless other arrangements are made with Owner.

C. Dewatering: Dispose of water produced by operating construction dewatering systems in location approved by Owner.

D. Protection and Repair of Existing Facilities and Utilities: Perform operations carefully and in such a manner as to protect existing facilities and utilities. Expose obstructions not shown on the Drawings without damage. Contractor shall be responsible for damage to existing facilities and utilities resulting from Contractor's operations, and shall repair or replace damaged items to Owner's satisfaction at no additional compensation. Protect groundwater monitoring wells during construction unless directed otherwise by Owner. Protect the survey monitoring points on the south embankment of Cell 4.

E. Unfavorable Construction Conditions: When unfavorable weather, soil, drainage, or other unsuitable construction conditions exist, Contractor shall confine operations to work which will not be adversely affected by such conditions. Do not construct any Work under conditions which would adversely affect the quality of the Work, unless special means or precautions are taken to perform the Work in a proper and satisfactory manner.

F. Survey Markers: Conduct operations so as to preserve bench marks, survey reference points, and stakes existing or established by Owner for the construction. Contractor will be charged the

expense of repairing or replacing survey markers and shall be responsible for mistakes or lost time resulting from damage or destruction of survey markers due to Contractor's operations.

**PART 2: PRODUCTS (NOT USED)**

**PART 3: EXECUTION (NOT USED)**

**END OF SECTION 01 11 00**

**SECTION 01 31 00**

**MEETINGS**

## PART 1: GENERAL

1.01 SUMMARY

A. Section includes required meetings.

1.02 PRECONSTRUCTION CONFERENCE

A. After Owner and Contractor have executed the Agreement, Owner will schedule a preconstruction conference at project site that shall be attended by Owner, Contractor, Engineer, Owner's On-site Representative, and others as appropriate. The meeting will be scheduled by Owner following formal agreement to Contract. The purpose of the meeting will be to ensure that all parties understand their responsibilities and the procedures that will be used to assure efficient completion of the Work.

B. Agenda items may include:

1. Distribution of Drawings and Specifications.
2. Designation of responsible personnel for all parties, lines of communication, and lines of authority.
3. Scope of work and the anticipated schedule of operations.
4. Critical work sequencing.
5. Submittal and field test reporting procedures.
6. Record documents and reporting.
7. Site safety and security procedures.
8. List of major subcontractors.
9. Procedures for processing change orders.
10. Use of premises including equipment and material storage.
11. Major equipment deliveries.
12. Housekeeping procedures.
13. Other items for consideration during construction activities.

1.03 PROGRESS MEETINGS

A. Weekly progress meetings will be scheduled by Owner's On-Site Representative at a regular time mutually agreeable to Owner, Contractor, and Owner's On-Site Representative. Contractor shall attend these meetings and shall coordinate and require the attendance of subcontractors whose work may be in progress at the time or whose presence may be required for any purpose. Scheduling of required attendees shall meet with the approval of Owner's On-Site Representative.

B. Following each meeting, Owner's On-Site Representative will prepare and distribute to Owner and Contractor copies of the minutes of the meeting. These will include a brief summary of the progress of the Work since the previous meeting.

C. The weekly meeting agenda will include:

1. Administrative/Purchasing issues.

2. Technical/Construction issues.

3. Design issues.

4. Schedule/Progress issues.

5. Construction site safety issues.

6. Review status of required submittals.

1.04 UNSCHEDULED MEETINGS

A. Contractor shall attend other unscheduled meetings which may be reasonably requested by Owner's On-Site Representative or Owner to discuss unanticipated changes in the Work or conditions at the Site and which must be resolved before progression of work.

**PART 2: PRODUCTS (NOT USED)**

**PART 3: EXECUTION (NOT USED)**

**END OF SECTION 01 31 00**

**SECTION 01 33 00**

**SUBMITTALS**

## PART 1: GENERAL

1.01 SUMMARY

A. Section includes submittal procedures.

1.02 GENERAL PROCEDURES

A. This Section stipulates the requirements for transmission of submittals from Contractor to Owner's On-Site Representative and actions taken by Owner's On-Site Representative regarding submittals.

B. Submittals shall be identified with the project name, name of submittal, and Specification Section for which the submittal is required.

C. Owner's On-Site Representative will accept submittals only from Contractor. Submittals from subcontractors, vendors, suppliers, or others will be returned without review or action.

D. Owner's On-Site Representative will accept only those submittals required by the Specifications. Unsolicited submittals will be returned without review or action.

E. All engineering data, regardless of origin, shall be stamped with the approval of Contractor. Contractor's stamp of approval will be a representation to Owner and Owner's On-Site Representative that Contractor has assumed full responsibility for determining and verifying all quantities, dimensions, field construction criteria, materials, catalog numbers, and similar data, and that he has reviewed or coordinated each submittal with the requirements of the Specifications.

F. All engineering data shall be identified by use of the nomenclature established by the Drawings and Specifications. Equipment drawings shall have the equipment name and number clearly displayed. Material drawings shall have the structure name and structure number (when applicable) clearly displayed.

1.03 CORRESPONDENCE

A. Correspondence forwarding engineering data shall be addressed to Owner and Owner's On-Site Representative as follows. Electronic submittals via email must be coordinated and approved by Owner prior to submission.

**To Owner:**
Minnkota Power Cooperative
Milton R. Young Station
3401 24th St. SW
Center, ND 58530
**Attention: Mr. Joe Grosz**

**To Owner's On-site Representative:**
Barr Engineering Co.
c/o Mr. Joe Grosz
Minnkota Power Cooperative
Milton R. Young Station
3401 24th St. SW
Center, ND 58530
**Attention: Mr. Seth Hueckman**

**To Owner:**
Minnkota Power Cooperative
5301 32nd Ave. S
Grand Forks, ND 58201
**Attention: Ms. Sadie Gilbraith**

B. Include a letter of transmittal with all submittals of engineering data and include a list of the data included in the transmittal. Lists shall include manufacturer's drawing numbers identified with the corresponding project equipment or structure nomenclature as applicable. The letter shall be identified by the project name.

1.04 PROGRESS SCHEDULE

A. Submit an estimated progress schedule and a finalized progress schedule in accordance with the requirements of the General Conditions.

B. Update the schedule on a weekly basis for presentation, discussion, and distribution at the weekly progress meeting.

1.05 SCHEDULE OF VALUES AND PROGRESS PAYMENT SCHEDULE

A. Submit a schedule of values for the Work. The schedule shall be broken out as follows for each Bid item on the Bid Form:

1. Item description

2. Unit of measure upon which the item is based

3. Contractor's estimated quantity (number of units upon which the total price for the item is based)

4. Total unit price, including materials, equipment, labor, coordination, supervision, management, overhead, and profit

5. Extension (total price for the item, calculated by multiplying the number of unit by the total unit price)

B. A schedule of anticipated progress payment requests shall accompany the schedule of values. The proposed progress payment schedule shall be based on monthly or target-percentage invoicing for Work completed, and shall be closely coordinated with the schedule of values.

Whenever the progress schedule is updated or revised, Contractor shall resubmit a revised schedule of anticipated progress payment requests. The payment schedule shall also be updated each time an actual payment request varies more than 10 percent from the schedule. The progress payment schedule shall take into consideration retainage as set forth in the Contract Documents.

C. The schedule of values and anticipated progress payment schedule shall be subject to review and approval by Owner. If, in the opinion of Owner, the schedules do not contain sufficient detail or appear to be unbalanced, the Owner may require Contractor to revise and resubmit the schedules and/or provide documentation to justify Contractor's distribution. Contractor shall correct such deficiencies and resubmit the schedules.

1.06 BONDS AND INSURANCE

A. Required Bonds and Certificates of Insurance shall be submitted to Owner with the executed copies of the Agreement.

1.07 REVIEW OF SUBMITTALS

A. Owner's On-Site Representative's review of engineering data will cover only general conformity of the data to the Specifications, external connections, and interfaces with equipment and materials furnished under separate specifications. Owner's On-Site Representative's review does not indicate a thorough review of all dimensions, quantities, and details of the equipment, material, device, or item indicated or the accuracy of the information or documentation submitted; nor shall review or approval by Owner's On-Site Representative be construed as relieving Contractor from any and all responsibility for errors or deviations from the requirements of Drawings and Specifications.

1.08 SUBMITTAL FOR INFORMATION OR DOCUMENTATION

A. Submit 2 copies to Owner's On-Site Representative and 2 copies to Owner.

B. Unless otherwise specified, submittal shall be made at least 1 day before the subject of the submittal is to be incorporated into the Work.

C. Submittal is for the purpose of formal verification that the subject of the submittal conforms to the requirements of the Specifications, for formal documentation of the Work, or both.

D. No action is required by Owner or Owner's On-Site Representative. Owner's On-Site Representative will generally notify Contractor if deficiencies are identified; however, Contractor is solely responsible for ensuring that the subject of the submittal conforms to the requirements of the Specifications.

1.09 SUBMITTAL FOR REVIEW

A. Submit 2 copies to Owner's On-Site Representative.

B. Unless otherwise specified, submittal shall be made at least 10 days before the subject of the submittal is to be incorporated into the Work. Owner's On-Site Representative will respond within 5 days from receipt of submittal.

C. Submittal is for the purpose of providing opportunity to Owner's On-Site Representative for review and comment on the subject of the submittal.

D. Owner's On-Site Representative will respond to the submittal either with a list of comments or indicating no comments.

E. If Owner's On-Site Representative's comments indicate a deficiency with respect to the requirement of the Specifications, Contractor shall amend the submittal and resubmit. Owner's On-Site Representative will again respond to the resubmittal.

F. If Owner's On-Site Representative's comments are in regards to an issue which is based upon the Contractor's discretion, Contractor shall furnish additional information, provide justification, and otherwise cooperate in addressing and resolving Owner's On-Site Representative's comments.

G. Contractor shall remain solely responsible for ensuring that the subject of the submittal conforms to the requirements of the Specifications.

1.10 RECORD DOCUMENTS

A. Submit record documents prior to Substantial Completion.

B. Record documents shall accurately reflect the as-constructed condition.

1.11 WARRANTY AND GUARANTEE CERTIFICATES

A. Submit warranty and guarantee certificates prior to Substantial Completion.

B. Warrantee and guarantee certificates shall be signed by Contractor, Installer, Manufacturer, and others as required by the Specifications.

**PART 2: PRODUCTS (NOT USED)**

**PART 3: EXECUTION (NOT USED)**

**END OF SECTION 01 33 00**

**SECTION 01 45 00**

**QUALITY CONTROL**

## PART 1: GENERAL

1.01 FIELD QUALITY CONTROL

A. Contractor shall be responsible for completion of construction quality control for the Work as described below.

B. Contractor shall retain an independent registered land surveyor licensed in the State of North Dakota for performing quality control on line and grade of the Work. The quality control certification survey data shall be available for review at all times by Owner or Owner's On-Site Representative.

C. Contractor shall retain an independent registered land surveyor licensed in the State of North Dakota for performing site progress topographic surveys that will be used to compute earthwork pay quantities.

D. Contractor shall retain an independent soil testing firm for performing compaction testing for Random Fill subgrade and embankment construction. The quality control compaction testing data shall be available for review at all times by Owner or Owner's On-Site Representative.

E. Owner will perform material verification testing for Random Fill (if deemed necessary) and Select Clay stockpiled during Phase 1A construction. Contractor shall coordinate and allow for project work access by Owner for proper testing.

1.02 REFERENCES

A. The following are complete titles of references cited in this Section. The date of the standard is that in effect as of the certification date.

1. American Society for Testing Materials (ASTM)

a. ASTM D698, Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft$^3$ (600 kN-m/m$^3$)) (referred to as "Standard Proctor Maximum Dry Density")

b. ASTM D3017, Standard Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth)

c. ASTM D6938, Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depths)

1.03 SUBMITTALS

A. Submit for information survey data on a daily basis for each day that survey work is performed.

B. Submit for documentation a tabulation of all results of survey work performed. This submittal shall be made prior to substantial completion. The tabulation shall be signed by the registered land surveyor. The tabulation shall contain the following information for each survey location:

1. A unique identification number

2. Coordinates

3. Elevation of the finished surface of each material (e.g. top of Random Fill)

4. Thickness of each material.

C. Contractor shall submit Survey Record Drawings containing the unique identification numbers and material thicknesses for each survey point. The drawings shall use a scale of 1 inch = 100 feet or as legible on 11-inch by 17-inch drawings and shall be submitted in reproducible paper and electronic (AutoCAD) format. The drawings shall be prepared and the reproducible paper plot certified by the independent registered land surveyor who performed the survey verifications during construction.

D. Contractor shall submit Site Progress Survey Drawings showing 1-foot interval contours of the site topographic survey data. The drawings shall be submitted in pdf and AutoCAD Civil3D 2020 format. Topographic surface files shall also be submitted in LandXML format. The drawings shall be certified by the independent registered land surveyor who performed the site progress topographic surveys.

E. Submit for documentation the results of all soil compaction testing performed. Test results shall be submitted on a daily basis for each day that compaction testing is performed. Test results shall also be compiled in a report-format and submitted prior to substantial completion of Work.

1.04 VERIFICATION REQUIREMENTS

A. Contractor's independent registered land surveyor shall verify that elevations, grades, slopes, and material thickness constructed by Contractor are within the tolerances specified in Section 31 23 00, Excavation, Backfilling, and Compacting. Surveying results will be used by Owner to demonstrate compliance with the North Dakota Department of Environmental Quality (NDDEQ) permit requirements. Material thickness shall be determined from the elevation difference between shots taken at the same coordinate location. On slopes, the surveyed vertical thickness shall be adjusted by calculating the thickness perpendicular to the slope for presentation in the submittals. The surveying work shall include determining elevations at specific locations on a matrix of survey points as described below.

1. Embankment: For elevation, grade, and material thickness verification, survey shots shall be taken on the top of Random Fill, top of SPGM Subsoil, and top of SPGM Topsoil. The Embankments shall be surveyed at 100-foot intervals along the embankment alignment.

2. Subgrade: For elevation, and grade verification, survey shots shall be taken on the subgrade surface at 100-foot intervals along the embankment alignment.

B. Contractor's independent soil testing firm shall verify that soil compaction during embankment construction is in conformance with the Specifications. Compaction test results will be used by Owner to demonstrate compliance with NDDEQ permit requirements. Tests shall be performed at random locations such that the test results may be considered representative of the entire embankment construction. Testing shall be performed at specific locations determined by Owner's On-Site Representative if requested. Such tests will be used to fulfill the testing frequency requirements specified below. Testing shall be performed in accordance with the following schedule:

1. Soil Density In Place (ASTM D6938): 1 test per 2,000 CY

2. Moisture Content (ASTM D3017): 1 test per 2,000 CY

3. Standard Proctor (ASTM D698): 1 test (3-point) per 50,000 CY of each soil type, or as determined by the Owner's On-Site Representative

1.05 SITE PROGRESS TOPOGRAPHIC SURVEYS

A. Contractor's independent registered land surveyor shall perform site topographic surveys of Cell 2, Cell 3, Cell 4, and Cell 5 including soil stockpile area(s) after each of the following construction milestones:

1. Completion of SPGM Topsoil and SPGM Subsoil stripping

2. Completion of excavation down to hagel bed

3. Completion of hagel bed removal

4. Completion of Phase 1A excavation/construction (final as-built)

B. Sufficient data shall be obtained to support a true accuracy level for 1.0-foot interval contours.

1.06 PRESENTATION OF QUALITY CONTROL DATA

A. All Contractor's independent registered land surveyor certification survey data shall be summarized and submitted to Owner or Owner's On-Site Representative on a daily basis that survey data is collected. Failure to submit data on a daily basis shall be cause for Owner to suspend Contractor's operations until submittals are made current. Contractor shall not be entitled to additional compensation for any suspension of operations ordered by Owner due to Contractor's failure to submit data on a daily basis.

B. All Contractor's independent registered land surveyor certification survey data shall be summarized in a tabular format listing each survey point by unique identification number, coordinate, elevation, difference from previous elevation (material thickness), and required material thickness as appropriate. Survey data shall also be presented in plan views showing each survey point by the unique identification number and elevation. Required material

thickness is measured perpendicular to the slope. Material thickness based upon survey shots at the same coordinate location shall be corrected to the perpendicular-to-slope thickness.

C. Compaction test data shall be summarized in a tabular format listing each compaction test by unique identification number, station and offset location, elevation (within 0.5 foot vertical of actual location), reference proctor, in-place moisture content, dry density, and percent compaction.

1.07 OWNER'S CONSTRUCTION QUALITY ASSURANCE PROGRAM

A. For purposes of verifying compliance with the Specifications and for documenting construction, Owner or Owner's On-Site Representative will be conducting a Construction Quality Assurance (CQA) program during construction. Contractor shall coordinate with and provide access to work areas for Owner's On-Site Representative and Owner's independent testing firms for sampling and/or testing.

B. Work failing to meet specifications shall be repaired at Contractor's expense. Owner will perform additional testing after repairs are completed. The expense of retesting will be charged to Contractor. Contractor may ask to review results of Owner's CQA program during construction.

C. Owner's CQA program will consist of collecting random samples and performing tests on materials placed by Contractor in the embankment and stockpiles. Results of testing will be used to verify that Random Fill and Select Clay materials comply with the Specifications. Test results will be used to demonstrate compliance with NDDEQ permit requirements. Testing work is listed below:

1. Material property tests for Random Fill include Standard Proctor maximum dry density.

2. Material property tests for the Select Clay include sieve and hydrometer analysis, Atterberg Limits, saturated hydraulic conductivity, and Standard Proctor maximum dry density.

**PART 2: PRODUCTS (NOT USED)**

**PART 3: EXECUTION (NOT USED)**

**END OF SECTION 01 45 00**

**SECTION 01 51 00**

**TEMPORARY UTILITIES**

## PART 1: GENERAL

1.01 SUMMARY

A. Section includes temporary utilities.

1.02 TEMPORARY UTILITIES

A. Water:

1. Potable water is not available at the Site. Make all arrangements necessary to provide water for potable consumption. Water used for construction purposes need not be potable but must meet all applicable North Dakota Department of Environmental Quality (NDDEQ) surface water quality criteria. Non-potable water from Nelson Lake or BNI Coal, Ltd.'s west sedimentation ponds is available for construction use. Contractor to coordinate with and receive permission from Owner prior to using water from Nelson Lake.

B. Sanitary Facilities:

1. Provide sanitary facilities for use by Contractor's employees, subcontractors, suppliers, Owner's On-Site Representative, Owner and all other persons to be working on the Site. Sanitary facilities shall, as a minimum, comply with the requirements of applicable Laws and Regulations for temporary sanitary facilities and shall be emptied and sanitized frequently, and shall at all times be maintained in a clean and useable condition. Sanitary facilities shall be maintained until Substantial Completion unless earlier removal is approved by Owner or Owner's On-Site Representative.

C. Electricity:

1. Furnish such portable electric power generators as Contractor considers necessary for construction of the Work. Should Contractor need electric power service for Contractor's purposes, it shall be Contractor's responsibility to arrange for and pay for such service. Owner will provide access to electric service connection at the location of Contractor's office location, and provide electric service to the Office Trailer furnished for Owner's On-Site Representative's use.

D. Telephone and Fax:

1. Phone service is not readily available at Contractor's trailer location shown on the Drawings. Cellular phone service has previously been used at elevated locations around the Site, including in the vicinity of Contractor's trailer location, but may not be

continuous throughout the entire Site. Make arrangements as necessary for phone and fax service for Contractor's use during the project.

E. Fire Protection:

1. Make all arrangements necessary to assure that the Site and the Work have adequate fire protection services throughout the duration of the Work. Any special fees or charges imposed by the City or other organization to provide such services shall be paid by Contractor.

1.03 OFFICE TRAILER

A. Furnish office trailer space for use by Owner and Owner's On-Site Representative in location approved by Owner. The space shall have a minimum of 120 square feet of floor area, be equipped with a desk, a table, and three chairs. The space shall be furnished with electrical service, operable lighting, heat, and air conditioning. This office space may be located in a trailer with other facilities but must be accessible to Owner and Owner's On-Site Representative at all times and must be secured by a separation wall and lockable door. Owner will provide 240 volt, 110 AMP service to the trailer and will make and disconnect electrical service as requested by Contractor.

**PART 2: PRODUCTS (NOT USED)**

**PART 3: EXECUTION (NOT USED)**

**END OF SECTION 01 51 00**

**SECTION 01 56 00**

**TEMPORARY CONTROLS**

## PART 1: GENERAL

1.01 SUMMARY

A. Section includes:

1. Controlling dust generation on access roads to the Site and within construction limits.

2. Controlling soil erosion and sediment transport at the Site.

## PART 2: PRODUCTS

2.01 MATERIALS

A. Water used for dust control may be obtained from Nelson Lake at a location approved by Owner or BNI Coal, Ltd.'s west sedimentation ponds.

B. Acceptable temporary erosion control devices include, but are not necessarily limited to, silt fence, straw and hay bales, rock check dams, geotextiles, erosion control blanket, and vegetative cover. Field Stone and Sandstone may be reused for rock check dam construction if approved by Owner.

2.02 EQUIPMENT

A. Water tank trucks equipped with water cannon capable of delivering water through either front or rear-mounted nozzles. Tank trucks shall be of sufficient size and mobility and carry a sufficient quantity of water to control dust generated by Contractor's activities.

## PART 3: EXECUTION

3.01 DUST CONTROL WATERING

A. Apply water to roads used by Contractor's equipment as directed by Owner or Owner's On-Site Representative to control dust generated by wind or by Contractor's vehicle traffic.

B. Apply water to ground surfaces within the construction limits as directed by Owner or Owner's On-Site Representative to control dust generated by Contractor's activities at the Site.

3.02 EROSION CONTROL

A. Install erosion control devices and materials at locations as directed by Owner or Owner's On-Site Representative where soil erosion at the Site may occur due to Contractor's activities.

B. Install temporary erosion control devices during the progress of the work and maintain them until permanent erosion control (turf establishment, aggregate surfacing, etc.) has been established.

**END OF SECTION 01 56 00**

**SECTION 31 01 00**

**SITE PREPARATION AND RESTORATION**

## PART 1: GENERAL

1.01 SUMMARY

A. Section includes:

1. Stripping, stockpiling, and placing SPGM Topsoil.

2. Stripping, stockpiling, and placing SPGM Subsoil.

3. Where applicable, coordinating with and receiving approval of SPGM stripping operations through BNI Coal Ltd. and Owner's On-Site Representative.

B. Stripping and stockpiling of SPGM Topsoil and SPGM Subsoil anticipated to be performed by BNI Coal Ltd. Contractor may be required to strip and stockpile SPGM Topsoil and SPGM Subsoil if not fully performed by BNI Coal Ltd.

C. Contractor

1.02 DEFINITIONS

A. SPGM: Suitable Plant Growth Material. SPGM is a resource of the State of North Dakota. Stripping, stockpiling, and restoration of SPGM at the Site, within the limits of the mining permit boundary, are governed by the requirements of the mining permit for the Site issued to BNI Coal, Ltd. by the North Dakota Public Service Commission (PSC).

B. SPGM Topsoil: The uppermost (first lift) soil horizon at the Site.

C. SPGM Subsoil: The second lift of soil at the Site, the lower limit of which is defined by the depth shown on the Drawings or the depth at which the buff-colored SPGM Subsoil changes to the underlying gray-colored soil horizon.

D. SPGM Monument: An undisturbed pillar of soil left in place at designated locations to demonstrate depth of removal of surrounding soil.

E. Topsoil: The uppermost soil horizon at the portions of the site noted on the Drawings, which is not governed by the mining permit. Topsoil is approximately 12-inches in thickness.

F. Prime Farmland: Land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and that is available for these uses. Some portions of Cell 4 and Cell 5 lie within designated areas defined as Prime Farmland as shown on the Drawings. SPGM Topsoil and SPGM Subsoil materials located within the Prime Farmland limits must be segregated and stockpiled in their own individual stockpiles as shown on the Drawings.

G. Field Stone: Prairie rock located in the SPGM layers that is greater than 6 inches in size.

1.03 SUBMITTALS

A. Submittals required under this Section require approval from the North Dakota Public Service Commission (PSC). The PSC has issued a mining permit to BNI Coal, Ltd., for mining and associated activities at the Site. SPGM stripping, stockpiling, and replacement activities to be performed by Contractor are subject to the requirements of the mining permit.

B. Coordinate with Owner and Owner's On-Site Representative to receive the required SPGM stripping approvals. Contractor will notify Owner and Owner's On-site Representative when SPGM Topsoil and SPGM Subsoil stripping is complete in a portion or all of the area. SPGM Monuments will be measured jointly by Contractor, Owner's On-site Representative, and BNI Coal, Ltd.

C. Submit for documentation written approval of BNI Coal, Ltd. and Owner's On-site Representative of SPGM Topsoil and SPGM Subsoil stripping before removing SPGM monuments and before excavating below the SPGM stripped area. BNI Coal, Ltd.'s approval shall be given after it receives approval from PSC.

**PART 2: PRODUCTS (NOT USED)**

**PART 3: EXECUTION**

3.01 GENERAL

A. SPGM operations, including stripping, stockpiling, maintaining stockpiles, and restoration shall comply with the requirements of the mining permit held by BNI Coal, Ltd., which are generally reiterated below.

B. The stripping limits included in this Work shall be staked on an approximate 100-foot by 200-foot grid to show the recommended SPGM removal depth. The grid and recommended SPGM removal depths within the SPGM stripping limits are shown on the Drawings.

C. SPGM Monuments shall be left in place at every grid intersection point as shown on the Drawings. SPGM Monuments shall be left in place until PSC approval is received. Excavation below the SPGM-stripped area shall not commence until PSC approval is received. Contractor will remove existing monuments if not completed by BNI Coal Ltd.

D. Stripped SPGM Topsoil and SPGM Subsoil shall be placed in the designated stockpile locations shown on the Drawings.

E. Stripped SPGM Topsoil and SPGM Subsoil located within the Prime Farmland limits shall be placed in the designated stockpile locations shown on the Drawings.

F. SPGM Topsoil and SPGM Subsoils removed from the Prime Farmland limits shall be stockpiled and not used in slope restoration.

G. Field Stone encountered while stripping the SPGM layers shall be removed and placed in the designated stockpile location in Cell 2. Field Stone may be reused for rock check dam construction if approved by Owner.

H. Institute and maintain, as directed by Owner, adequate dust control measures such as watering, for all its work areas, haul routes, and parking areas.

3.02 SPGM TOPSOIL STRIPPING

A. Strip SPGM Topsoil to the depth shown on the Drawings or to the depth where SPGM Subsoil is present, whichever occurs first. Contractor shall not over excavate SPGM Topsoil or mix SPGM Topsoil with other soil horizons.

B. Leave SPGM Topsoil in place at each grid stake to form a SPGM Monument which shows the removal depth.

C. Maintain the soil monuments in place until SPGM Subsoil stripping is complete and PSC approval of SPGM stripping operations is received.

3.03 SPGM TOPSOIL STOCKPILING

A. Stockpile SPGM Topsoil in SPGM Topsoil stockpile location shown on the Drawings.

B. Maintain stockpile slopes to meet current MSHA standards. Construct stockpiles to slopes no steeper than 3 horizontal to 1 vertical.

3.04 SPGM SUBSOIL STRIPPING

A. Strip SPGM Subsoil to the depth shown on the Drawings or to the depth where the buff-colored SPGM Subsoil changes to a gray-colored soil horizon, whichever occurs first. Contractor shall not over excavate SPGM Subsoil or mix SPGM Subsoil with other soil horizons.

B. Leave SPGM Subsoil in place at each grid stake to form a SPGM Monument which shows the removal depth.

C. Maintain the soil monuments in place until PSC approval of SPGM stripping operations is received.

D. After PSC approval, excavate soil monuments (Topsoil and Subsoil together) and either stockpile with other SPGM Subsoil or replace as SPGM Subsoil restoration on approved surfaces.

3.05 SPGM SUBSOIL STOCKPILING

A. Stockpile SPGM Subsoil in SPGM Subsoil stockpile location shown on the Drawings.

B. Maintain stockpile slopes to meet current MSHA standards. Construct stockpiles to slopes no steeper than 3 horizontal to 1 vertical.

3.06 SUBGRADE REPAIR

A. In areas where slope restoration or clay liner is to be constructed, Contractor shall repair the subgrade that has been eroded or weathered.

B. Repair includes excavating to subgrade in areas where excess soil has been deposited by wind or surface water; filling and re-compacting to subgrade in areas where wind or surface water has eroded the subgrade; and re-establishing the subgrade to the lines and grades shown on the Drawings. In areas where clay liner is to be constructed, Random Fill shall be used as fill to repair the subgrade.

C. Subgrade shall be verified to the tolerances given in Section 31 23 00, Excavation, Backfilling, and Compacting, by Contractor's registered land surveyor in accordance with Section 01 45 00, Quality Control.

3.07 SPGM SUBSOIL PLACEMENT

A. Prepare the external embankment face for restoration as shown on the Drawings.

B. Place SPGM Subsoil to a uniform 30-inch thickness or other thickness shown on the Drawings. Place SPGM Subsoil in lifts of no more than 12 inches. Minimize compaction of SPGM Subsoil during placement.

C. Prime Farmland SPGM Subsoil materials shall not be used for slope restoration.

3.08 SPGM TOPSOIL PLACEMENT

A. Place SPGM Topsoil, from stockpile, to a uniform 12-inch thickness in a single lift. Minimize compaction of SPGM Topsoil during placement.

B. Place SPGM Topsoil in the locations and thickness shown on the Drawings or as specified for restoration.

C. Prime Farmland SPGM Topsoil materials shall not be used for slope restoration.

3.09 EROSION CONTROL

A. As directed by Owner, install and maintain heavy silt fence at the toe of slope of the embankments prior to construction of the embankment slope. Inspect and maintain silt fence after SPGM Topsoil has been placed until final stabilization is achieved.

B. Establish turf on the finished SPGM Topsoil surface as quickly as practicable. Maintain erosion controls until an effective vegetative cover has been established.

C. Establish turf as quickly as practicable on SPGM stockpile areas which will remain inactive for 30 days or longer.

D. Provide and maintain appropriate erosion control measures throughout construction.

3.10 TOLERANCES

A. Construct the restoration work within the dimensional tolerances given below. Thickness tolerances are acceptable deviations from the thickness given above provided that the average thickness meets the thickness given above. No compensation will be made for additional work on materials required by Contractor as a result of construction beyond specified limits, elevations, thickness, or grades.

B. Thickness Tolerances:

1. SPGM Subsoil Restoration: +/-0.2 foot

2. SPGM Topsoil Restoration: +/-0.1 foot

**END OF SECTION 31 01 00**

**SECTION 31 23 00**

**EXCAVATION, BACKFILLING, AND COMPACTING**

## PART 1: GENERAL

1.01 SUMMARY

A. Section includes:

1. General site grading requirements.

2. Excavating, segregating, loading, hauling, and placing or stockpiling native soils (Select Clay, Granular Random Fill, Random Fill, and Sandstone) from Cell 5 excavation.

3. Placing and compacting Random Fill for embankment construction.

4. Alignment, elevation, and material thickness tolerances.

1.02 REFERENCES

A. The following are complete titles of references cited in this Section. The date of the standard is that in effect as of the certification date.

1. American Society for Testing Materials (ASTM)

a. ASTM D698, Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft$^3$ (600 kN-m/m$^3$)) (referred to as "Standard Proctor Maximum Dry Density")

b. ASTM D6938, Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depths)

2. Mine Safety and Health Administration (MSHA)

3. Occupational Safety and Health Standards-Excavations (OSHA)

a. OSHA set forth in 29 CFR 1926, Subpart P.

4. Energy Coalition for Contractor Safety (ECCS)

1.03 SUBMITTALS

A. Submit soil testing and survey data as specified in Section 01 45 00, Quality Control.

1.04 SEQUENCING AND SCHEDULING

A. Owner will be evaluating results of the independent registered land surveyor's grade, slope, and material thickness verifications, collecting material samples, and conducting field testing of materials throughout the duration of the Project, as described in Section 01 45 00, Quality Control of these Specifications. Do not proceed with subsequent operations until Owner or Owner's On-Site Representative has been notified, has been given opportunity to test or review Contractor's test data, and has informed Contractor of any test results that have been gathered.

B. The required completion date for the Work as described in these Contract Documents is specified elsewhere in these Contract Documents.

1.05 JOB CONDITIONS

A. It shall be solely Contractor's responsibility to review available tests and reports, conduct additional tests, and otherwise determine to its own satisfaction the location and nature of all surface and subsurface features and the soil and water conditions that may be encountered. Owner's information on site conditions may be reviewed at Owner's offices as scheduled with Owner.

B. Use of explosives will not be permitted.

C. Contractor shall be solely responsible for determining the means and methods for meeting the excavation and compaction requirements unless otherwise specified herein, except that compaction by flooding or puddling or other means that involve saturation or over-wetting the soil will not be permitted.

D. Provide all shoring, bracing, sheet piling, trench boxes, tie backs, and other measures required to perform all Work in accordance with Laws and Regulations. Specifically, all excavations shall conform to the requirements of OSHA set forth in 29 CFR 1926, Subpart P (Occupational Safety and Health Standards-Excavations).

E. Contractor shall adhere to ECCS guidelines.

## PART 2: PRODUCTS

2.01 MATERIALS

A. Select Clay

1. Inorganic native soils excavated, segregated, and processed by Contractor during the performance of the Work. Select Clay shall meet the following requirements:

a. Classified as CL, CH, or CL/CH by the Unified Soil Classification System. Some SC/CL soils may be acceptable if hydraulic conductivity criterion is met.

b. Hydraulic Conductivity: Maximum of $1x10^{-7}$ cm/s, when compacted to 95 percent Standard Proctor maximum dry density at a moisture content over optimum.

c. Maximum particle size: 3/4 inch (gravel); soil clods shall be pulverized prior to placement and compaction.

2. Select Clay may require pulverizing, screening, moisture conditioning, and reworking in order to meet the requirements of the specifications. Such operations shall be conducted as part of the performance of the Work.

B. Granular Random Fill

1. Inorganic native soils excavated and segregated by Contractor during the performance of the Work. Granular Random Soil shall be soil which:

2. Does not meet the requirements for Select Clay.

3. Classified as SP, SM, or SP-SM by the Unified Soil Classification System.

4. Will tend to be relatively free-draining when placed and compacted.

C. Random Fill

1. Inorganic native soils excavated and segregated by Contractor during the performance of the Work which do not meet the requirements for Select Clay and which has a 6-inch or less maximum particle size.

D. Sandstone

1. Naturally cemented soil present in the excavation area that is greater than 6 inches in size. Sandstone is naturally cemented soil, which cannot be excavated using scrapers and/or backhoes, but must be fractured by rock breaking equipment such as hydraulic hammers. Naturally cemented soil of this nature has been slabbed and broken for removal with the use of track hoe mounted hydraulic hammers during previous Cell 1, Cell 2, Cell 3, and Cell 4 excavation work.

## PART 3: EXECUTION

3.01 GENERAL

A. Locate and protect overhead and underground utilities.

B. Construct excavations in accordance with applicable Laws and Regulations.

C. Provide temporary controls such as diversions and dewatering equipment to prevent surface runoff from entering excavations and to remove ponded water from excavations. Maintain excavations in a dry and stable condition at all times.

3.02 CELL 5 EXCAVATION

A. Excavate native soil to the elevations, slopes, and dimensions shown on the Drawings.

B. Segregate Random Fill materials as they are excavated and use in embankment construction.

C. Segregate and stockpile Sandstone.

D. Segregate and stockpile waste coal material.

E. Segregate and stockpile Select Clay for future use in clay liner construction.

F. Segregate and stockpile Granular Random Fill as it is excavated for use in future gradient control system construction.

3.03 SANDSTONE STOCKPILE

A. Coordinate stockpile location in Cell 2 with Owner.

B. Maintain stable stockpile slopes.

3.04 SELECT CLAY STOCKPILE

A. Coordinate stockpile location in Cell 6 footprint with Owner.

B. Maintain stockpile slopes to meet current MSHA standards.

C. Place Select Clay within the stockpile in a maximum 3-foot daily lift thickness so that Owner or Owner's On-Site Representative has the opportunity to observe and sample stockpiled Select Clay. Contractor shall be responsible to remove any material not meeting the requirements of Select Clay. Add water and process the stockpiled Select Clay material to achieve specified moisture content.

D. Install erosion control devices around the stockpile as necessary to minimize erosion.

E. This section does not apply to temporary stockpiles, located within the limits of Cell 5, of Select Clay that the Contractor might utilize during the Work.

3.05 GRANULAR RANDOM FILL STOCKPILE

A. Coordinate stockpile location with Owner.

B. Maintain stable stockpile slopes.

3.06 EMBANKMENT CONSTRUCTION

A. Construct the Cell 5 embankments using Random Fill to the lines and grades shown on the Drawings.

B. Soil material classified as Select Clay shall not be used for construction of the embankment unless directed otherwise by Owner. Soil in the embankment which is found to be classified as Select Clay shall be removed at Contractor's expense.

C. Excavate, load, haul and place Random Fill in maximum 12-inch loose lifts. Moisture content at time of material placement and compaction shall be at or above the lower moisture content at which the Standard Proctor (ASTM D698) moisture-density analysis curve exceeds 95 percent of Standard Proctor maximum dry density. Compact each lift to at least 95 percent Standard Proctor maximum dry density (ASTM D6938).

D. Place Random Fill where required to dress the existing subgrade for clay liner construction. Lifts shall be constructed in a generally horizontal orientation. Compact each lift to at least 95 percent Standard Proctor maximum dry density (ASTM D6938) before proceeding to the next lift.

E. Do not incorporate snow, ice, or frozen earth in embankments.

F. Do not place Random Fill on surfaces that are frozen, muddy, or contain ice or frost, including layers of previously placed and compacted Random Fill which become the foundations for successive layers of fill.

G. All Random Fill that freezes or has been subjected to freeze-thaw action during the construction work, or during periods of temporary shutdowns, such as, but not limited to, nights, holidays, weekends, or winter shutdowns of earthwork operations shall be removed to an acceptable depth and replaced.

## 3.07 SITE GRADING

A. Grade intermediate slopes to minimize erosion potential. Maintain temporary erosion controls as necessary to minimize erosion.

B. Smooth-grade finished ground on exterior slopes of berms, along access roads, and other areas disturbed by Contractor's activities, to uniform levels or slopes between points where elevations are shown, or between such points and existing ground.

C. Construct ditches and/or drainage swales to control run-on onto and run-off from SPGM soils and within the Construction Limits as directed by Owner.

## 3.08 ACCESS ROAD AND RAMP CONSTRUCTION

A. Coordinate with Owner and determine location of temporary access roads and ramps into the Cell 5 construction area.

B. Crown or slope access roads and ramps to promote surface water runoff.

## 3.09 TOLERANCES

A. Construct the excavation and backfill work within the dimensional tolerances given below. Alignment, elevation and thickness tolerances are acceptable deviations from the elevations and material thicknesses shown on the Drawings. No compensation will be made for additional work on materials required by Contractor as a result of construction beyond specified elevations, thicknesses, or grades.

B. Alignment Tolerances (subgrade and embankment)

1. Embankment Centerline: +/- 0.2 foot.

2. Top of Slope:

   a. Interior slope: +/- 1.0 foot.

   b. Exterior slope: +/- 1.0 foot at any location, +/- 0.5 foot average.

3. Toe of Slope:

   a. Interior slope: +/- 1.0 foot.

   b. Exterior slope: +/- 2 foot at any location, +/- 0.5 foot average.

4. Elevation Tolerances (subgrade and embankment):

   a. Top of Embankment: + 0.2 foot, -0.0 foot.

   b. Interior Surface: +/- 0.1 foot.

   c. Exterior Surface: +/- 0.5 foot at any location, +/- 0.2 foot average.

5. Elevation Tolerances (Select Clay):

   a. Excavation/Select Clay Subgrade: +0.0 foot, -0.5 foot.

   b. Random Fill/Select Clay Subgrade: +0.0 foot, -0.5 foot.

## 3.10 FIELD QUALITY CONTROL

A. Contractor shall perform field quality control as specified in Section 01 45 00, Quality Control of these Specifications.

## 3.11 DEBRIS MANAGEMENT

A. Manage debris resulting from the Work or encountered on Site in accordance with applicable Laws and Regulations. Debris may include abandoned electrical cable, abandoned well materials, or other man-made objects.

**END OF SECTION 31 23 00**

**SECTION 31 25 19**

**DEWATERING AND DIVERSION**

## PART 1: GENERAL

1.01 SUMMARY

A. All work included in this Section shall be done in accordance with the following paragraphs as well as the general requirements outlined in Division 1 of these Specifications.

B. Section includes furnishing all labor, coordination, supervision, management, equipment, and materials, and for performing all operations necessary for dewatering the Site during construction.

1.02 SUBMITTALS

A. No submittals are required from this Section.

## PART 2: PRODUCTS

2.01 PUMPS

A. Contractor shall supply and maintain pumps capable of pumping water from the excavation area in the event of groundwater infiltration, heavy rains or runoff so work will not be significantly delayed and water will not be allowed enough time to saturate the soils.

## PART 3: EXECUTION

3.01 GENERAL

A. Furnish and operate temporary controls such as diversions and dewatering equipment to prevent surface water and groundwater from entering and ponding in excavations and allow construction under dry conditions.

B. Water flows will vary in proportion to recent rainfall events, and with rapid and heavy rains, ponded water may accumulate. Take measures to protect personnel, equipment, and supplies from such an event should conditions render.

C. Discharge water from construction dewatering to location approved by Owner. Identify conditions requiring water discharge and propose discharge points to Owner. Owner will consult with BNI Coal, Ltd. to approve Contractor's proposed discharge points. Owner reserves the right to terminate discharge to the sedimentation ponds. Contractor shall also provide necessary measures to prevent erosion or transportation of sediments at the discharge locations. Remove and dispose of transported sediment.

**END OF SECTION 31 25 19**

**SECTION 32 92 00**

**TURF ESTABLISHMENT**

## PART 1: GENERAL

1.01 SUMMARY

A. Section includes:

1. Establishing vegetation on all topsoiled areas of the Site.

2. Furnishing and installing Erosion Control Blanket.

3. Furnishing and installing Silt Fence and Heavy Duty Silt Fence.

4. Furnishing and installing Fiber Rolls.

5. Furnishing and installing Straw Bales.

1.02 REFERENCES

A. The following are complete titles of references cited in this Section. The date of the standard is that in effect as of the certification date.

1. North Dakota Department of Transportation Standard Specifications for Construction, hereafter referred to as ND/DOT Standard Specifications.

1.03 SUBMITTALS

A. Submit for documentation test report from seed supplier indicating seed mix ratios and percent live seed prior to mobilizing for seeding operations.

## PART 2: PRODUCTS

2.01 MATERIALS

A. Seed: Seed shall meet the requirements of ND/DOT Section 251 for general requirements, equipment, seed testing, and labeling.

B. Seed Mix:

| | |
|---|---|
| Western Wheatgrass (Rodan or Rosanna) | 10% |
| Green Needlegrass (Lodorm) | 25% |
| Switchgrass (Dacotah or Forsberg) | 20% |
| Sideoats Grama (Killdeer or Pierre) | 15% |
| Blue Grama (SD Common) | 15% |
| Little Bluestem (Camper or Blaze) | 10% |
| Big Bluestem (Bison) | 5% |

C. Seed Application Rate: Minimum 40 pure live seeds per square foot.

D. In addition to the seed mix, Oats shall be placed at the rate of 64 pounds per acre.

E. Mulch: Mulch shall meet the requirements of ND/DOT Section 253.03C. Mulch shall be applied at a rate of 2 tons per acre.

F. Erosion Control Blanket: A three-dimensional permanent net with coconut fiber erosion control turf reinforcement matting. Product shall be North American Green C350 or approved equal.

1. Matrix: 100% coconut fiber, min. wt. 0.50lbs/yd^2 (0.27kg/m^2)

2. Netting:

   a. Top, heavyweight UV stabilized polypropylene with 0.50in (1.27cm) openings.

   b. Center, super heavyweight corrugated (crimped) UV stable polypropylene (0.50in openings).

   c. Bottom, heavyweight UV stabilized polypropylene with 0.50in (1.27cm) openings.

3. Stitching: Non-degradable thread on 1.50in (3.81cm) centers

G. Erosion Control Blanket Staple: A 6in (15.2cm) wire "U" shaped staple. North American Green staple or approved equal: 11 gauge wire, min. 1in (2.5cm) crown, 6in (15.2cm) legs.

H. Silt Fence: Silt Fence shall meet the requirements of ND/DOT Section 260.

I. Heavy Duty Silt Fence: Heavy Duty Silt Fence shall meet the requirements of ND/DOT Section 260 and include the steel wire silt fence backing.

J. Fiber Rolls: Fiber Rolls shall meet the requirements of ND/DOT Section 261.

K. Straw Bales: Each straw bale shall be a minimum of 14in wide, 18in in height, 36in in length and a minimum of 50 pounds.

## PART 3: EXECUTION

### 3.01 SEQUENCING AND SCHEDULE

A. Coordinate the turf establishment work with the topsoiling and finishing operations, so as to reduce to a minimum the lag time between the initial and final phases of the combined work and to establish turf protection as soon as possible after the graded areas have been topsoiled or finish graded.

### 3.02 TURF ESTABLISHMENT

A. Place SPGM Topsoil and SPGM Subsoil as specified in Section 31 01 00, Site Preparation and Restoration.

B. Establish turf on all disturbed and topsoiled areas including the Cell 5 Borrow Area and Southwest Drainage Ditch and all stockpile locations. Turf establishment shall be performed in accordance with the requirements of ND/DOT Section 251.04.

1. Seedbed preparation (ND/DOT Section 251.04B).

2. Sowing seed (ND/DOT Section 251.02).

3. Mulching (ND/DOT Section 253.04C). Mulch shall be anchored by punching.

C. Sow the appropriate seed mixture depending upon the sowing date, as specified in ND/DOT Section 251.04C.

### 3.03 MAINTENANCE

A. Rework/replace topsoil where original topsoil has eroded or washed away as directed by Owner or Owner's On-site Representative.

B. Remulch any areas on which the original mulch has eroded, washed away, or blown off, as directed by Owner or Owner's On-Site Representative.

C. Reseed any areas on which the original seed has failed to grow or has eroded away, using the specified seed mixture, as directed by Owner or Owner's On-site Representative.

### 3.04 EROSION CONTROL BLANKET

A. Install Erosion Control Blanket in areas shown on the Drawings and as directed by Owner or Owner's On-Site Representative.

B. Install in accordance with manufacturer's recommendations for staple pattern E.

C. Staples shall be placed in rows spaced at 2 ft on center perpendicular to flow. Staples shall be spaced at 1.6 ft along each row. Staples on alternating rows shall be offset by 0.8 ft. Place a staple within 3 inches of the edge of fabric on all rows.

D. Overlap edges of blanket panels as recommended by manufacturer.

3.05 SILT FENCE

A. Install Silt Fence and Heavy Duty Silt Fence in areas shown on the Drawings and as directed by Owner or Owner's On-Site Representative.

B. Install in accordance to ND/DOT Section 260.04.

3.06 FIBER ROLLS

A. Install Fiber Rolls in areas shown on the Drawings and as directed by Owner or Owner's On-Site Representative.

B. Install in accordance to ND/DOT Section 261.

3.07 STRAW BALES

A. Install Straw Bales in areas shown on the Drawings and as directed by Owner or Owner's On-Site Representative.

B. Each row of bales must be trenched in and firmly staked. Butt ends of bales tightly together. Anchor bales with either two wood stakes or four bars driven through bale and into the soil.

**END OF SECTION 32 92 00**

# Construction Specifications – Phase 1B

# Technical Specifications

## *Coal Combustion Waste Disposal Facility*
## *Cell 5 Phase 1B*

## *Milton R. Young Station*
## *Center, North Dakota*

Prepared for
Minnkota Power Cooperative, Inc.

July 2023 (Rev 0)

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# Technical Specifications for
# Cell 5 Phase 1B
# Coal Combustion Waste Disposal Facility

## Minnkota Power Cooperative, Inc.
## Milton R. Young Station
## Center, North Dakota

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**CERTIFICATION**

This document was originally issued and sealed by Seth W. Hueckman, Registration Number PE-10057, on July 11, 2023, and the original document is stored at Barr Engineering Co., Minneapolis, MN.

**PROFESSIONAL ENGINEER**

I hereby certify that these specifications were prepared by me or under my direct supervision and that I am a duly Registered Professional Engineer under the laws of the State of North Dakota.

**SECTION 01 11 00**

**SUMMARY OF WORK**

## PART 1: GENERAL

1.01 SPECIFICATIONS

A. The format of these Specifications is based upon the CSI MASTERFORMAT, however differences in format and subject matter location do exist. These Specifications are written in imperative and streamlined form. This imperative language is directed to the Contractor, unless specifically noted otherwise. It is solely the Contractor's responsibility to thoroughly read and understand these Specifications and request written clarification of those portions which are unclear.

B. Division of the Work as made in these Specifications is for the purpose of specifying and describing work which is to be completed. There has been no attempt to make a classification according to trade or agreements which may exist between Contractor, Subcontractors, or trade unions or other organizations. Such division and classification of the Work shall be solely the Contractor's responsibility.

1.02 EXISTING SITE CONDITIONS AND USES

A. The Site is located south of the power plant and immediately south of and adjacent to Cell 1, Cell 2, Cell 3, and Cell 4 of the Coal Combustion Waste Disposal Facility.

B. Contractor shall enter the Site from the main gate on the east side of the plant or as otherwise directed by Owner.

C. Cell 2 and Cell 3 dry disposal filling activities are and will remain in service for waste disposal during the Work. Cell 4 and its related piping systems are and will remain in service for waste disposal during the Work. Contractor shall perform work as not to impact the current operations of Cell 2, Cell 3, and Cell 4.

D. Groundwater monitoring wells are present at the Site and are sampled regularly. Contractor shall cooperate with others and allow samples from the wells to be taken as necessary.

E. There are no potable water supplies or sanitary facilities at the Site. The Owner will provide electrical service and connection to the Contractor's office location as shown on the Drawings.

F. The available soil boring logs and soil test results for Cell 5 and the select clay stockpiles can be provided by Owner upon request. Contractor shall have full responsibility for interpretation of the data.

G. Construction activities performed by Contractor are subject to the requirements of the mining permit issued to BNI Coal, Ltd. by the North Dakota Public Service Commission (PSC), and to the requirements of the permit issued to Minnkota Power Cooperative, Inc. by the North Dakota Department of Environmental Quality (NDDEQ), which are described within these Specifications.

H. Mining and hazard training are required for Contractor's on-site personnel.

I. All contractors and subcontractors must adhere to the Energy Coalition for Contractor Safety (ECCS) guidelines.

1.03 WORK COVERED BY SPECIFICATIONS

A. The overall scope of the Work which is more fully described in these Specifications includes, but is not necessarily limited to, furnishing all labor, coordination, supervision, management, tools, equipment, and materials necessary to perform the Work described below:

1. Remove water from the Cell 5 excavation area as necessary to perform the Work.

2. Suitable Plant Growth Material (SPGM) stripping

   a. Strip SPGM Topsoil from the area shown on the Drawings. Stockpile stripped SPGM Topsoil at the designated location shown on the Drawings.

   b. Strip SPGM Subsoil from the area shown on the Drawings. Stockpile stripped SPGM Subsoil at the designated location shown on the Drawings.

   c. Remove and stockpile field stone encountered during SPGM stripping.

3. Cell 5 Subgrade Excavation

   a. Excavate all soil materials down to subgrade.

   b. Stockpile any sandstone (larger than 6 inches) encountered in Cell 5 as determined by the Owner.

   c. Segregate, load, haul, and place Random Fill.

   d. Load, haul, and place Select Clay.

   e. After completion of the embankment construction, remaining Random Fill shall be stockpiled as directed by Minnkota.

4. Construct Embankment

   a. Place and compact Random Fill from excavations and Clayey Random Stockpile.

   b. Restore west and south embankment (SPGM Subsoil and SPGM Topsoil Placement, and turf establishment).

   c. Install Compacted Gravel surface on top of embankments.

5. Stormwater ditch construction

   a. Excavate drainage ditches as shown on the Drawings.

b. As directed by Owner, restore ditch grading (SPGM Subsoil and SPGM Topsoil Placement, and turf establishment).

6. Construct Hagel Bed Gradient Control Drain

   a. Excavate soils as required to place the Hagel Bed Drain.

   b. Place filter fabric, gradient control collection pipe, and gradient control sump pipe as shown on the Drawings.

   c. Load, haul, and place Drainage Aggregate and Granular Random Fill to cover the gradient control system as shown on the Drawings.

7. Construct Base Composite Liner System

   a. Compact and prepare subgrade.

   b. Place and compact Select Clay.

   c. Furnish and install Geomembrane directly over the Select Clay layer.

   d. Furnish and install Protective Geotextile below Drainage Layer Material.

   e. Install Drainage Layer Material.

8. Construct Sidewall Composite Liner System

   a. Compact and prepare subgrade.

   b. Place and compact Select Clay to elevation as shown on the Drawings.

   c. Furnish and install the Geomembrane liner directly over the Select Clay layer, anchoring it as shown on the Drawings.

9. Construct dewatering system and transition between Base Composite Liner and Sidewall Composite Liner

   a. Construct transition between Base Composite Liner and Sidewall Composite Liner as shown on the Drawings.

   b. Construct dewatering sump and dewatering trench

      1) Furnish and install Protective Geotextile.

      2) Furnish and install dewatering sump piping.

      3) Furnish and install Drainage Aggregate.

      4) Install Drainage Layer.

c. Construct dewatering system sidewall riser pipes

1) Furnish and install dewatering sump and collection trench piping.

2) Furnish and install Protective Geotextile.

3) Furnish and install Drainage Aggregate.

4) Furnish and install reinforced concrete embedment for sidewall riser pipes.

10. Extend Pond Return Water System

a. Place new return line pipes and tie in to the existing return line pipes as shown on the Drawings.

11. Construct Blowdown Pipe Extension

a. Furnish and install new blowdown pipes across Cell 4 embankment crest.

b. Furnish and install new blowdown pipes and anchoring system components into Cell 5.

12. As directed by Owner, installation and maintenance of stormwater erosion controls

a. Furnish and install silt fence.

b. Furnish and install erosion control blanket.

c. Furnish and install fiber rolls.

d. Furnish and install straw bales.

e. Install rock check dams.

13. Establish vegetation

14. Submit construction documentation as specified.

B. It is the intent of the Specifications to cover all aspects of the Project. Should there be some item or items not shown on the Drawings or not described in these Specifications which are required for the Work, those items and the furnishing of all labor, materials, and equipment shall be considered incidental to the Work and no additional compensation will be provided.

C. The Work includes the furnishing of all labor, equipment, tools, machinery, materials, and other items required for the construction of a complete project as specified and shown on the Drawings. Equipment furnished shall be in safe operating condition and of adequate size, capacity, and condition for the performance of the Work. Contractor shall obtain all measurements necessary for the Work and shall be responsible for establishing all dimensions, levels, and layout of the Work.

D. Contractor shall be solely responsible for the coordination of its activities with regard to the Project and the activities of Subcontractors and Owner.

1.04 WORK BY OWNER

A. Owner will provide bench mark and site coordinate information necessary for construction of the Work. Once provided, it is Contractor's responsibility to protect the bench marks. Contractor shall request benchmark and site coordinate information from Owner a minimum of five days prior to the time when such information is needed.

B. Owner will provide electrical service and connection to the Contractor's trailer at the location shown on the Drawings.

1.05 WORK BY OTHERS

A. Operation and maintenance of site perimeter sedimentation basins, stormwater drains, and diversions will be performed by BNI Coal Ltd.

1.06 OWNER FURNISHED PRODUCTS

A. Bottom Ash material for use as the Hagel Drain Material and Drainage Layer Material.

B. Return pipeline siphon floats.

1.07 CONTRACTOR USE OF PREMISES

A. Definition of Site: The Site is defined as the area within the construction limits shown on the Drawings, plus a nearby material and equipment storage and staging area, the location of which will be designated by Owner. Contractor shall limit operations, including material and equipment storage, to within those boundaries. Under no circumstance shall Contractor work or travel directly on SPGM Topsoil.

B. Hours of Operation: Contractor's operations shall be limited to the hours of 7:00 am to 7:00 pm (Central Time), Monday through Saturday, unless other arrangements are made with Owner.

C. Water produced by operating construction dewatering systems in Cell 5 shall be disposed of in one of the west sedimentation ponds, as approved by Owner.

D. Protection and Repair of Existing Facilities and Utilities: Contractor shall perform operations carefully and in such a manner as to protect existing facilities and utilities. Obstructions not shown on the Drawings may exist and shall be exposed by Contractor without damage. Contractor shall be responsible for damage to existing facilities and utilities resulting from Contractor's operations, and shall repair or replace damaged items to Owner's satisfaction. Groundwater monitoring wells shall be protected during construction unless directed otherwise by the Owner.

E. Unfavorable Construction Conditions: When unfavorable weather, soil, drainage, or other unsuitable construction conditions exist, Contractor shall confine operations to work which will

not be adversely affected by such conditions. No portion of the Work shall be constructed under conditions which would adversely affect the quality of the Work, unless special means or precautions are taken to perform the Work in a proper and satisfactory manner.

F. Survey Markers: Contractor shall conduct operations so as to preserve bench marks, survey reference points, and stakes existing or established by Owner for the construction. Contractor will be charged the expense of repairing or replacing survey markers and shall be responsible for mistakes or lost time resulting from damage or destruction of survey markers due to Contractor's operations.

**PART 2: PRODUCTS (NOT USED)**

**PART 3: EXECUTION (NOT USED)**

**END OF SECTION 01 11 00**

**SECTION 01 31 00**

**MEETINGS**

## PART 1: GENERAL

1.01 SUMMARY

A. Section includes required meetings.

1.02 PRECONSTRUCTION CONFERENCE

A. After Owner and Contractor have executed the Agreement, Owner will schedule a preconstruction conference at project site that shall be attended by Owner, Contractor, Engineer, Owner's On-site Representative, and others as appropriate. The meeting will be scheduled by Owner following formal agreement to Contract. The purpose of the meeting will be to ensure that all parties understand their responsibilities and the procedures that will be used to assure efficient completion of the Work.

B. Agenda items may include:

1. Distribution of Drawings and Specifications.
2. Designation of responsible personnel for all parties, lines of communication, and lines of authority.
3. Scope of work and the anticipated schedule of operations.
4. Critical work sequencing.
5. Submittal and field test reporting procedures.
6. Record documents and reporting.
7. Site safety and security procedures.
8. List of major subcontractors.
9. Procedures for processing change orders.
10. Use of premises including equipment and material storage.
11. Major equipment deliveries.
12. Housekeeping procedures.
13. Other items for consideration during construction activities.

1.03 PROGRESS MEETINGS

A. Weekly progress meetings will be scheduled by Owner's On-Site Representative at a regular time mutually agreeable to Owner, Contractor, and Owner's On-Site Representative. Contractor shall attend these meetings and shall coordinate and require the attendance of subcontractors whose work may be in progress at the time or whose presence may be required for any purpose. Scheduling of required attendees shall meet with the approval of Owner's On-Site Representative.

B. Following each meeting, Owner's On-Site Representative will prepare and distribute to Owner and Contractor copies of the meeting notes. These will include a brief summary of the progress of the Work since the previous meeting.

C. The weekly meeting agenda will include:

1. Administrative/Purchasing issues.

2. Technical/Construction issues.

3. Design issues.

4. Schedule/Progress issues.

5. Construction site safety issues.

6. Review status of required submittals.

1.04 UNSCHEDULED MEETINGS

A. Contractor shall attend other unscheduled meetings which may be reasonably requested by Owner's On-Site Representative or Owner to discuss unanticipated changes in the Work or conditions at the Site and which must be resolved before progression of work.

**PART 2: PRODUCTS (NOT USED)**

**PART 3: EXECUTION (NOT USED)**

**END OF SECTION 01 31 00**

**SECTION 01 33 00**

**SUBMITTALS**

## PART 1: GENERAL

1.01 SUMMARY

A. Section includes submittal procedures.

1.02 GENERAL PROCEDURES

A. This Section stipulates the requirements for transmission of submittals from Contractor to Owner's On-Site Representative and actions taken by Owner's On-Site Representative regarding submittals.

B. Submittals shall be identified with the project name, name of submittal, and Specification Section for which the submittal is required.

C. Owner's On-Site Representative will accept submittals only from Contractor. Submittals from subcontractors, vendors, suppliers, or others will be returned without review or action.

D. Owner's On-Site Representative will accept only those submittals required by the Specifications. Unsolicited submittals will be returned without review or action.

E. All engineering data, regardless of origin, shall be stamped with the approval of Contractor. Contractor's stamp of approval will be a representation to Owner and Owner's On-Site Representative that Contractor has assumed full responsibility for determining and verifying all quantities, dimensions, field construction criteria, materials, catalog numbers, and similar data, and that he has reviewed or coordinated each submittal with the requirements of the Specifications.

F. All engineering data shall be identified by use of the nomenclature established by the Drawings and Specifications. Equipment drawings shall have the equipment name and number clearly displayed. Material drawings shall have the structure name and structure number (when applicable) clearly displayed.

1.03 CORRESPONDENCE

A. Correspondence forwarding engineering data shall be addressed to Owner and Owner's On-Site Representative as follows. Electronic submittals via email must be coordinated and approved by Owner prior to submission.

**To Owner:**
Minnkota Power Cooperative
Milton R. Young Station
3401 24th St. SW
Center, ND 58530
**Attention: Mr. Joe Grosz**

**To Owner's On-site Representative:**
Barr Engineering Co.
c/o Mr. Joe Grosz
Minnkota Power Cooperative
Milton R. Young Station
3401 24th St. SW
Center, ND 58530
**Attention: Mr. Seth Hueckman**

**To Owner:**
Minnkota Power Cooperative
5301 32nd Ave. S
Grand Forks, ND 58201
**Attention: Ms. Sadie Gilbraith**

B. Include a letter of transmittal with all submittals of engineering data and include a list of the data included in the transmittal. Lists shall include manufacturer's drawing numbers identified with the corresponding project equipment or structure nomenclature as applicable. The letter shall be identified by the project name.

1.04 PROGRESS SCHEDULE

A. Submit an estimated progress schedule and a finalized progress schedule in accordance with the requirements of the General Conditions.

B. Update the schedule on a weekly basis for presentation, discussion, and distribution at the weekly progress meeting.

1.05 SCHEDULE OF VALUES AND PROGRESS PAYMENT SCHEDULE

A. Submit a schedule of values for the Work. The schedule shall be broken out as follows for each Bid item on the Bid Form:

1. Item description

2. Unit of measure upon which the item is based

3. Contractor's estimated quantity (number of units upon which the total price for the item is based)

4. Total unit price, including materials, equipment, labor, coordination, supervision, management, overhead, and profit

5. Extension (total price for the item, calculated by multiplying the number of unit by the total unit price)

B. A schedule of anticipated progress payment requests shall accompany the schedule of values. The proposed progress payment schedule shall be based on monthly or target-percentage invoicing for Work completed, and shall be closely coordinated with the schedule of values.

Whenever the progress schedule is updated or revised, Contractor shall resubmit a revised schedule of anticipated progress payment requests. The payment schedule shall also be updated each time an actual payment request varies more than 10 percent from the schedule. The progress payment schedule shall take into consideration retainage as set forth in the Contract Documents.

C. The schedule of values and anticipated progress payment schedule shall be subject to review and approval by Owner. If, in the opinion of Owner, the schedules do not contain sufficient detail or appear to be unbalanced, the Owner may require Contractor to revise and resubmit the schedules and/or provide documentation to justify Contractor's distribution. Contractor shall correct such deficiencies and resubmit the schedules.

1.06 BONDS AND INSURANCE

A. Required Bonds and Certificates of Insurance shall be submitted to Owner with the executed copies of the Agreement.

1.07 REVIEW OF SUBMITTALS

A. Owner's On-Site Representative's review of engineering data will cover only general conformity of the data to the Specifications, external connections, and interfaces with equipment and materials furnished under separate specifications. Owner's On-Site Representative's review does not indicate a thorough review of all dimensions, quantities, and details of the equipment, material, device, or item indicated or the accuracy of the information or documentation submitted; nor shall review or approval by Owner's On-Site Representative be construed as relieving Contractor from any and all responsibility for errors or deviations from the requirements of Drawings and Specifications.

1.08 SUBMITTAL FOR INFORMATION OR DOCUMENTATION

A. Submit 2 copies to Owner's On-Site Representative and 2 copies to Owner.

B. Unless otherwise specified, submittal shall be made at least 1 day before the subject of the submittal is to be incorporated into the Work.

C. Submittal is for the purpose of formal verification that the subject of the submittal conforms to the requirements of the Specifications, for formal documentation of the Work, or both.

D. No action is required by Owner or Owner's On-Site Representative. Owner's On-Site Representative will generally notify Contractor if deficiencies are identified; however, Contractor is solely responsible for ensuring that the subject of the submittal conforms to the requirements of the Specifications.

1.09 SUBMITTAL FOR REVIEW

A. Submit 2 copies to Owner's On-Site Representative.

B. Unless otherwise specified, submittal shall be made at least 10 days before the subject of the submittal is to be incorporated into the Work. Owner's On-Site Representative will respond within 5 days from receipt of submittal.

C. Submittal is for the purpose of providing opportunity to Owner's On-Site Representative for review and comment on the subject of the submittal.

D. Owner's On-Site Representative will respond to the submittal either with a list of comments or indicating no comments.

E. If Owner's On-Site Representative's comments indicate a deficiency with respect to the requirement of the Specifications, Contractor shall amend the submittal and resubmit. Owner's On-Site Representative will again respond to the resubmittal.

F. If Owner's On-Site Representative's comments are in regards to an issue which is based upon the Contractor's discretion, Contractor shall furnish additional information, provide justification, and otherwise cooperate in addressing and resolving Owner's On-Site Representative's comments.

G. Contractor shall remain solely responsible for ensuring that the subject of the submittal conforms to the requirements of the Specifications.

1.10 RECORD DOCUMENTS

A. Submit record documents prior to Substantial Completion.

B. Record documents shall accurately reflect the as-constructed condition.

1.11 WARRANTY AND GUARANTEE CERTIFICATES

A. Submit warranty and guarantee certificates prior to Substantial Completion.

B. Warrantee and guarantee certificates shall be signed by Contractor, Installer, Manufacturer, and others as required by the Specifications.

**PART 2: PRODUCTS (NOT USED)**

**PART 3: EXECUTION (NOT USED)**

**END OF SECTION 01 33 00**

**SECTION 01 45 00**

**QUALITY CONTROL**

## PART 1: GENERAL

1.01 FIELD QUALITY CONTROL

A. Contractor shall be responsible for completion of construction quality control for the Work as described below.

B. Contractor shall retain an independent registered land surveyor licensed in the State of North Dakota for performing quality control on line and grade of the Work. The quality control survey data shall be available for review at all times by Owner or Owner's On-Site Representative.

C. Contractor shall retain an independent soil testing firm for performing compaction testing for Random Fill subgrade and embankment construction. The quality control compaction testing data shall be available for review at all times by Owner or Owner's On-Site Representative.

D. Contractor shall retain an independent soil testing firm for performing material verification testing for the Drainage Aggregate.

E. Owner will perform compaction and moisture content testing for Select Clay liner construction.

F. Owner will perform material verification testing on the Drainage Layer Material.

G. Owner will retain an independent geomembrane testing firm for performing the 3rd party destructive testing for the geomembrane liner.

1.02 SUBMITTALS

A. Submit for information survey data on a daily basis for each day that survey work is performed.

B. Submit for documentation a tabulation of all results of survey work performed. This submittal shall be made prior to substantial completion. The tabulation shall be signed by the registered land surveyor. The tabulation shall contain the following information for each survey location:

1. A unique identification number

2. Coordinates

3. Elevation of the finished surface of each material (e.g. top of Random Fill, SPGM Subsoil, and SPGM Topsoil for embankment construction; subgrade and finished Select Clay surface)

4. Thickness of each material

C. Submit for documentation Survey Record Drawings containing the unique identification numbers and material thicknesses for each survey point. The drawings shall use a scale of 1 inch = 100 feet or as legible on 11-inch by 17-inch drawings and shall be submitted in reproducible paper and electronic (AutoCAD) format. The drawings shall be prepared and the reproducible paper plot certified by the independent registered land surveyor who performed the survey verifications during construction.

D. Submit for documentation the results of all soil compaction testing performed. Test results shall be submitted on a daily basis for each day that compaction testing is performed. Test results shall also be compiled in a report-format and submitted prior to substantial completion of Work.

1.03 REFERENCES

A. The following are complete titles of references cited in this Section. The date of the standard is that in effect as of the certification date.

1. American Society for Testing and Materials, Current Edition, hereafter referred to as ASTM.

a. ASTM C117, Standard Test Method for Materials Finer than 75-µm (No. 200) Sieve in Mineral Aggregate by Washing

b. ASTM C136, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates

c. ASTM D6913, Standard Test Method for Particle-Size Distribution (Gradation) of Soils Using Sieve Analysis

d. ASTM D7928, Standard Test Method for Particle-Size Distribution (Gradation) of Fine-Grained Soils Using the Sedimentation (Hydrometer) Analysis

e. ASTM D698, Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft$^3$ (600 kN-m/m$^3$)) (referred to as "Standard Proctor Maximum Dry Density")

f. ASTM D2434, Standard Test Method for Permeability of Granular Soils (Constant Head)

g. ASTM D2487, Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System)

h. ASTM D2488, Standard Practice for Description and Identification of Soils (Visual-Manual Procedures)

i. ASTM D1556, Standard Test Method for Density and Unit Weight of Soil in Place by Sand-Cone Method

j. ASTM D1140, Standard Test Method for Determining the Amount of Material Finer than 75-µm (No. 200) Sieve in Soils by Washing

k. ASTM D3017, Standard Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth)

l. ASTM D4318, Standard Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils

m. ASTM D5084, Standard Test Method for Measurement of Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter

n. ASTM D6392, Standard Test Method for Determining the Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods

o. ASTM D6938, Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods

## 1.04 VERIFICATION REQUIREMENTS

A. Contractor's independent registered land surveyor shall verify that elevations, grades, slopes, and material thickness constructed by Contractor are within the tolerances specified in Section 31 23 00, Excavation, Backfilling, and Compacting. Surveying results will be used by Owner to demonstrate compliance with the North Dakota Department of Environmental Quality (NDDEQ) permit requirements. Material thickness shall be determined from the elevation difference between shots taken at the same coordinate location. On slopes, the surveyed vertical thickness shall be adjusted by calculating the thickness perpendicular to the slope for presentation in the submittals. The surveying work shall include determining elevations at specific locations on a matrix of survey points as described below.

1. Embankment: For elevation, grade, and material thickness verification, survey shots shall be taken on the top of Random Fill, top of SPGM Subsoil, and top of SPGM Topsoil. The West and East Embankments shall be surveyed at 100-foot intervals along the embankment alignment at points shown on the Drawings.

2. Subgrade: For elevation, and grade verification, survey shots shall be taken on the subgrade surface at points shown on the Drawings.

3. Select Clay: For elevation, grade, and material thickness verification, survey shots will be taken on the top of Select Clay at points shown on the Drawings.

4. Drainage Layer Material: For material thickness verification, survey shots will be taken on the top of Drainage Layer Material at points shown on the Drawings

5. Blowdown Pipelines: For elevation and grade verification, survey shots shall be taken on the top of pipe at a maximum of 25-foot intervals (lineal) in the areas where pipe has little or no significant change in elevation, and at changes in grade. Coordinate the location of these shots with Owner or Owner's On-Site Representative.

6. Siphon Return Pipelines: For elevation and grade verification, survey shots shall be taken on the top of pipe (for pipe group centerline) at a maximum of 25-foot (lineal) intervals, at all changes in horizontal and vertical alignment along the pipelines, and at the tie-in to existing pipe.

7. Dewatering System: For elevation, grade, and material thickness verification, survey shots will be taken on the top of pipe at a maximum of 25-foot intervals (lineal) and at the termination points including the top of pipe in the dewatering sump.

8. Hagel Bed Gradient Control Riser Pipe: For elevation and grade verification, survey shots shall be taken on top of pipe at a maximum of 25-foot intervals (lineal) and termination points.

B. Unless specified otherwise, the survey for the various soil components will be conducted on a 100 foot by 100 foot grid on the cell floor with survey points at all major breaks in slope (i.e., top and toe of slope of berms and trenches). On the sideslopes, the survey will be conducted every 100 feet along the embankment alignment. The grid will be extended vertically to enable calculation of cell component vertical thicknesses (clay liner, granular drainage, SPGM subsoil, and SPGM topsoil layers).

C. Contractor's independent soil testing firm shall verify that Random Fill soil compaction during embankment construction is in conformance with the Specifications. Compaction test results will be used by Owner to demonstrate compliance with NDDEQ permit requirements. Tests shall be performed at random locations such that the test results may be considered representative of the entire embankment construction. Testing shall be performed at specific locations determined by Owner's On-Site Representative if requested. Such tests will be used to fulfill the testing frequency requirements specified below. Testing shall be performed in accordance with the following schedule:

1. Soil Density In Place (ASTM D6938): 1 test per 2,000 cubic yard (CY)

2. Moisture Content (ASTM D3017): 1 test per 2,000 CY

3. Standard Proctor (ASTM D698): 1 test (3-point) per 50,000 CY of each soil type, or as determined by the Owner's On-Site Representative

D. Contractor's independent soil testing firm shall verify that Drainage Aggregate materials are in conformance with the Specifications. Testing shall be performed in accordance with the following schedule:

1. Sieve Analysis (ASTM C136): 1 test per 1,000 (CY)

2. Particle Shape (ASTM D2488): Engineer's discretion

1.05 PRESENTATION OF DATA

A. All Contractor's independent registered land surveyor data shall be summarized and submitted to Owner or Owner's On-Site Representative on a daily basis that survey data is collected. Failure to submit data on a daily basis shall be cause for Owner to suspend Contractor's

operations until submittals are made current. Contractor shall not be entitled to additional compensation for any suspension of operations ordered by Owner due to Contractor's failure to submit data on a daily basis.

B. All Contractor's independent registered land surveyor data shall be summarized in a tabular format listing each survey point by unique identification number, coordinate, elevation, difference from previous elevation (material thickness), and required material thickness as appropriate. Survey data shall also be presented in plan views showing each survey point by the unique identification number and elevation. Required material thickness is measured perpendicular to the slope. Material thickness based upon survey shots at the same coordinate location shall be corrected to the perpendicular-to-slope thickness.

C. Following construction of Cell 5, Contractor's independent registered land surveyor shall create an as-built topographic survey drawing of the entire Cell 5 footprint (all excavation areas, fill area, and entire cell stripping limits) that include at a minimum the certification shots required in paragraph 1.04.A.

D. Compaction test data shall be summarized in a tabular format listing each compaction test by unique identification number, station and offset location, elevation (within 0.5 foot vertical of actual location), reference proctor, in-place moisture content, dry density, and percent compaction.

1.06 OWNER'S CONSTRUCTION QUALITY ASSURANCE PROGRAM

A. For purposes of verifying compliance with the Specifications and for documenting construction, Owner or Owner's On-Site Representative will be conducting a Construction Quality Assurance (CQA) program during construction. Contractor shall coordinate with and provide access to work areas for Owner's On-Site Representative and Owner's independent testing firms for sampling and/or testing.

B. Work failing to meet specifications shall be repaired at Contractor's expense. Owner will perform additional testing after repairs are completed. The expense of retesting will be charged to Contractor. Contractor may ask to review results of Owner's CQA program during construction.

C. Owner's CQA program will consist of collecting random samples and performing tests on materials placed by Contractor in the embankment and stockpiles. Results of testing will be used to verify that Select Clay and Drainage Layer Material comply with the Specifications and meet compaction and permeability requirements. Test results will be used to demonstrate compliance with NDDEQ permit requirements. Select Clay and Drainage Layer Material testing work is listed below:

1. Material property tests for the Select Clay include the following:

a. Soil Classification (ASTM D2487): 3 tests per soil type

b. Soil Description (ASTM D2488): 3 tests per soil type

c. Sieve and Hydrometer Analysis (ASTM D6913 and D7928): 1 test per 5,000 CY

d. Atterberg Limits (ASTM D4318): 1 test per 5,000 CY

e. Saturated Hydraulic Conductivity (ASTM D5084): 1 test per 15,000 CY

f. Standard Proctor (ASTM D698): 3 tests (3-point minimum) per soil type or as determined by Owner's On-Site Representative.

2. Compaction tests will be performed during Select Clay placement. Density and moisture content tests (ASTM D6938 and D1556 (minimum of 1 per soil type)) will be performed on each lift of Select Clay placed. Notify Owner's On-Site Representative upon completion of each lift and provide time and access for testing work to be completed prior to placing subsequent lifts. Approximately, one test will be conducted for every 200-feet of select clay and will be offset approximately 50 feet each direction for each lift. The test frequency and location will be randomly selected at the time of construction and need not be established by Contractor's registered land surveyor.

3. Material property tests for the Drainage Layer Material include the following:

a. Sieve Analysis (ASTM C136 and C117): 1 test per 1,000 CY

b. Constant Head Permeability (ASTM D2434): 1 test per 2,000 CY

D. Owner's CQA program will include 3rd party independent laboratory testing of the installed geomembrane liner. Destructive seam test samples (ASTM D6392) will be collected by Owner or Owner's Representative at the frequency described in these Specifications. Results of these tests will be compared to the field test results found by the geomembrane subcontractor.

**PART 2: PRODUCTS (NOT USED)**

**PART 3: EXECUTION (NOT USED)**

**END OF SECTION 01 45 00**

**SECTION 01 51 00**

**TEMPORARY UTILITIES**

## PART 1: GENERAL

1.01 SUMMARY

A. Section includes temporary utilities.

1.02 TEMPORARY UTILITIES

A. Water:

1. Potable water is not available at the Site. Make all arrangements necessary to provide water for potable consumption. Water used for construction purposes need not be potable but must meet all applicable North Dakota Department of Environmental Quality (NDDEQ) surface water quality criteria. Non-potable water from Nelson Lake or BNI Coal, Ltd.'s west sedimentation ponds is available for construction use. Contractor to coordinate with and receive permission from Owner prior to using water from Nelson Lake.

B. Sanitary Facilities:

1. Provide sanitary facilities for use by Contractor's employees, subcontractors, suppliers, Owner's On-Site Representative, Owner and all other persons to be working on the Site. Sanitary facilities shall, as a minimum, comply with the requirements of applicable Laws and Regulations for temporary sanitary facilities and shall be emptied and sanitized frequently, and shall at all times be maintained in a clean and useable condition. Sanitary facilities shall be maintained until Substantial Completion unless earlier removal is approved by Owner or Owner's On-Site Representative.

C. Electricity:

1. Furnish such portable electric power generators as Contractor considers necessary for construction of the Work. Should Contractor need electric power service for Contractor's purposes, it shall be Contractor's responsibility to arrange for and pay for such service. Owner will provide access to electric service connection at the location of Contractor's office location, and provide electric service to the Office Trailer furnished for Owner's On-Site Representative's use.

D. Telephone and Fax:

1. Phone service is not readily available at Contractor's trailer location shown on the Drawings. Cellular phone service has previously been used at elevated locations around the Site, including in the vicinity of Contractor's trailer location, but may not be

continuous throughout the entire Site. Make arrangements as necessary for phone and fax service for Contractor's use during the project.

E. Fire Protection:

1. Make all arrangements necessary to assure that the Site and the Work have adequate fire protection services throughout the duration of the Work. Any special fees or charges imposed by the City or other organization to provide such services shall be paid by Contractor.

1.03 OFFICE TRAILER

A. Furnish office trailer space for use by Owner and Owner's On-Site Representative in location approved by Owner. The space shall have a minimum of 120 square feet of floor area, be equipped with a desk, a table, and three chairs. The space shall be furnished with electrical service, operable lighting, heat, and air conditioning. This office space may be located in a trailer with other facilities but must be accessible to Owner and Owner's On-Site Representative at all times and must be secured by a separation wall and lockable door. Owner will provide 240 volt, 110 AMP service to the trailer and will make and disconnect electrical service as requested by Contractor.

**PART 2: PRODUCTS (NOT USED)**

**PART 3: EXECUTION (NOT USED)**

**END OF SECTION 01 51 00**

**SECTION 01 56 00**

**TEMPORARY CONTROLS**

## PART 1: GENERAL

1.01 SUMMARY

A. Section includes:

1. Controlling dust generation on access roads to the Site and within construction limits.

2. Controlling soil erosion and sediment transport at the Site.

## PART 2: PRODUCTS

2.01 MATERIALS

A. Water used for dust control may be obtained from Nelson Lake at a location approved by Owner or the west sedimentation ponds.

B. Acceptable temporary erosion control devices include, but are not necessarily limited to, silt fence, straw and hay bales, rock check dams, geotextiles, erosion control blanket, and vegetative cover. Field Stone and Sandstone may be reused for rock check dam construction if approved by Owner.

2.02 EQUIPMENT

A. Water tank trucks equipped with water cannon capable of delivering water through either front or rear-mounted nozzles. Tank trucks shall be of sufficient size and mobility and carry a sufficient quantity of water to control dust generated by Contractor's activities.

## PART 3: EXECUTION

3.01 DUST CONTROL WATERING

A. Apply water to roads used by Contractor's equipment as directed by Owner or Owner's On-Site Representative to control dust generated by wind or by Contractor's vehicle traffic.

B. Apply water to ground surfaces within the construction limits as directed by Owner or Owner's On-Site Representative to control dust generated by Contractor's activities at the Site.

3.02 EROSION CONTROL

A. Install erosion control devices and materials at locations as directed by Owner or Owner's On-Site Representative where soil erosion at the Site may occur due to Contractor's activities.

B. Install temporary erosion control devices during the progress of the work and maintain them until permanent erosion control (turf establishment, aggregate surfacing, etc.) has been established.

**END OF SECTION 01 56 00**

**SECTION 31 01 00**

**SITE PREPARATION AND RESTORATION**

## PART 1: GENERAL

1.01 SUMMARY

A. Section includes:

1. Stripping, stockpiling, and placing SPGM Topsoil.

2. Stripping, stockpiling, and placing SPGM Subsoil.

3. Where applicable, coordinating with and receiving approval of SPGM stripping operations through BNI Coal Ltd. and Owner's On-Site Representative.

B. Stripping and stockpiling of SPGM Topsoil and SPGM Subsoil anticipated to be performed by BNI Coal Ltd. Contractor may be required to strip and stockpile SPGM Topsoil and SPGM Subsoil if not fully performed by BNI Coal Ltd.

1.02 DEFINITIONS

A. SPGM: Suitable Plant Growth Material. SPGM is a resource of the State of North Dakota. Stripping, stockpiling, and restoration of SPGM at the Site, within the limits of the mining permit boundary, are governed by the requirements of the mining permit for the Site issued to BNI Coal, Ltd. by the North Dakota Public Service Commission (PSC).

B. SPGM Topsoil: The uppermost (first lift) soil horizon at the Site.

C. SPGM Subsoil: The second lift of soil at the Site, the lower limit of which is defined by the depth shown on the Drawings or the depth at which the buff-colored SPGM Subsoil changes to the underlying gray-colored soil horizon.

D. SPGM Monument: An undisturbed pillar of soil left in place at designated locations to demonstrate depth of removal of surrounding soil.

E. Topsoil: The uppermost soil horizon at the portions of the site noted on the Drawings, which is not governed by the mining permit. Topsoil is approximately 12-inches in thickness.

F. Prime Farmland: Land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and that is available for these uses. Some portions of Cell 4 and Cell 5 lie within designated areas defined as Prime Farmland as shown on the Drawings. SPGM Topsoil and SPGM Subsoil materials located within the Prime Farmland limits must be segregated and stockpiled in their own individual stockpiles as shown on the Drawings.

G. Field Stone: Prairie rock located in the SPGM layers that is greater than 6 inches in size.

1.03 SUBMITTALS

A. Submittals required under this Section require approval from the North Dakota Public Service Commission (PSC). The PSC has issued a mining permit to BNI Coal, Ltd., for mining and associated activities at the Site. SPGM stripping, stockpiling, and replacement activities to be performed by Contractor are subject to the requirements of the mining permit.

B. Coordinate with Owner and Owner's On-Site Representative to receive the required SPGM stripping approvals. Contractor will notify Owner and Owner's On-site Representative when SPGM Topsoil and SPGM Subsoil stripping is complete in a portion or all of the area. SPGM Monuments will be measured jointly by Contractor, Owner's On-site Representative, and BNI Coal, Ltd.

C. Submit for documentation written approval of BNI Coal, Ltd. and Owner's On-site Representative of SPGM Topsoil and SPGM Subsoil stripping before removing SPGM monuments and before excavating below the SPGM stripped area. BNI Coal, Ltd.'s approval shall be given after it receives approval from PSC.

**PART 2: PRODUCTS (NOT USED)**

**PART 3: EXECUTION**

3.01 GENERAL

A. SPGM operations, including stripping, stockpiling, maintaining stockpiles, and restoration shall comply with the requirements of the mining permit held by BNI Coal, Ltd., which are generally reiterated below.

B. The stripping limits included in this Work shall be staked on an approximate 100-foot by 200-foot grid to show the recommended SPGM removal depth. The grid and recommended SPGM removal depths within the SPGM stripping limits are shown on the Drawings.

C. SPGM Monuments shall be left in place at every grid intersection point as shown on the Drawings. SPGM Monuments shall be left in place until PSC approval is received. Excavation below the SPGM-stripped area shall not commence until PSC approval is received. Contractor will remove existing monuments if not completed by BNI Coal Ltd.

D. Stripped SPGM Topsoil and SPGM Subsoil shall be placed in the designated stockpile locations shown on the Drawings.

E. Stripped SPGM Topsoil and SPGM Subsoil located within the Prime Farmland limits shall be placed in the designated stockpile locations shown on the Drawings.

F. SPGM Topsoil and SPGM Subsoils removed from the Prime Farmland limits shall be stockpiled and not used in slope restoration.

G. Field Stone encountered while stripping the SPGM layers shall be removed and placed in the designated stockpile location in Cell 3. Field Stone may be reused for rock check dam construction if approved by Owner.

H. Institute and maintain, as directed by Owner, adequate dust control measures such as watering, for all its work areas, haul routes, and parking areas.

3.02 SPGM TOPSOIL STRIPPING

A. Strip SPGM Topsoil to the depth shown on the Drawings or to the depth where SPGM Subsoil is present, whichever occurs first. Contractor shall not over excavate SPGM Topsoil or mix SPGM Topsoil with other soil horizons.

B. Leave SPGM Topsoil in place at each grid stake to form a SPGM Monument which shows the removal depth.

C. Maintain the soil monuments in place until SPGM Subsoil stripping is complete and PSC approval of SPGM stripping operations is received.

3.03 SPGM TOPSOIL STOCKPILING

A. Stockpile SPGM Topsoil in SPGM Topsoil stockpile location shown on the Drawings.

B. Maintain stockpile slopes to meet current MSHA standards. Construct stockpiles to slopes no steeper than 3 horizontal to 1 vertical.

3.04 SPGM SUBSOIL STRIPPING

A. Strip SPGM Subsoil to the depth shown on the Drawings or to the depth where the buff-colored SPGM Subsoil changes to a gray-colored soil horizon, whichever occurs first. Contractor shall not over excavate SPGM Subsoil or mix SPGM Subsoil with other soil horizons.

B. Leave SPGM Subsoil in place at each grid stake to form a SPGM Monument which shows the removal depth.

C. Maintain the soil monuments in place until PSC approval of SPGM stripping operations is received.

D. After PSC approval, excavate soil monuments (Topsoil and Subsoil together) and either stockpile with other SPGM Subsoil or replace as SPGM Subsoil restoration on approved surfaces.

3.05 SPGM SUBSOIL STOCKPILING

A. Stockpile SPGM Subsoil in SPGM Subsoil stockpile location shown on the Drawings.

B. Maintain stockpile slopes to meet current MSHA standards. Construct stockpiles to slopes no steeper than 3 horizontal to 1 vertical.

3.06 SUBGRADE REPAIR

A. In areas where slope restoration or clay liner is to be constructed, Contractor shall repair the subgrade that has been eroded or weathered.

B. Repair includes excavating to subgrade in areas where excess soil has been deposited by wind or surface water; filling and re-compacting to subgrade in areas where wind or surface water has eroded the subgrade; and re-establishing the subgrade to the lines and grades shown on the Drawings. In areas where clay liner is to be constructed, Random Fill shall be used as fill to repair the subgrade.

C. Subgrade shall be verified to the tolerances given in Section 31 23 00, Excavation, Backfilling, and Compacting, by Contractor's registered land surveyor in accordance with Section 01 45 00, Quality Control.

3.07 SPGM SUBSOIL PLACEMENT

A. Prepare the external embankment face for restoration as shown on the Drawings.

B. Place SPGM Subsoil to a uniform 30-inch thickness or other thickness shown on the Drawings. Place SPGM Subsoil in lifts of no more than 12 inches. Minimize compaction of SPGM Subsoil during placement.

C. Prime Farmland SPGM Subsoil materials shall not be used for slope restoration.

3.08 SPGM TOPSOIL PLACEMENT

A. Place SPGM Topsoil, from stockpile, to a uniform 12-inch thickness in a single lift. Minimize compaction of SPGM Topsoil during placement.

B. Place SPGM Topsoil in the locations and thickness shown on the Drawings or as specified for restoration.

C. Prime Farmland SPGM Topsoil materials shall not be used for slope restoration.

3.09 EROSION CONTROL

A. As directed by Owner, install and maintain heavy silt fence at the toe of slope of the embankments prior to construction of the embankment slope. Inspect and maintain silt fence after SPGM Topsoil has been placed until final stabilization is achieved.

B. Establish turf on the finished SPGM Topsoil surface as quickly as practicable. Maintain erosion controls until an effective vegetative cover has been established.

C. Establish turf as quickly as practicable on SPGM stockpile areas which will remain inactive for 30 days or longer.

D. Provide and maintain appropriate erosion control measures throughout construction.

3.10 TOLERANCES

A. Construct the restoration work within the dimensional tolerances given below. Thickness tolerances are acceptable deviations from the thickness given above provided that the average thickness meets the thickness given above. No compensation will be made for additional work on materials required by Contractor as a result of construction beyond specified limits, elevations, thickness, or grades.

B. Thickness Tolerances:

1. SPGM Subsoil Restoration: +/-0.2 foot

2. SPGM Topsoil Restoration: +/-0.1 foot

**END OF SECTION 31 01 00**

**SECTION 31 05 19.13**

**GEOTEXTILES**

## PART 1: GENERAL

1.01 SECTION INCLUDES

A. Furnishing and installing the Protective Geotextile.

B. Furnishing and installing Filter Fabric as part of the gradient control system.

1.02 REFERENCES

A. North Dakota Department of Transportation Standard Specifications for Road and Bridge Construction, Current Edition, hereafter referred to as ND/DOT Standard Specifications.

1.03 SUBMITTALS

A. For each material specified in this Section, submit for documentation quality control certificates from the manufacturer, representative of the rolls delivered to the Site. The document shall present test results for the physical properties specified below. A quality control certificate shall be submitted for each 50,000 square feet of continuously produced material. A quality control certificate shall be submitted for each roll of material that is not from a continuous production run for which a certificate has not previously been provided.

1.04 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Roll Identification:

1. Provide geotextiles in rolls protected by impermeable and opaque covers and tagged with the following information:

a. Manufacturer's name, address, and telephone number.

b. Product identification.

c. Lot number.

d. Roll number.

e. Roll dimensions.

2. Provide instructions on special handling during hauling and storage.

3. Handle and protect product to ensure product is not damaged.

B. Material will not be accepted on site without quality control certificates.

## PART 2: PRODUCTS

2.01 MATERIALS

A. Protective Geotextile shall meet the requirements of ND/DOT 709 Geotextile Fabric Type S2 for Geotextile Separation Fabric, with a minimum weight of 16 oz./sq. yd.

B. Filter Fabric shall meet the requirements of ND/DOT 709 Geotextile Fabric Type S2 for Geotextile Separation Fabric, with a minimum weight of 16 oz./sq. yd.

## PART 3: EXECUTION

3.01 EXAMINATION

A. Examine and verify acceptability of surface to receive installation of geotextile.

3.02 INSTALLATION

A. General

1. Roll out in a manner to keep material in constant tension.

2. Weight material with sandbags or approved equivalent during installation to prevent movement and wind disruption. Keep weight in-place until cover material is applied.

3. Prevent damage to underlying material during installation.

4. During installation, do not entrap stones, soil, dust, or moisture which would damage underlying material, hamper seaming, or impede performance of the product.

5. Do not expose material to precipitation prior to installation.

6. Do not expose material to direct sunlight for more than 300 hours prior to installation.

B. Seams

1. Slopes steeper than 10 horizontal to 1 vertical:

a. Seam with sewing, fusion, or other approved methods.

b. Seam shall be continuous.

c. Seam vertical on slope not across slope.

d. Orient overlap in direction of filling (cover material).

2. Slopes flatter than 10 horizontal to 1 vertical:

   a. Overlap shall be a minimum of 18-inches.

   b. Spot seam may be used to prevent wind uplift in-place of sandbags where appropriate.

   c. Orient overlap in direction of filling (cover material).

3.03 REPAIR

A. Remove debris, soil, or other material which may have penetrated geotextile.

B. Slope Areas

1. Sew seams using a J-type or double-fold type double-lock stitch, seam stitches 1/2 to 3/4 inch apart and no closer than one inch from edges.

2. For tears exceeding 10 percent of roll width, remove roll from slope and replace.

C. Non Slope Areas

1. Spot seam fabric patch in-place with a minimum 24-inch overlap in each direction.

**END OF SECTION 31 05 19.13**

**SECTION 31 05 19.16**

**GEOMEMBRANE LINERS**

## PART 1: GENERAL

1.01 SUMMARY

A. Section includes installation of the high density polyethylene (HDPE) geomembrane for composite liner system.

B. This specification covers the technical requirements for the Manufacturing and Installation of geomembrane liner used on the project. All materials must meet or exceed the requirements of this specification, and all work must be performed in accordance with the procedures provided in these Specifications.

1.02 REFERENCES

A. American Society for Testing and Materials, Current Edition, hereafter referred to as ASTM.

1. ASTM D792, Standard Test Methods for Density and Specific Gravity (Relative Density) and Density of Plastics by Displacement

2. ASTM D1004, Standard Test Method for Tear Resistance (Graves Tear) of Plastic Film and Sheeting

3. ASTM D1238, Standard Test Method for Melt Flow Rates of Thermoplastics by Extrusion Plastometer

4. ASTM D1505, Standard Test Method for Density of Plastics by the Density-Gradient Technique

5. ASTM D1603, Standard Test Method for Carbon Black Content in Olefin Plastics

6. ASTM D3895, Standard Test Method for Oxidative-Induction Time of Polyolefins by Differential Scanning Calorimetry

7. ASTM D4218, Standard Test Method for Determination of Carbon Black Content in Polyethylene Compounds By the Muffle-Furnace Technique

8. ASTM D4833, Standard Test Method for Index Puncture Resistance of Geomembranes and Related Products

9. ASTM D5199, Standard Test Method for Measuring Nominal Thickness of Geosynthetics

10. ASTM D5397, Standard Test Method for Evaluation of Stress Crack Resistance of Polyolefin Geomembranes Using Notched Constant Tensile Load Test

11. ASTM D5596, Standard Test Method for Microscopic Evaluation of the Dispersion of Carbon Black in Polyolefin Geosynthetics

12. ASTM D5641, Standard Practice for Geomembrane Seam Evaluation by Vacuum Chamber

13. ASTM D5820, Standard Practice for Pressurized Air Channel Evaluation of Dual Seamed Geomembranes

14. ASTM D5994, Standard Test Method for Measuring Core Thickness of Textured Geomembranes

15. ASTM D6392, Standard Test Method for Determining the Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods

16. ASTM D6693, Standard Test Method for Determining Tensile Properties of Nonreinforced Polyethylene and Nonreinforced Flexible Polypropylene Geomembranes

17. ASTM D7238, Standard Test Method for Effect of Exposure of Unreinforced Polyolefin Geomembrane Using Fluorescent UV Condensation Apparatus

18. ASTM D7466, Standard Test Method for Measuring Asperity Height of Textured Geomembranes

19. ASTM D6938, Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods

B. Geosynthetic Research Institute (GRI)

1. GM 13 Test Methods, Test Properties, Testing Frequency and Recommended Warranty for High Density Polyethylene (HDPE) Smooth and Textured Geomembranes

2. GM 19a Seam Strength and Related Properties of Thermally Bonded Homogeneous Polyolefin Geomembranes/Barriers

1.03 DEFINITIONS

A. Lot: A quantity of resin (usually the capacity of one rail car) used in the manufacture of geomembranes. Finished rolls shall be identified by a roll number traceable to the resin lot used.

B. Geomembrane Manufacturer (Manufacturer): The party responsible for manufacturing the geomembrane rolls.

C. Geosynthetic Quality Assurance Laboratory (Testing Laboratory): Party, independent from Owner, Owner's On-Site Representative, Manufacturer and Installer, responsible for conducting laboratory tests on samples of geosynthetics obtained at the Site or during manufacturing, under the direction of Owner's On-Site Representative.

D. Installer: Party responsible for field handling, transporting, storing, deploying, seaming and testing of the geomembrane seams.

E. Master Seamer: Must have completed a minimum of 1,000,000 square feet of geomembrane seaming work using the type of seaming apparatus proposed for the use on this Project.

F. Panel: Unit area of a geomembrane that will be seamed in the field that is larger than 100 square feet.

G. Patch: Unit area of a geomembrane that will be seamed in the field that is less than 100 square feet.

H. Subgrade Surface: Soil layer surface which immediately underlies the geomembrane panel.

1.04 SUBMITTALS

A. Submit for documentation the following product data, in writing, to Engineer prior to installation of the geomembrane material:

1. Resin Data shall include the following.

a. Certification stating that the resin meets the specification requirements (Table 2.1) and the requirements in 2.01 (no recycled polymer and no more than 10 percent rework of the same type of material is added to the resin (product run may be recycled)) shall be furnished at the time of shipment.

2. Geomembrane Roll

a. Certification stating that the material was manufactured and tested in accordance with this specification (Table 2.2), together with a report of the test results, shall be furnished at the time of shipment.

b. As geomembrane rolls are delivered to the Site, a copy of each roll's label shall be delivered to Owner's On-Site Representative.

B. Submit for review the following information to Engineer and Owner prior to installation:

1. Installation layout drawings.

a. Must show proposed panel layout including field seams and details.

b. Must be approved prior to installing the geomembrane.

c. Approved drawings will be for concept only and actual panel placement will be determined by site conditions.

2. Installer's Geosynthetic Field Installation Quality Assurance Plan.

C. Submit for documentation copies of "Certificate of Acceptance of Geomembrane Subgrade Surface by Installer" to Owner's On-Site Representative.

D. Each day (at the end of each working day), the Installer shall provide to Owner's On-Site Representative a signed report and sketch of Work completed on that day. Owner's On-Site

Representative shall review and sign report acknowledging receipt of report. Report and sketch shall include but not be limited to the following information:

1. Panel placement.

2. Trial welds.

3. Seams.

4. Seam testing and results.

5. Destructive testing and results.

6. Repair locations and log.

E. The Installer shall, within 15 working days of their final demobilization from the Site, submit for documentation the following to Engineer:

1. Formal field logs of each item required to be documented in Paragraph 1.04.D.

2. Certificate stating the geomembrane has been installed in accordance with the Contract Documents.

3. Material and installation warranties.

4. As-built drawings showing actual geomembrane placement and seams.

1.05 QUALIFICATIONS

A. Manufacturer

1. Geomembrane Manufacturer shall have manufactured a minimum of 20,000,000 square feet of polyethylene geomembrane during the last year and shall have a minimum of ten years of continuous experience in the manufacture of HDPE geomembrane liner.

B. Installer

1. Installer shall have installed a minimum of 50,000,000 square feet of HDPE geomembrane for a minimum of 10 completed facilities.

2. Installer shall have worked in a similar capacity on at least 10 projects similar in complexity to the project described in the contract documents.

3. The Installation Supervisor shall have worked in a similar capacity on projects similar in size and complexity.

4. The Installer shall provide a minimum of one Master Seamer for work on the project.

1.06 MATERIAL LABELING, DELIVERY, STORAGE AND HANDLING

A. Labeling - Each roll of geomembrane delivered to the Site shall be labeled by the Manufacturer. The label will identify:

1. Manufacturer's name
2. Product identification
3. Thickness
4. Length
5. Width
6. Roll number

B. Delivery: Rolls of liner shall be prepared to ship by appropriate means to prevent damage to the material and to facilitate off-loading.

C. Storage: The on-site storage location for the geomembrane material, prepared by Contractor to protect the geomembrane from punctures, abrasions and excessive dirt and moisture, shall have the following characteristics:

1. Level (no wooden pallets)
2. Smooth
3. Dry
4. Protected from theft and vandalism
5. Adjacent to the area being lined

D. Handling: Materials are to be handled so as to prevent damage.

1.07 WARRANTY

A. Material shall be warranted against Manufacturer's defects for a period of 5 years from the date of geomembrane installation.

B. Installation shall be warranted against defects in workmanship for a period of 1 year from the date of geomembrane completion.

## PART 2: PRODUCTS

2.01 MATERIALS

A. Geomembrane: 60-mil single-side-textured HDPE geomembrane on all sideslopes, as approved by Engineer. Dual-sided, smooth 60-mil HDPE geomembrane may be used on the cell floor on slopes less than 5 percent. Dual-sided, smooth geomembrane may be used on steeper cell floor slopes if approved by Engineer. The material must meet the following:

1. Raw Materials/Resin:

   a. HDPE geomembrane, and extrudate rods used for this project shall be manufactured of new, first quality resins, compounded and manufactured specifically for producing geomembrane for use in flexible membrane liner installations.

   b. Natural HDPE resin (without carbon black) used for this Project shall meet the specifications set forth in Table 2.1.

   c. Recycled polymer shall not be added to the resin. However, the resin may contain polymer reclaimed during the manufacturing process if reclaimed polymer content does not exceed 10 percent by weight.

2. Roll Goods:

   a. HDPE geomembrane shall meet the requirements shown in Table 2.2.

   b. The geomembranes shall be unreinforced.

   c. Geomembrane shall be free of holes, pinholes (as verified by on-line electrical detection), bubbles, blisters, excessive contamination by foreign matter, and nicks and cuts on roll edges.

   d. Geomembrane material is to be supplied in roll form.

   e. All liner sheets produced at the factory shall be inspected prior to shipment for compliance with the physical properties specified and be tested by an acceptable method of inspecting for pinholes. If pinholes are located, identified and indicated during manufacturing, these pinholes may be corrected during installation.

3. Extrudate: Resin used in the polyethylene extrudate shall be the same as that used to manufacture the geomembrane sheets. Extrudate rods are to be delivered in original containers with the manufacturer's labeling. Extrudate rods shall be free of dirt, grease, moisture, other contaminants, and shall be free of damage.

**Table 2.1: Raw Material Properties**

| Property | Test Method | HDPE |
|---|---|---|
| Density (g/cm3) | ASTM D1505 | ≥0.932 |
| Melt Flow Index (g/10 min) | ASTM D1238 (190/2.16) | ≤1.0 |
| OIT (minutes) | ASTM D3895 (1 atm/200$^0$C) | ≥100 |

**Table 2.2: Geomembrane Sheet Properties**

| Tested Property | Test Method | Frequency | 60 mil Minimum Average Value (Except as Noted |
|---|---|---|---|
| Thickness, (minimum average) mil<br>Lowest individual reading for 8 of 10<br>Lowest individual reading | ASTM D5199 | every roll | 60<br>54<br>51 |
| Density, g/cm$^3$ | ASTM D1505 | 200,000 lb | 0.94 |
| Tensile Properties (each direction)<br>Strength at Break, lb/in-width<br>Strength at Yield, lb/in-width<br>Elongation at Break, %<br>Elongation at Yield, % | ASTM D6693,<br>Type IV Dumbbell, 2 ipm<br><br>G.L. 2.0 in<br>G.L. 1.3 in | 20,000 lb | <br>90<br>126<br>100<br>12 |
| Tear Resistance, lb | ASTM D1004 | 45,000 lb | 42 |
| Puncture Resistance, lb | ASTM D4833 | 45,000 lb | 90 |
| Carbon Black Content, % (Range) | ASTM D4218 | 20,000 lb | 2.0 - 3.0 |
| Carbon Black Dispersion | ASTM D5596 | 45,000 lb | Note (1) |
| Asperity Height, mil | ASTM D7466 | Every 2nd roll | **35** |
| Stress Crack Resistance(2), hr | ASTM D5397, Appendix | 200,000 lb | 500 |
| Oxidative Induction Time, min | ASTM D3895,<br>200° C; $O_2$, 1 atm | 200,000 lb | >100 |

(1) Carbon black dispersion (only near spherical agglomerates) for 10 different views: 9 in Categories 1 or 2 and 1 in Category 3.

(2) P-NCTL test is not appropriate for testing geomembranes with textured or irregular rough surfaces. Test should be conducted on smooth edges of textured rolls or on smooth sheets made from the same formulation as being used for the textured sheet materials. The yield stress used to calculate the applied load for the SP-NCTL test should be the manufacturer's mean value via MQC testing.

B. Geomembrane Rub Sheet: 60-mil (minimum) HDPE geomembrane.

2.02 EQUIPMENT

A. Extruding equipment shall be equipped with a temperature gauge at the barrel and nozzle.

B. Fusion equipment shall be equipped with a temperature gauge capable of continuous monitoring.

C. Provide digital or dial continuous temperature recording instruments, in satisfactory working condition, with each welding unit. Welding equipment shall not be operated without functioning temperature recording instruments for measuring geomembrane sheet temperature.

D. A coupon cutter and a calibrated tensiometer shall be provided for in-field seaming prequalification testing and destructive sample testing.

E. Store, transport, and operate all equipment to avoid damage to geomembranes.

F. Glass top of each vacuum box must be clear and free of scratches for easy reading of pressure gauge. The sealing gasket shall be intact and functioning to form close seals during testing.

G. Owner or Owner's On-Site Representative reserves the right to order the Installer to remove any equipment that in Owner's or Owner's On-Site Representative's opinion is not satisfactory. The Installer will remove the equipment promptly from the construction site and replace the unsatisfactory equipment with suitable equipment within 24 hours.

H. An adequate number of welding apparatuses shall be available to avoid delaying work.

## PART 3: EXECUTION

3.01 EXAMINATION

A. Examine and certify in writing acceptability of surface (supporting soil) to receive installation of Geomembrane. A certificate of acceptance of geomembrane subgrade surface form to be used during the performance of the Work is included at the end of this Section.

B. Submit certification to Owner or Owner's On-Site Representative prior to installing geomembrane.

3.02 EARTHWORK PREPARATION

A. General:

1. After supporting soil is accepted by Installer, it is Installer's responsibility to indicate to Owner or Owner's On-Site Representative and to Contractor changes in supporting soil condition that may require repair work. Maintain prepared soil surface. Soil surface shall be observed daily to evaluate desiccation cracking. Daily observations shall ascertain effects of surface desiccation cracking upon integrity of soil liner.

2. Do not place geomembrane in area softened by precipitation.

**3. Do not place geomembrane until subgrade certification survey is completed and approved by Owner's On-Site Representative.**

B. Anchoring System:

1. Excavate anchor trench to lines and grades shown on Drawings, prior to geomembrane placement.

2. Backfilling of Anchor Trench:

a. Backfill anchor trench as shown on the Drawings and compact to at least 95 percent Standard Proctor maximum dry density (ASTM D6938).

b. Prevent damage to geomembrane when backfilling trenches.

3.03 DEPLOYMENT

A. Assign each panel a simple and logical identifying code. The coding system shall be subject to approval by Owner's On-Site Representative and shall be determined at the job site.

B. Installer shall visually inspect the geomembrane during deployment for imperfections and mark faulty or suspect areas.

C. Deployment of geomembrane panels shall be performed in a manner that will comply with the following guidelines:

1. Geomembranes shall be installed according to these specifications and manufacturer's recommendations.

2. Unroll geomembrane using methods that will not damage geomembrane and will protect underlying surface from damage (spreader bar, protected equipment bucket).

3. Place ballast (such as sandbags) on geomembrane which will not damage geomembrane to prevent wind uplift.

4. Personnel walking on geomembrane shall not engage in activities or wear shoes that could damage it. Smoking will not be permitted on the geomembrane.

5. Do not allow heavy vehicular traffic directly on geomembrane.

6. Protect geomembrane in areas of heavy traffic by placing protective cover over the geomembrane.

D. Sufficient material (slack) shall be provided to allow for thermal expansion and contraction of the material.

3.04 FIELD SEAMING

A. Seams shall meet the following requirements:

1. To the maximum extent possible, orient seams parallel to line of slope, i.e., down and not across slope.

2. Minimize number of field seams in corners, odd-shaped geometric locations and outside corners.

3. Panels shall be installed continuously down the slope; no butt seams on slopes unless approved by Engineer.

4. Slope seams (panels) shall extend a minimum of five feet beyond the grade break into the flat area.

5. Use a sequential seam numbering system compatible with panel numbering system that is agreeable to Owner's On-Site Representative and Installer.

6. Align seam overlaps consistent with the requirements of the welding equipment being used.

B. During Welding Operations

1. Master Seamer shall provide direct supervision over all other welders.

2. At the start of each seam, the Master Seamer shall clearly write the following information on the panel adjacent to each seam:

a. Seamer ID

b. Tool No.

c. Time started

d. Seam No.

C. Extrusion Welding

1. Hot-air tack adjacent pieces together using procedures that do not damage the geomembrane.

2. Clean geomembrane surfaces by disc grinder or equivalent.

3. Purge welding apparatus of heat-degraded extrudate before welding.

D. Hot Wedge Welding

1. Welding apparatus shall be a self-propelled device equipped with an electronic controller which displays applicable temperatures.

2. Clean seam area of dust, mud, moisture and debris immediately ahead of hot wedge welder.

3. Protect against moisture build-up between sheets.

E. Trial Welds

1. Perform trial welds on geomembrane samples to verify welding equipment is operating properly.

2. Make trial welds under the same surface and environmental conditions as the production welds, i.e., in contact with subgrade and similar ambient temperature.

3. Minimum of two trial welds per day, per welding apparatus; one made prior to the start of work and one completed at mid shift.

4. Cut one-inch wide by six-inch long test strips from the trial weld and perform a minimum of four peel tests (test both sides for fusion welds) and four shear tests.

5. Quantitatively and qualitatively test specimens for peel adhesion and for shear strength.

6. Trial weld specimens shall pass when the results shown in Table 3.1 are achieved in both peel and shear test.

**Table 3.1: Minimum Weld Values for HDPE Geomembranes**

| Property | Test Method | 60 mil |
|---|---|---|
| Peel Strength (fusion), ppi | ASTM D6392 | 91 |
| Peel Strength (extrusion), ppi | ASTM D6392 | 78 |
| Shear Strength (fusion & ext.), ppi | ASTM D6392 | 120 |

   a. The break, when peel testing, shall occur in the liner material itself, not through peel separation (FTB – Film Tear Bond).

   b. The break shall be a ductile break.

7. Repeat the trial weld, in its entirety, when any of the trial weld samples fail in either peel or shear.

8. No welding equipment or welder shall be allowed to perform production welds until equipment and welders have successfully completed trial weld.

9. The following information should be logged for each trial weld.

   a. date and time of the trial weld completion,

   b. ambient temperature,

   c. apparatus identification,

   d. seaming technician,

   e. barrel temperature or preheat setting for extrusion welding,

   f. wedge temperature for fusion welding,

   g. trial weld number, and

   h. pass or fail of the trial weld.

F. Seaming shall not proceed when ambient air temperature or adverse weather conditions jeopardize the integrity of the liner installation. Installer shall demonstrate that acceptable seaming can be performed by completing acceptable trial welds.

G. Defects and Repairs

1. Examine all seams and non-seam areas of the geomembrane for defects, holes, blisters, undispersed raw materials, and any sign of contamination by foreign matter.

2. Repair and non-destructively test each suspect location in both seam and non-seam areas. Do not cover geomembrane at locations that have been repaired until test results with passing values are available.

3.05 FIELD QUALITY ASSURANCE

A. Manufacturer and Installer shall participate in and conform to all terms and requirements of Owner's quality assurance program.

B. Quality assurance requirements are as specified in this Section.

C. Field Testing

1. Non-destructive testing shall be carried out as the seaming progresses on all seams.

a. Vacuum Testing

1) Shall be performed in accordance with ASTM D5641, Standard Practice for Geomembrane Seam Evaluation by Vacuum Chamber.

2) The vacuum shall be applied for no less than 10 seconds with a minimum of 4 to 8 psi registered on the vacuum gauge.

3) If bubbles appear on the geomembrane seam, the area is considered defective and shall be marked for repair.

b. Air Pressure Testing

1) Shall be performed in accordance with ASTM D5820, Standard Practice for Pressurized Air Channel Evaluation of Dual Seamed Geomembranes.

2) Pressurize the air channel to 30 psi.

3) Note time test starts and wait a minimum of 5 minutes to check. If pressure after 5 minutes has dropped less than 2 psi then the test is successful.

4) If the recorded pressure drop is above the maximum allowable after the test period, the end seals shall be checked and resealed if a leak is present. The entire test shall then be repeated.

c. The following information shall be logged for each seam tested:

1) date and time of the completion of the test,

2) seam number,

3) the general seam location,

4) the test crew,

5) the air pressure at the beginning and end of the test for double-track fusion,

6) the length of time that the air pressure was held for double-track fusion welds, and

7) pass or fail result of the test.

2. Destructive Testing

a. Location and Frequency of Testing

1) Collect destructive test samples at a frequency of one per every 500 lineal feet (maximum) of seam length.

2) Test locations will be determined after seaming by Owner's On-Site Representative.

b. Sampling Procedures are performed as follows:

1) Installer shall cut samples at locations designated by Owner's On-Site Representative as the seaming progresses in order to obtain field laboratory test results before the geomembrane is covered.

2) Installer will number each sample, and the location will be noted on the installation as-built.

3) Samples shall be twelve (12) inches wide by minimal length with the seam centered lengthwise.

4) Cut the remaining sample into two parts for distribution as follows:

a) One portion for Installer's field testing, 12-inches by 12 inches;

b) One portion for the Third Party laboratory testing, 12-inches by 16-inches;

c) One portion for Owner's On-Site Representative for archive, 12-inches by 12 inches.

5) Destructive testing shall be performed in accordance with ASTM D6392, Standard Test Method for Determining the Integrity of Non-Reinforced Geomembrane Seams Produced Using Thermo-Fusion Methods.

6) Five weld specimens shall be tested for peel and five shall be tested for shear. The weld shall pass when:

a) Four of five specimens (both peel and shear) exceed the values shown in Table 3.1, and the fifth specimen meets or exceeds 80% of the value shown in Table 3.1.

b) The break, when peel testing, shall occur in the liner material itself, not through peel separation (FTB).

c) The break shall be a ductile break.

7) Installer shall repair all holes in the geomembrane resulting from destructive sampling.

8) Repair and test the continuity of the repair in accordance with these specifications.

c. The following information shall be logged for each seam tested:

1) date and time of the completion of the test,

2) seam number,

3) test sample number, and

4) the general seam location.

3. Failed Seam Procedures

a. If the seam fails, Installer shall follow one of two options:

1) Reconstruct the seam between any two passed test locations.

2) Trace the weld to intermediate location at least 10 feet minimum or where the seam ends in both directions from the location of the failed test.

b. The next seam welded using the same welding device is required to obtain an additional sample, i.e., if one side of the seam is less than 10 feet long.

c. If sample passes, then the seam shall be reconstructed or capped between the test sample locations.

d. If any sample fails, the process shall be repeated to establish the zone in which the seam shall be reconstructed.

D. 3rd Party Independent Laboratory Destructive Seem Testing

1. Destructive seam samples shall be sent to the 3rd party independent laboratory for quality assurance quality.

2. Samples shall be sent to the independent laboratory periodically throughout geomembrane installation so not to delay placement of overlying materials.

3. Test results from the independent laboratory shall be provided to Owner's On-Site Representative within 72 hours from when the destructive sample was retrieved from the in-place geomembrane liner.

4. Owner and Owner's On-Site Representative shall be responsible for coordinating and performing the 3rd party independent laboratory testing.

3.06 REPAIR PROCEDURES

A. Remove damaged geomembrane and replace with acceptable geomembrane materials if damage cannot be satisfactorily repaired.

B. Repair any portion of unsatisfactory geomembrane or seam area failing a destructive or non-destructive test.

C. Installer shall be responsible for repair of defective areas.

D. Agreement upon the appropriate repair method shall be decided between Owner's On-Site Representative and Installer by using one of the following repair methods:

1. Patching- Used to repair large holes, tears, undispersed raw materials and contamination by foreign matter.

2. Abrading and Re-welding- Used to repair short section of a seam.

3. Spot Welding- Used to repair pinholes or other minor, localized flaws or where geomembrane thickness has been reduced.

4. Capping- Used to repair long lengths of failed seams.

5. Flap Welding- Used to extrusion weld the flap (excess outer portion) of a fusion weld in lieu of a full cap.

6. Remove the unacceptable seam and replace with new material.

E. The following procedures shall be observed when a repair method is used:

1. All geomembrane surfaces shall be clean and dry at the time of repair.

2. Surfaces of the polyethylene which are to be repaired by extrusion welds shall be lightly abraded to assure cleanliness.

3. Extend patches or caps at least 6 inches for extrusion welds and 4 inches for wedge welds beyond the edge of the defect, and around all corners of patch material.

F. Repair Verification

1. Number and log each patch repair (performed by Installer).

2. Non-destructively test each repair using methods specified in this Specification.

**END OF SECTION 31 05 19.16**

**CERTIFICATE OF ACCEPTANCE OF**
**GEOMEMBRANE SUBGRADE SURFACE BY INSTALLER**

DESCRIPTION OF AREA TO BE CERTIFIED _____

_____

| INSTALLER | PROJECT |
|---|---|
| NAME: _____ | LOCATION: _____ |
| ADDRESS: _____ | PROJECT: _____ |
| _____ | _____ |
| AUTHORIZED REPRESENTATIVE: _____ | OWNER: _____ |

The undersigned, _____ certifies that he is a representative of (company), duly authorized to execute this certificate, that he visually inspected the subgrade surface described above on _____ (date) and found the surface to be acceptable for installation of the geomembrane.

This certification is based on observations of the surface of the subgrade only. No subterrain inspections or tests have been performed and _____ (company) makes no representations or warranties regarding conditions which may exist below the surface of the subgrade.

DATE: _____ SIGNATURE: _____

NAME: _____

TITLE: _____

| **CERTIFICATE RECEIVED BY CONTRACTOR:** | **CERTIFICATE RECEIVED BY OWNER:** |
|---|---|
| DATE: _____ | DATE: _____ |
| COMPANY: _____ | COMPANY: _____ |
| SIGNATURE: _____ | SIGNATURE: _____ |
| NAME: _____ | NAME: _____ |
| TITLE: _____ | TITLE: _____ |

**SECTION 31 23 00**

**EXCAVATION, BACKFILLING, AND COMPACTING**

## PART 1: GENERAL

1.01 SUMMARY

A. Section includes:

1. General site grading requirements.

2. Excavating, segregating, loading, hauling, and placing or stockpiling native soils (Select Clay, Granular Random Fill, Random Fill, and Sandstone) from Cell 5 excavation.

3. Placing and compacting Granular Random Fill and Random Fill for embankment construction.

4. Load, Haul and place excess Random Fill in Owner designated area.

5. Processing, placing, and compacting Select Clay required for Cell 5 liner construction.

6. Placing and compacting Hagel Drain Material inside Cell 5 for the gradient control system.

7. Providing and placing Drainage Aggregate for Cell Dewatering System.

8. Hauling and placing Drainage Layer Material.

9. Excavating, stockpiling, and replacement of soils and hauling and placing pipe bedding for return water system pipeline construction.

10. Access road and ramp construction.

11. Alignment, elevation, and material thickness tolerances.

1.02 REFERENCES

A. The following are complete titles of references cited in this Section. The date of the standard is that in effect as of the certification date.

1. American Society for Testing Materials (ASTM)

a. ASTM D698, Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft$^3$ (600 kN-m/m$^3$)) (referred to as "Standard Proctor Maximum Dry Density")

b. ASTM D6938, Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depths)

2. Mine Safety and Health Administration (MSHA)

3. North Dakota Department of Transportation Standard Specifications for Construction, hereafter referred to as ND/DOT Standard Specifications.

4. Occupational Safety and Health Standards-Excavations (OSHA)

   a. OSHA set forth in 29 CFR 1926, Subpart P.

5. Energy Coalition for Contractor Safety (ECCS)

1.03 SUBMITTALS

A. Submit soil testing and survey data as specified in Section 01 45 00, Quality Control.

1.04 SEQUENCING AND SCHEDULING

A. Owner will be evaluating results of the independent registered land surveyor's grade, slope, and material thickness verifications, collecting material samples, and conducting field testing of materials throughout the duration of the Project, as described in Section 01 45 00, Quality Control of these Specifications. Do not proceed with subsequent operations until Owner or Owner's On-Site Representative has been notified, has been given opportunity to test or review Contractor's test data, and has informed Contractor of any test results that have been gathered.

B. The required completion date for the Work as described in these Contract Documents is specified elsewhere in these Contract Documents.

1.05 JOB CONDITIONS

A. It shall be solely Contractor's responsibility to review available tests and reports, conduct additional tests, and otherwise determine to its own satisfaction the location and nature of all surface and subsurface features and the soil and water conditions that may be encountered. Owner's information on site conditions may be reviewed at Owner's offices as scheduled with Owner.

B. Use of explosives will not be permitted.

C. Contractor shall be solely responsible for determining the means and methods for meeting the excavation and compaction requirements unless otherwise specified herein, except that compaction by flooding or puddling or other means that involve saturation or over-wetting the soil will not be permitted.

D. Provide all shoring, bracing, sheet piling, trench boxes, tie backs, and other measures required to perform all Work in accordance with Laws and Regulations. Specifically, all excavations shall

conform to the requirements of OSHA set forth in 29 CFR 1926, Subpart P (Occupational Safety and Health Standards-Excavations).

E. Contractor shall adhere to ECCS guidelines.

## PART 2: PRODUCTS

2.01 MATERIALS

A. Select Clay

1. Inorganic native soils excavated, segregated, and processed by Contractor during the performance of the Work. Select Clay shall meet the following requirements:

   a. Classified as CL, CH, or CL/CH by the Unified Soil Classification System. Some SC/CL soils may be acceptable if hydraulic conductivity criterion is met.

   b. Hydraulic Conductivity: Maximum of $1x10^{-7}$ cm/s, when compacted to 95 percent Standard Proctor maximum dry density at a moisture content over optimum.

   c. Maximum particle size: 3/4 inch (gravel); soil clods shall be pulverized prior to placement and compaction.

2. Select Clay may require pulverizing, screening, moisture conditioning, and reworking in order to meet the requirements of the specifications. Such operations shall be conducted as part of the performance of the Work.

B. Granular Random Fill

1. Inorganic native soils excavated and segregated by Contractor during the performance of the Work. Granular Random Soil shall be soil which:

2. Does not meet the requirements for Select Clay.

3. Classified as SP, SM, or SP-SM by the Unified Soil Classification System.

4. Will tend to be relatively free-draining when placed and compacted.

C. Random Fill

1. Inorganic native soils excavated and segregated by Contractor during the performance of the Work which do not meet the requirements for Select Clay and which has a 6-inch or less maximum particle size.

D. Sandstone

1. Naturally cemented soil present in the excavation area that is greater than 6 inches in size. Sandstone is naturally cemented soil, which cannot be excavated using scrapers and/or backhoes, but must be fractured by rock breaking equipment such as hydraulic

hammers. Naturally cemented soil of this nature has been slabbed and broken for removal with the use of track hoe mounted hydraulic hammers during previous Cell 1, Cell 2, Cell 3, and Cell 4 excavation work.

E. Drainage Layer Material

1. Bottom Ash furnished and stockpiled by Owner in Cell 5. Contractor shall screen material to be placed as Drainage Layer Material to a 3/8-inch minus size prior to placing on the composite liner system.

2. Durable washed sand exhibiting the following:

a. Grain Size: 100 percent passing 3/8-inch sieve and maximum 5 percent by weight which passes the #200 sieve.

b. $k \geq 1 \times 10\text{-}3$ cm/sec

F. Hagel Drain Material

1. Bottom Ash furnished and stockpiled by Owner.

G. Sand Bedding

1. Bottom Ash furnished and stockpiled by Owner.

H. Pipe Bedding

1. Bottom Ash furnished and stockpiled by Owner.

I. Drainage Aggregate

1. Drainage Aggregate: A mineral product consisting of sound, durable particles, excluding sandstone, crushed carbonate quarry rock, crushed concrete, salvaged bituminous mixture, and free of all organic material, and which is in conformance with the following gradation requirements:

| Sieve | % Passing |
|---|---|
| 1-1/2″ | 100 |
| 3/4″ | 35-80 |
| 3/8″ | 15-40 |
| #4 | 5-25 |
| #10 | 0-10 |
| #100 | 0-5 |

J. Compacted Gravel

1. Compacted Gravel: ND/DOT "Class 13" Aggregate Surfacing Material or comparable product approved by Owner.

## PART 3: EXECUTION

3.01 GENERAL

A. Locate and protect overhead and underground utilities.

B. Construct excavations in accordance with applicable Laws and Regulations.

C. Provide temporary controls such as diversions and dewatering equipment to prevent surface runoff from entering excavations and to remove ponded water from excavations. Maintain excavations in a dry and stable condition at all times.

3.02 CELL 5 EXCAVATION

A. Excavate native soil to the elevations, slopes, and dimensions shown on the Drawings.

B. Segregate Granular Random Fill as it is excavated, and use in gradient control system construction.

C. Excess Granular Random Fill is to be used as Random Fill

D. Segregate Random Fill materials as they are excavated and use in embankment construction.

E. Stockpile excess Random Fill, if found, in Cell 3 at location determined by Owner.

F. Segregate and stockpile Sandstone.

G. Segregate and stockpile waste coal material.

H. Segregate Select Clay and place for clay liner construction.

I. Stockpile excess Select Clay material in the designated Select Clay stockpile shown on the Drawings.

3.03 SANDSTONE STOCKPILE

A. Coordinate stockpile location in Cell 2 with Owner.

B. Maintain stable stockpile slopes.

## 3.04 SELECT CLAY STOCKPILE

A. Additional Select Clay beyond that quantity required for placement and compaction for clay liner construction shall be stockpiled at the location shown on the Drawings.

B. Maintain stockpile slopes to meet current MSHA standards.

C. Place Select Clay within the stockpile in a maximum 3-foot daily lift thickness so that Owner or Owner's On-Site Representative has the opportunity to observe and sample stockpiled Select Clay. Contractor shall be responsible to remove any material not meeting the requirements of Select Clay. Add water and process the stockpiled Select Clay material to achieve specified moisture content.

D. Install erosion control devices around the stockpile as necessary to minimize erosion.

E. This section does not apply to temporary stockpiles, located within the limits of Cell 5, of Select Clay that the Contractor might utilize during the Work.

## 3.05 RANDOM FILL STOCKPILE

A. Additional Random Fill beyond that quantity required for placement and compaction for embankment construction shall be stockpiled in Cell 3 at a location determined by the Owner.

B. Maintain stockpile slopes to meet current MSHA standards.

C. Install erosion control devices around the stockpile as necessary to minimize erosion.

## 3.06 GRANULAR RANDOM FILL STOCKPILE

A. Coordinate stockpile location with Owner.

B. Maintain stockpile slopes to meet current MSHA standards.

C. Install erosion control devices around the stockpile as necessary to minimize erosion.

## 3.07 EMBANKMENT CONSTRUCTION

A. Construct the Cell 5 embankments using Random Fill to the lines and grades shown on the Drawings.

B. Soil material classified as Select Clay shall not be used for construction of the embankment unless directed otherwise by Owner. Soil in the embankment which is found to be classified as Select Clay shall be removed at Contractor's expense.

C. Excavate, load, haul and place Random Fill in maximum 12-inch loose lifts. Moisture content at time of material placement and compaction shall be at or above the lower moisture content at which the Standard Proctor (ASTM D698) moisture-density analysis curve exceeds 95 percent of Standard Proctor maximum dry density. Compact each lift to at least 95 percent Standard Proctor maximum dry density (ASTM D6938).

D. Place Random Fill where required to dress the existing subgrade for clay liner construction. Lifts shall be constructed in a generally horizontal orientation. Compact each lift to at least 95 percent Standard Proctor maximum dry density (ASTM D6938) before proceeding to the next lift.

E. Do not incorporate snow, ice, or frozen earth in embankments.

F. Do not place Random Fill on surfaces that are frozen, muddy, or contain ice or frost, including layers of previously placed and compacted Random Fill which become the foundations for successive layers of fill.

G. All Random Fill that freezes or has been subjected to freeze-thaw action during the construction work, or during periods of temporary shutdowns, such as, but not limited to, nights, holidays, weekends, or winter shutdowns of earthwork operations shall be removed to an acceptable depth and replaced.

## 3.08 CLAY LINER CONSTRUCTION

A. Select Clay material shall be placed for liner construction as long as the daily average temperature is above 40 degrees Fahrenheit, and the Contractor can demonstrate the clay liner construction meets specifications detailed in this section. Contractor must obtain approval from Owner or Owner's On-Site Representative prior to placement of clay material.

B. Select Clay material shall be taken from the Select Clay stockpile or as directed by Owner. Maintain stockpile slopes to meet current MSHA standards. Install erosion control devices around the stockpile as necessary to minimize erosion.

C. Select Clay material shall have a water content over optimum moisture content at the time of placement and compaction. If moisture conditioning of the Select Clay is necessary prior to compaction, such conditioning shall be performed so that the soil is mixed with uniform moisture content.

D. Over-wetted Select Clay shall not be used for construction of the clay liner. Select Clay shall be determined to be over-wetted if displacement occurs under the weight of vehicle traffic or if the required compaction cannot be achieved with a reasonable number of passes with compaction equipment.

E. Place Select Clay in maximum 8-inch loose lifts, or thinner, so that each compacted lift is not greater than 6 inches thick. Compact each lift to at least 95 percent Standard Proctor maximum dry density (ASTM D6938). Compaction shall be performed with sheepsfoot compactors.

F. The existing Select Clay surface shall be scarified and wetted prior to beginning clay liner construction as shown on the Drawings.

G. Select Clay lifts shall be constructed in an approximately horizontal orientation.

H. Stagger edge joints in overlying lifts. Joints shall be offset at least 15 feet.

I. The surface of each Select Clay lift shall be kept moist until the next lift is placed. If the Select Clay surface becomes dry, apply water and rework the surface with a sheepsfoot compactor, disc, scarified, or other suitable equipment to thoroughly remoisten the material. The Select Clay surface from the previous day's construction shall be scarified and wetted prior to beginning clay liner construction every day.

J. The finished clay liner surface shall be maintained in a moist condition until covered by the geomembrane to prevent desiccation and deep cracking.

K. Construction stakes, hubs, or lath shall not be left in place in the clay liner after construction.

## 3.09 DRAINAGE LAYER MATERIAL PLACEMENT ABOVE GEOMEMBRANE

A. Place Drainage Layer Material over the geomembrane in a single lift. Placement of the Drainage Layer Material over the geomembrane shall be performed in accordance with the geomembrane manufacturer's recommendations, and under the supervision of the Owner's On-Site Representative.

B. Spreading shall occur by pushing the material from discrete dumping points and pushing the newly dumped materials outward over that material already placed. The Drainage Layer Material shall be "rolled" over the edge of the material already placed, rather than pushed or slid across the surface of the geomembrane. Compaction should be limited to that provided by the construction vehicle traffic.

C. In no case shall any construction equipment be allowed to operate on the geomembrane when less than 12 inches of Drainage Layer Material is covering the geomembrane. Only tracked, low pressure skidsteers are allowed to operate on the geomembrane when less than 12 inches of Drainage Layer Material, but not less than 6 inches of Drainage Layer Material, is covering the geomembrane. At least 2-foot of material must be placed above the geomembrane to support truck traffic.

## 3.10 CELL DEWATERING SYSTEM CONSTRUCTION

A. Place Drainage Aggregate over the Protective Geotextile in the dewatering system trenches to a uniform 3-inch thickness before installing dewatering system collection pipes. After dewatering system collection pipes have been installed, place Drainage Aggregate over pipes to form a mound to the dimensions shown on the Drawings.

B. Place Drainage Aggregate in the dewatering system sump to the elevation shown on the Drawings.

C. Do not spill Drainage Aggregate directly on geomembrane surface or areas outside of the Protective Geotextile. Spilled Drainage Aggregate shall be carefully recovered by hand and replaced to its proper location.

D. Place Drainage Aggregate material carefully by dropping from backhoe or loader bucket from a height of less than 2 feet and spread by hand with rakes or other suitable tools. Do not spread with mechanical equipment.

## 3.11 SITE GRADING

A. Grade intermediate slopes to minimize erosion potential. Maintain temporary erosion controls as necessary to minimize erosion.

B. Smooth-grade finished ground on exterior slopes of berms, along access roads, and other areas disturbed by Contractor's activities, to uniform levels or slopes between points where elevations are shown, or between such points and existing ground.

C. Construct ditches and/or drainage swales to control run-on onto and run-off from SPGM soils and within the Construction Limits as directed by Owner.

## 3.12 PIPE TRENCH BACKFILL AND COMPACTION

A. This Section applies to underground return water system pipeline siphon construction.

B. Place backfill materials at the locations and to the dimensions shown on the Drawings. Furnish equipment suitable for soil conditions and compactive effort required to meet compaction criteria specified herein, and where needed, use thinner lifts than those specified herein. Sheepsfoot compaction equipment shall be used to compact clayey soils. Vibratory equipment shall be used to compact granular soils.

C. Remove trash and debris from trench. Remove loose soil from bottom of trench, or recompact loose soil to 100 percent standard Proctor maximum dry density (ASTM D6938) before placing backfill materials.

D. Place a minimum of 6-inches of Pipe Bedding Material in bottom of trench before laying pipe. Place bedding in maximum 6-inch lifts. Bedding materials shall extend across full width of the trench. Compact each lift to 100 percent of Standard Proctor maximum dry density (ASTM D6938).

E. Place Pipe Bedding Material bedding in maximum 4-inch loose lifts under pipe haunches and compact each lift to at least 100 percent Standard Proctor maximum dry density (ASTM D6938) until firmly compacted to the pipe spring line.

F. Place Pipe Bedding Material in maximum 6-inch lifts, compacting to 100 percent of Standard Proctor maximum dry density (ASTM D6938) to an elevation at least 6-inches over the top of the pipe.

G. Backfill remainder of trench with Random Fill in maximum 12-inch loose lifts. Compact each lift to at least 95 percent of standard Proctor maximum dry density (ASTM D6938).

## 3.13 ACCESS ROAD AND RAMP CONSTRUCTION

A. Coordinate with Owner and determine location of temporary access roads and ramps into the Cell 5 construction area.

B. Permanent access roads and ramps shall be constructed at the locations shown on the Drawings or as directed by Owner or Owner's On-Site Representative.

C. Crown or slope access roads and ramps to promote surface water runoff.

D. After shaping permanent access roads, place Compacted Gravel in maximum 6-inch loose lifts and compact each lift to at least 95 percent Standard Proctor maximum dry density (ASTM D6938). Do not place compacted gravel on surfaces that are frozen or muddy or that contain ice or frost. Scarify, remoisten, and recompact surfaces that have been dried, weathered, or loosened between lifts.

## 3.14 TOLERANCES

A. Construct the excavation and backfill work within the dimensional tolerances given below. Alignment, elevation and thickness tolerances are acceptable deviations from the elevations and material thicknesses shown on the Drawings. No compensation will be made for additional work on materials required by Contractor as a result of construction beyond specified elevations, thicknesses, or grades.

B. Alignment Tolerances (subgrade and embankment)

1. Embankment Centerline: +/- 0.2 foot.

2. Top of Slope:

    a. Interior slope: +/- 1.0 foot.

    b. Exterior slope: +/- 1.0 foot at any location, +/- 0.5 foot average.

3. Toe of Slope:

    a. Interior slope: +/- 1.0 foot.

    b. Exterior slope: +/- 2 foot at any location, +/- 0.5 foot average.

4. Elevation Tolerances (subgrade and embankment):

    a. Top of Embankment: + 0.2 foot, -0.0 foot.

    b. Interior Surface: +/- 0.1 foot.

    c. Exterior Surface: +/- 0.5 foot at any location, +/- 0.2 foot average.

5. Elevation Tolerances (Select Clay):

    a. Excavation/Select Clay Subgrade: +0.0 foot, -0.5 foot.

    b. Random Fill/Select Clay Subgrade: +0.0 foot, -0.5 foot.

    c. Finished Select Clay Surface: +0.2 foot, -0.0 foot.

6. Thickness Tolerances:

a. Select Clay: -0.0 foot, +0.7 foot

b. Drainage Layer Material: -0.0 foot, +0.5 foot

c. Drainage Aggregate: -0.0 foot, +0.5 foot

d. Refer to Section 31 01 00 for SPGM Subsoil and SPGM Topsoil tolerance requirements.

3.15 FIELD QUALITY CONTROL

A. Contractor shall perform field quality control as specified in Section 01 45 00, Quality Control of these Specifications.

3.16 DEBRIS MANAGEMENT

A. Manage debris resulting from the Work or encountered on Site in accordance with applicable Laws and Regulations. Debris may include abandoned electrical cable, abandoned well materials, or other man-made objects.

**END OF SECTION 31 23 00**

**SECTION 31 25 19**

**DEWATERING AND DIVERSION**

## PART 1: GENERAL

1.01 SUMMARY

A. All work included in this Section shall be done in accordance with the following paragraphs as well as the general requirements outlined in Division 1 of these Specifications.

B. Section includes furnishing all labor, coordination, supervision, management, equipment, and materials, and for performing all operations necessary for dewatering the Site during construction.

1.02 SUBMITTALS

A. No submittals are required from this Section.

## PART 2: PRODUCTS

2.01 PUMPS

A. Contractor shall supply and maintain pumps capable of pumping water from the excavation area in the event of groundwater infiltration, heavy rains or runoff so work will not be significantly delayed and water will not be allowed enough time to saturate the soils.

## PART 3: EXECUTION

3.01 GENERAL

A. Furnish and operate temporary controls such as diversions and dewatering equipment to prevent surface water and groundwater from entering and ponding in excavations and allow construction under dry conditions.

B. Water flows will vary in proportion to recent rainfall events, and with rapid and heavy rains, ponded water may accumulate. Take measures to protect personnel, equipment, and supplies from such an event should conditions render.

C. Discharge water from construction dewatering to location approved by Owner. Identify conditions requiring water discharge and propose discharge points to Owner. Owner will consult with BNI Coal, Ltd. to approve Contractor's proposed discharge points. Owner reserves the right to terminate discharge to the sedimentation ponds. Contractor shall also provide

necessary measures to prevent erosion or transportation of sediments at the discharge locations. Remove and dispose of transported sediment.

**END OF SECTION 31 25 19**

**SECTION 32 92 00**

**TURF ESTABLISHMENT**

## PART 1: GENERAL

1.01 SUMMARY

A. Section includes:

1. Establishing vegetation on all topsoiled areas of the Site.

2. Furnishing and installing Erosion Control Blanket.

3. Furnishing and installing Silt Fence and Heavy Duty Silt Fence.

4. Furnishing and installing Fiber Rolls.

5. Furnishing and installing Straw Bales.

1.02 REFERENCES

A. The following are complete titles of references cited in this Section. The date of the standard is that in effect as of the certification date.

1. North Dakota Department of Transportation Standard Specifications for Construction, hereafter referred to as ND/DOT Standard Specifications.

1.03 SUBMITTALS

A. Submit for documentation test report from seed supplier indicating seed mix ratios and percent live seed prior to mobilizing for seeding operations.

## PART 2: PRODUCTS

2.01 MATERIALS

A. Seed: Seed shall meet the requirements of ND/DOT Section 251 for general requirements, equipment, seed testing, and labeling.

B. Seed Mix:

| | |
|---|---|
| Western Wheatgrass (Rodan or Rosanna) | 10% |
| Green Needlegrass (Lodorm) | 25% |
| Switchgrass (Dacotah or Forsberg) | 20% |
| Sideoats Grama (Killdeer or Pierre) | 15% |
| Blue Grama (SD Common) | 15% |
| Little Bluestem (Camper or Blaze) | 10% |
| Big Bluestem (Bison) | 5% |

C. Seed Application Rate: Minimum 40 pure live seeds per square foot.

D. In addition to the seed mix, Oats shall be placed at the rate of 64 pounds per acre.

E. Mulch: Mulch shall meet the requirements of ND/DOT Section 253.03C. Mulch shall be applied at a rate of 2 tons per acre.

F. Erosion Control Blanket: A three-dimensional permanent net with coconut fiber erosion control turf reinforcement matting. Product shall be North American Green C350 or approved equal.

1. Matrix: 100% coconut fiber, min. wt. 0.50lbs/yd^2 (0.27kg/m^2)

2. Netting:

   a. Top, heavyweight UV stabilized polypropylene with 0.50in (1.27cm) openings.

   b. Center, super heavyweight corrugated (crimped) UV stable polypropylene (0.50in openings).

   c. Bottom, heavyweight UV stabilized polypropylene with 0.50in (1.27cm) openings.

3. Stitching: Non-degradable thread on 1.50in (3.81cm) centers

4. Roll Weight: 37.00 lbs (16.80kg) +/- 10%

G. Erosion Control Blanket Staple: A 6in (15.2cm) wire "U" shaped staple. North American Green staple or approved equal: 11 gauge wire, min. 1in (2.5cm) crown, 6in (15.2cm) legs.

H. Silt Fence: Silt Fence shall meet the requirements of ND/DOT Section 260.

I. Heavy Duty Silt Fence: Heavy Duty Silt Fence shall meet the requirements of ND/DOT Section 260 and include the steel wire silt fence backing.

J. Fiber Rolls: Fiber Rolls shall meet the requirements of ND/DOT Section 261.

K. Straw Bales: Each straw bale shall be a minimum of 14in wide, 18in in height, 36in in length and a minimum of 50 pounds.

## PART 3: EXECUTION

### 3.01 SEQUENCING AND SCHEDULE

A. Coordinate the turf establishment work with the topsoiling and finishing operations, so as to reduce to a minimum the lag time between the initial and final phases of the combined work and to establish turf protection as soon as possible after the graded areas have been topsoiled or finish graded.

### 3.02 TURF ESTABLISHMENT

A. Place SPGM Topsoil and SPGM Subsoil as specified in Section 31 01 00, Site Preparation and Restoration.

B. Establish turf on all disturbed and topsoiled areas including the Cell 5 Borrow Area and Southwest Drainage Ditch and all stockpile locations. Turf establishment shall be performed in accordance with the requirements of ND/DOT Section 251.04.

1. Seedbed preparation (ND/DOT Section 251.04B).

2. Sowing seed (ND/DOT Section 251.02).

3. Mulching (ND/DOT Section 253.04C). Mulch shall be anchored by punching.

C. Sow the appropriate seed mixture depending upon the sowing date, as specified in ND/DOT Section 251.04C.

### 3.03 MAINTENANCE

A. Rework/replace topsoil where original topsoil has eroded or washed away as directed by Owner or Owner's On-site Representative.

B. Remulch any areas on which the original mulch has eroded, washed away, or blown off, as directed by Owner or Owner's On-Site Representative.

C. Reseed any areas on which the original seed has failed to grow or has eroded away, using the specified seed mixture, as directed by Owner or Owner's On-site Representative.

### 3.04 EROSION CONTROL BLANKET

A. Install Erosion Control Blanket in areas shown on the Drawings and as directed by Owner or Owner's On-Site Representative.

B. Install in accordance with manufacturer's recommendations for staple pattern E.

C. Staples shall be placed in rows spaced at 2 ft on center perpendicular to flow. Staples shall be spaced at 1.6 ft along each row. Staples on alternating rows shall be offset by 0.8 ft. Place a staple within 3 inches of the edge of fabric on all rows.

D. Overlap edges of blanket panels as recommended by manufacturer.

3.05 SILT FENCE

A. Install Silt Fence and Heavy Duty Silt Fence in areas shown on the Drawings and as directed by Owner or Owner's On-Site Representative.

B. Install in accordance to ND/DOT Section 260.04.

3.06 FIBER ROLLS

A. Install Fiber Rolls in areas shown on the Drawings and as directed by Owner or Owner's On-Site Representative.

B. Install in accordance to ND/DOT Section 261.

3.07 STRAW BALES

A. Install Straw Bales in areas shown on the Drawings and as directed by Owner or Owner's On-Site Representative.

B. Each row of bales must be trenched in and firmly staked. Butt ends of bales tightly together. Anchor bales with either two wood stakes or four bars driven through bale and into the soil.

**END OF SECTION 32 92 00**

**SECTION 33 90 00**

**PIPES AND FITTINGS**

## PART 1: GENERAL

1.01 SUMMARY

A. SECTION INCLUDES

1. Providing high density polyethylene (HDPE) blowdown pipelines, return pipelines, and gradient control piping.

2. Providing polyvinyl chloride (PVC) piping for pond dewatering system.

1.02 REFERENCES

A. The following are complete titles of references cited in this Section. The date of the standard is that in effect as of the certification date.

1. American Association of State Highway and Transportation Officials hereafter referred to as AASHTO.

2. American Society for Testing and Materials, current edition, hereafter referred to as ASTM.

3. American National Standards Institute, current edition, hereafter referred to as ANSI.

## PART 2: PRODUCTS

2.01 HDPE PIPE AND FITTINGS

A. HDPE pipe material: ASTM D 3350 with a minimum cell classification of 445474C, and have a PPE rating of PE4710.

B. Dimensions and wall thickness: ASTM F 714 for the size and Standard Dimension Ratio (SDR) shown on the Drawings.

C. Mark HDPE pipe at maximum 5 foot intervals with the manufacturer's name or trademark, nominal size and SDR, cell classification, and extrusion date, period of manufacture, or lot number.

D. HDPE pipe fittings: manufactured from resin having the same classification and properties as the pipe resin, and supplied by the pipe manufacturer. Use molded fittings instead of fabricated fittings, if available. All fittings, bends, and couplings for the HDPE piping shall meet the

requirements of this pipe specification and shall have an SDR at or lower than the pipe it is being connected to as shown on the Drawings.

E. Electrofusion fittings (if needed): HDPE material PE4710 and with a minimum cell classification as noted in 2.01.A. Size and install in accordance with manufacturer recommendations for coupling HDPE pipe of the size and class shown on the Drawings.

F. It should be noted that the pipe installed as part of this Project will be joined to existing pipe. The existing pipe is HDPE with a designation code of PE 3408, which has a lower pressure rating than the material specified for this Project. Take caution when applying pressure to these pipelines so as not to exceed the pressure rating of the existing pipe.

2.02 PVC PIPE AND FITTINGS

A. PVC pipe and fittings: Schedule 80, solvent-weld, AASHTO M 278.

2.03 BLOWDOWN PIPELINE ANCHOR

A. Use Random Fill cover to anchor blowdown pipes unless shown otherwise on the Drawings. Place Random Fill as shown on the Drawings or as determined in the field.

2.04 FLANGES

A. Nuts and bolts: Stainless Steel Grade 316 meeting the requirements of ASTM F593. Hex head bolts to conform to ANSI B18.2.1. Use hex nuts conforming to ANSI B18.2.2. Bolt and nut threads: ANSI B1.1. Plain washers: ANSI B18.22.1.

B. Slip-on metal flanges: 150-lb. Stainless Steel Grade 316 and furnished with full-face rubber gaskets.

C. Flange adapter and slip-on flanges: drilled to ANSI 16.1/16.47/16.5 Class 125/150 bolt circles and AWWA C-207 class D (type).

## PART 3: EXECUTION

3.01 PIPE TRENCH BACKFILL AND COMPACTION

A. See Specification 31 23 00 for requirements.

3.02 HDPE PIPE

A. General

1. General steps for butt-fusion joints:

a. Free contaminants from all surfaces of fusion tools, pipe, and fittings prior to use. Trim pipe ends as necessary prior to joining.

b. Heat both pipe ends simultaneously at specified temperature for specified time.

c. Remove heater and press melted surfaces together to form joint.

d. Maintain uniform pressure until solidified. Prevent rough handling (testing, stress movements, pulling, or laying) until fully cooled to ambient material temperatures.

2. General steps for electrofusion (if approved by Owner):

a. Perform electrofusion joining in accordance with manufacturers recommended procedure. Free contaminants from all surfaces of fusion tools, pipe, and fittings prior to use. Trim pipe ends as necessary prior to joining.

b. Demonstrate fusion technician qualifications by evidence of electrofusion training within the past year on the equipment to be utilized for this Project.

c. Install electrofusion couplings a minimum of 10 feet away from any structure.

B. Fusion Unit Operators

1. Demonstrate to Owner's or Owner's Representative's evidence of training that operator is qualified to perform consistently correct fusion joints acceptable to Owner. Replace any fusion unit operator to which Owner or Owner's Representative has reasonable objection based on the operator's failure to perform consistently correct fusion joints as recommended by pipe manufacturer or the provision of this Section.

C. Blowdown Pipeline Routing

1. The Unit 1 blowdown pipelines: two 10-inch SDR 9 HDPE pipes. The Unit 2 blowdown pipelines: two 12-inch SDR 11 HDPE pipes.

2. Do not install flanged fittings on the blowdown pipelines. Use butt-fused fittings, or electrofusion couplings if approved by Owner or Owner's On-Site Representative. Install electrofusion couplings according to manufacturer's recommendations. Inform Owner or Owner's On-site Representative prior to commencing with electrofusion procedure.

3. Install blowdown pipelines to grades shown on the Drawings or as directed by Owner.

D. Return Pipeline Routing

1. The AB and CD return pipelines both consist of two 14-inch SDR 11 HDPE pipes.

2. Do not install flanged fittings on the return pipelines, other than those shown on the Drawings. Use butt-fused fittings, or electrofusion couplings if approved by Owner or Owner's On-Site Representative. Install electrofusion couplings according to manufacturer's recommendations. Inform Owner or Owner's On-site Representative prior to commencing with electrofusion procedure.

3. Install return pipelines to the grades and slopes shown on the Drawings.

E. Pressure Testing

1. Partial Pipe Hydrostatic Testing (pre-installation):

a. Test the AB and CD return pipelines using water as the pressure medium. Do not exceed 700 feet in length for each section tested.

b. Fill the pipelines with water to a pressure of 200 psi for SDR 11 HDPE. Maintain this pressure in the pipe for a period of one hour.

2. Post-installation Hydrostatic Testing:

a. After installation, perform the testing of pipe materials, joints, and/or other materials incorporated into the construction of the AB and CD return pipelines to determine leakage and water tightness.

1) Fill the pipeline sections installed under this Project to a pressure of 160 psi for a time period of one hour. Perform this test prior to backfilling pipe.

2) After Cell 4 is operational, test entire length of return pipelines between plant and Cell 4. Tie-in joint between existing and new pipe shall remain exposed during this test. Fill pipeline sections to a pressure of 160 psi for a time period of one hour.

F. Internal Fusion Bead Removal

1. Remove internal fusion bead from each butt weld from the A, B, C, and D return pipelines and from 14-inch gradient control riser pipe by using the Bead Trimmer II or approved to equal.

2. Inspect the external and extracted internal fusion bead. The internal bead shall have a smooth root cut of the wall area; this may include wall mass that has been misaligned during fusion process. However, any wall mass that is removed should not exceed 1/10th of the wall thickness of the pipe itself.

## 3.03 PVC PIPE INSTALLATION

A. Construct the PVC piping at the locations and grades as shown on the Drawings.

B. Connect PVC piping per manufacturer's recommendation or other methods as approved by Engineer.

## 3.04 FIELD QUALITY CONTROL

A. Pipe and pipe installations will be subject to rejection for any of the following reasons:

1. Failure to conform to the specifications, particularly compaction under and around the pipe.

2. Fractures or cracks passing through pipe wall.

3. Chips or fractures on interior of pipes.

4. Cracks which, in the opinion of Owner or Owner's On-site Representative, may impair strength, durability, or serviceability of pipe.

5. Defects indicating improper proportioning, mixing, or molding.

6. Damaged ends where such damage would prevent making a satisfactory joint.

**END OF SECTION 33 90 00**

# Appendix D

## Construction Quality Assurance / Quality Control Plan

# Coal Combustion Residuals Disposal Facility
# Construction Quality Assurance Manual

## *Milton R. Young Station*
## *Permit No. 0159*

Prepared for
Minnkota Power Cooperative, Inc.

June 2022

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# Coal Combustion Residuals Disposal Facility
# Construction Quality Assurance Manual
# Milton R. Young Station
# Permit No. 0159

June 2022

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Table 2 Geomembrane Quality Assurance Testing Requirements

# 1 Introduction

This manual describes the Construction Quality Assurance (CQA) procedures to be followed during construction of the Minnkota Power Cooperative, Inc. (MPC) - Milton R. Young Station (MRYS) Coal Combustion Residuals (CCR) Disposal Facility (Facility) under Permit No. 0159. This manual is to be used as the basis for the overall CQA program and presents methods and requirements for testing components of the permitted Facility including: the soil embankment, the composite liner system, the dewatering system, the surface water drainage system, and the final cover.

The overall goals of this CQA program are to ensure that proper construction techniques and procedures are used and to verify that the materials and installation techniques used meet the project design and specification requirements. At completion of the work, the program will culminate in a report to document that the grading, liner, cover, and piping systems have been constructed in accordance with design standards and specifications, which will be submitted for approval as required by the North Dakota Department of Environmental Quality (NDDEQ).

This manual may contain requirements that affect the Contractor's performance of their work. Contractors shall consider the requirements of this manual in preparation of their bid. The Contractor shall notify MPC, with their bid, of any conflicts that arise between the requirements of this manual and the requirements of the construction Drawings and Specifications. In the event that conflicts exist that are not identified and resolved with MPC, the most stringent requirement shall govern.

Throughout this manual, reference is made to MPC's Representative. MPC's Representative refers to the MPC engineer or technician or MPC's contracted engineer or technician assigned to perform the day-to-day on-site construction observation and documentation work for each construction event at the Facility. Additionally, reference is made to "Engineer" throughout this manual. Engineer refers to the design engineer of the Facility who signed the construction Drawings and Specifications.

This manual includes standard test methods, specifications for the frequency of testing, and the planned response to failed tests. This report outlines testing to be performed by MPC's Representative related to the permitted Facility. Other testing performed on ancillary equipment such as that normally performed by the Contractor on piping systems, is outlined in the Specifications.

# 2 Standard Test Methods

Test methods to be used for the determination of soil characteristics are as follows:

a. Particle Size Analysis according to ASTM C117 (Standard Test Method for Materials Finer than 75-µm (No. 200) Sieve in Mineral Aggregates by Washing)

b. Particle Size Analysis according to ASTM C136 (Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates)

c. Particle Size Analysis according to ASTM D6913 (Standard Test Methods for Particle-Size Distribution (Gradation) of Soils Using Sieve Analysis), and ASTM D7928 (Standard Test Method for Particle-Size Distribution (Gradation) of Fine-Grained Soils Using the Sedimentation (Hydrometer) Analysis)

d. Percent Fines according to ASTM D1140 (Amount of Material in Soils Finer than the No. 200 Sieve)

e. Atterberg Limits according to ASTM D4318 (Liquid Limit, Plastic Limit, and Plasticity Index of Soils)

f. Soil Classification according to ASTM D2487 (Classification of Soils for Engineering Purposes (Unified Soil Classification System))

g. Soil Description according to ASTM D2488 (Description and Identification of Soils (Visual-Manual Procedure))

h. Moisture Content according to ASTM D2216 (Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass) or ASTM D6938 (Standard Test Method for In-Place Density and Water Content of Soil and Soil Aggregate by Nuclear Methods (Shallow Depth))

i. Density In Place according to ASTM D1556 (Density and Unit Weight of Soil In Place by the Sand-Cone Method) or ASTM D6938 (Standard Test Method for In-Place Density and Water Content of Soil and Soil Aggregate by Nuclear Methods (Shallow Depth))

j. Moisture/Density Relations according to ASTM D698 ((Standard Proctor) Laboratory Compaction Characteristics of Soil Using Standard Effort (12 400 ft-lbf/ft3 (600 Kn-m/m3))) or ASTM D1557 ((Modified Proctor) Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft3 (2,700 Kn-m/m3)))

k. Constant Head Permeability according to ASTM D2434 (Permeability of Granular Soils (Constant Head))

l. Falling Head Permeability according to ASTM D5084 (Measurement of Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter)

m. Particle Shape according to ASTM D2488 (Description and Identification of Soils (Visual-Manual Procedure))

n. Particle Size Analysis according to ASTM D5519 (Standard Test Methods for Particle Size Analysis of Natural and Man-Made Riprap Materials)

o. Nutrient Content, pH, and Percent Organic Matter according to Recommended Chemical Soil Test Procedures for the North Central Region, North Dakota State University Agricultural Experiment Station, Fargo, North Dakota, Bulletin No. 499 (Revised)

Test methods to be used for the determination of geomembrane characteristics are as follows:

a. American Society for Testing and Materials (ASTM)

    1. D5641, Standard Practice for Geomembrane Seam Evaluation by Vacuum Chamber
    2. D5820, Standard Practice for Pressurized Air Channel Evaluation of Dual Seamed Geomembranes
    3. D6392 Standard Test Method for Determining the Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods
    4. D7747 Standard Test Method for Determining Integrity of Seams Produced Using Thermo-Fusion Methods for Reinforced Geomembranes by the Strip Tensile Method

b. Geosynthetic Research Institute (GRI)

    1. GM 13 Test Methods, Test Properties, Testing Frequency and Recommended Warranty for High Density Polyethylene (HDPE) Smooth and Textured Geomembranes
    2. GM 17 Test Methods, Test Properties, Testing Frequency and Recommended Warranty for Linear Low Density Polyethylene (LLDPE) Smooth and Textured Geomembranes
    3. GM 19a Seam Strength and Related Properties of Thermally Bonded Homogeneous Polyolefin Geomembranes/Barriers

# 3 Construction Quality Assurance and Testing

Construction quality assurance will be performed by an independent and MPC-approved materials testing company subcontracted by Contractor as required by the project Contract Documents. If such responsibility is not assigned to Contractor via the Construction Contract Documents/Specifications, MPC's Representative will then perform construction quality assurance on all components of soil construction. Criteria to be used for determination of acceptability of the construction work will be as identified in the project Drawings and Specifications.

Construction Quality Assurance testing will consist of (1) observation of the work, (2) field and laboratory tests, and (3) survey. All field and laboratory tests will be conducted on samples taken from material during the course of the work.

## 3.1 Soil Components

### 3.1.1 Random Fill

Random fill will be used for construction of roadways, embankments, and berms and to level the subgrade prior to placement of the select clay liner and final cover. Select clay excavated during construction of a cell may be used to construct embankment and to level subgrades and must satisfy the requirements of random fill for these applications. The material will be obtained from an on-site source or will be imported from off-site. The following tests will be performed on random fill samples:

- Soil Classification of Soils, ASTM D2487
- Description and Identification of Soils, ASTM D2488
- Moisture/Density Relations, ASTM D698 (Standard Proctor Test) or ASTM D1557 (Modified Proctor Test)
- Density In Place, ASTM D1556 or D6938
- Moisture Content, ASTM D2216 or D6938

A summary of test requirements is provided in Table 1. A Standard Proctor Test will be performed on each type of random fill before compaction of random fill begins in order to establish moisture/density relations. Density of compacted lifts will then be verified to determine compliance with Specifications. The material does not need to meet specific gradation or permeability requirements.

### 3.1.2 Select Clay

Select clay will be used for construction of the composite liner system and barrier layer in the earthen final cover system. Select clay soil excavated will be used as the source, but soil meeting the specifications of this section could be brought from off-site if necessary. Excavated clay which is used to construct embankments must satisfy the requirements for random fill (Section 3.1.1). The following tests will be performed on clay:

- Soil Classification of Soils, ASTM D2487
- Description and Identification of Soils, ASTM D2488

- Moisture/Density Relations, ASTM D698 (Standard Proctor Test) or ASTM D1557 (Modified Proctor Test)
- Density In Place, ASTM D1556 and D6938
- Moisture Content, ASTM D2216 or D6938
- Particle Size Analysis, ASTM D6913 and D7928
- Atterberg Limits, ASTM D4318
- Falling Head Permeability, ASTM D5084
- Thickness of Layer Placed

A summary of test requirements is provided in Table 1. Soil description, particle size analysis, and Atterberg limits will be used to verify that the soil possesses suitable characteristics for a soil liner or final cover barrier layer. Standard Proctor Tests will be used to establish moisture/density relations prior to compacting the soil. In-place density and moisture content testing will be used to assess the effectiveness of placement of the materials. Permeability testing will be conducted on extruded cores of thin-wall tube samples to verify that the permeability requirements are met. The holes from the extracted thin-wall tubes will be filled with clay and hand-compacted with a tamping rod or backfilled with powdered bentonite.

### 3.1.3 Drainage Layer Material

Drainage layer material will be placed above the geomembrane liner and cover systems to convey liquid toward the dewatering systems at the base and convey clean water off the final cover system on the top. Bottom ash produced at the plant that meets the Specifications may be used for the bottom liner drainage layer material. Tests to be performed on the drainage layer material are:

- Particle Size Analysis, ASTM C136 and C117
- Constant Head Permeability, ASTM D2434
- Thickness of Layer Placed

A summary of test requirements is provided in Table 1. Drainage layer material must meet the gradation and permeability requirements stated in the Specifications. Drainage layer material meeting permeability requirements but not gradation requirements, which is not in immediate contact with the geomembrane liner, piping, or filter material, may fall outside gradation requirements following approval by the Facility designer.

### 3.1.4 Drainage Aggregate

Drainage aggregate will be placed in the cell sump and around slotted pipes. Drainage aggregate may also be required at other drainage locations at the Facility. The source of drainage aggregate will be off-site, and the tests required to verify its suitability as a filter are:

- Particle Size Analysis, ASTM C136
- Particle Shape, ASTM D2488

A summary of test requirements is provided in Table 1. The characteristics of the filter must adhere to the Specifications.

### 3.1.5 SPGM Subsoil

SPGM subsoil will be placed on the outer slopes of the embankment and in the upper portion of the final cover to provide a sufficient rooting zone for establishing vegetation. The source for SPGM subsoil will be on-site stockpiles from soil stripping prior to construction. The following tests will be performed on the SPGM subsoil:

- Soil Description, ASTM D2488
- Thickness of Layer Placed

A summary of test requirements is provided in Table 1.

### 3.1.6 SPGM Topsoil

SPGM topsoil will be placed above the SPGM subsoil layer on both the outer embankment and final cover areas to provide a sufficient depth of material for establishing vegetation The source for SPGM topsoil will be on-site stockpiles from soil stripping prior to construction. The following tests will be performed on the topsoil:

- Nutrient Content
- pH
- Percent Organic Matter
- Thickness of Layer Placed

Nutrient content, pH, and percent organic matter tests are required to determine fertilizer requirements. Determination of these properties will be in accordance with North Dakota State University Agricultural Experiment Station Bulletin No. 499. A summary of the test requirements is provided in Table 1.

### 3.1.7 Riprap

Riprap may be used to prevent soil loss in surface drainage swales or ditches, along slopes within the Facility, or along exterior slopes. The source of riprap may be on-site or off-site. Material chosen for riprap must comply with the Specifications. The following tests will be performed on the riprap:

- Particle Size Analysis, ASTM D5519

A summary of test requirements is set forth in Table 1.

## 3.2 Observation of the Work

Observation of the construction work by MPC's Representative will include the following:

- Observation of the thickness of soil lifts as loosely placed and as compacted.
- Observation of the action of compaction and operation of heavy hauling equipment on the construction surface (sheepsfoot penetration, pumping, cracking, etc.).
- Monitoring of material test results for pass/fail relative to Drawings and Specification requirements and for proper test distribution and frequency.

- Observation of removal of large stones, roots, and other deleterious material as required.
- Observation that only the appropriate soils are used and that unacceptable materials are rejected at the site.
- Observation that all materials used meet the project Specifications and have been approved for use by the project Engineer.
- Maintenance of a daily field-log of construction activities.
- Maintenance of a photographic record of construction activities.
- Performance of other project administration activities as may be required to confirm Contractor compliance with requirements of the project Drawings, Specifications, Contract Documents, and this CQA manual.

## 3.3 Laboratory and Field Tests

Table 1 describes laboratory test methods typically utilized to develop data upon which material acceptability evaluations can be based. Table 1 also describes in detail the types and number of tests required for each cover component during construction. Questions concerning the accuracy of any single test will be addressed by retesting in the same or nearby location.

Construction quality assurance testing will be conducted on samples taken from the material during the course of construction. Sampling locations will be selected by MPC's Representative according to the number of required tests. Locations of all tests will be documented for report purposes.

A special testing frequency will be used at the discretion of MPC's Representative when visual observations of construction performance indicate a potential problem. Additional testing for suspected areas will be considered when:

- Soil lift thickness is greater than specified
- Earth fill is at improper and/or variable moisture content
- Rollers are not using optimum ballast
- Dirt-clogged rollers are used to compact the material
- Fill materials differ substantially from those specified
- Degree of compaction is doubtful

During construction, the frequency of testing may also be increased in the following situations:

- Adverse weather conditions
- Breakdown of equipment
- At the start and finish of grading
- When material fails to meet specifications
- When the work area is increased.

## 3.4 Certification Surveys

The survey of specific locations will provide the basis for the construction documentation drawings and provide documentation of layer unit thicknesses. The certification survey will be performed by a qualified

land surveyor and presented in plan and tabular form. The major components of the certification survey will include the following:

- Top of subgrade
- Top of clay liner
- Top of drainage pipes
- Top of drainage aggregate
- Top of drainage layer
- Top of outer slope random fill
- Top of SPGM subsoil layer
- Top of SPGM topsoil layer
- Topographic survey of the completed site, perimeter roads, and ditches
- Other items as directed by MPC's Representative

## 3.5 Swales and Ditches

Drainage swales and ditches, either permanent or temporary, will be examined for competence and erosion protection. Erosion protection material will be placed where appropriate to limit soil loss.

## 3.6 Vegetation

The seed mixture used to establish vegetation on any portion of the site will comply with requirements of the Specifications. Vegetation will be monitored over a period of one year to observe that it becomes well established.

## 3.7 Geosynthetics

The composite liner system is composed of a select clay layer overlain by a geosynthetic liner system. The geosynthetic liner system on the sideslopes is composed of a high density polyethylene (HDPE) geomembrane. The geosynthetic liner system on the cell floor is composed of two parts: a HDPE geomembrane and a protective geotextile. The geomembrane cover system is composed of a linear low density polyethylene (LLDPE) geomembrane. The liner and cover geomembranes will be different materials but installed similarly, thus the following quality control methods for geomembrane installation will be the same, except at noted.

### 3.7.1 Geomembrane Surface Preparation

The subgrade surface for the geomembrane liner and cover will be examined for rock protrusions and overall smoothness following compaction. The subgrade surface for the geomembrane liner and cover will be observed by MPC's Representative during smooth drum rolling to detect soft or loose areas.

The Contractor and the Installer shall certify in writing that the surface on which the geomembrane liner will be installed is acceptable. The certificate of acceptance shall be given to MPC's Representative prior to commencement of geomembrane installation in the area under consideration. Commencement of installation without written certification of subgrade acceptance will mean the Installer has accepted the subgrade surface.

After supporting soil has been accepted, any change in the supporting soil condition that may require repair work is to be repaired.

### 3.7.2 Geomembrane Installation

Material quality assurance documentation will be provided with material delivered to the project site. Construction quality testing and documentation will be performed on-site. Criteria to be used for determination of acceptability of the installation will be as identified in the project Plans and Specifications. Table 2 summarizes the geomembrane testing methods, frequencies, and criteria for determining acceptability of the geomembrane installation.

#### 3.7.2.1 Field Panel Placement

The Installer will establish an identification code for each panel installed as part of the liner. The identification code system will be consistent with the proposed panel layout developed by the Installer and will be provided to MPC's Representative prior to start of installation. MPC's Representative will maintain a list showing the correspondence between panel numbers and roll numbers.

MPC's Representative will verify that geomembrane panels are installed at the location indicated on the Installer's proposed panel layout plan or with agreed modifications and will maintain (along with the Installer) a record drawing of the installed panel layout.

#### 3.7.2.2 Trial Welds

MPC's Representative shall observe and verify that all trial weld procedures and testing methods are conducted according to the Specifications. The following information will be logged:

- Date and time of the trial weld completion
- Ambient temperature
- Apparatus identification
- Seaming technician
- Barrel temperature for extrusion welding
- Preheat temperature or preheat setting for extrusion welding
- Wedge temperature for fusion welding
- Trial weld number
- Pass or fail of the trial weld

#### 3.7.2.3 Field Seaming

A seam numbering system compatible with the panel numbering system shall be agreed upon between MPC's Representative and the Installer. Weather conditions such as wind and ambient temperature will be logged for each construction day. At the start of each seam, the seamer shall clearly write the following information on the panel adjacent to each seam:

- Seamer ID
- Tool number

- Time started
- Seam number

#### 3.7.2.3.1 Seaming Preparation

The Installer shall verify that:

- Prior to seaming, the seam area is clean and free of moisture, dust, dirt, debris of any kind, and foreign material
- Seam overlap grinding, if required, is completed according to the Geomembrane Manufacturer's instructions within 1 hour of the seaming operation and done in a way that does not damage the geomembrane
- Seams are aligned with the fewest possible number of wrinkles and "fishmouths"

MPC's Representative may independently verify these conditions.

#### 3.7.2.3.2 Extrusion Process

The Installer shall provide MPC's Representative with certification that the extrudate meets the Specifications and is composed of the same resin type as the geomembrane sheeting.

The following information for each extrusion-welded seam will be logged:

- Time and date of the beginning of each seam
- Seam number
- Seam length
- Seaming technician
- Apparatus identification

#### 3.7.2.3.3 Fusion Process

The following information will be logged:

- Time and date of the beginning of each seam
- Seam number
- Seam length
- Seaming technician
- Apparatus identification

#### 3.7.2.3.4 Nondestructive Seam Testing

All field seams, over their full length, shall be nondestructively tested using a vacuum test unit, air pressure test (for double-fusion seams only), or other approved method. The purpose of nondestructive tests is to check the continuity of seams. It does not provide any information on seam strength. Continuity testing shall be carried out as the seaming work progresses, not at the completion of all field seaming.

The following information will be logged:

- Date and time of test completion
- Seam number
- General seam location
- Test crew
- Air pressure at the beginning and end of the test for double-track fusion
- Length of time that the air pressure was held for double-track fusion welds
- Pass or fail result of the test

#### 3.7.2.3.5 Destructive Seam Testing

MPC's Representative will select locations where seam samples will be cut out for laboratory testing. Those locations will be established as follows:

a. A minimum frequency of one test location per 500 feet of seam length. This minimum frequency is to be determined as an average taken throughout the entire area to be covered.

b. Test locations will be determined during seaming at MPC's Representative's discretion. Selection of such locations may be prompted by suspicion of excess crystallinity, contamination, offset welds, or any other potential cause of imperfect welding.

The Installer will not be informed in advance of the locations where the seam samples will be taken.

Samples shall be cut by the Installer as the seaming progresses in order to have field and laboratory test results before the geomembrane is covered by another material. MPC's Representative will observe and verify that testing and sampling procedures are conducted in accordance with the Contract Documents. This will include:

- Observe sample cutting
- Assign a number to each sample and mark it accordingly
- Witness all field tests
- Verify portions of samples to be sent to independent geosynthetic testing laboratory
- Record sample location on the panel layout record drawing

All holes in the geomembrane resulting from destructive seam sampling shall be immediately repaired in accordance with approved repair procedures. The continuity of the new seams in the repaired area shall be tested as described in the Specifications or, if not described therein, as described in Section 3.7.2.3.7.

MPC's Representative will witness all field tests and mark all samples and portions with the sample number.

#### 3.7.2.3.6 Independent Geosynthetic Testing Laboratory

The geosynthetic testing laboratory will be selected by MPC's Representative. Destructive test samples will be packaged and shipped under the responsibility of MPC's Representative in a manner which will not

damage the test sample. MPC's Representative will be responsible for storage and archiving the remaining portion of the sample.

Testing will include shear strength and peel adhesion. At least five specimens will be tested for each test method. Specimens will be selected alternately by test from the samples (i.e., peel, shear, peel, shear…).

The geosynthetic testing laboratory will provide test results no more than 48 hours after they receive the samples. MPC's Representative will review laboratory test results as soon as they become available and inform the Installer of the results.

Alternatively, the Installer may select the independent geosynthetic testing laboratory, package and ship samples, and coordinate other aspects of independent geosynthetic testing upon approval of MPC's Representative. In such case MPC's Representative shall be copied on all test results immediately upon receipt.

#### 3.7.2.3.7 Defects and Repairs

All seams and non-seam areas of the geomembrane will be examined by MPC's Representative. Defects, holes, blisters, undispersed raw materials, and any sign of contamination by foreign matter will be identified. Because light reflected by the geomembrane helps to detect defects, the surface of the geomembrane shall be clean at the time of examination. The geomembrane surface shall be broomed or washed by the Installer if the amount of dust or mud inhibits examination.

When seaming of the geomembrane is completed (or when seaming of a large area of the geomembrane is completed) and prior to placing overlying materials, MPC's Representative will observe the geomembrane wrinkles. MPC's Representative will indicate to the Installer which wrinkles shall be repaired.

#### 3.7.2.3.8 Geomembrane Acceptance

The geomembrane installation shall be accepted by MPC's Representative when:

- Installation is finished
- Verification of the adequacy of all seams and repairs, including associated testing, is complete
- All documentation of installation is completed

MPC's Representative will certify that installation has proceeded in accordance with the CQA manual and project Specifications for the project except as noted in the documentation report.

#### 3.7.2.3.9 Backfilling of the Anchor Trench

MPC's Representative will observe the anchor trench backfilling operation and verify that the geomembrane extends into the horizontal portion of the anchor trench as specified.

#### 3.7.2.4 Protective Geotextile Installation

Material quality assurance documentation will be provided with material delivered to the project site. Criteria to be used for determination of acceptability of the installation will be as identified in the project Plans and Specifications.

MPC's Representative will observe the anchor trench backfilling operation and verify that the geotextile extends into the horizontal portion of the anchor trench as specified. All seams and non-seam areas of the geotextile will be examined. Defects, holes, blisters, undispersed raw materials, and any sign of contamination by foreign matter will be identified and repaired.

# 4 Test Frequency

Table 1 lists the frequency of soil, pipe and pipe structures, and vegetation testing to be performed during construction, the required results, and the response to failed tests. The response to failed tests is further described in Section 5.1 through 5.4. Table 2 lists the frequency of geomembrane testing performed during construction, the required results, and the response to failed tests. The response to failed tests is described in Section 5.5.

## 4.1 Soil Components

Soil tests will be conducted before construction and/or after placement. Tests necessary to characterize those materials before use include: Standard Proctor tests, particle size analyses, Atterberg limits, permeability, and description and classification. Tests to be performed during construction include: description and classification, density, moisture content, and permeability. A detailed list of test frequencies for each soil component is included in Table 1.

## 4.2 Survey of Earthwork

Unless specified otherwise, the survey for the various soil components will be conducted on a 100-foot by 100-foot grid on the cell floor and final cover with survey points at all major breaks in slope (i.e., top and toe of slope of berms and trenches). On the sideslopes, the survey will be conducted every 100 feet along the embankment alignment. The grid will be extended vertically to enable calculation of cell component vertical thicknesses (clay liner, granular drainage, SPGM subsoil, and SPGM topsoil layers).

## 4.3 Surface Drainage Systems

Surface drainage systems will be visually monitored throughout construction to ensure competence and erosion protection. After construction, all systems must be inspected to ensure that final construction has not caused damage. Components of the surface drainage systems must be continuous and competent.

## 4.4 Vegetation

Seeding and vegetation establishment will be monitored for one year following construction to ensure competence.

## 4.5 Geosynthetics

### 4.5.1 Geomembranes

Geomembrane liner and seam tests will be conducted during and after placement. Tests necessary during placement include: trial welds, nondestructive seam testing, and destructive seam testing. Following placement, geomembrane visual tests will be conducted to detect holes, blisters, undispersed raw materials, and any sign of contamination by foreign matter.

The frequency of destructive seam testing will be as follows:

- A minimum frequency of one test location per 500 feet of seam length. This minimum frequency is to be determined as an average taken throughout the entire area to be covered.

### 4.5.2 Geotextile Layers

Following placement, geotextile visual tests will be conducted to detect deficient seams and panels, holes, excessive wrinkles or fishmouths, and any sign of contamination by foreign matter.

# 5 Response to Failed Tests

The minimum acceptable test results and proposed responses to failed tests are summarized in Table 1 and Table 2.

## 5.1 Soil Components

Soils failing to meet moisture content or compaction specifications shall be moistened and/or recompacted as appropriate and retested until the specification is met. Recompaction will cover an area equivalent in size to one grid square (100 feet by 100 feet) centered over the location of the failed test.

Clay borrow soils will be tested for grain size, Atterberg Limits, and hydraulic conductivity. A failed hydraulic conductivity test resulting from placement of unsuitable material may result in the removal of, at minimum, one lift of soil from the 100-foot grid square centered over the location of the failed test if the area is available for removal. Additional lifts may require removal if the failed test is in one of the initial lifts placed. At the discretion of the Engineer, additional tests on remaining soil will be performed or additional soil will be removed until visual classification indicates that the remaining soils are acceptable.

A failed hydraulic conductivity test resulting from inadequate compaction and/or moisture content will result in watering and/or reworking and recompacting the lift as necessary to achieve the specified compaction. A failed hydraulic conductivity test resulting from leakage of the soil testing apparatus will result in retesting using other apparatuses or test techniques as appropriate.

On any project utilizing natural soil as a construction material, a percentage of tests results may fall slightly below specifications. This may be a result of the heterogeneous nature of soil deposits and occasional variability in testing methods. Unless the overall hydraulic conductivity of the liner fails to meet specifications, soil materials associated with such test results will be left in place since they will meet the intent of the Specifications and will not significantly jeopardize the overall performance of the Facility. Removing some soils from a liner, then attempting to replace them with new material, could result in a liner with overall lesser performance than if the original soils were left in place.

Granular materials for which a minimum hydraulic conductivity and/or gradation is specified will be tested prior to placement. Material not meeting the Specifications will be removed from the site or used for other noncritical construction.

## 5.2 Survey of Earthwork

Survey shots indicating areas where the constructed grades lie outside the acceptable deviations from the elevations and material thicknesses shown on the Drawings, shall be regraded so that they are within the acceptable tolerances as determined by the Specifications. Placement of overlying materials shall not commence until the area is regraded and re-surveyed showing that the grades are within the specified tolerances.

## 5.3 Surface Drainage Systems

Components of the dewatering and surface drainage systems must be continuous and competent. Any indication of possible damage or clogging will result in repair or replacement of the faulty component.

## 5.4 Vegetation

The seed mixture used for vegetation will be documented and must comply with the Specifications. Areas where the vegetation fails to grow will be reseeded, fertilized, and mulched. If vegetation remains unestablished, an evaluation will be performed to determine more suitable measures for erosion control or additional actions to be taken to establish vegetation.

## 5.5 Geosynthetics

### 5.5.1 Geomembranes

All manufactured roll goods not meeting the Specifications will be rejected on site.

Any portion of the geomembrane exhibiting a flaw or failing a destructive or nondestructive test shall be repaired. Repair procedures shall follow the guidelines listed in the Specifications.

Each repair will be numbered and logged. Each repair shall be nondestructively tested using the methods as appropriate. Repairs which pass the nondestructive test will be taken as an indication of an adequate repair.

Large repairs may be of sufficient extent to require destructive test sampling in accordance with the Specifications. Failed tests indicate that the repair shall be redone and retested until a passing test result is obtained.

Any wrinkles deemed inadequate by MPC's Representative shall be cut and re-seamed. The seam, thus produced, shall be tested like any other seam.

### 5.5.2 Geotextile Layers

All manufactured roll goods not meeting the Specifications will be rejected on site.

Any portion of the geotextile exhibiting a flaw shall be repaired. Repair procedures shall follow the guidelines listed in the Specifications. Any wrinkles deemed inadequate by MPC's Representative shall be cut and re-seamed.

# 6 Documentation Requirements

A construction documentation report will be prepared following each phase of liner and cover construction. The construction documentation report is the summary document of the construction activities throughout the project. The written portion of the report will include description of deviation from established construction procedures, will include results from field and laboratory tests, and will summarize survey documentation. A summary of the documentation report contents is as follows:

a. Narrative description of all variances from the project Drawings and/or Specifications that occurred in the construction

b. A comparison of material test results and frequencies to construction Specifications and the CQAM

c. Construction record drawings

d. Certification survey documentation of liner and cover systems components including the following:

    1. Completed liner subgrade elevations
    2. Top of select clay grades
    3. Top of drainage layer material grades
    4. Top of SPGM subsoil layer grades
    5. Top of SPGM topsoil layer grades
    6. Piping
    7. Drainage features
    8. Other site information as appropriate

e. Photo documentation of all critical aspects of construction

f. Geomembrane installation information including field forms and as-built drawings

g. All shop drawings for prefabricated components

h. All physical testing results (field and laboratory)

i. Completed manufacturer warranties

The documentation report will be certified by a professional engineer registered in the State of North Dakota.

# Tables

**Table 1 Earthwork, Piping and Piping Structures, and Vegetation Quality Assurance Testing Requirements**

| Soil Type-Intended Use | Required Test | Test Frequency[1][2] | Required Result[3] | Response for Failed Test |
|---|---|---|---|---|
| **Random Fill** | Density In Place (ASTM D1556 or D6938) | One test/2,000 c.y. placed | >95% of Std. Proctor Maximum Dry Density | Recompact and retest |
| | Moisture Content (ASTM D2216 or D6938) | One test/2,000 c.y. placed | NA | NA |
| | Standard Proctor (ASTM D698 or D1557) | One per soil type | NA | NA |
| | Soil Classification (ASTM D2487) | One per soil type | Inorganic native soils; 6-inch or less maximum particle size | Remove and replace[4] |
| | Soil Description (ASTM D2488) | One per soil type | Inorganic native soils; 6-inch or less maximum particle size | Remove and replace[4] |
| **Select Clay** | Density In Place (ASTM D6938) | 100' grid pattern offset every lift (12") with min. 4/acre/lift on liner base and cover. On the sideslopes, one test per 200 linear feet per lift with a minimum number of tests during a single phase of construction to average one test per 200 linear feet per lift. | >95% of Std. Proctor Maximum Dry Density | Recompact and retest |
| | Density In Place (ASTM D1556) | One per soil type | >95% of Std. Proctor Maximum Dry Density | Recompact and retest |
| | Moisture Content (ASTM D2216 or D6938) | 100' grid pattern offset every lift (12") with min. 4/acre/lift on liner base and cover. On the sideslopes, one test per approximately 200 linear feet per lift with a minimum number of tests during a single phase of construction to average one test per 200 linear feet per lift.[4] | Above Optimum | Water and rework |
| | Standard Proctor (ASTM D698 or D1557) | Three per soil type | NA | NA |
| | Soil Classification (ASTM D2487) | Three per soil type | CL, CH, or CL/CH Some SC/CL soils may be acceptable if hydraulic conductivity criterion is met | Remove and replace[4] |

| Soil Type-Intended Use | Required Test | Test Frequency[1][2] | Required Result[3] | Response for Failed Test |
|---|---|---|---|---|
| **Select Clay (cont'd)** | Soil Description (ASTM D2488) | Three per soil type | NA | NA |
| | Particle Size Analysis (ASTM D6913 and D7928) | One test/5,000 c.y. to the 0.002 mm particle size | >50% passing No. 200 sieve; 3/4-inch maximum particle size | Remove and replace[4] |
| | Atterberg Limits (ASTM D4318) | One test/5,000 c.y. | LL >25%<br>PI >12% | Remove and replace[4] |
| | Falling Head Permeability ASTM D5084) | One test/15,000 c.y. | <1 x $10^{-7}$ cm/sec | Remove and replace[4] |
| | Layer Thickness Verification | 100' by 100' grid on cell floor; every 100' along the embankment alignment on sideslopes | -0.0 foot, +0.7 foot | Regrade |
| **Drainage Layer Materia** | Particle Size Analysis (ASTM C136 & C117) | One test/1,000 c.y. to the No. 200 sieve[6] | Within range specified | Remove and replace[4] |
| | Constant Head Permeability (ASTM D2434) | One test/2,000 c.y.[6] | >1 x $10^{-3}$ cm/sec | Remove and replace[4] |
| | Layer Thickness Verification | 100' by 100' grid | -0.0 foot to +0.2 foot | Regrade |
| **Drainage Aggregate** | Particle Size Analysis (ASTM C136) | One per 1,000 c.y. placed | Within range specified | Remove and replace[4] |
| | Particle Shape (ASTM D2488) | Engineer's discretion | Rounded to sub-rounded | Remove and replace[4] |
| **SPGM Subsoil[5]** | Soil Description (ASTM D2488) | Min. two tests per source | NA | NA |
| | Layer Thickness Verification | Every 100' along the embankment alignment (outer slopes); 100' by 100' grid on final cover | +/-0.2 foot | Regrade |

| Soil Type-Intended Use | Required Test | Test Frequency[1][2] | Required Result[3] | Response for Failed Test |
|---|---|---|---|---|
| **SPGM Topsoil[5]** | Nutrient Content, pH, and Percent Organic Matter | Min. two tests per source | pH 6.1 to 7.5<br>Organic matter 3% to 20% | Add organic material and fertilizer as required |
| | Layer Thickness Verification | Every 100' along the embankment alignment (outer slopes); 100' by 100' grid on final cover | +/-0.1 foot | Regrade |
| **Riprap** | Particle Size Analysis (ASTM D5519) | Min. one time per construction season and at Engineer's discretion | Within range specified | Remove and replace[4] |
| **Drainage Pipes** | External Inspection | Continuous | No breaks in line | Repair or replace |
| | Leak Inspection | Continuous | No breaks in line | Repair or replace |
| **Manholes and Cleanouts** | Operational Inspection | Continuous | Operational | Repair or replace |
| **Vegetation** | Seed Mixture | Min. two tests per source | Within Specifications | Replace |
| | One-Year Monitoring | Continuous | Established vegetation | Investigate/remediate |

(1) Where conflicts arise between this testing plan and the requirements of the Technical Specifications, the more restrictive of the two takes precedence.
(2) More frequent if required by soil variability.
(3) Test results to be available prior to placing the material.
(4) "Remove and Replace" means material shall be rejected, removed from site and/or utilized in other construction as approved by Engineer, and replaced by suitable material, unless otherwise specified by Engineer or allowed by quality control plan.
(5) Soil testing frequency of the subsoil and topsoil may be reduced or eliminated at the discretion of the Engineer if the materials appear consistent with those successfully used on previous projects at the Facility where lush vegetation established quickly.
(6) Testing frequency can be reduced to 1 test per 10,000 c.y. when a synthetic drainage layer material (i.e., bottom ash) is used.

**Table 2 Geomembrane Quality Assurance Testing Requirements**

| Geosynthetic Type-Intended Use | Required Test | Test Frequency | Required Result | Response for |
|---|---|---|---|---|
| **Geomembrane** | Material Properties (GRI-GM13, GRI-GM17, and/or GRI-GM19a as applicable) | By manufacturer Every roll provided | Per Specification | Reject roll |
| | Visual Inspection | Entire sheet | — | Patch holes and/or replace panels |
| | Trial Seam Welding | Start of seaming process, every 4 hours minimum, each seamer | Passing destructive field test results in both peel and shear | Retrieve another sample and retest until passing results are obtained |
| | Non-Destructive Seam Testing (ASTM D5641 & ASTM D5820) | All seams/patches | Per Specification | Per Specification |
| | Destructive Seam Strength Test – Peel – Fusion (GRI-GM 19; ASTM D 6392) | 1 test per 500 L.F. seam minimum | 98 pounds per inch (ppi) The break shall occur in the liner material itself, not through peel separation. The break shall be ductile. | Per Specification |
| | Destructive Seam Strength Test – Peel – Extrusion (GRI-GM 19; ASTM D6392) | 1 test per 500 L.F. seam minimum | 78 pounds per inch (ppi) The break shall occur in the liner material itself, not through peel separation. The break shall be ductile. | Per Specification |
| | Destructive Seam Strength Test – Shear – Fusion & Extrusion (GRI-GM 19; ASTM D6392) | 1 test per 500 L.F. seam minimum | 120 pounds per inch (ppi) The break shall occur in the liner material itself, not through peel separation. The break shall be ductile. | Per Specification |
| **Protective Geotextile** | Material Properties | By manufacturer Every roll provided | Per Specification | Reject roll |
| | Visual Inspection | Entire sheet | — | Repair wrinkles/fishmouths and/or replace panels |

(1) Destructive seam testing for each geomembrane sample by independent testing laboratory required as noted in this testing plan and the Technical Specifications.
(2) See Technical Specifications for additional geomembrane installation and testing requirements.
(3) Where conflicts arise between this testing plan and the requirements of the Technical Specifications, the more restrictive of the two takes precedence.

# Appendix E

## Weekly Inspection Report Example

Route 1333_____POSTED__161.010_____

Date: _____

# MINNKOTA POWER COOPERATIVE, INC.
# Milton R. Young Station
# CCR Weekly Inspection

**At intervals not exceeding seven days, inspect the CCR Disposal Facility for any appearance of actual or potential structure weakness and other conditions which are disrupting or have the potential to disrupt the operation or safety of the facility.**

| ***ACTIVE CCR LANDFILL*** | | |
|---|---|---|
| Is settlement observed in the roadway surface? | Y | N |
| Is cracking observed in the roadway surface? | Y | N |
| Is the roadway in acceptable condition? | Y | N |
| Are there any areas of loose liner within the landfill? | Y | N |
| Are there areas of settlement within the landfill? | Y | N |
| Is there any sign of erosion on the exterior slopes? | Y | N |
| Is the overall vegetation height above six inches? | Y | N |
| Are there any areas where precipitation could run-off from the landfill? | Y | N |
| Is the Fugitive Dust Plan being implemented? | Y | N |
| Are the cell dewatering pumps operational? | Y | N |

**Any other signs of structural instability and or hazardous conditions? Identify concern and location.**

Date: _____

| ***ACTIVE CCR SURFACE IMPOUNDMENT*** | | |
|---|---|---|
| Is settlement observed in the roadway surface? | Y | N |
| Is cracking observed in the roadway surface? | Y | N |
| Is the roadway in acceptable condition? | Y | N |
| Are there any areas of loose liner within the surface impoundment? | Y | N |
| What is the current water elevation? Reading shall be taken from the staff gauge on the dewatering structure. | | |
| Are there areas of settlement, scarps, sloughs, bulges or boils within the surface impoundment? | Y | N |
| Is there unusual debris within the surface impoundment? | Y | N |
| Are there trees growing on the exterior slopes? | Y | N |
| Are animal burrows observed? | Y | N |
| Are there areas of visual settlement such as slides or slumps present? | Y | N |
| Is the overall vegetation height above six inches? | Y | N |
| Are there transverse, longitudinal, or severe desiccation cracks present? | Y | N |
| Any signs of erosion on the exterior slopes? | Y | N |
| Any areas of the exterior embankment where seepage is occurring, and is the water of high turbidity and sediment-laden? | Y | N |
| Are there areas of stressed vegetation? | Y | N |
| **Any other signs of structural instability and or hazardous conditions? Identify concern and location.** | | |

Date: _____

| ***HYDRAULIC STRUCTURES*** | |
|---|---|
| What blow down line is in-service from Unit 1? | 1A 1B |
| What blow down line is in-service from Unit 2? | 1 2 |
| What pond return lines are in-service? A B C D | |
| Is water exiting the pond return line manholes? | Y N |
| Is water exiting the blow down lines into the active surface impoundment? | Y N |
| Are the floats attached to the pond return lines? | Y N |

**Any other signs of structural instability and or hazardous conditions? Identify concern and location.**

# ANY AREAS OF CONCERN SHALL BE FORWARDED TO THE SHIFT SUPERVISOR IMMEDIATELY.

Remarks:

Operator Name and Job title

# Appendix F

## Cell 5 Phase 1 Construction Documentation Report

# Construction Documentation Report
# Cell 5 Phase 1
# Coal Combustion Waste Disposal Facility

## *Milton R. Young Station*
## *Center, North Dakota*

Prepared for
Minnkota Power Cooperative, Inc.

December 2023

4300 MarketPointe Drive, Suite 200
Minneapolis, MN 55435
952.832.2600
www.barr.com

# Construction Documentation Report
# Cell 5 Phase 1
# Minnkota Power Cooperative, Inc.
# Milton R. Young Station
# Center, North Dakota

## Certification

I hereby certify that this report was prepared by me or under my direct supervision, and that I am a duly Registered Professional Engineer under the laws of the State of North Dakota.

Seth Hueckman
PE #: 10057

December 26, 2023
Date

# Construction Documentation Report
# Cell 5 Phase 1
# Minnkota Power Cooperative, Inc.
# Milton R. Young Station
# Center, North Dakota

## December 2023

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# Abbreviations

| | |
|---|---|
| Baranko | Baranko Bros., Inc. |
| Barr | Barr Engineering Co. |
| BNI | BNI Coal Ltd. |
| Braun | Braun Intertec Corporation |
| CQAM | Construction Quality Assurance Manual |
| cy | cubic yards |
| ECA | E.C. Applications, Inc. |
| Geoserv | Geoserv, Inc. |
| GPS | Global Positioning System |
| GRI | Geosynthetic Research Institute |
| HDPE | High Density Polyethylene |
| Interstate | Interstate Engineering Inc. |
| MPC | Minnkota Power Cooperative, Inc. |
| MRYS | Milton R. Young Station |
| NDDEQ | North Dakota Department of Environmental Quality |
| PSC | Public Service Commission |
| PVC | Poly Vinyl Chloride |
| QA/QC | Quality Assurance/Quality Control |
| SDR | Standard Dimension Ratio |
| SPGM | Suitable Plant Growth Material |
| TRI | Tri Environmental, Inc. |
| USCS | Unified Soil Classification System |

# 1 Introduction

This report presents the results of construction observation, documentation, and testing work performed during construction of Cell 5 at Minnkota Power Cooperative, Inc.'s (MPC) Coal Combustion Residuals Waste Disposal Facility, located at the Milton R. Young Station (MRYS) near Center, North Dakota. The facility operates under North Dakota Department of Environmental Quality (NDDEQ) Permit No. 0159. Cell 5 is the fifth of six permitted waste disposal cells at the MRYS.

Cell 5 Phase 1 was constructed in two phases: Phase 1A, beginning in 2021 and completed in 2023, and Phase 1B completed in 2023. Both phases of Cell 5 Phase 1 construction are described in this report. Phase 1A construction included site stripping in the fall of 2021, and overburden removal, lignite coal (hagel bed) removal, excavation below the hagel bed to clay subgrade in the western half of the cell, and embankment construction in 2022-2023. Site stripping and lignite coal removal was completed by BNI Coal Ltd. (BNI). Between Phase 1A and 1B construction, Cell 5 was redesigned to include removal and excavation below the hagel bed in the eastern half of Cell 5, referred to and shown on the drawings as "Federal Coal." As a result, Phase 1B construction included removal of remaining overburden and lignite in the eastern half of the cell, piping systems installation, and composite liner installation to elevation 2080. Phase 1B construction was performed between April 2023 and substantially completed November 2023. As of the date of this report, two out of four blowdown pipelines have been tied into Cell 5 and are actively filling Cell 5, and one of four siphon return pipelines have been tied in. Final tie-in of the remaining blowdown and return line pipelines is planned to be performed in the spring of 2024 after initial filling of Cell 5 is sufficient to operate the siphon return pipelines. The composite liner will be raised to elevation 2098 as part of Phase 2 construction, anticipated to be completed in 2027.

Construction was performed in accordance with the "Cell 5 – Phase 1A, Coal Combustion Waste Disposal Facility Plans and Specifications" prepared by Barr Engineering Co. (Barr), April 2022; the "Cell 5 – Phase 1B, Coal Combustion Waste Disposal Facility Plans and Specifications" prepared by Barr, June and July 2023; and the Construction Quality Assurance Manual (CQAM) included in the "Application for Permit Modification" prepared by Barr, June 2022.

Baranko Bros., Inc. (Baranko) served as the general contractor for Cell 5 construction. E.C. Applications, Inc. (ECA), Interstate Engineering Inc. (Interstate), and Geoserv, Inc. (Geoserv) served as subcontractors under the direction of Baranko. ECA installed the geomembrane liner, and Interstate conducted the survey verifications for earthwork grading and pipe installations. Geoserv performed material verification testing and compaction testing of the random fill for Phase 1A and 1B construction and also performed material verification testing of the drainage aggregate.

In addition to the construction quality control testing directed by Baranko, MPC independently retained the services of Braun Intertec Corporation (Braun) and Tri Environmental, Inc. (TRI) to perform their own construction quality control testing for Phase 1A and 1B construction. Braun performed material verification testing on prospective select clay materials during Phase 1A construction. In Phase 1B, Braun performed select clay and drainage layer material (bottom ash) material verification testing, compaction

testing of the select clay liner, and thin-wall hydraulic conductivity laboratory testing on the select clay liner. TRI performed all third-party destructive testing on the geomembrane liner installed in Phase 1B.

In 2022, Barr was on site periodically (approximately once per week) during excavation above the hagel bed and embankment construction activities in Phase 1A. Barr was not onsite during removal of the western hagel bed and returned during excavation below the western hagel bed in Phase 1A. Barr began full-time observation on April 26, 2023 with the commencement of select clay liner installation. Barr's full-time construction observation ended on October 24, 2023 after the geomembrane installation was finished. Barr was not onsite for the final weeks while Baranko finished miscellaneous tasks including but not limited to: return pipeline installation, remaining sandbag installation, and remaining bottom ash, random fill, and gravel placement on the upper embankment roadways. Daily visits by MPC personnel were conducted in the absence of Barr's field staff. In addition, personnel from the NDDEQ performed routine, quarterly inspections of the permitted cells and cell 5 construction over 2022 and 2023. During inspections, the NDDEQ personnel were accompanied by MPC employees and no concerns were raised.

Construction observation consisted of observing and recording activities of the general contractor and subcontractors; answering questions and interpreting information contained in the drawings and specifications as requested by the contractor; performing daily record keeping and taking photos of various aspects of construction; conducting weekly construction meetings; providing assistance in directing testing and quality control activities performed by the contractor, subcontractors, and MPC; and reviewing construction material test results.

Construction deviations from the specifications and drawings are noted on the enclosed record drawings in Appendix A and are described in the following sections of this report. Construction photographs showing the various construction phases, methods, and materials are presented in Appendix B. Quality control test results for random fill, select clay, drainage layer material, and drainage aggregate are provided in Appendix C, Appendix D, Appendix E, and Appendix F, respectively. Survey verification data, geomembrane data and test results, and concrete data and test results are provided in Appendix G, Appendix H, and Appendix I, respectively.

# 2 Cell 5 Construction

Cell 5 included the following primary construction activities:

- Suitable plant growth material (SPGM) stripping and segregation
- Mass excavation
- Embankment construction
- Select clay liner construction
- Geosynthetic liner installation
- Drainage layer placement
- Piping systems installation
- Slope restoration
- Access road construction

The above-mentioned components of Cell 5 construction are described in the following subsections.

## 2.1 SPGM Stripping and Soil Segregation

Prior to excavation of the Cell 5 footprint, SPGM topsoil and subsoil were stripped and stockpiled in designated areas using dozers, excavators, and off-road haul trucks. The Cell 5 footprint was stripped in the fall of 2021 during Phase 1A construction. SPGM stripping included the segregation of SPGM topsoil and subsoil. The SPGM topsoil and subsoil were stripped and stockpiled into two designated stockpiles: one each for SPGM topsoil and subsoil, respectively. Field stone encountered while performing SPGM stripping activities was hauled and placed in a designated stockpile in Cell 2.

Prior to SPGM removal, the stripping limits were staked on an approximate 100-foot by 200-foot grid. SPGM monuments were left in place at every grid intersection while the SPGM materials were being removed. The soil monuments were left in place and further excavation below SPGM did not occur until BNI received Public Service Commission (PSC) approval.

During Phase 1A construction in 2022, stripping limits were expanded to accommodate the Phase 1A design and select clay stockpile area. The expanded stripping was completed by BNI, and soil monuments were left in place until PSC approval was received. The expanded stripping limits and grid plan are shown on Dwg. C-04 of the Phase 1A record drawings. The contractor completed limited SPGM stripping detail work after BNI as directed by MPC.

## 2.2 Mass Excavation

Mass excavation of soil materials to reach select clay liner subgrade elevations was performed in the Cell 5 area. Mass excavation activity began in 2022 during Phase 1A and was performed using scrapers, excavators, off-road haul trucks, and dozers. During Phase 1A excavation, the Cell 5 footprint was excavated down to the hagel bed. Following excavation to hagel bed, BNI excavated and removed the hagel bed in the general western half of the Cell 5 footprint outside the federal coal limits. In Phase 1B construction, the Cell 5 footprint was excavated down to select clay liner subgrade and the overburden

and hagel bed were excavated from the eastern half of Cell 5 within the federal coal limits, after approval was received.

The excavated soils were divided into four main groups by the contractor: select clay, random fill, sandstone, and waste coal. All material that was not classified as select clay, sandstone, or waste coal was considered random fill. Excavated random fill material was loaded, hauled, placed, and compacted in the exterior embankment fill areas. Excess random fill was disposed in Cells 2 and 3.

Suitable select clay material encountered throughout the excavation was separated for use as clay liner material and placed in a designated stockpile south of Cell 5. Some of the select clay encountered was excavated and placed in the liner directly following processing. Onsite select clay materials were primarily found in the Cell 5 excavation below the hagel bed with some suitable select clay materials found above the hagel bed.

Sandstone materials encountered during excavation were ripped with large dozers, broken up into chunks with hammer attachments on excavators, and loaded into off-road haul trucks for final disposal in Cells 2 or 3. Approximately 70,000 cubic yards (cy) of sandstone material was removed during Cell 5 construction.

Stringers of coal seams encountered, and waste coal left following BNI removal was removed by the contractor with scrapers and hauled to designated stockpiles in Cells 2 and 3 for final disposal.

## 2.3 Embankment Construction

Random fill was used for embankment construction. Random fill was placed with scrapers and compacted with a sheepsfoot compactor and staggered wheel loading of subsequent scrapers. During embankment construction, random fill was placed in maximum 12-inch lifts and compacted to at least 95 percent of standard proctor maximum dry density.

Random fill material was taken from the excavated materials within the Cell 5 footprint. Construction of the west and south embankment was completed during Phase 1A construction.

## 2.4 Select Clay Liner Construction

Select clay material was used for clay liner construction. A 4-foot-thick clay liner was constructed on the cell floor and an 8-foot-thick clay liner was constructed on the side slopes to the elevation 2080 bench (final Phase 1 liner elevation). All of the select clay material was excavated from within the Cell 5 footprint.

Select clay was placed with scrapers, rough graded with a dozer or motor grader, and compacted with several passes of a sheepsfoot compactor and the staggered wheel loading of scrapers placing the subsequent lift. All select clay layers were constructed in horizontal lifts and rough graded with global positioning system (GPS) controlled dozers and/or motor graders to assure proper lift thickness. The select clay material was placed over optimum moisture content in maximum 6-inch-thick compacted lifts and compacted to at least 95 percent of standard Proctor maximum dry density.

The general process of select clay placement included a process area within the stripping or stockpile limits and the final placement area. The stockpiled and excavated select clay was processed by disking and watering prior to placement; no select clay material was excavated and placed without being disked and watered first. The prior day's final placed lift was wetted and scarified by the sheepsfoot or dozer prior to placing the next lift of select clay.

The final lift of select clay material was placed a couple tenths of a foot high so that it could be fine-graded smooth. The fine grading of the select clay liner was performed by a GPS-controlled dozer and/or motor grader. Excess cut material was collected following fine grading by scrapers and brought back to the select clay stockpiles or processing areas. A skid steer equipped with a smooth drum roller attachment was used on the Cell 5 floor and sideslopes to smooth the finished clay surface liner prior to geomembrane installation. The contractor hand-removed any visible large clay clods or rocks from the finished select clay surface prior to geomembrane installation.

## 2.5 Geosynthetic Liner Installation

The geosynthetic liner portion of Cell 5 construction can be broken down into four categories: geomembrane liner installation, geomembrane rub sheet installation, protective geotextile installation, and sandbag and suction vent system installation. The geomembrane is a part of the composite liner (along with the select clay liner) and the geomembrane rub sheets, protective geotextile, and sandbag and suction vent system are intended to protect the geomembrane.

### 2.5.1 Geomembrane Liner Installation

The geomembrane liner is a 60-mil high density polyethylene (HDPE) material. Single-sided, textured geomembrane was installed on top of the select clay liner (textured side down) on the sideslopes. Dual-sided, smooth geomembrane was installed on top of the select clay liner on the cell floor. The single-sided, textured geomembrane was provided in 24-foot-wide by 530-foot-long rolls, and the dual-sided, smooth geomembrane was provided in 24-foot-wide by 540-foot-long rolls.

The geomembrane was installed after clay liner construction was verified and approved in areas. Subgrade acceptance forms were filled out by the contractor, installer, and Barr's onsite field representative prior to liner deployment. The geomembrane rolls were deployed with a spreader bar attached to a forklift and/or skidsteer.

Geomembrane was deployed on the western half of Cell 5 in July 2023, while clay liner construction continued in the eastern half of the cell. Geomembrane was deployed on the remaining eastern half of Cell 5 beginning in September 2023. Geomembrane rolls on the cell floor were generally deployed in a west-to-east direction working from the high side of the floor to the low side. Geomembrane rolls were pulled down the slope from the top on the sideslopes. The sideslope panels were pulled down past the dewatering trench at the toe of slope by approximately 5 feet or more on the cell floors. Sideslope panels were anchored in the elevation 2080 bench with a 3-foot-wide by 3-foot-deep anchor trench constructed 6 feet from the crest of the bench. A majority of sideslope panels were installed continuously down the

slope; however, some partial rolls, horizontal seams, were constructed on the sideslopes. Horizontal seams on the sideslope were limited to the bottom 1/3 of the slope and were not installed higher on the slope.

The geomembrane anchor trenches were backfilled with select clay material. Select clay material was placed in maximum 12-inch-thick loose lifts in the anchor trench with an excavator and/or skidsteer and compacted to 95 percent of standard Proctor maximum dry density with a remote-controlled trench compactor.

During geomembrane installation, seaming of adjacent panels was accomplished using a hot wedge fusion seaming apparatus. Geomembrane patches were seamed using an extrusion welder. Panel orientation and seam lengths are shown on the geomembrane as-built drawing included in Appendix H.

### 2.5.2 Geomembrane Rub Sheet Installation

Rub sheets to protect the geomembrane were installed under the blowdown pipelines, the dewatering structure and sump, the downspout dewatering trenches, the siphon return pipelines, and various heavy equipment access ramps (before the ramps were constructed with bottom ash and random fill) to the cell floor. Panels of 60-mil HDPE geomembrane were used for rub sheets.

Rub sheets were temporarily held in place with sandbags placed on the rub sheet edge, until the respective overlying structure, e.g. piping, ramp, etc. was in place. Once the overlying structures were in place, the sandbags were removed.

### 2.5.3 Protective Geotextile Installation

A protective geotextile was installed above the geomembrane liner on the cell floor where drainage layer material was placed. Protective geotextile was also installed in the sump, underneath the dewatering trench pipe and drainage aggregate, and underneath the concrete riser encasement for the dewatering structure.

The protective geotextile is composed of a 16-ounce non-woven geotextile and was provided in 15-foot-wide by 300-foot-long rolls. Protective geotextile was deployed by manually pushing/rolling out the material over the geomembrane. Adjacent panels were overlapped and heat fused together.

### 2.5.4 Sandbag and Suction Vent System

A permanent sandbag system was constructed from elevation 2080 down to elevation 2060 around the perimeter of the cell following geomembrane installation. The sandbag system is composed of reinforced polyethylene sandbags filled with bottom ash material, to a designed weight of at least 40 pounds, spaced every 2.5 feet down the slope and held together with three-strand ¾-inch-diameter polypropylene rope. A wire rebar tie coated with 7-mil Poly Vinyl Chloride (PVC) was used to tie the sandbags to the rope. Technical data sheets for the sandbags specified a weight of 35 pounds, however, the contractor verified in the field that sandbags were capable of holding the designed 40 pounds prior to installation. The rope and sandbags were tied at the top to a steel post anchor. The sandbag strings were

spaced approximately every 44 feet around the perimeter of the cell with geomembrane suction vents installed between each string at the crest.

## 2.6 Drainage Layer Placement

A drainage layer was constructed on the cell floor. The drainage layer material consisted of bottom ash material produced by MPC and stockpiled in Cell 2 where it was screened by the contractor prior to placement over the protective geotextile.

Prior to bottom ash placement, access ramps were constructed in the southeast and northwest corners of Cell 5. These ramps were constructed by placing rub sheets over the geomembrane liner followed by bottom ash overlaid by random fill. Bottom ash was then generally placed on the floor from west to east. A minimum of 3 feet of bottom ash remained in place on all temporary haul roads. A GPS-controlled dozer graded the bottom ash in place to the minimum specified thicknesses. Bottom ash placement was monitored visually by Barr's onsite field representative to verify that no damage was caused to the geomembrane liner during placement.

## 2.7 Piping Systems Installation

Four distinct piping systems were installed or extended during construction: the hagel bed gradient control system, the dewatering structure, the blowdown pipelines extension, and the return pipelines extension. The following subsections describe the various piping systems in more detail.

### 2.7.1 Hagel Bed Gradient Control System

The hagel bed gradient control system was constructed in Phase 1B. The hagel bed gradient control pipe was installed adjacent to the exposed hagel bed face on the west and south embankments. A 6-inch-diameter slotted standard dimension ratio (SDR) 11 HDPE pipe was placed in a pipe trench adjacent and behind the select clay liner. The pipe trench was covered on the bottom and the sides (not the top) with geotextile filter fabric material. The pipe was placed in the pipe trench with the slots faced down and covered with drainage aggregate. The pipe trench and drainage aggregate were subsequently covered with bottom ash and random fill and overlaid by the composite liner system.

The gradient control pipe daylights out the west embankment through a 14-inch-diameter SDR 11 HDPE riser pipe. The riser pipe was installed behind the select clay liner in the random fill embankment materials and daylights on the outside of the embankment near the crest.

### 2.7.2 Dewatering Structure

The dewatering structure consists of a series of dewatering trenches that lie around the perimeter and middle of the cell floor which ultimately drain to a sump in the lower southwest corner of the cell. The dewatering trenches consist of an 8-inch-diameter schedule 80 PVC slotted pipe laid out with the slots faced down on an approximately 0.5-foot-thick bed of drainage aggregate. The drainage pipes were mounded with a minimum 1.5-foot-thick drainage aggregate overlaid by a minimum 1.5-foot-thick drainage layer. The pipe and drainage aggregate lie over a protective geotextile but are not wrapped in the geotextile. Drainage aggregate was placed around the drainage pipes and in the sump with an

excavator that gently placed the aggregate above the protective geotextile without dropping it more than 2 feet to avoid damage to the underlying geomembrane liner.

The sump consists of an approximate 8-foot-deep depression in the cell floor with a bottom elevation of 2008. The 8-inch-diameter slotted dewatering trench pipes connect to perforated, 18-inch-diameter schedule 80 PVC pipe located on the bottom perimeter of the sump. The perforated pipe system connects to two 18-inch-diameter schedule 80 PVC sidewall riser pipes. The PVC pipe used in the dewatering trenches and sump were connected with either glue or screws drilled through the pipe bells of the interconnected pipes.

The 18-inch-diameter sidewall riser pipes were constructed from elevation 2008 to elevation 2080 and encased in concrete. The PVC pipe extensions were dry fitted to the subsequent sections of pipe by slipping the pipe bells over the ends of the lower pipes and then extended up the slope. The PVC pipe joints on the sidewall riser pipes were not glued together as they were encased in reinforced concrete.

The contractor added a layer of protective geotextile above the geomembrane rub sheet in the southwest corner to provide additional protection of the geomembrane liner during installation of the dewatering structure concrete forms. The concrete forms could not be anchored/supported in the ground because they sat above the geomembrane liner. The contractor used 2x4 lumber bracing and a horizontal threaded bar tie-back system to support the plywood forms. The concrete was installed using a concrete pump truck located on the cell floor and the elevation 2080 bench. A 6.5-foot-wide by 8-foot-long by 2.5-foot-tall concrete bulkhead was first poured in the sump to buttress future concrete pours up the slope and facilitate aggregate placement in the sump. Following aggregate placement in the sump, concrete was placed in multiple pours moving up the slope in the southwest corner. The approved concrete mix design is included in Appendix I.

### 2.7.3 Blowdown Pipelines

A total of four blowdown pipelines, two for Unit 1 and two for Unit 2, were extended into Cell 5 from the existing discharge area in Cell 4. The two blowdown pipelines for the Unit 1 system consisted of 10-inch-diameter SDR 9 HDPE pipes and the two blowdown pipelines for the Unit 2 system consisted of 12-inch-diameter SDR 11 HDPE pipes.

The blowdown pipelines were buried in the west embankment of Cell 4 above the existing composite liner system and day-lighted near the northwest corner of Cell 5. The blowdown pipelines were then extended straight down the northwest corner of Cell 5 over a rub sheet to protect the geomembrane liner system. All four pipelines were extended down to the elevation 2060 bench and one pipeline from each unit was extended all the way down to the cell floor above the drainage layer where it was covered with geotextile and waste rock piles to prevent it from floating. The two pipelines installed to the cell floor will be used to initially fill the cell. The other two pipelines are still discharging to Cell 4 and will be until final tie-in to Cell 5, which is planned for January/February 2024. Detailed changes to the blowdown pipelines are shown on Dwg. C-20 of the Phase 1B record drawings.

### 2.7.4 Return Pipelines

Four new siphon return pipelines were temporarily stubbed out adjacent to the existing, active pipelines on the east side of Cell 4 and extended south into Cell 5. The return pipelines consisted of 14-inch-diameter SDR 11 HDPE pipe and were installed a minimum of 4 feet below ground surface. The return pipelines were embedded and compacted in bottom ash material and then covered with random fill and SPGM soils. The pipelines day-lighted above the composite liner system (elevation 2080) on the east embankment and extend down the exposed geomembrane liner. A rub sheet was placed underneath the return pipelines to protect the geomembrane liner system.

The final tie-in of the return pipelines is planned for the spring of 2024 after Cell 5 is filled up enough to activate the new siphons.

## 2.8 Slope Restoration

Final and temporary slope restoration was performed on the Cell 5 outer embankment slopes. Final slope restoration included the placement of 30 inches of SPGM subsoil and 12 inches of SPGM topsoil on the outer slope of the west and east embankments up to elevation 2100. Following SPGM placement, the entire outer west embankment slope was covered with erosion control blanket. The south embankment was temporarily restored (to be removed during Cell 6 construction) with 6 inches of SPGM subsoil. All disturbed slopes were seeded and mulched once SPGM subsoil/topsoil was placed.

## 2.9 Access Road Construction

A 3-inch-thick gravel surface was constructed over the random fill material on the west, east, and south embankments of Cell 5 and the west and east embankments of Cell 4. A 6-inch-thick gravel surface was originally designed for the new road around Cell 5 and no new gravel was planned for around Cells 3 and 4; the contractor was supposed to salvage and re-use the Cells 3 and 4 gravel after completion of hauling activities. However, the contractor was unable to salvage enough gravel from existing roadways around Cells 3 and 4 for re-use. As a result, 3 inches of gravel were placed around the Cell 5 perimeter and restored Cell 3 and 4 roadways. Due to the temporary nature of the perimeter access roads (e.g., the Cell 5 access road will be removed and replaced in Phase 2 construction), it was determined by MPC that a 3-inch-thick gravel layer will suffice for the light vehicle access required around the perimeter of the cells. Typical cross sections of the perimeter access roads are shown on Dwgs. C-07 and C-08 of the Phase 1B record drawings.

# 3 Surveying, Testing, and Quality Control

Verification surveying, material testing, and other quality control activities were performed during the Cell 5 Phase 1 construction work. Soil material testing and quality control was performed by MPC's independent soil testing firm (Braun) and the contractor's independent soil testing firm (Geoserv). Surveying was performed by the contractor's independent surveyor (Interstate). Geomembrane third-party destructive testing was performed by MPC's independent laboratory (TRI). Barr reviewed quality control activities throughout the project.

## 3.1 Embankment Testing

Geoserv performed field moisture and density testing for all materials used in embankment construction (random fill) during Phase 1A and Phase 1B construction. Embankment testing included collection of samples of material to be used during embankment construction for standard Proctor analyses. These standard Proctor analyses were conducted throughout the course of construction as needed or as physical soil properties varied.

The required compaction for embankment construction was 95 percent of the standard Proctor maximum dry density. The required moisture content at the time of material placement was at or above the lower moisture content at which the standard Proctor moisture-density analysis curve exceeds 95 percent of standard Proctor maximum dry density.

Testing frequency for random fill placed during embankment construction was performed in accordance with the CQAM for the project. The number of tests required and tests performed are shown in Table 1. Field density testing was performed with a nuclear density gauge at a frequency of approximately one test per 1,670 cy of material placed (the required minimum testing frequency is one test per 2,000 cy of material placed). For Phase 1A construction, a total of 153 field moisture-density tests were required (estimated) for random fill material and 160 field moisture-density tests were performed. For Phase 1B construction, a total of 22 field moisture-density tests were required (estimated) for random fill material and 28 field moisture-density tests were performed. Each field density test result was matched with its corresponding Proctor result to determine if the field density test met the specified density and moisture criteria. All field moisture-density tests met the compaction and moisture requirements. The results of the standard Proctor maximum dry density are summarized in Table 2 and the formal laboratory and field moisture-density tests are included in Appendix C.

## 3.2 Select Clay Liner Testing

Braun performed field moisture and density testing for all materials used in select clay liner construction during Phase 1B construction. Select clay liner testing included collection of samples of material to be used during clay liner construction for standard Proctor analyses, material verification including remolded hydraulic conductivity testing, particle size and Atterberg limit testing, and collection of thin-wall samples for in-place hydraulic conductivity testing. A total of 22 standard Proctor analyses were conducted and 83 total samples were collected for material verification (particle size testing, Atterberg limits, and soil classification). A total of 24 thin-wall samples were tested throughout the course of construction.

The required compaction for clay liner construction was 95 percent of the standard Proctor maximum dry density. The required moisture content at the time of material placement was above optimum moisture content at standard Proctor maximum dry density.

Testing frequency for select clay placed during clay liner construction was performed in accordance with the CQAM for the project. The clay liner was tested at a minimum frequency of 1 test per lift (6-inch-thick) per 200 lineal feet on the sideslopes and 1 test per lift (6-inch-thick) per 100-foot square grid on the cell floor as required. A select clay testing zone overall plan drawing was developed prior to construction to aid the contractor and Barr's onsite field representative in assuring that the appropriate frequency of testing would be performed. The testing zones are shown on Dwg. C-27 of the Phase 1B record drawings. The number of tests required and tests performed are shown in Table 1. Field density testing was primarily performed with a nuclear density gauge. Sand cone testing was also utilized to verify the nuclear density gauge results. The first sand cone test taken failed to meet the moisture requirements, however this was likely because the test was taken several days after the clay liner material had been placed, allowing the exposed surface to dry out. Two additional sand cones were taken after this failure, one in the same zone as the failed test, after the contractor removed the top 1 to 2 inches of material to expose representative material. Both additional sand cone tests met the project compaction and moisture requirements. Barr believes the failed sand cone was representative of the exposed clay surface and not the liner as a whole. Shortly after clay liner placement and testing was completed, it was covered with geomembrane minimizing the time of exposure and potential for drying. A total of 2,908 field moisture-density tests were required (estimated) for select clay material and 3,407 field moisture-density tests (not including the sand cone tests) were performed.

Each field density test result was compared to its corresponding Proctor result to determine if the field density test met the specified density and moisture criteria. A total of 28 moisture-density tests initially failed out of the 3,407 tests performed on the select clay material. Corrective action was taken in areas where testing indicated that the select clay did not meet the required compaction or moisture content criteria. Soil was removed, recompacted, and/or the moisture content adjusted in these areas. Re-tests were then performed in the same location as the previous failing tests. This procedure was repeated until a passing result was obtained. All final field moisture-density tests met the compaction and moisture requirement.

Five remolded hydraulic conductivity tests were performed on the clay materials encountered during excavation of Cell 5 to verify that the clay source would meet the project requirements prior to stockpiling as select clay material. All remolded samples met the hydraulic conductivity requirements of the project.

A total of 24 hydraulic conductivity tests were performed on the in-place select clay materials. The thin-wall samples were collected by Braun's onsite personnel, under the direction of Barr's onsite field representative, and shipped to Braun's laboratory located in Minneapolis, MN. Two thin-wall samples were retrieved at each testing location and labeled as "A" and "B." The thin-wall samples were retrieved redundantly in case there were issues with sample collection, sample extraction, and/or damaged in shipping. All samples tested were "A" samples, and all hydraulic conductivity tests met the permeability requirements.

A total of 83 select clay samples were collected and tested in the laboratory to verify that the material met project specifications for particle size analysis, Atterberg limits, and Unified Soil Classification System (USCS) classification. All samples were classified as CH (fat clay) or CL (lean clay) and met the Atterberg limits requirements. One sample, SC-46, failed to meet the maximum particle size specification of ¾ inch. 99 percent of this sample passed the ¾-inch sieve (100 percent required), leaving 1 percent retained. SC-46 material was approved for use as select clay liner. During clay construction, Baranko, MPC, and Barr staff made frequent inspections of the in-place clay material to locate and remove any large-diameter particles from the clay material. As discussed above, any clay clods and rock visible in the select clay material during placement were removed prior to geomembrane installation. It is Barr's opinion that the slight variation to maximum particle size found in one bag sample will have no adverse effect on the performance of the overall clay liner system.

The results of the standard Proctor maximum dry density analyses, USCS classifications, and hydraulic conductivity tests are summarized in Table 3. Formal laboratory and field moisture-density test reports are included in Appendix D.

## 3.3 Geomembrane Liner Testing

Numerous in-field tests were performed on the geomembrane liner by the geosynthetic liner installer. In-field testing included destructive testing trial welds prior to each seaming period, destructive testing of random in-place seams, non-destructively air testing the hot wedge fusion welds, and vacuum box testing all extrusion welds and patches. In-field destructive test seams were also sent to an independent testing laboratory, TRI, as a quality control check coordinated by MPC and Barr's onsite field representative. Furthermore, the geomembrane liner was visually inspected by the liner installer's quality assurance / quality control (QA/QC) personnel and Barr's onsite field representative during and after installation to detect the presence of any manufacturing or installation defects. All geomembrane seam testing and quality control is described in further detail in the following subsections.

### 3.3.1 Trial Welds

Trial welds were prepared at the beginning of each seaming period (morning and afternoon, if seaming occurred during that period) by the operator of each piece of seaming equipment. The trial welds for both the hot wedge fusion welded seams and extrusion welded seams were cut into 1-inch-wide strips and tested with an onsite tensiometer by the liner installer's QA/QC representative, under observation of Barr's onsite field representative, for mechanical seam strength (shear and peel). The operator and each piece of seaming equipment did not commence welding the deployed geomembrane until a passing trial weld was performed. The trial weld and testing data is included in Appendix H.

### 3.3.2 Non-destructive Seam Testing

All seams were non-destructively tested over their full length using air pressure or vacuum testing. Each seam was pressurized to 30 psi and left for 5 minutes to see if there was a pressure drop of over 2 psi. Fusion welds that failed to hold pressure were repaired using a geomembrane patch or extrusion bead. All extrusion welded seams were tested using a vacuum box and any defects found were sealed with an

additional patch or extrusion bead. All test results, seaming logs, panel placement forms, repair forms, roll list and material certifications are also included in Appendix H.

### 3.3.3 Destructive Seam Testing

Destructive seam tests were performed on samples taken randomly from seams in the geomembrane at a minimum rate of 1 per 500 lineal feet of installed seam as specified. The destructive samples were cut into three portions: one portion for testing in the field by the installer, one portion for third-party or independent laboratory (TRI) testing, and one portion saved as an archived sample. A total of 126 destructive seam samples were taken resulting in a testing frequency of 1 per 497 lineal feet of installed seam. No destructive test samples failed field testing, however, seven samples failed third-party destructive testing. In all failed destructive locations, additional samples were taken on either end of the failed seam. For failed samples taken at the beginning or end of a seam, a sample was taken from the seam welded immediately prior to or after the failed seam, by the same machine. The additional destructive samples were field tested to isolate the defective weld and the field-passing additional samples were sent to the third-party laboratory for confirmation. When the defective segment of seam was isolated (confirmed by third-party laboratory testing), that segment was repaired with a geomembrane patch or an extrusion cap. In addition, archives of failed samples were also sent in for third-party testing to gain more information on the quality of welds and mode of failure.

The location of these destructive seam tests are shown on the geomembrane liner as-built drawing included in Appendix H. Results of the destructive seam field tests and third-party laboratory tests are summarized in Table 4 and also included in Appendix H.

### 3.3.4 Anchor Trench Testing

The geomembrane liner was secured in an anchor trench at the elevation 2080 bench. After liner deployment, the anchor trench was backfilled with clay materials and compacted to 95 percent of the standard Proctor dry density. Braun conducted in-place nuclear density testing of the backfilled anchor trenches, conducting a test in each sidewall testing zone for a total of 21 tests. All tests met the compaction requirements, and the results are included in Appendix D.

## 3.4 Drainage Layer Testing

Braun performed field collection and laboratory testing for the drainage layer (bottom ash) material. Sieve analysis and hydraulic conductivity testing was performed on the onsite samples collected. The bottom ash material was screened on site to a maximum 3/8-inch particle size by the contractor. Testing frequency for the drainage layer was performed in accordance with the CQAM. The number of tests required and tests performed are shown in Table 1. A total of five sieve analysis and hydraulic conductivity tests were performed on the drainage layer material and all five test results met the particle size and permeability requirements.

The drainage layer material laboratory test results are summarized in Table 5. The results of the sieve analyses and hydraulic conductivity tests are included in Appendix E.

## 3.5 Drainage Aggregate Testing

Geoserv performed field collection and laboratory testing for the drainage aggregate. Sieve analysis testing was performed on the onsite samples collected. Testing frequency for drainage aggregate was performed in accordance with the CQAM. The number of tests required and tests performed are shown in Table 1.

A total of four sieve analysis tests were performed on the drainage aggregate. All four samples met the specified gradation requirements for the project. No testing was performed on the drainage aggregate material roundness and shape. However, all drainage aggregate was visually inspected and classified as rounded to sub-rounded by Barr.

The drainage aggregate material laboratory test results are summarized in Table 6. The results of the sieve analyses are included in Appendix F.

## 3.6 Slope Restoration Testing

SPGM subsoil and SPGM topsoil testing is required by the CQAM but may be reduced or eliminated at the discretion of the Engineer. No soil testing was performed on these materials during Cell 5 Phase 1 construction. The SPGM materials have been segregated, stockpiled, and placed on site for numerous projects over decades at the ash disposal ponds, with lush vegetation always establishing quickly. Additional testing of these materials was deemed unnecessary by MPC and Barr based on the consistency of the materials and previous project success.

## 3.7 Surveying

Interstate established benchmark information and performed the certification or verification (used interchangeably) surveys required by the specifications for the contractor. The contractor used the established benchmark information to perform most of their own construction staking utilizing Topcon GPS technology on their dozers, motor graders, and hand-held rovers. The contractor did most of their fine grading with the GPS-controlled dozer and/or motor grader resulting in less construction staking and more accurate layer thicknesses. Interstate verified the contractor's grades by performing certification surveys on the embankment fill, select clay, drainage layer material, piping systems, and SPGM materials. Interstate performed all certification surveys with a Trimble GPS system. The following subsections describe the various certification surveys in more detail. All certification survey data, including the signed certification letter from a professional land surveyor, is provided in Appendix G.

### 3.7.1 Embankment

Interstate verified that elevations, grades, slopes, and material thickness constructed by the contractor were within the tolerances specified for the project. Survey shots were taken on the subgrade (shots labeled RF), top of subsoil (shots labeled SS), and top of topsoil (shots labeled TS). Locations of the survey verification points are shown on Dwgs. C-12 and C-13 of the Phase 1A record drawings and C-28 and C-31 of the Phase 1B record drawings. Sideslope survey points were grouped in straight lines, spaced at 100-foot intervals or less, perpendicular to the perimeter of the cell. All embankment subgrade

certification survey shots met elevation, grade, and slope requirements. The required minimum thickness for SPGM topsoil and SPGM subsoil is based on a vertical orientation to the slope (e.g., a 2.5-foot minimum SPGM subsoil layer measured normal to the slope would be 2.56 feet in the vertical orientation). The "A" verification shots on the interior embankment of Cell 5 were not collected in Phase IB construction. These shots were located on the embankment random fill above clay liner below the embankment crest. These areas will be disturbed and surveyed during future Phase 2 construction prior to clay liner installation. In addition, "E" verification shots of the East embankment exterior restoration were also not collected in Phase IB. These shots were located at the tie-in of restored topsoil to existing ground. These areas were verified in the field to smoothly tie-in to existing ground. Verification surveying results for the embankment subgrade and outer slopes are shown in the data package prepared by Interstate and included in Appendix G.

### 3.7.2 Select Clay Liner

Interstate verified that elevations, grades, slopes, and material thickness of the select clay liner were within the tolerances specified for the project. Survey shots were taken on the subgrade (shots labeled RF) and top of select clay (shots labeled SC). Locations of the survey verification points are shown on Dwgs. C-27, C-29, and C-30 of the Phase 1B record drawings. Sideslope survey points were grouped in straight lines, spaced at 100-foot intervals or less perpendicular to the perimeter of the cell. The required minimum thickness for select clay is based on a vertical orientation to the slope (e.g., the 8-foot minimum select clay layer measured normal to the slope would be 8.43 feet in the vertical orientation). The select clay thicknesses surveyed at each certification shot met the minimum thickness requirement specified. Verification surveying results for the select clay are shown in the data package prepared by Interstate and included in Appendix G.

### 3.7.3 Drainage Layer

Interstate verified the material thickness of the drainage layer (bottom ash) material placed above the geomembrane on the west and east floors. The top of ash survey shots (shots labeled Ash) were generally compared to the top of the select clay liner shots (shots labeled SC) established on the cell bottom grid to determine material thickness. The drainage layer surveyed met the minimum thickness on all verification survey shots. Verification surveying results for the drainage layer are shown in the data package prepared by Interstate and included in Appendix G.

### 3.7.4 Piping Systems

The piping components of Cell 5 were also surveyed by Interstate to document location, grades, and elevations. The top of pipe grades were shot along the alignment approximately every 50 feet for the hagel bed gradient control pipe, dewatering pipes, blowdown pipelines, and return pipelines. The piping systems were field fit by the contractor, MPC, and Barr's onsite field representative with the pipelines generally following the alignments that were shown in the project drawings. All piping systems met acceptable grades and elevations. The as-built pipeline alignments are included in the data package prepared by Interstate and included in Appendix G.

# 4 Conclusion

This report presents the summary of all observations, documentation, testing, and deviations from the project drawings and specifications during construction of Cell 5 Phase 1A and Phase 1B. Cell 5 Phase 1 construction has been completed and is in conformance with the design as presented in the project drawings and specifications.

# Tables

Table 1
Construction Quality Control Plan Requirements and Testing Performed
Cell 5 - Phase 1

| MATERIAL (PLANNED QUANTITY) | REQUIRED TEST | TEST FREQUENCY | REQUIRED RESULT | NUMBER OF TESTS REQUIRED | NUMBER OF TESTS PERFORMED |
|---|---|---|---|---|---|
| Random Fill Phase 1A ($305{,}000\ yd^3$ - Neatline) | Standard Proctor (ASTM D698) | 1 test/soil type | NA | Unknown | 7 |
| | Classification of Soils (ASTM D2487) | 1 test/soil type | Inorganic native soils; 6" or less maximum particle size | Unknown | 7 |
| | Description and Identification of Soils (ASTM D2488) | 1 test/soil type | Inorganic native soils; 6" or less maximum particle size | Unknown | 7 |
| | In-Place Moisture - Nuclear (ASTM D6938) | 1 test/2,000 $yd^3$ placed | See Note (1) | 153 | 160 |
| | In-Place Density - Nuclear (ASTM D6938) | 1 test/2,000 $yd^3$ placed | ≥ 95% of Standard Proctor Maximum Dry Density | 153 | 160 |
| Random Fill Phase 1B ($43{,}000\ yd^3$ - Neatline) | Standard Proctor (ASTM D698) | 1 test/soil type | NA | Unknown | 2 |
| | Classification of Soils (ASTM D2487) | 1 test/soil type | Inorganic native soils; 6" or less maximum particle size | Unknown | 2 |
| | Description and Identification of Soils (ASTM D2488) | 1 test/soil type | Inorganic native soils; 6" or less maximum particle size | Unknown | 2 |
| | In-Place Moisture - Nuclear (ASTM D6938) | 1 test/2,000 $yd^3$ placed | See Note (1) | 22 | 28 |
| | In-Place Density - Nuclear (ASTM D6938) | 1 test/2,000 $yd^3$ placed | ≥ 95% of Standard Proctor Maximum Dry Density | 22 | 28 |
| Select Clay ($360{,}000\ yd^3$ - Neatline) | Particle Size (ASTM D6913 & D7928) | 1 test/5,000 $yd^3$ placed | ≥ 50% passing No. 200 sieve; 3/4-inch maximum particle size | 72 | 83 |
| | Standard Proctor (ASTM D698) | 3 tests/soil type | NA | Unknown | 22 |
| | Classification of Soils (ASTM D2487) | 3 tests/soil type | CL, CH, or CL/CH<br>See Note (2) | Unknown | 83 |
| | Description and Identification of Soils (ASTM D2488) | 3 tests/soil type | CL, CH, or CL/CH | Unknown | 83 |
| | Atterbergs (ASTM D4318) | 1 test/5,000 $yd^3$ placed | LL ≥ 25%<br>PI ≥ 12% | 72 | 83 |
| | Remolded Hydraulic Conductivity (ASTM D5856) | N/A | N/A | 0 | 5 |
| | Falling Head Permeability (ASTM D5084) | 1 test/15,000 $yd^3$ placed | ≤ $1 \times 10^{-7}$ cm/sec | 24 | 24 |
| | In-Place Moisture - Nuclear (ASTM D6938) | See Note (3) | Over optimum moisture | 2908 | 3379 |
| | In-Place Density - Nuclear (ASTM D6938) | See Note (3) | ≥ 95% of Standard Proctor Maximum Dry Density | 2908 | 3379 |
| | In-Place Density - Sandcone (ASTM D1556) | 1 test/soil type | ≥ 95% of Standard Proctor Maximum Dry Density | 1 | 2 |
| Drainage Layer Material ($42{,}000\ yd^3$ - Neatline) | Particle Size (ASTM C136 & C117) | 1 test/10,000 $yd^3$ placed | 100% passing 3/8" sieve | 5 | 5 |
| | Constant Head Permeability (ASTM D2434) | 1 test/10,000 $yd^3$ placed | ≤ $1 \times 10^{-3}$ cm/sec | 5 | 5 |
| Drainage Aggregate ($3{,}300\ yd^3$ - Neatline) | Particle Size (ASTM C136 & D117) | 1 test/1,000 $yd^3$ placed | 100% passing 1-1/2", 35%-80% passing 3/4", 15%-20% passing 3/8", 5%-25% passing #4, 0%-10% passing #10, 0%-5% passing #100 | 4 | 4 |
| | Particle Shape (ASTM D2488) | Engineer's Discretion | Rounded and Sub-rounded | Unknown | 0<br>See Note 4 |
| Primary Geomembrane ($1{,}372{,}000\ ft^2$) | Destructive Seam Strength Test<br>(GRI-GM 19; D6392) | 1 test/500 L.F. seam min. | Peel (Fusion) - 98 pounds per inch (ppi)<br>Peel (Extrusion) - 78 pounds per inch (ppi)<br>Shear - 120 pounds per inch (ppi)<br>No peel adhesion failure | Unknown | 126<br>(1/497 L.F. seam) |

NOTES:
(1) Moisture shall be at or above the lower moisture content at which the standard Proctor moisture-density curve exceeds 95 percent of the standard Proctor maximum dry density.
(2) Some SC/CL soils may be acceptable if hydraulic conductivity criterion is met.
(3) 1 test per lift (6-inch thick) per 200 linear feet on sideslope, 1 test per lift (6-inch thick) per 100-foot grid on cell floors.
(4) Drainage Aggregate was visually classified as rounded to sub-rounded.

Table 2
Random Fill Test Results Summary
Cell 5 - Phase 1

| Sample ID | Laboratory | Sampling Date | Maximum Dry Density (pcf) | Optimum Moisture Content (%) | USCS Classification |
|---|---|---|---|---|---|
| **Cell 5 Phase 1A - 2022** | | | | | |
| 1 | Geoserv | 6/12/2022 | 94.8 | 26.5 | CH |
| 2 | Geoserv | 6/12/2022 | 111.0 | 15.7 | SM |
| 3 | Geoserv | 6/12/2023 | 109.2 | 15.1 | SM |
| 4 | Geoserv | 6/17/2022 | 106.2 | 19.1 | SC |
| 5 | Geoserv | 6/27/2022 | 107.2 | 18.7 | SC |
| 6 | Geoserv | 7/1/2022 | 105.8 | 20.0 | CL |
| 7 | Geoserv | 10/5/2022 | 98.1 | 23.9 | CH |
| **Cell 5 Phase 1B - 2023** | | | | | |
| 1 | Geoserv | 6/7/2023 | 98.2 | 24.1 | CH |
| 2 | Geoserv | 6/7/2023 | 96.6 | 24.2 | CH |

NOTES:

(1) See Appendix C for Random Fill laboratory and in-place moisture/density test results.

Table 3
Select Clay Test Results Summary
Cell 5 - Phase 1

| Sample ID (Alt ID) | Laboratory | Sampling Date | Zone[1]/ Location | Elevation (ft) | Liquid Limit (%) | Plastic Limit (%) | Plasticity Index (%) | Maximum Dry Density (pcf) | Optimum Moisture Content (%) | Coefficient of Permeability (cm/s) | P200 (%) | 3/4" (19mm) | USCS Classification |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P-01 | Braun | 7/11/2022 | Stockpile | - | 53 | 18 | 35 | 100.8 | 19.4 | 7.60E-08 | 94.0 | 100.0 | CH |
| P-02 | Braun | 7/11/2022 | Stockpile | - | 57 | 19 | 38 | 97.7 | 22.6 | - | 98.3 | 100.0 | CH |
| P-03 | Braun | 7/12/2022 | Stockpile | - | 53 | 16 | 37 | 99.3 | 20.2 | - | 97.2 | 100.0 | CH |
| P-04 | Braun | 7/12/2022 | Stockpile | - | 54 | 16 | 38 | 99.3 | 20.2 | - | 98.6 | 100.0 | CH |
| P-05 | Braun | 7/12/2022 | Stockpile | - | 66 | 18 | 48 | 96.2 | 24.5 | - | 96.6 | 100.0 | CH |
| P-06 | Braun | 7/12/2022 | Stockpile | - | 61 | 18 | 43 | 97.3 | 24.5 | - | 85.7 | 100.0 | CH |
| P-07 | Braun | 7/12/2022 | Stockpile | - | 67 | 19 | 48 | 93.8 | 22.6 | - | 98.9 | 100.0 | CH |
| P-08 | Braun | 7/14/2022 | Stockpile | - | 58 | 17 | 41 | 97 | 24.4 | - | 96.0 | 100.0 | CH |
| P-09 | Braun | 7/18/2022 | Stockpile | - | 57 | 18 | 39 | 98.6 | 23.9 | - | 99.1 | 100.0 | CH |
| P-10 | Braun | 7/18/2022 | Stockpile | - | 65 | 20 | 45 | 94.6 | 25.0 | - | 100.0 | 100.0 | CH |
| P-11 | Braun | 7/18/2022 | Stockpile | - | 63 | 19 | 44 | 95.9 | 24.8 | - | 99.1 | 100.0 | CH |
| P-12 | Braun | 7/18/2022 | Stockpile | - | 60 | 18 | 42 | 97.4 | 23.6 | - | 98.3 | 100.0 | CH |
| SC-13 | Braun | 7/20/2022 | In-place | - | 57 | 17 | 40 | - | - | - | 98.0 | 100.0 | CH |
| SC-14 | Braun | 7/20/2022 | In-place | - | 64 | 20 | 44 | - | - | - | 97.9 | 100.0 | CH |
| SC-15 | Braun | 7/27/2022 | Stockpile | - | 53 | 19 | 34 | - | - | - | 97.8 | 100.0 | CH |
| SC-16 | Braun | 7/27/2022 | Stockpile | - | 53 | 19 | 34 | 97.9 | 21.7 | 9.40E-08 | 98.5 | 100.0 | CH |
| SC-17 | Braun | 7/27/2022 | Stockpile | - | 54 | 18 | 36 | - | - | - | 97.7 | 100.0 | CH |
| SC-18 | Braun | 8/4/2022 | Stockpile | - | 54 | 18 | 36 | - | - | - | 97.2 | 100.0 | CH |
| SC-19 | Braun | 8/4/2022 | Stockpile | - | 53 | 17 | 36 | - | - | - | 93.8 | 100.0 | CH |
| SC-20 | Braun | 9/12/2022 | Stockpile | - | 54 | 17 | 37 | - | - | - | 98.2 | 100.0 | CH |
| SC-21 | Braun | 9/12/2022 | Stockpile | - | 49 | 16 | 33 | - | - | - | 98.3 | 100.0 | CL |
| SC-22 | Braun | 9/12/2022 | Stockpile | - | 53 | 17 | 36 | - | - | - | 98.0 | 100.0 | CH |
| SC-23 | Braun | 9/12/2022 | Stockpile | - | 72 | 21 | 51 | 92.4 | 27.2 | - | 99.1 | 100.0 | CH |
| SC-24 | Braun | 9/12/2022 | Stockpile | - | 57 | 17 | 40 | - | - | - | 99.5 | 100.0 | CH |
| SC-25 | Braun | 9/14/2022 | Stockpile | - | 59 | 17 | 42 | - | - | - | 99.2 | 100.0 | CH |
| SC-26 | Braun | 9/14/2022 | Stockpile | - | 59 | 17 | 42 | - | - | - | 98.9 | 100.0 | CH |
| SC-27 | Braun | 9/14/2022 | Stockpile | - | 57 | 17 | 40 | - | - | - | 98.6 | 100.0 | CH |
| SC-28 | Braun | 9/14/2022 | Stockpile | - | 63 | 17 | 46 | 98.6 | 24.1 | 6.30E-09 | 99.3 | 100.0 | CH |
| SC-29 | Braun | 9/21/2022 | Stockpile | - | 58 | 15 | 43 | - | - | - | 99.1 | 100.0 | CH |
| SC-30 | Braun | 9/21/2022 | Stockpile | - | 51 | 15 | 36 | - | - | - | 99.0 | 100.0 | CH |
| SC-31 | Braun | 9/21/2022 | Stockpile | - | 61 | 16 | 45 | - | - | - | 98.4 | 100.0 | CH |
| SC-32 | Braun | 9/21/2022 | Stockpile | - | 48 | 14 | 34 | - | - | - | 97.3 | 100.0 | CL |
| SC-33 | Braun | 9/30/2022 | Stockpile | - | 59 | 16 | 43 | - | - | - | 99.4 | 100.0 | CH |
| SC-34 | Braun | 9/30/2022 | Stockpile | - | 55 | 16 | 39 | 101.8 | 20.2 | - | 99.4 | 100.0 | CH |
| SC-35 | Braun | 9/30/2022 | Stockpile | - | 56 | 16 | 40 | - | - | - | 98.9 | 100.0 | CH |
| SC-36 | Braun | 9/30/2022 | Stockpile | - | 59 | 17 | 42 | - | - | - | 99.0 | 100.0 | CH |
| SC-37 | Braun | 10/6/2022 | Stockpile | - | 53 | 17 | 36 | - | - | - | 98.8 | 100.0 | CH |
| SC-38 | Braun | 10/12/2022 | Stockpile | - | 52 | 18 | 34 | - | - | - | 99.1 | 100.0 | CH |
| SC-39 | Braun | 10/19/2022 | In-place | - | 97 | 17 | 80 | - | - | - | 99.9 | 100.0 | CH |
| SC-40 | Braun | 10/19/2022 | In-place | - | 115 | 20 | 95 | 95.9 | 25.6 | - | 100.0 | 100.0 | CH |
| SC-41 | Braun | 10/19/2022 | In-place | - | 107 | 19 | 88 | - | - | - | 99.9 | 100.0 | CH |
| SC-42 | Braun | 10/19/2022 | In-place | - | 98 | 17 | 91 | - | - | - | 99.9 | 100.0 | CH |
| SC-43 | Braun | 10/19/2022 | In-place | - | 51 | 16 | 35 | - | - | - | 93.7 | 100.0 | CH |
| SC-44 | Braun | 10/19/2022 | In-place | - | 105 | 18 | 87 | - | - | - | 99.9 | 100.0 | CH |
| SC-45 | Braun | 10/19/2022 | In-place | - | 69 | 20 | 49 | - | - | - | 98.4 | 100.0 | CH |
| SC-46 | Braun | 10/28/2022 | In-place | - | 66 | 19 | 47 | 94.5 | 25.7 | 1.80E-08 | 97.3 | 99.0 | CH |
| SC-47 | Braun | 10/28/2022 | In-place | - | 69 | 16 | 53 | - | - | - | 96.6 | 100.0 | CH |

Table 3
Select Clay Test Results Summary
Cell 5 - Phase 1

| Sample ID (Alt ID) | Laboratory | Sampling Date | Zone[1]/ Location | Elevation (ft) | Liquid Limit (%) | Plastic Limit (%) | Plasticity Index (%) | Maximum Dry Density (pcf) | Optimum Moisture Content (%) | Coefficient of Permeability (cm/s) | P200 (%) | 3/4" (19mm) | USCS Classification |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SC-48 | Braun | 10/28/2022 | In-place | - | 67 | 16 | 51 | - | - | - | 97.6 | 100.0 | CH |
| SC-49 | Braun | 10/28/2022 | In-place | - | 86 | 16 | 70 | - | - | - | 99.0 | 100.0 | CH |
| SC-50 | Braun | 10/28/2022 | In-place | - | 65 | 15 | 50 | - | - | - | 97.7 | 100.0 | CH |
| SC-51 | Braun | 10/28/2022 | In-place | - | 54 | 18 | 36 | - | - | - | 95.1 | 100.0 | CH |
| SC-52 | Braun | 10/28/2022 | In-place | - | 54 | 18 | 36 | 105 | 18.4 | - | 95.7 | 100.0 | CH |
| SC-53 | Braun | 11/3/2022 | In-place | - | 55 | 17 | 38 | - | - | - | 97.2 | 100.0 | CH |
| SC-54 | Braun | 11/3/2022 | In-place | - | 79 | 18 | 61 | - | - | - | 98.5 | 100.0 | CH |
| SC-55 | Braun | 11/3/2022 | In-place | - | 76 | 16 | 60 | - | - | - | 98.7 | 100.0 | CH |
| SC-56 | Braun | 11/3/2022 | In-place | - | 62 | 18 | 44 | - | - | - | 97.7 | 100.0 | CH |
| SC-57 | Braun | 11/3/2022 | In-place | - | 60 | 17 | 43 | - | - | - | 92.0 | 100.0 | CH |
| SC-58 | Braun | 11/3/2022 | In-place | - | 59 | 17 | 42 | - | - | - | 95.1 | 100.0 | CH |
| SC-59 | Braun | 11/3/2022 | In-place | - | 60 | 19 | 41 | - | - | - | 93.4 | 100.0 | CH |
| SC-60 | Braun | 11/3/2022 | In-place | - | 60 | 17 | 43 | - | - | - | 97.0 | 100.0 | CH |
| SC-61 | Braun | 11/3/2022 | In-place | - | 71 | 18 | 53 | - | - | - | 98.9 | 100.0 | CH |
| SC-62 | Braun | 11/3/2022 | In-place | - | 80 | 18 | 62 | - | - | - | 99.3 | 100.0 | CH |
| P-20 | Braun | 5/2/2023 | In-place | - | 89 | 27 | 62 | 78.6 | 32.9 | - | 98.0 | 100.0 | CH |
| SC-01 | Braun | 5/2/2023 | Stockpile | - | 78 | 17 | 61 | - | - | - | 88.8 | 100.0 | CH |
| SC-02 | Braun | 5/2/2023 | Stockpile | - | 84 | 18 | 66 | - | - | - | 98.8 | 100.0 | CH |
| SC-3 | Braun | 5/10/2023 | Stockpile | - | 54 | 15 | 39 | - | - | - | 97.5 | 100.0 | CH |
| SC-4 | Braun | 5/10/2023 | Stockpile | - | 71 | 16 | 55 | - | - | - | 97.9 | 100.0 | CH |
| SC-5 | Braun | 5/10/2023 | Stockpile | - | 62 | 15 | 47 | - | - | - | 98.1 | 100.0 | CH |
| SC-66 (P-21) | Braun | 6/19/2023 | In-place | - | 96 | 19 | 77 | 106.3 | 18.1 | 2.40E-09 | 97.5 | 100.0 | CL |
| SC-63 | Braun | 6/26/2023 | In-place | - | 94 | 19 | 75 | - | - | - | 96.7 | 100.0 | CH |
| SC-64 | Braun | 6/26/2023 | In-place | - | 111 | 22 | 89 | - | - | - | 99.1 | 100.0 | CH |
| SC-65 | Braun | 6/26/2023 | In-place | - | 47 | 20 | 27 | - | - | - | 97.0 | 100.0 | CL |
| SC-67 | Braun | 6/21/2023 | In-place | - | 77 | 15 | 62 | - | - | - | 98.4 | 100.0 | CH |
| SC-68 | Braun | 6/21/2023 | In-place | - | 90 | 15 | 75 | - | - | - | 99.5 | 100.0 | CH |
| SC-69 | Braun | 6/21/2023 | In-place | - | 65 | 16 | 49 | - | - | - | 96.6 | 100.0 | CH |
| SC-70 | Braun | 6/21/2023 | In-place | - | 69 | 16 | 53 | - | - | - | 96.9 | 100.0 | CH |
| SC-71 | Braun | 7/13/2023 | In-place | - | 114 | 20 | 94 | - | - | - | 100.0 | 100.0 | CH |
| SC-72 | Braun | 7/13/2023 | In-place | - | 72 | 14 | 58 | - | - | - | 79.8 | 100.0 | CH |
| SC-73 | Braun | 7/13/2023 | In-place | - | 74 | 15 | 59 | - | - | - | 84.5 | 100.0 | CH |
| P-22 (SC-74) | Braun | 7/14/2023 | In-place | - | 56 | 16 | 40 | 107 | 16.8 | - | 61.5 | 100.0 | CH |
| SC-75 | Braun | 7/14/2023 | In-place | - | 70 | 20 | 50 | - | - | - | 89.7 | 100.0 | CH |
| SC-76 | Braun | 7/14/2023 | In-place | - | 80 | 19 | 61 | - | - | - | 93.2 | 100.0 | CH |
| SC-77 | Braun | 7/14/2023 | In-place | - | 70 | 20 | 50 | - | - | - | 91.3 | 100.0 | CH |
| **Thin-Walled Tube Samples (Falling Head Permeability)** | | | | | | | | | | | | | |
| Z-6-A | Braun | 6/2/2023 | In-place | - | - | - | - | - | - | 6.30E-09 | - | - | CH |
| Z-26-A | Braun | 6/2/2023 | In-place | - | - | - | - | - | - | 1.10E-08 | - | - | CH |
| Z-16-A | Braun | 6/2/2023 | In-place | - | - | - | - | - | - | 3.20E-09 | - | - | CH |
| Z-23-A | Braun | 6/2/2023 | In-place | - | - | - | - | - | - | 1.40E-09 | - | - | CH |
| 16A | Braun | 6/30/2023 | In-place | - | - | - | - | - | - | 2.40E-09 | - | - | CH |
| 26A | Braun | 6/30/2023 | In-place | - | - | - | - | - | - | 1.80E-09 | - | - | CH |
| Z-25A | Braun | 6/26/2023 | In-place | - | - | - | - | - | - | 2.50E-09 | - | - | CH |
| Z-23A | Braun | 6/26/2023 | In-place | - | - | - | - | - | - | 2.20E-09 | - | - | CH |
| Z-52-9A | Braun | 7/31/2023 | In-place | - | - | - | - | - | - | 1.70E-09 | - | - | CH |

Table 3
Select Clay Test Results Summary
Cell 5 - Phase 1

| Sample ID (Alt ID) | Laboratory | Sampling Date | Zone[1]/ Location | Elevation (ft) | Liquid Limit (%) | Plastic Limit (%) | Plasticity Index (%) | Maximum Dry Density (pcf) | Optimum Moisture Content (%) | Coefficient of Permeability (cm/s) | P200 (%) | 3/4" (19mm) | USCS Classification |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Z-54-10A | Braun | 8/1/2023 | In-place | - | - | - | - | - | - | 2.60E-09 | - | - | CH |
| Z-59A | Braun | 8/1/2023 | In-place | - | - | - | - | - | - | 4.20E-09 | - | - | CH |
| Z-54A | Braun | 8/1/2023 | In-place | - | - | - | - | - | - | 2.50E-09 | - | - | CH |
| Z-56A | Braun | 8/1/2023 | In-place | - | - | - | - | - | - | 5.30E-10 | - | - | CH |
| Z-56-A | Braun | 8/17/2023 | In-place | - | - | - | - | - | - | 3.80E-09 | - | - | CH |
| Z-18-A | Braun | 8/17/2023 | In-place | - | - | - | - | - | - | 3.40E-09 | - | - | CH |
| Z-54-A | Braun | 8/17/2023 | In-place | - | - | - | - | - | - | 2.60E-09 | - | - | CH |
| Z-18A | Braun | 8/25/2023 | In-place | - | - | - | - | - | - | 2.00E-09 | - | - | CH |
| Z-56A | Braun | 8/25/2023 | In-place | - | - | - | - | - | - | 2.00E-09 | - | - | CH |
| Z-59A | Braun | 8/25/2023 | In-place | - | - | - | - | - | - | 2.40E-09 | - | - | CH |
| Z-56A | Braun | 7/18/2023 | In-place | - | - | - | - | - | - | 2.20E-09 | - | - | CH |
| Z-58A | Braun | 8/18/2023 | In-place | - | - | - | - | - | - | 1.90E-09 | - | - | CH |
| Z-36A | Braun | 9/12/2023 | In-place | - | - | - | - | - | - | 3.20E-09 | - | - | CH |
| Z-28A | Braun | 9/12/2023 | In-place | - | - | - | - | - | - | 2.00E-09 | - | - | CH |
| Z-32A | Braun | 9/12/2023 | In-place | - | - | - | - | - | - | 2.20E-09 | - | - | CH |

NOTES:

(1) See Dwg. C-27 in Appendix A for testing zone locations.

(2) See Appendix D for Select Clay laboratory and in-place moisture/density test results.

Table 4
Geomembrane Destructive Test Results Summary
Cell 5 - Phase 1

| Sample ID | Weld Type | Failure Mode[1] | | Peel A (ppi)[2] | | Peel B (ppi)[2] | | Shear (ppi)[2] | |
|---|---|---|---|---|---|---|---|---|---|
| | | Peel | Shear | Field[3] | Lab[4] | Field[3] | Lab[4] | Field[3] | Lab[4] |
| DS-1 | Fusion | FTB | >50 | 102 | 127 | 99 | 121 | 148 | 168 |
| DS-2 | Fusion | FTB | >50 | 106 | 123 | 110 | 125 | 143 | 163 |
| DS-3 | Fusion | FTB | >50 | 104 | 125 | 106 | 121 | 145 | 167 |
| DS-4 | Fusion | FTB | >50 | 113 | 119 | 110 | 129 | 145 | 167 |
| DS-5 | Fusion | FTB | >50 | 113 | 123 | 115 | 125 | 152 | 170 |
| DS-6 | Fusion | FTB | >50 | 111 | 119 | 116 | 124 | 150 | 166 |
| DS-7 | Fusion | FTB | >50 | 109 | 126 | 108 | 120 | 152 | 167 |
| DS-8 | Fusion | FTB | >50 | 114 | 121 | 111 | 132 | 154 | 169 |
| DS-9 | Fusion | FTB | >50 | 112 | 134 | 115 | 134 | 150 | 172 |
| DS-10 | Fusion | FTB | >50 | 109 | 125 | 108 | 131 | 148 | 176 |
| DS-11 | Fusion | FTB | >50 | 112 | 132 | 113 | 125 | 149 | 174 |
| DS-12 | Fusion | FTB | >50 | 109 | 126 | 110 | 121 | 150 | 168 |
| DS-13 | Fusion | FTB | >50 | 105 | 122 | 112 | 130 | 146 | 161 |
| DS-14 | Fusion | FTB | >50 | 109 | 111 | 110 | 127 | 148 | 167 |
| DS-15 | Fusion | FTB | >50 | 102 | 121 | 114 | 120 | 147 | 171 |
| DS-16 | Fusion | FTB | >50 | 108 | 130 | 104 | 125 | 145 | 174 |
| DS-17 | Fusion | AD | >50 | 98 | 120 | 98 | 118 | 146 | 174 |
| DS-17 Archive[(7)] | Fusion | FTB | >50 | - | 124 | - | 138 | - | 176 |
| DS-17A | Fusion | FTB | >50 | 119 | 124 | 116 | 129 | 173 | 172 |
| DS-17B | Fusion | FTB | >50 | 109 | 131 | 113 | 127 | 167 | 174 |
| DS-18 | Fusion | FTB | >50 | 100 | 132 | 103 | 139 | 148 | 160 |
| DS-19 | Fusion | FTB | >50 | 111 | 137 | 106 | 133 | 155 | 176 |
| DS-20 | Fusion | FTB | >50 | 111 | 133 | 113 | 127 | 157 | 175 |
| DS-21 | Fusion | FTB | >50 | 109 | 124 | 118 | 126 | 151 | 168 |
| DS-22 | Fusion | FTB | >50 | 103 | 121 | 104 | 127 | 152 | 170 |
| DS-23 | Fusion | FTB | >50 | 100 | 129 | 100 | 120 | 157 | 169 |
| DS-24 | Fusion | FTB | >50 | 102 | 130 | 108 | 125 | 146 | 166 |

Table 4
Geomembrane Destructive Test Results Summary
Cell 5 - Phase 1

| Sample ID | Weld Type | Failure Mode[1] | | Peel A (ppi)[2] | | Peel B (ppi)[2] | | Shear (ppi)[2] | |
|---|---|---|---|---|---|---|---|---|---|
| | | Peel | Shear | Field[3] | Lab[4] | Field[3] | Lab[4] | Field[3] | Lab[4] |
| DS-25 | Fusion | FTB | >50 | 119 | 127 | 120 | 122 | 184 | 175 |
| DS-26 | Fusion | FTB | >50 | 111 | 125 | 115 | 132 | 148 | 175 |
| DS-27 | Fusion | FTB | >50 | 116 | 133 | 115 | 126 | 151 | 173 |
| DS-28 | Fusion | FTB | >50 | 106 | 135 | 113 | 129 | 166 | 179 |
| DS-29 | Fusion | AD | >50 | 130 | 129 | 114 | 133 | 161 | 172 |
| DS-29 Archive[(7)] | Fusion | FTB | >50 | - | 141 | - | 124 | - | 163 |
| DS-29A | Fusion | FTB | >50 | 124 | 130 | 120 | 122 | 162 | 169 |
| DS-29B | Fusion | FTB | >50 | 115 | 113 | 115 | 128 | 167 | 167 |
| DS-30 | Fusion | FTB | >50 | 114 | 127 | 119 | 137 | 165 | 172 |
| DS-31 | Fusion | FTB | >50 | 121 | 130 | 116 | 128 | 160 | 174 |
| DS-32 | Fusion | FTB | >50 | 108 | 133 | 114 | 131 | 158 | 178 |
| DS-33 | Fusion | FTB | >50 | 117 | 131 | 115 | 128 | 164 | 178 |
| DS-34 | Fusion | FTB | >50 | 113 | 132 | 116 | 132 | 162 | 173 |
| DS-35 | Fusion | FTB | >50 | 115 | 136 | 119 | 151 | 164 | 175 |
| DS-36 | Fusion | FTB | >50 | 118 | 127 | 114 | 122 | 183 | 175 |
| DS-37 | Fusion | FTB | >50 | 115 | 139 | 116 | 126 | 171 | 174 |
| DS-38 | Fusion | FTB | >50 | 117 | 141 | 113 | 129 | 173 | 175 |
| DS-39 | Fusion | FTB | >50 | 122 | 127 | 118 | 130 | 173 | 173 |
| DS-40 | Fusion | FTB | >50 | 129 | 126 | 119 | 122 | 170 | 175 |
| DS-41 | Fusion | FTB | >50 | 118 | 131 | 111 | 125 | 181 | 176 |
| DS-42 | Fusion | FTB | >50 | 118 | 133 | 127 | 123 | 176 | 174 |
| DS-43 | Fusion | FTB | >50 | 120 | 124 | 125 | 114 | 161 | 175 |
| DS-44 | Fusion | FTB | >50 | 120 | 129 | 108 | 123 | 160 | 172 |
| DS-45 | Fusion | FTB | >50 | 117 | 142 | 119 | 127 | 164 | 171 |
| DS-46 | Fusion | FTB | >50 | 120 | 123 | 111 | 131 | 164 | 172 |
| DS-47 | Fusion | FTB | >50 | 121 | 120 | 134 | 125 | 156 | 171 |
| DS-48 | Fusion | FTB | >50 | 121 | 136 | 106 | 120 | 155 | 175 |

Table 4
Geomembrane Destructive Test Results Summary
Cell 5 - Phase 1

| Sample ID | Weld Type | Failure Mode[1] | | Peel A (ppi)[2] | | Peel B (ppi)[2] | | Shear (ppi)[2] | |
|---|---|---|---|---|---|---|---|---|---|
| | | Peel | Shear | Field[3] | Lab[4] | Field[3] | Lab[4] | Field[3] | Lab[4] |
| DS-49 | Fusion | FTB | >50 | 115 | 144 | 112 | 119 | 164 | 174 |
| DS-50 | Fusion | FTB | >50 | 116 | 142 | 123 | 119 | 169 | 174 |
| DS-51 | Fusion | FTB | >50 | 114 | 142 | 112 | 131 | 166 | 179 |
| DS-52 | Fusion | FTB | >50 | 110 | 147 | 124 | 130 | 172 | 176 |
| DS-53 | Fusion | FTB | >50 | 115 | 128 | 117 | 118 | 160 | 175 |
| DS-54 | Fusion | FTB | >50 | 113 | 120 | 111 | 131 | 162 | 168 |
| DS-55 | Fusion | FTB | >50 | 118 | 132 | 109 | 113 | 161 | 172 |
| DS-56 | Fusion | FTB | >50 | 119 | 120 | 125 | 124 | 166 | 170 |
| DS-57 | Fusion | FTB | >50 | 121 | 118 | 119 | 124 | 168 | 169 |
| DS-58 | Fusion | FTB | >50 | 117 | 134 | 124 | 126 | 162 | 168 |
| DS-59 | Fusion | FTB | >50 | 116 | 131 | 111 | 126 | 164 | 168 |
| DS-60 | Fusion | FTB | >50 | 113 | 134 | 114 | 123 | 160 | 169 |
| DS-61 | Fusion | FTB | >50 | 110 | 125 | 113 | 127 | 159 | 167 |
| DS-62 | Fusion | FTB | >50 | 112 | 137 | 112 | 120 | 167 | 168 |
| DS-63 | Fusion | FTB | >50 | 117 | 129 | 116 | 131 | 157 | 171 |
| DS-64 | Fusion | FTB | >50 | 113 | 132 | 111 | 119 | 154 | 168 |
| DS-65 | Fusion | FTB | >50 | 115 | 119 | 127 | 136 | 161 | 165 |
| DS-66 | Fusion | FTB | >50 | 122 | 132 | 126 | 141 | 166 | 172 |
| DS-67 | Fusion | FTB | >50 | 118 | 132 | 115 | 114 | 169 | 170 |
| DS-68 | Fusion | FTB | >50 | 119 | 135 | 119 | 126 | 164 | 171 |
| DS-69 | Fusion | FTB | >50 | 119 | 130 | 116 | 121 | 162 | 170 |
| DS-70 | Fusion | FTB | >50 | 127 | 134 | 116 | 133 | 158 | 173 |
| DS-71 | Fusion | FTB | >50 | 120 | 131 | 113 | 121 | 161 | 172 |
| DS-72 | Fusion | FTB | >50 | 123 | 140 | 119 | 128 | 171 | 173 |
| DS-73 | Fusion | FTB | >50 | 127 | 134 | 119 | 132 | 166 | 171 |
| DS-74 | Fusion | FTB | >50 | 113 | 130 | 129 | 134 | 165 | 178 |
| DS-75 | Fusion | FTB | >50 | 117 | 127 | 115 | 129 | 156 | 172 |

Table 4
Geomembrane Destructive Test Results Summary
Cell 5 - Phase 1

| Sample ID | Weld Type | Failure Mode[1] | | Peel A (ppi)[2] | | Peel B (ppi)[2] | | Shear (ppi)[2] | |
|---|---|---|---|---|---|---|---|---|---|
| | | Peel | Shear | Field[3] | Lab[4] | Field[3] | Lab[4] | Field[3] | Lab[4] |
| DS-76 | Fusion | AD-BRK | >50 | 123 | 118 | 118 | 125 | 161 | 169 |
| DS-76 Archive[(7)] | Fusion | AD-BRK | >50 | - | 127 | - | 132 | - | 168 |
| DS-76A | Fusion | FTB | >50 | 118 | 141 | 111 | 142 | 158 | 162 |
| DS-76B | Fusion | FTB | >50 | 106 | 128 | 116 | 136 | 160 | 173 |
| DS-77 | Fusion | FTB | >50 | 116 | 131 | 117 | 135 | 169 | 171 |
| DS-78 | Fusion | FTB | >50 | 125 | 132 | 118 | 136 | 168 | 176 |
| DS-79 | Fusion | FTB | >50 | 117 | 131 | 122 | 122 | 161 | 171 |
| DS-80 | Fusion | FTB | >50 | 121 | 131 | 122 | 132 | 161 | 171 |
| DS-81 | Fusion | FTB | >50 | 130 | 119 | 119 | 125 | 171 | 170 |
| DS-82 | Fusion | FTB | >50 | 128 | 146 | 126 | 136 | 200 | 173 |
| DS-83 | Fusion | FTB | >50 | 125 | 134 | 128 | 132 | 202 | 175 |
| DS-84 | Fusion | AD | >50 | 122 | 118 | 126 | 130 | 199 | 175 |
| DS-84 Archive[(7)] | Fusion | FTB | >50 | - | 119 | - | 130 | - | 168 |
| DS-84A | Fusion | FTB | >50 | 134 | 133 | 129 | 120 | 199 | 166 |
| DS-84B | Fusion | FTB | >50 | 126 | 126 | 129 | 125 | 193 | 166 |
| DS-85 | Fusion | FTB | >50 | 131 | 144 | 131 | 128 | 202 | 176 |
| DS-86 | Fusion | FTB | >50 | 118 | 117 | 140 | 133 | 197 | 175 |
| DS-87 | Fusion | FTB | >50 | 141 | 113 | 132 | 128 | 197 | 175 |
| DS-88 | Fusion | FTB | >50 | 135 | 124 | 130 | 134 | 199 | 178 |
| DS-89 | Fusion | FTB | >50 | 127 | 127 | 129 | 128 | 197 | 177 |
| DS-90 | Fusion | FTB | >50 | 126 | 129 | 122 | 127 | 188 | 170 |
| DS-91 | Fusion | FTB | >50 | 134 | 130 | 123 | 129 | 194 | 176 |
| DS-92 | Fusion | FTB | >50 | 133 | 121 | 124 | 129 | 187 | 173 |
| DS-93 | Fusion | AD | >50 | 139 | 118 | 119 | 128 | 189 | 175 |
| DS-93 Archive[(7)] | Fusion | AD | >50 | - | 135 | - | 129 | - | 169 |
| DS-93A | Fusion | AD | >50 | 122 | 120 | 127 | 123 | 189 | 167 |
| DS-93A Archive[(7] | Fusion | FTB | >50 | - | 125 | - | 109 | - | 171 |

Table 4
Geomembrane Destructive Test Results Summary
Cell 5 - Phase 1

| Sample ID | Weld Type | Failure Mode[1] | | Peel A (ppi)[2] | | Peel B (ppi)[2] | | Shear (ppi)[2] | |
|---|---|---|---|---|---|---|---|---|---|
| | | Peel | Shear | Field[3] | Lab[4] | Field[3] | Lab[4] | Field[3] | Lab[4] |
| DS-93A1 | Fusion | FTB | >50 | 119 | 135 | 117 | 126 | 193 | 173 |
| DS-93B | Fusion | FTB | >50 | 120 | 121 | 121 | 118 | 188 | 166 |
| DS-94 | Fusion | FTB | >50 | 123 | 142 | 123 | 123 | 182 | 173 |
| DS-95 | Fusion | FTB | >50 | 113 | 134 | 121 | 105 | 195 | 167 |
| DS-96 | Fusion | FTB | >50 | 122 | 118 | 117 | 106 | 191 | 168 |
| DS-96A | Fusion | FTB | >50 | 133 | 133 | 123 | 134 | 199 | 163 |
| DS-96B | Fusion | FTB | >50 | 127 | 124 | 123 | 122 | 202 | 168 |
| DS-96 Archive[(7)] | Fusion | FTB | >50 | - | 128 | - | 119 | - | 165 |
| DS-97 | Fusion | FTB | >50 | 123 | 114 | 120 | 124 | 191 | 171 |
| DS-98 | Fusion | FTB | >50 | 111 | 102 | 119 | 129 | 196 | 171 |
| DS-99 | Fusion | FTB | >50 | 118 | 115 | 122 | 128 | 181 | 168 |
| DS-100 | Extrusion[(5)] | FTB | >50 | 106 | 112 | - | - | 164 | 165 |
| DS-101 | Extrusion[(5)] | FTB | >50 | 144 | 124 | - | - | 173 | 159 |
| DS-102 | Fusion | FTB | >50 | 137 | 127 | 130 | 125 | 196 | 167 |
| DS-103 | Fusion | FTB | >50 | 128 | 123 | 125 | 124 | 183 | 169 |
| DS-104 | Extrusion[(5)] | FTB | >50 | 142 | 155 | - | - | 181 | 164 |
| DS-105 | Extrusion[(5)] | FTB | >50 | 121 | 113 | - | - | 180 | 161 |
| DS-106 | Fusion | FTB | >50 | 136 | 133 | 132 | 131 | 194 | 169 |
| DS-107 | Fusion | FTB | >50 | 128 | 131 | 118 | 138 | 170 | 168 |
| DS-108 | Fusion | FTB | >50 | 126 | 138 | 131 | 130 | 176 | 165 |
| DS-109 | Fusion | FTB | >50 | 117 | 121 | 109 | 124 | 167 | 160 |
| DS-110 | Fusion | FTB | >50 | 110 | 122 | 108 | 115 | 184 | 157 |
| DS-111 | Fusion | FTB | >50 | 117 | 134 | 123 | 142 | 155 | 166 |
| DS-112 | Fusion | FTB | >50 | 121 | 137 | 120 | 134 | 168 | 165 |
| DS-113 | Fusion | FTB | >50 | 106 | 140 | 106 | 140 | 160 | 173 |
| DS-114 | Fusion | FTB | >50 | 116 | 114 | 124 | 111 | 198 | 158 |
| DS-115 | Fusion | FTB | >50 | 115 | 120 | 109 | 117 | 184 | 153 |

Table 4
Geomembrane Destructive Test Results Summary
Cell 5 - Phase 1

| Sample ID | Weld Type | Failure Mode[1] | | Peel A (ppi)[2] | | Peel B (ppi)[2] | | Shear (ppi)[2] | |
|---|---|---|---|---|---|---|---|---|---|
| | | Peel | Shear | Field[3] | Lab[4] | Field[3] | Lab[4] | Field[3] | Lab[4] |
| DS-116 | Fusion | FTB | >50 | 153 | 146 | 140 | 128 | 189 | 165 |
| DS-117 | Fusion | FTB | >50 | 128 | 121 | 135 | 143 | 186 | 159 |
| DS-118 | Fusion | FTB | >50 | 127 | 131 | 120 | 130 | 186 | 164 |
| DS-119 | Fusion | FTB | >50 | 109 | 113 | 114 | 132 | 170 | 162 |
| DS-120 | Fusion | AD | >50 | 117 | 107 | 124 | 145 | 181 | 174 |
| DS-120A | Fusion | FTB | >50 | 123 | 106 | 128 | 113 | 179 | 159 |
| DS-120B | Fusion | FTB | >50 | 115 | 107 | 109 | 110 | 177 | 159 |
| DS-120 Archive[7] | Fusion | AD-BRK | >50 | - | 123 | - | 135 | - | 161 |
| DS-121 | Fusion | FTB | >50 | 123 | 130 | 128 | 132 | 198 | 173 |
| DS-122 | Fusion | FTB | >50 | 112 | 118 | 109 | 128 | 192 | 170 |
| DS-123 | Extrusion[5] | FTB | >50 | 121 | 156 | - | - | 180 | 158 |
| DS-124 | Fusion | FTB | >50 | 119 | 118 | 136 | 134 | 193 | 173 |
| DS-125 | Fusion | FTB | >50 | 134 | 128 | 126 | 130 | 188 | 173 |
| DS-126 | Fusion | FTB | >50 | 128 | 141 | 127 | 140 | 181 | 172 |
| Requirement | | Ductile (Non-adhesion Failure) | | 91 (fusion)/78 (extrusion) | | 91 (fusion)/78 (extrusion) | | 120 | |

NOTES:
1) Failure Mode Codes:
SE: Break in sheeting at edge of seam
AD: Adhesion Failure (100% Peel)
AD-BRK: (>25%): Break in sheeting after some adhesion failure - partial peel
FTB: Film Tearing Bond
NON-FTB: 100% Peel
>50%: Elongation at break >50%
2) The reported field and laboratory result values are the average of 5 coupons tested.
3) The field tests were performed by the liner installer's onsite quality control personnel.
4) The third party laboratory tests were performed by TRI Environmental Inc.
5) Peel B results are not applicable to extrusion weld destructive tests.
6) See Appendix H geomembrane field test results and third party labroartory test results.
7) Archive samples were tested for informational purposes after a sample failed third party testing.

Table 5
Drainage Layer Material Test Results Summary
Cell 5 - Phase 1

| Sample ID | Laboratory | Sampling Date | Location | Coefficient of Permeability (cm/s) | % Passing 3/8"Sieve | % Passing #200 Sieve |
|---|---|---|---|---|---|---|
| Bottom Ash -1 | Braun | 7/28/2023 | Stockpile | 0.13 | 100 | 1.5 |
| Bottom Ash #2 | Braun | 8/30/2023 | Stockpile | 0.22 | 100 | 1.4 |
| Bottom Ash #3 | Braun | 8/30/2023 | Stockpile | 0.11 | 100 | 1.4 |
| Bottom Ash #4 | Braun | 9/12/2023 | Stockpile | 0.11 | 100 | 0.8 |
| Bottom Ash #5 | Braun | 9/12/2023 | Stockpile | 0.11 | 100 | 0.9 |

NOTES:

(1) See Appendix E for Drainage Layer Material laboratory test results.

Table 6
Drainage Aggregate Test Results Summary
Cell 5 - Phase 1

| Sample No. | Laboratory | Sampling Date | Location | % Passing 1-1/2" Sieve | % Passing 3/4 Sieve | % Passing 3/8 Sieve | % Passing #4 Sieve | % Passing #10 Sieve | % Passing #100 Sieve |
|---|---|---|---|---|---|---|---|---|---|
| 2 | Geoserv | - | 100 | 75 | 35 | 15 | 3 | 1.2 | 0.7 |
| 3 | Geoserv | 8/10/23 | 100 | 79 | 37 | 18 | 3 | 1.2 | 0.7 |
| 4 | Geoserv | 8/10/23 | 100 | 67 | 16 | 5 | 1 | 0.7 | 0.7 |
| 5 | Geoserv | 10/25/23 | 100 | 66 | 20 | 8 | 2 | 0.8 | 0.3 |

NOTES:
(1) See Appendix F for Drainage Aggregate laboratory test results.

# Reference Tables

**Table 1 Earthwork, Piping and Piping Structures, and Vegetation Quality Assurance Testing Requirements**

| Soil Type-Intended Use | Required Test | Test Frequency[1][2] | Required Result[3] | Response for Failed Test |
|---|---|---|---|---|
| **Random Fill** | Density In Place (ASTM D1556 or D6938) | One test/2,000 c.y. placed | >95% of Std. Proctor Maximum Dry Density | Recompact and retest |
| | Moisture Content (ASTM D2216 or D6938) | One test/2,000 c.y. placed | NA | NA |
| | Standard Proctor (ASTM D698 or D1557) | One per soil type | NA | NA |
| | Soil Classification (ASTM D2487) | One per soil type | Inorganic native soils; 6-inch or less maximum particle size | Remove and replace[4] |
| | Soil Description (ASTM D2488) | One per soil type | Inorganic native soils; 6-inch or less maximum particle size | Remove and replace[4] |
| **Select Clay** | Density In Place (ASTM D6938) | 100' grid pattern offset every lift (12") with min. 4/acre/lift on liner base and cover. On the sideslopes, one test per 200 linear feet per lift with a minimum number of tests during a single phase of construction to average one test per 200 linear feet per lift. | >95% of Std. Proctor Maximum Dry Density | Recompact and retest |
| | Density In Place (ASTM D1556) | One per soil type | >95% of Std. Proctor Maximum Dry Density | Recompact and retest |
| | Moisture Content (ASTM D2216 or D6938) | 100' grid pattern offset every lift (12") with min. 4/acre/lift on liner base and cover. On the sideslopes, one test per approximately 200 linear feet per lift with a minimum number of tests during a single phase of construction to average one test per 200 linear feet per lift.[4] | Above Optimum | Water and rework |
| | Standard Proctor (ASTM D698 or D1557) | Three per soil type | NA | NA |
| | Soil Classification (ASTM D2487) | Three per soil type | CL, CH, or CL/CH Some SC/CL soils may be acceptable if hydraulic conductivity criterion is met | Remove and replace[4] |

| Soil Type-Intended Use | Required Test | Test Frequency[1][2] | Required Result[3] | Response for Failed Test |
|---|---|---|---|---|
| **Select Clay (cont'd)** | Soil Description (ASTM D2488) | Three per soil type | NA | NA |
| | Particle Size Analysis (ASTM D6913 and D7928) | One test/5,000 c.y. to the 0.002 mm particle size | >50% passing No. 200 sieve; 3/4-inch maximum particle size | Remove and replace[4] |
| | Atterberg Limits (ASTM D4318) | One test/5,000 c.y. | LL >25%<br>PI >12% | Remove and replace[4] |
| | Falling Head Permeability ASTM D5084) | One test/15,000 c.y. | <1 x $10^{-7}$ cm/sec | Remove and replace[4] |
| | Layer Thickness Verification | 100' by 100' grid on cell floor; every 100' along the embankment alignment on sideslopes | -0.0 foot, +0.7 foot | Regrade |
| **Drainage Layer Materia** | Particle Size Analysis (ASTM C136 & C117) | One test/1,000 c.y. to the No. 200 sieve[6] | Within range specified | Remove and replace[4] |
| | Constant Head Permeability (ASTM D2434) | One test/2,000 c.y.[6] | >1 x $10^{-3}$ cm/sec | Remove and replace[4] |
| | Layer Thickness Verification | 100' by 100' grid | -0.0 foot to +0.2 foot | Regrade |
| **Drainage Aggregate** | Particle Size Analysis (ASTM C136) | One per 1,000 c.y. placed | Within range specified | Remove and replace[4] |
| | Particle Shape (ASTM D2488) | Engineer's discretion | Rounded to sub-rounded | Remove and replace[4] |
| **SPGM Subsoil[5]** | Soil Description (ASTM D2488) | Min. two tests per source | NA | NA |
| | Layer Thickness Verification | Every 100' along the embankment alignment (outer slopes); 100' by 100' grid on final cover | +/-0.2 foot | Regrade |

| Soil Type-Intended Use | Required Test | Test Frequency[1][2] | Required Result[3] | Response for Failed Test |
|---|---|---|---|---|
| **SPGM Topsoil[5]** | Nutrient Content, pH, and Percent Organic Matter | Min. two tests per source | pH 6.1 to 7.5<br>Organic matter 3% to 20% | Add organic material and fertilizer as required |
| | Layer Thickness Verification | Every 100' along the embankment alignment (outer slopes); 100' by 100' grid on final cover | +/-0.1 foot | Regrade |
| **Riprap** | Particle Size Analysis (ASTM D5519) | Min. one time per construction season and at Engineer's discretion | Within range specified | Remove and replace[4] |
| **Drainage Pipes** | External Inspection | Continuous | No breaks in line | Repair or replace |
| | Leak Inspection | Continuous | No breaks in line | Repair or replace |
| **Manholes and Cleanouts** | Operational Inspection | Continuous | Operational | Repair or replace |
| **Vegetation** | Seed Mixture | Min. two tests per source | Within Specifications | Replace |
| | One-Year Monitoring | Continuous | Established vegetation | Investigate/remediate |

(1) Where conflicts arise between this testing plan and the requirements of the Technical Specifications, the more restrictive of the two takes precedence.
(2) More frequent if required by soil variability.
(3) Test results to be available prior to placing the material.
(4) "Remove and Replace" means material shall be rejected, removed from site and/or utilized in other construction as approved by Engineer, and replaced by suitable material, unless otherwise specified by Engineer or allowed by quality control plan.
(5) Soil testing frequency of the subsoil and topsoil may be reduced or eliminated at the discretion of the Engineer if the materials appear consistent with those successfully used on previous projects at the Facility where lush vegetation established quickly.
(6) Testing frequency can be reduced to 1 test per 10,000 c.y. when a synthetic drainage layer material (i.e., bottom ash) is used.

**Table 2 Geomembrane Quality Assurance Testing Requirements**

| Geosynthetic Type-Intended Use | Required Test | Test Frequency | Required Result | Response for |
|---|---|---|---|---|
| **Geomembrane** | Material Properties (GRI-GM13, GRI-GM17, and/or GRI-GM19a as applicable) | By manufacturer Every roll provided | Per Specification | Reject roll |
| | Visual Inspection | Entire sheet | — | Patch holes and/or replace panels |
| | Trial Seam Welding | Start of seaming process, every 4 hours minimum, each seamer | Passing destructive field test results in both peel and shear | Retrieve another sample and retest until passing results are obtained |
| | Non-Destructive Seam Testing (ASTM D5641 & ASTM D5820) | All seams/patches | Per Specification | Per Specification |
| | Destructive Seam Strength Test – Peel – Fusion (GRI-GM 19; ASTM D 6392) | 1 test per 500 L.F. seam minimum | 98 pounds per inch (ppi) The break shall occur in the liner material itself, not through peel separation. The break shall be ductile. | Per Specification |
| | Destructive Seam Strength Test – Peel – Extrusion (GRI-GM 19; ASTM D6392) | 1 test per 500 L.F. seam minimum | 78 pounds per inch (ppi) The break shall occur in the liner material itself, not through peel separation. The break shall be ductile. | Per Specification |
| | Destructive Seam Strength Test – Shear – Fusion & Extrusion (GRI-GM 19; ASTM D6392) | 1 test per 500 L.F. seam minimum | 120 pounds per inch (ppi) The break shall occur in the liner material itself, not through peel separation. The break shall be ductile. | Per Specification |
| **Protective Geotextile** | Material Properties | By manufacturer Every roll provided | Per Specification | Reject roll |
| | Visual Inspection | Entire sheet | — | Repair wrinkles/fishmouths and/or replace panels |

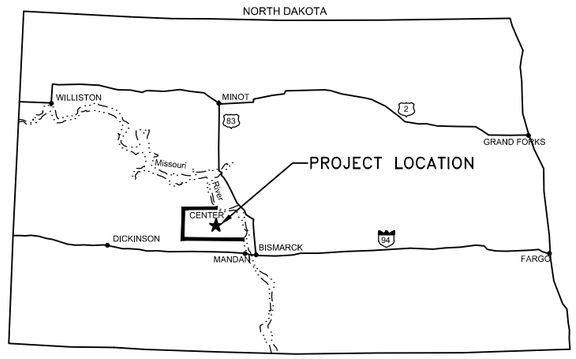
(1) Destructive seam testing for each geomembrane sample by independent testing laboratory required as noted in this testing plan and the Technical Specifications.
(2) See Technical Specifications for additional geomembrane installation and testing requirements.
(3) Where conflicts arise between this testing plan and the requirements of the Technical Specifications, the more restrictive of the two takes precedence.

# Appendices

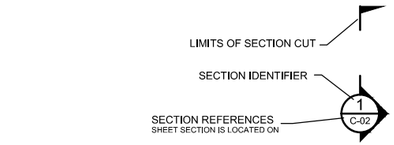
# Appendix A

## Record Drawings

# RECORD DRAWINGS
# MINNKOTA POWER COOPERATIVE, INC.
# CELL 5 - PHASE 1A
# COAL COMBUSTION WASTE DISPOSAL FACILITY
# CENTER, NORTH DAKOTA




LOCATION MAP

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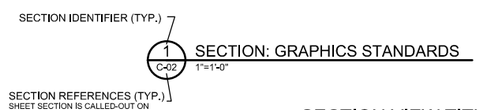


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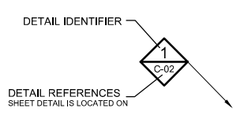


DETAIL VIEW CALL OUT

DETAIL VIEW TITLE

Minnkota Power COOPERATIVE
A Touchstone Energy® Cooperative

VICINITY MAP

## DRAWING INDEX


| DWG NO. | TITLE |
|---|---|
| G-01 | INDEX, LOCATION MAP, AND VICINITY MAP |
| C-01 | EXISTING CONDITIONS - PLAN |
| C-02 | PROJECT LAYOUT - PLAN |
| C-03 | SOIL BORINGS - PLAN AND CROSS SECTIONS |
| C-04 | SPGM STRIPPING - PLAN |
| C-05 | EXCAVATION TO HAGEL - PLAN |
| C-06 | EXCAVATION BELOW HAGEL - PLAN |
| C-07 | CELL 5 EXCAVATION AND EMBANKMENT FILL - OVERALL SECTIONS |
| C-08 | CELL 5 EXCAVATION AND EMBANKMENT FILL - SECTIONS 1 OF 2 |
| C-09 | CELL 5 EXCAVATION AND EMBANKMENT FILL - SECTIONS 2 OF 2 |
| C-10 | HAGEL BED OUTCROP - PLAN, SECTION AND DETAILS |
| C-11 | ELEVATION AND COORDINATES - PLAN |
| C-12 | SURVEY VERIFICATION - WEST EMBANKMENT |
| C-13 | SURVEY VERIFICATION - EMBANKMENT SECTION |



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| NO. | BY | CHK. | APP. | DATE | REVISION DESCRIPTION |
|---|---|---|---|---|---|
| ▲ | AWT | SWH | SWH | 12/15/23 | RECORD DRAWING |

| | A | B | C | 0 | 1 | 2 | 3 |
|---|---|---|---|---|---|---|---|
| CLIENT | 03/14/22 | | | | | | |
| BID | | | | | | | |
| CONSTRUCTION | | | | 04/07/22 | | | |
| RECORD | | | | | 12/15/23 | | |
| RELEASED TO/FOR | DATE RELEASED | | | | | | |


BARR
Corporate Headquarters: Minneapolis, Minnesota
Ph: 1-800-632-2277

Project Office:
BARR ENGINEERING CO.
4300 MARKETPOINTE DRIVE
Suite 200
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www.barr.com


| | |
|---|---|
| Scale | AS SHOWN |
| Date | 02/24/22 |
| Drawn | JEK2 |
| Checked | JKH2 |
| Designed | SWH |
| Approved | SWH |

Minnkota Power COOPERATIVE
A Touchstone Energy® Cooperative

MINNKOTA FGD POND CELL 5 - PHASE 1A
CENTER, NORTH DAKOTA

INDEX, LOCATION MAP, AND VICINITY MAP

| BARR PROJECT No. | |
|---|---|
| 34331014.51 | |
| CLIENT PROJECT No. | |
| DWG. No. | REV. No. |
| G-01 | 1 |


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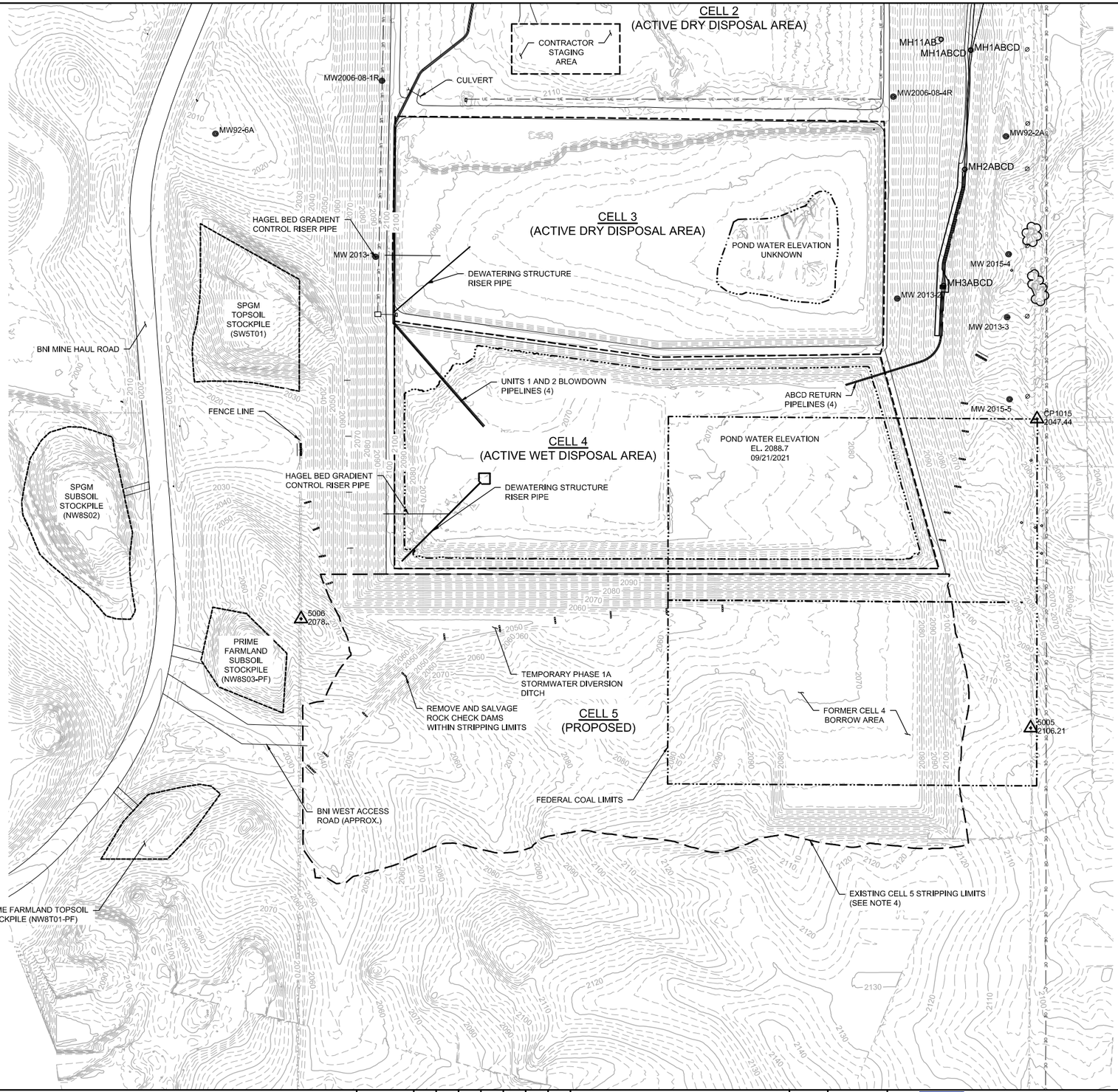


1 PLAN: EXISTING CONDITIONS

0 200 400

SCALE IN FEET

LEGEND

- EXISTING 10' MAJOR CONTOUR
- EXISTING 2' MINOR CONTOUR
- EXISTING ROAD
- EXISTING PIPE
- EXISTING GEOMEMBRANE LINER LIMITS
- FENCE LINE
- FIELD LINE
- UNDERGROUND ELECTRIC
- OVERHEAD ELECTRIC
- STORM SEWER
- EXISTING CELL 5 STRIPPING LIMITS
- STOCKPILE EXTENTS
- WATERLINE
- SHRUB EDGE
- FEDERAL COAL TRACT LIMITS
- CULVERT
- BUILDING
- SINGLE TREES
- UTILITY POLE
- MH7AB — EXISTING MANHOLE, CATCH BASIN
- MW97-2 — MONITORING WELL
- CP10 2109.27 — CONTROL POINT

| CONTROL POINTS | | | |
|---|---|---|---|
| CONTROL POINT | NORTHING | EASTING | ELEVATION |
| CP13 | 508,526.39 | 1,821,517.66 | 2,092.74 |
| CP1015 | 506,603.78 | 1,822,015.47 | 2,047.44 |
| 5005 | 505,499.46 | 1,821,992.35 | 2,106.21 |
| 5006 | 505,889.21 | 1,819,384.17 | 2,078.56 |

NOTE:

CONTROL POINT CP13 IS OUTSIDE OF VIEWPORT EXTENTS. LOCATION SHOWN ON G-01.

NOTES:

1. PROTECT ALL WELLS WITHIN THE CONSTRUCTION LIMITS, UNLESS OTHERWISE DIRECTED.
2. EXISTING GROUND TOPOGRAPHY SHOWN IS A COMBINATION OF THE FOLLOWING DRONE SURVEYS PROVIDED TO BARR AND COMBINED BY BARR:
   -JUNE 2021 PERFORMED BY BNI
   -OCTOBER 5, 2021 PERFORMED BY BNI
   -DECEMBER 8, 2021 PERFORMED BY BNI (PERFORMED OVER STRIPPING AREA)
3. COORDINATE SYSTEM IS NORTH DAKOTA STATE PLANE SOUTH ZONE, NAD 27 - US SURVEY FEET (HORIZONTAL): NVGD 1929 (VERTICAL).
4. CELL 5 STRIPPING WAS COMPLETED BY OTHERS IN FALL 2021. CONTOURS SHOWN REPRESENT POST-STRIPPING CONDITIONS. ADDITIONAL STRIPPING WILL BE REQUIRED AND WILL BE COMPLETED BY OTHERS.

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|---|---|---|---|---|---|
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|---|---|---|---|---|---|---|---|
| CLIENT | 03/14/22 | | | | | | |
| BID | | | | | | | |
| CONSTRUCTION | | | | 04/07/22 | | | |
| RECORD | | | | | 12/15/23 | | |

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Minneapolis, Minnesota
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Ph: 1-800-632-2277
Fax: (952) 832-2601
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| Scale | AS SHOWN |
| Date | 02/24/22 |
| Drawn | JEK2 |
| Checked | JKH2 |
| Designed | SWH |
| Approved | SWH |

Minnkota Power COOPERATIVE
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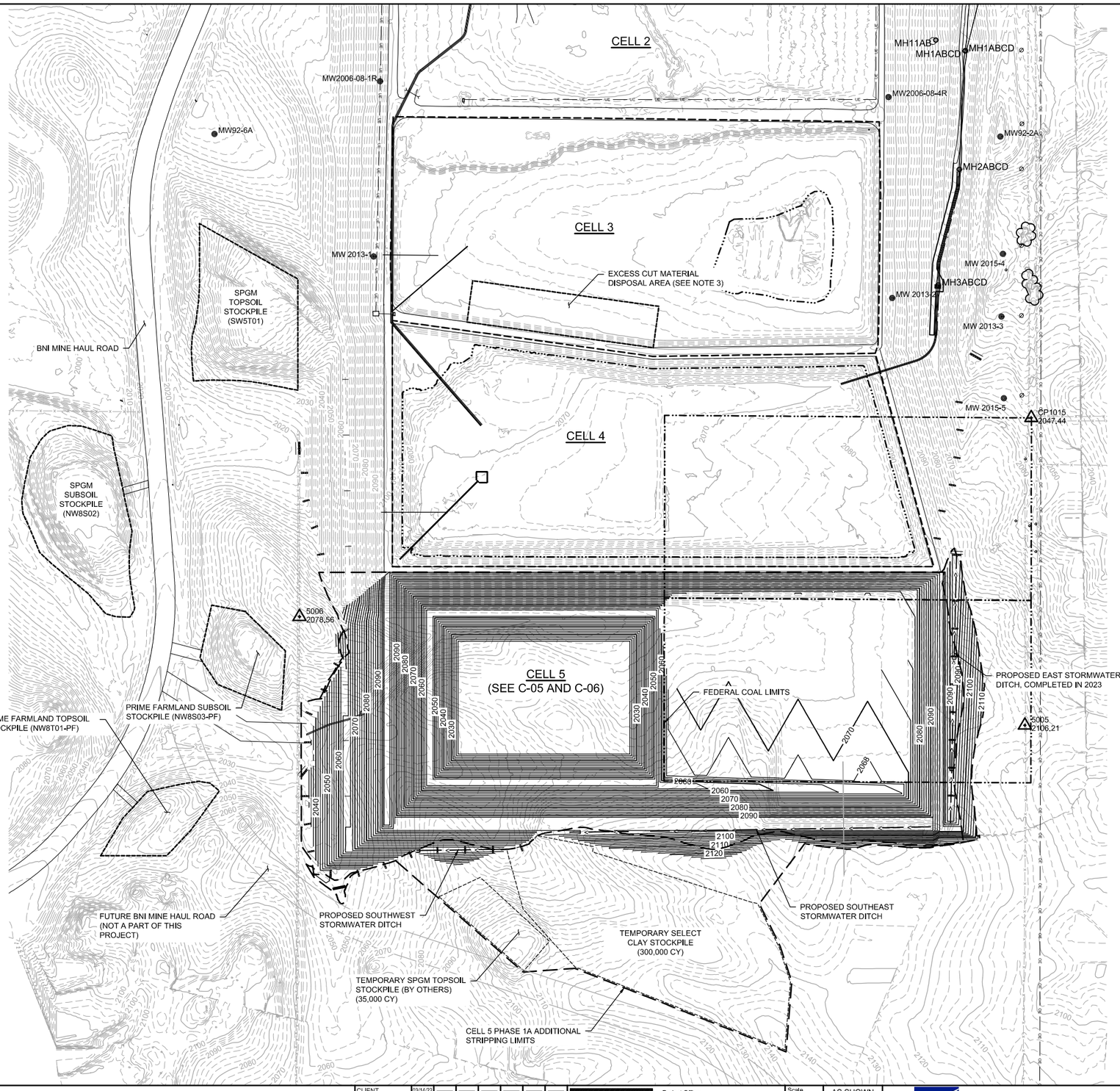
MINNKOTA FGD POND CELL 5 - PHASE 1A
CENTER, NORTH DAKOTA

EXISTING CONDITIONS PLAN

| BARR PROJECT No. | |
|---|---|
| 34331014.51 | |
| CLIENT PROJECT No. | |
| DWG. No. | REV. No. |
| C-01 | 1 |

CADD USER: ANDERS W. TOLKKINEN FILE: M:\DESIGN\34331014.51\13433101451_PHASE 1A_C-01.DWG PLOT SCALE: 1:2 PLOT DATE: 12/6/2023 12:18 PM




1 PLAN: CELL 5 - PHASE 1

0 200 400

SCALE IN FEET

N

## LEGEND

- EXISTING 10' MAJOR CONTOUR
- EXISTING 2' MINOR CONTOUR
- PROPOSED 10' MAJOR CONTOUR
- PROPOSED 2' MINOR CONTOUR
- EXISTING ROAD
- EXISTING PIPE
- FENCE LINE
- FIELD LINE
- UNDERGROUND ELECTRIC
- OVERHEAD ELECTRIC
- STORM SEWER
- CELL 5 PHASE 1A STRIPPING LIMITS
- CELL 5 PHASE 1A ADDITIONAL STRIPPING LIMITS
- STOCKPILE EXTENTS
- WATERLINE
- SHRUB EDGE
- FEDERAL COAL TRACT LIMITS
- CULVERT
- BUILDING
- SINGLE TREES
- UTILITY POLE
- MH7AB — EXISTING MANHOLE, CATCH BASIN
- MW97-2 — MONITORING WELL
- CP10 2109.27 — CONTROL POINT

NOTES:

1. BNI COAL LTD. WILL PROVIDE ACCESS TO ALL SOIL STOCKPILES.
2. FINISHED GROUND CONTOURS SHOWN REPRESENT TOP OF RANDOM FILL.
3. EXACT DISPOSAL AREA LIMITS TO BE DETERMINED BY AND COORDINATED WITH OWNER.

PRELIMINARY DRAFT
NOT FOR CONSTRUCTION

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| Checked | JKH2 |
| Designed | SWH |
| Approved | SWH |

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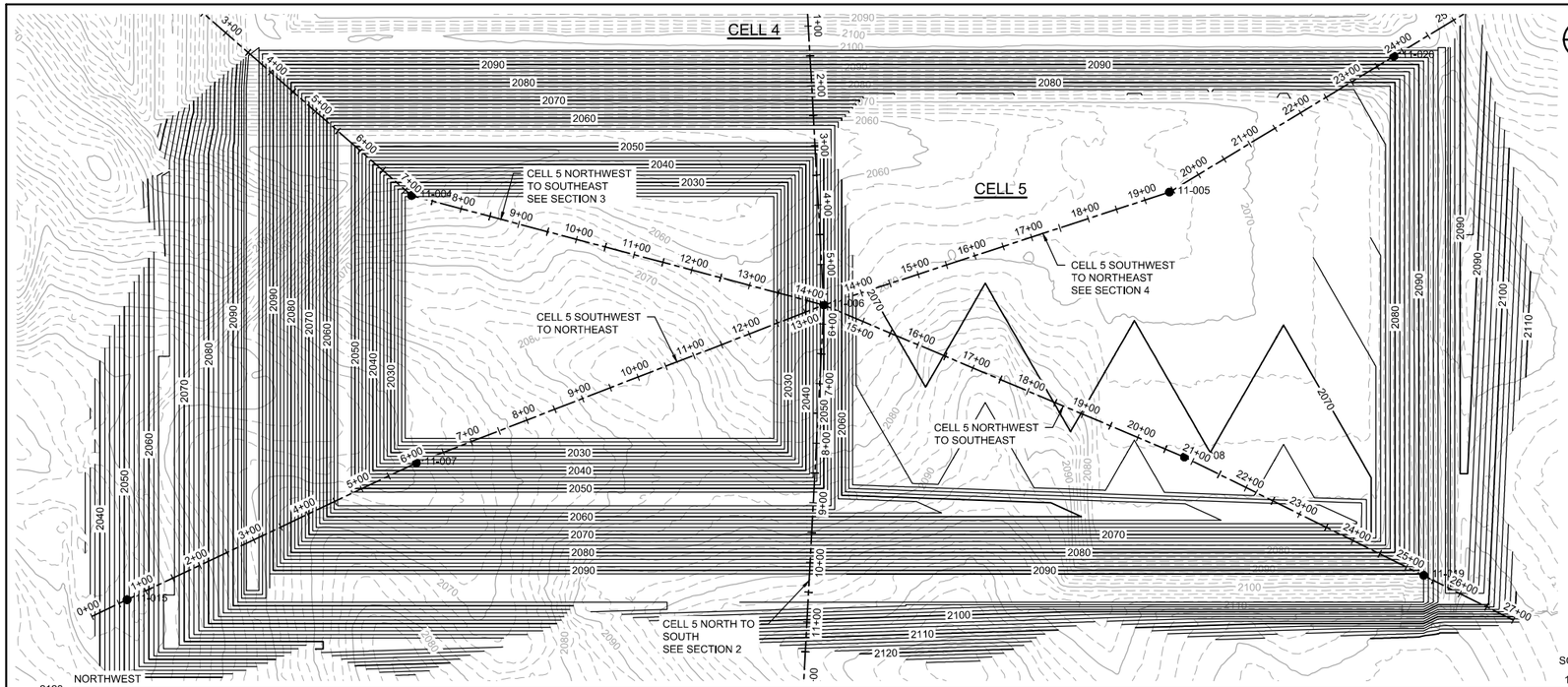
MINNKOTA FGD POND CELL 5 - PHASE 1B
CENTER, NORTH DAKOTA

PROJECT LAYOUT
PLAN

BARR PROJECT No. 34331014.51
CLIENT PROJECT No.
DWG. No. C-02
REV. No. A




1 - PLAN: 2011 BORING LOCATIONS

0 125 250

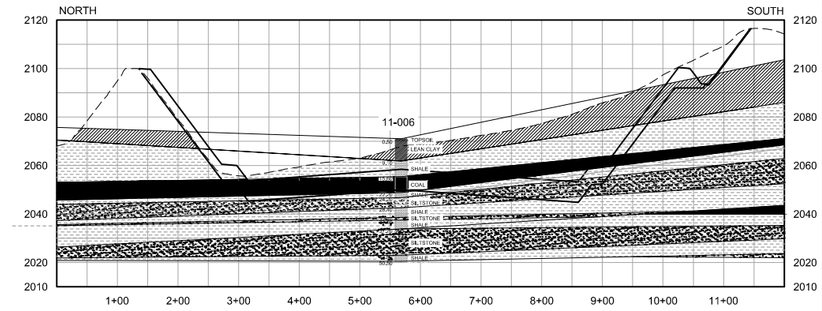
SCALE IN FEET

LEGEND

- EXISTING 10' MAJOR CONTOUR
- EXISTING 2' MINOR CONTOUR
- PROPOSED 10' MAJOR CONTOUR
- PROPOSED 2' MINOR CONTOUR
- CROSS SECTION ALIGNMENT
- SOIL BORING

NOTES:

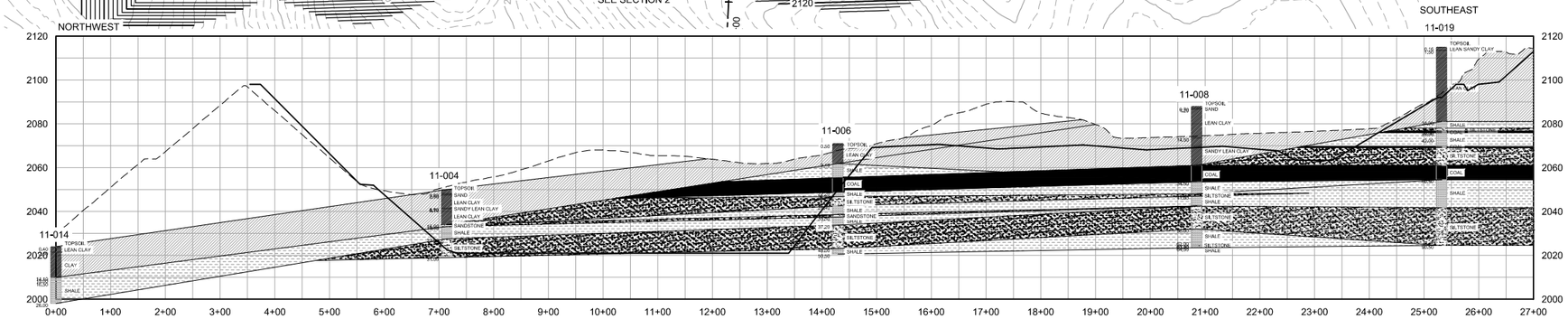
1. ALL EXCAVATED MATERIALS ARE ESTIMATED BASED ON THE SOIL INVESTIGATION WORK COMPLETED IN 2011. CONTRACTOR MUST FIELD VERIFY EACH MATERIAL PRIOR TO USE AS CONSTRUCTION MATERIAL. A COPY OF THE INFORMATION OBTAINED AS PART OF THE 2011 INVESTIGATION IS AVAILABLE UPON REQUEST.
2. INFORMATION ON THIS SHEET IS PROVIDED TO CONTRACTOR FOR INFORMATIONAL PURPOSES ONLY. CONTRACTOR SHALL MAKE ITS OWN DETERMINATION OF THE SUBSURFACE CONDITIONS BASED ON SOIL BORINGS PROVIDED.
3. MATERIAL SURFACES ARE INTERPOLATED BETWEEN BORING LOCATIONS.
4. PROPOSED CONTOURS SHOWN REPRESENT TOP OF RANDOM FILL.




2 - CROSS SECTION: CELL 5 - NORTH TO SOUTH

0 125 250 SCALE IN FEET HORIZONTAL

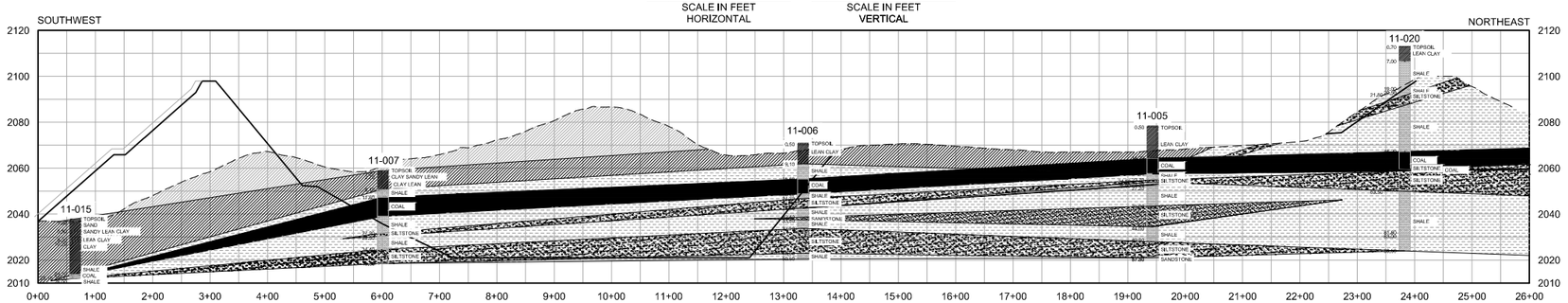
0 31.25 62.5 SCALE IN FEET VERTICAL




3 - CROSS SECTION: CELL 5 - NORTHWEST TO SOUTHEAST

0 125 250 SCALE IN FEET HORIZONTAL

0 31.25 62.5 SCALE IN FEET VERTICAL




4 - CROSS SECTION: CELL 5 - SOUTHWEST TO NORTHEAST

0 125 250 SCALE IN FEET HORIZONTAL

0 31.25 62.5 SCALE IN FEET VERTICAL

EXCAVATED MATERIAL DESCRIPTION

| HATCH | LABEL | DESCRIPTION |
|---|---|---|
| | TILL | SANDY GRAVELLY CLAY. |
| | SHALE | UPPER SHALES - VERY WEAK TO WEAK IN STRENGTH, GENERALLY LIGHT YELLOWISH, BROWN TO LIGHT BROWN, OR GRAY IN COLOR, SLIGHTLY WEATHERED TO HIGHLY WEATHERED, FINE GRAINED, MEDIUM TO CLOSE FRACTURE SPACING, DRY OR DAMP.<br>LOWER SHALES - STRONG TO WEAK STRENGTH, GENERALLY GRAY TO LIGHT GRAY IN COLOR, HIGHLY TO MODERATELY WEATHERED, FINE GRAINED, THICK TO MEDIUM BEDDED, MEDIUM TO UNFRACTURED FRACTURE SPACING, DRY OR DAMP. OBSERVED WHITE LAMINATIONS IN SOME SAMPLES. |
| | HAGEL/COAL | LIGNITE COAL, CARBONACEOUS, BLACK IN COLOR. |
| | SILTSTONE | STRONG TO VERY WEAK STRENGTH, GENERALLY GRAY TO LIGHT GRAY IN COLOR, SLIGHTLY TO MODERATELY WEATHERED, FINE GRAINED, THINLY BEDDED, WIDE TO CLOSE FRACTURE SPACING, DAMP, SOMETIMES WITH NON SILTY/SANDY SHALE INTERBEDDED THROUGHOUT. |
| | SANDSTONE | SANDSTONE WITH SAND AND FINE CONTENT VARIABLE, GRAY IN COLOR |

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| CONSTRUCTION | | | | 04/07/22 | | | |
| RECORD | | | | | 12/15/23 | | |

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MINNKOTA FGD POND CELL 5 - PHASE 1A
CENTER, NORTH DAKOTA

SOIL BORINGS
PLAN AND CROSS SECTIONS

BARR PROJECT No. 34331014.51
CLIENT PROJECT No.
DWG. No. C-03
REV. No. 1

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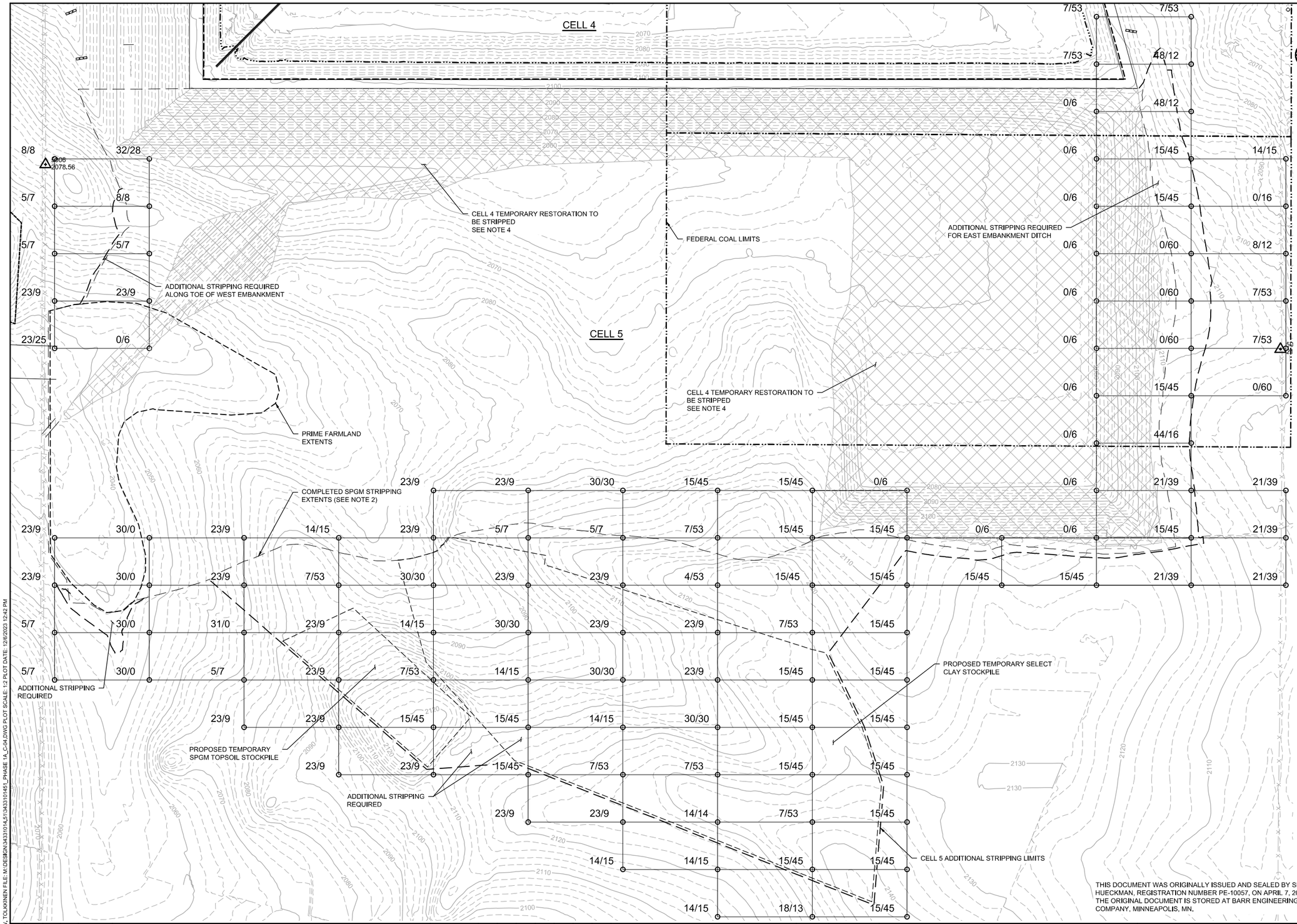


## PLAN: SPGM STRIPPING LIMITS

0 100 200

SCALE IN FEET

### LEGEND

- EXISTING 10' MAJOR CONTOUR
- EXISTING 2' MINOR CONTOUR
- EXISTING ROAD
- EXISTING ACCESS ROAD
- EXISTING PIPELINE
- FEDERAL COAL LIMITS
- FENCE LINE
- UNDERGROUND ELECTRIC
- OVERHEAD ELECTRIC
- SPGM GRID
- X/Y — X = X-ESTIMATED THICKNESS (IN.) OF SPGM TOPSOIL; Y = Y-ESTIMATED THICKNESS (IN.) OF SPGM SUBSOIL
- COMPLETED SPGM STRIPPING LIMITS (SEE NOTE 2)
- CELL 5 PHASE 1A ADDITIONAL SPGM STRIPPING LIMITS
- STOCKPILE EXTENTS
- WATERLINE
- SHRUB EDGE
- PRIME FARMLAND LIMITS (SEE NOTE 3)
- TEMPORARY RESTORATION FROM CELL 4 CONSTRUCTION (SEE NOTE 4)
- BUILDING
- SINGLE TREES
- UTILITY POLE
- LIGHT POLE
- MH7AB — EXISTING MANHOLE
- MW97-2 — MONITORING WELL
- CP10 2109.27 — CONTROL POINT

NOTES:

1. PRIOR TO STRIPPING TOPSOIL, CONTRACTOR SHALL HAVE STORM WATER CONTROLS IN PLACE TO PREVENT STORM WATER RUNOFF FROM DISTURBED AREAS FROM LEAVING THE SITE UNTREATED. ACCEPTABLE STORM WATER CONTROL MEASURES INCLUDE SILT FENCE, FILTER LOGS, OR OTHER APPROVED METHODS TO PREVENT SEDIMENT TRANSPORT OUTSIDE OF THE WORK AREAS. OWNER'S ONSITE REPRESENTATIVE WILL REVIEW AND APPROVE CONTRACTOR'S STORM WATER CONTROL METHODS.
2. MOST OF SPGM STRIPPING IN CELL 5 EXTENTS WERE COMPLETED DURING CELL 4 CONSTRUCTION AND IN THE FALL OF 2021 BY BNI. ADDITIONAL STRIPPING AREAS SHOWN WILL BE PERFORMED BY BNI PRIOR TO CELL 5 PHASE 1A CONSTRUCTION UNLESS OTHERWISE DIRECTED BY OWNER.
3. SOIL STRIPPED WITHIN PRIME FARMLAND LIMITS SHALL BE PLACED IN THE PROPOSED PRIME FARMLAND SPGM TOPSOIL STOCKPILES AS SHOWN ON DWG C-02. ALL OTHER STRIPPED SOILS SHALL BE PLACED IN THEIR CORRESPONDING STOCKPILES.
4. STRIP AND STOCKPILE 6" SUBSOIL FROM AREA RESTORED DURING CELL 4 CONSTRUCTION.

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MINNKOTA FGD POND CELL 5 - PHASE 1A
CENTER, NORTH DAKOTA

SPGM STRIPPING PLAN

| BARR PROJECT No. | |
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| 34331014.51 | |
| CLIENT PROJECT No. | |
| DWG. No. | REV. No. |
| C-04 | 1 |


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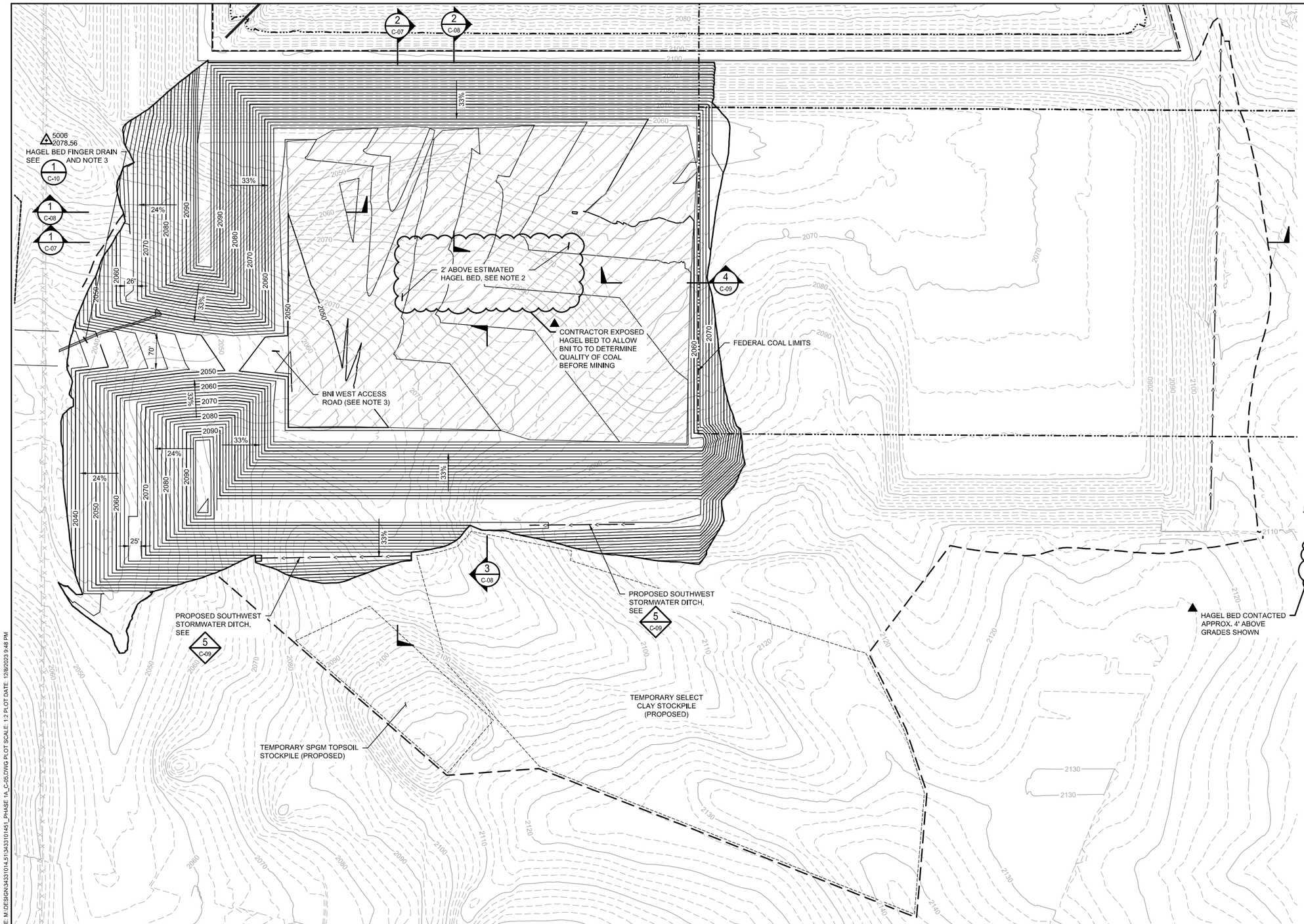


## LEGEND

- EXISTING 10' MAJOR CONTOUR
- EXISTING 2' MINOR CONTOUR
- PROPOSED 10' MAJOR CONTOUR
- PROPOSED 2' MINOR CONTOUR
- EXISTING ROAD
- EXISTING PIPE
- EXISTING GEOMEMBRANE LINER LIMITS
- FENCE LINE
- FIELD LINE
- UNDERGROUND ELECTRIC
- OVERHEAD ELECTRIC
- STORM SEWER
- PROPOSED CELL 5 STRIPPING LIMITS
- STOCKPILE EXTENTS
- STORMWATER DRAINAGE DITCH
- WATERLINE
- SHRUB EDGE
- FEDERAL COAL TRACT LIMITS
- CULVERT
- BUILDING
- SINGLE TREES
- UTILITY POLE
- MH7AB — EXISTING MANHOLE, CATCH BASIN
- MW97-2 — MONITORING WELL
- CP10 2109.27 — CONTROL POINT
- 2' ABOVE ESTIMATED TOP OF HAGEL BED (SEE NOTE 2)
- HAGEL BED DRAIN

NOTES:

1. PROTECT ALL WELLS WITHIN THE CONSTRUCTION LIMITS, UNLESS OTHERWISE DIRECTED.
2. PROPOSED CONTOURS SHOWN REPRESENT TOP OF RANDOM FILL. CONTOURS WITHIN THE HATCHED BOUNDARY REPRESENT 2 FEET ABOVE TOP OF HAGEL BED. CONTOURS ARE APPROXIMATE AND SHALL BE VERIFIED DURING CONSTRUCTION. DO NOT EXCAVATE HAGEL BED MATERIAL.
3. DETERMINE FINAL EXTENTS OF HAGEL BED DRAIN IN THE FIELD BASED ON LOCATION OF THE HAGEL BED OUTCROP (LOCATIONS ON DRAWINGS ARE ESTIMATED), PLACE DRAIN MATERIAL DIRECTLY AGAINST THE EXPOSED HAGEL BED ON THE WEST SLOPE AT A MINIMUM WIDTH OF 5-FEET. PLACE FINGER DRAINS 4' BY 4' IN NATURAL DRAINAGE AREAS AS SHOWN ON THE DRAWINGS. DO NOT INSTALL FINGER DRAIN BELOW BNI WEST ACCESS ROAD UNTIL AFTER HAGEL BED REMOVAL.

**CELL 5 PHASE 1A EXCAVATION TO HAGEL NEATLINE EARTHWORK QUANTITIES**

| MATERIAL | ESTIMATED QUANTITIES (CY) |
|---|---|
| SPGM STRIPPING | |
| SPGM TOPSOIL | 38,000 |
| SPGM SUBSOIL | 68,000 |
| 6" TEMPORARY SPGM SUBSOIL | 18,000 |
| EARTHWORK | |
| WEST FLOOR CUT ABOVE HAGEL BED | 316,000 |
| EMBANKMENT FILL | 261,000 |
| EXCESS MATERIAL TO BE STOCKPILED AS SELECT CLAY OR WASTED IN CELL 2 OR CELL 3 | 55,000 |

NOTE: NEATLINE QUANTITIES ARE ROUNDED TO THE NEAREST ONE-THOUSAND CUBIC YARDS, NO WASTE, SHRINKAGE, OR SWELL IS ASSUMED.

1/- PLAN: CELL 5 - PHASE 1A EXCAVATION TO HAGEL

0 100 200
SCALE IN FEET

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MINNKOTA FGD POND CELL 5 - PHASE 1A
CENTER, NORTH DAKOTA

EXCAVATION TO HAGEL
PLAN

| BARR PROJECT No. | |
|---|---|
| 34331014.51 | |
| CLIENT PROJECT No. | |
| DWG. No. | REV. No. |
| C-05 | 1 |

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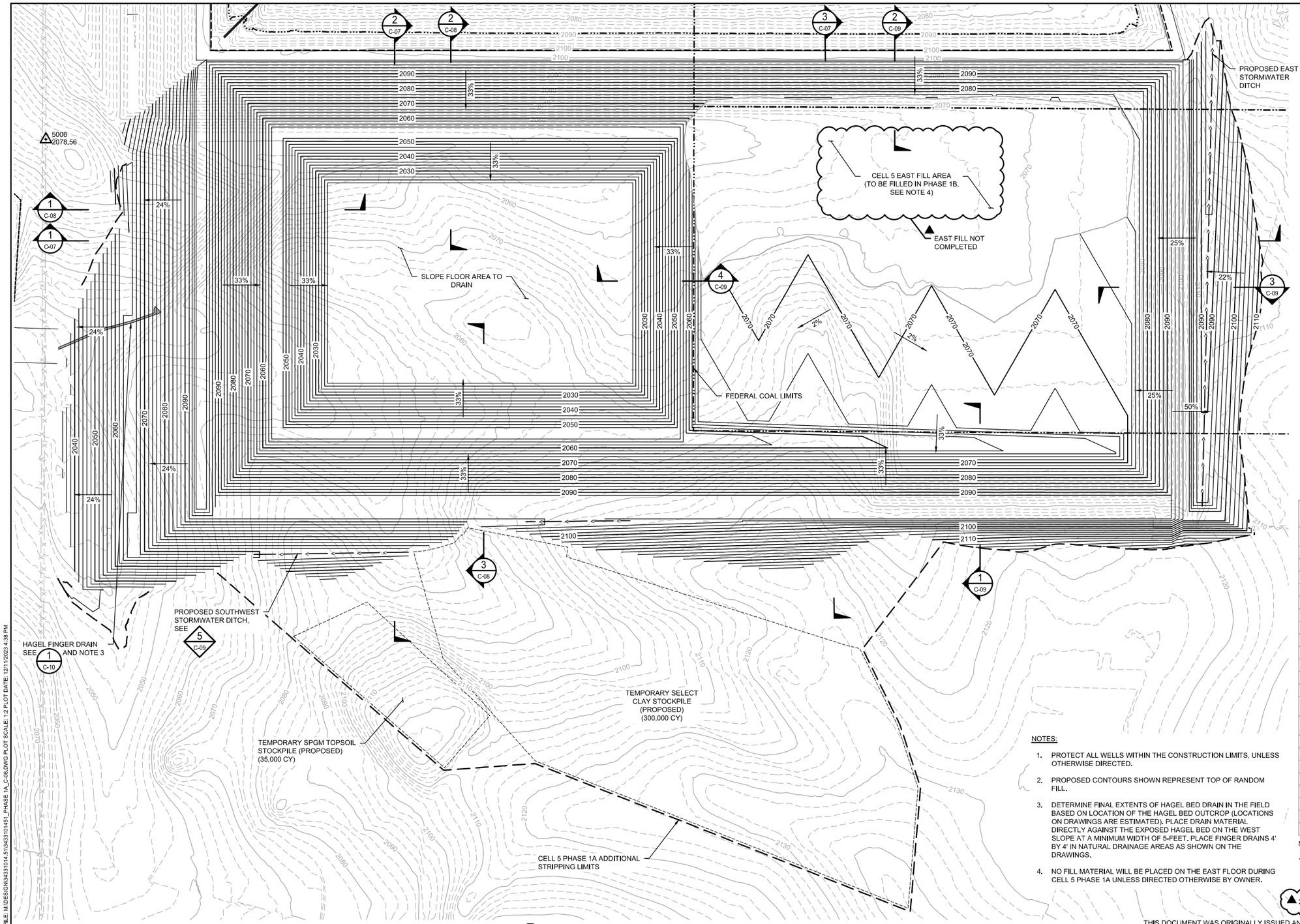


## LEGEND

- EXISTING 10' MAJOR CONTOUR
- EXISTING 2' MINOR CONTOUR
- PROPOSED 10' MAJOR CONTOUR
- PROPOSED 2' MINOR CONTOUR
- EXISTING ROAD
- EXISTING PIPE
- EXISTING GEOMEMBRANE LINER LIMITS
- FENCE LINE
- FIELD LINE
- UNDERGROUND ELECTRIC
- OVERHEAD ELECTRIC
- STORM SEWER
- PROPOSED CELL 5 STRIPPING LIMITS
- STOCKPILE EXTENTS
- STORMWATER DRAINAGE DITCH
- WATERLINE
- SHRUB EDGE
- FEDERAL COAL TRACT LIMITS
- CULVERT
- BUILDING
- SINGLE TREES
- UTILITY POLE
- MH7AB — EXISTING MANHOLE, CATCH BASIN
- MW97-2 — MONITORING WELL
- CP10 2109,27 — CONTROL POINT
- HAGEL BED DRAIN

## CELL 5 PHASE 1A EXCAVATION NEATLINE EARTHWORK QUANTITIES

| MATERIAL | ESTIMATED QUANTITIES (CY) |
|---|---|
| EARTHWORK | |
| 2' BUFFER AND HAGEL REMOVAL | 149,000 |
| WEST FLOOR CUT BELOW HAGEL | 283,000 |
| WASTE (ROCK AND COAL) | 15,000 |
| RANDOM FILL | 50,000 |
| SELECT CLAY | 220,000 |
| | |
| MATERIAL REMAINING IN WEST FLOOR | 61,000 |
| EAST FLOOR CUT ABOVE HAGEL | 276,000 |
| | |
| EMBANKMENT FILL | 44,000 |
| SELECT CLAY TO BE STOCKPILED | 220,000 |
| RANDOM FILL TO BE STOCKPILED FOR PH1B - EAST FLOOR FILL | 54,000 |
| EXCESS MATERIAL TO CELL 2 OR CELL 3 | 228,000 |
| | |
| RESTORATION | |
| WEST EMBANKMENT SPGM TOPSOIL | 11,000 |
| WEST EMBANKMENT SPGM SUBSIOL | 21,000 |
| EAST EMBANKMENT SPGM TOPSOIL | 4,000 |
| EAST EMBANKMENT SPGM SUBSOIL | 10,000 |
| SOUTH EMBANKMENT TOPSOIL | 0 |
| SOUTH EMBANKMENT SUBSOIL | 5,000 |

NOTES:

1. NEATLINE QUANTITIES ARE ROUNDED TO THE NEAREST ONE-THOUSAND CUBIC YARDS, NO WASTE, SHRINKAGE, OR SWELL IS ASSUMED. EXCAVATION BELOW HAGEL ASSUMED TO BE 5% WASTE, 11.5% RANDOM FILL, 77.5% SELECT CLAY.
2. THE NEATLINE QUANTITY OF REQUIRED CLAY FOR CELL 5 PHASE 1B IS ~~271,000 CY.~~ 360,000 CY.

NOTES:

1. PROTECT ALL WELLS WITHIN THE CONSTRUCTION LIMITS, UNLESS OTHERWISE DIRECTED.
2. PROPOSED CONTOURS SHOWN REPRESENT TOP OF RANDOM FILL.
3. DETERMINE FINAL EXTENTS OF HAGEL BED DRAIN IN THE FIELD BASED ON LOCATION OF THE HAGEL BED OUTCROP (LOCATIONS ON DRAWINGS ARE ESTIMATED). PLACE DRAIN MATERIAL DIRECTLY AGAINST THE EXPOSED HAGEL BED ON THE WEST SLOPE AT A MINIMUM WIDTH OF 5-FEET. PLACE FINGER DRAINS 4' BY 4' IN NATURAL DRAINAGE AREAS AS SHOWN ON THE DRAWINGS.
4. NO FILL MATERIAL WILL BE PLACED ON THE EAST FLOOR DURING CELL 5 PHASE 1A UNLESS DIRECTED OTHERWISE BY OWNER.

1 PLAN: CELL 5 - PHASE 1A EXCAVATION BELOW HAGEL

0 100 200
SCALE IN FEET

N

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Minnkota Power COOPERATIVE
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MINNKOTA FGD POND CELL 5 - PHASE 1A
CENTER, NORTH DAKOTA

EXCAVATION BELOW HAGEL
PLAN

| BARR PROJECT No. | |
|---|---|
| 34331014.51 | |
| CLIENT PROJECT No. | |
| DWG. No. | REV. No. |
| C-06 | 1 |


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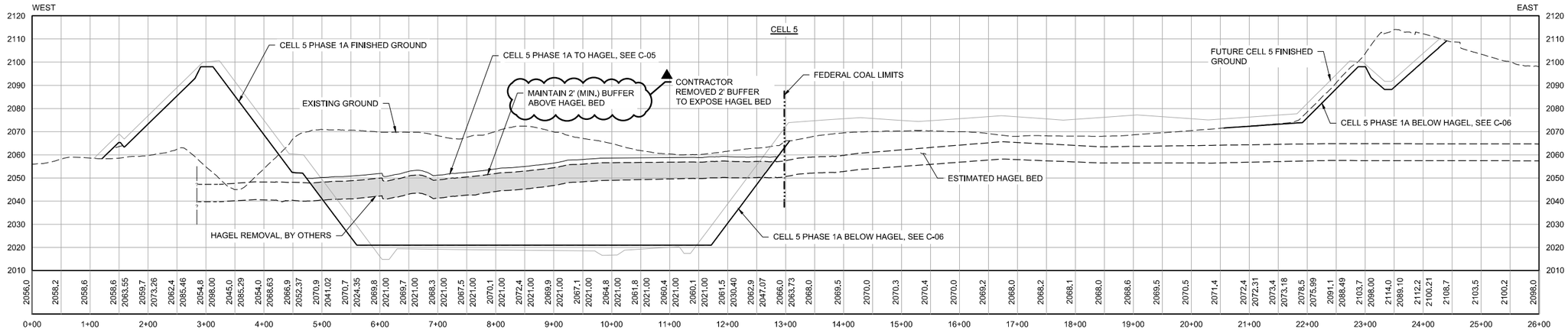
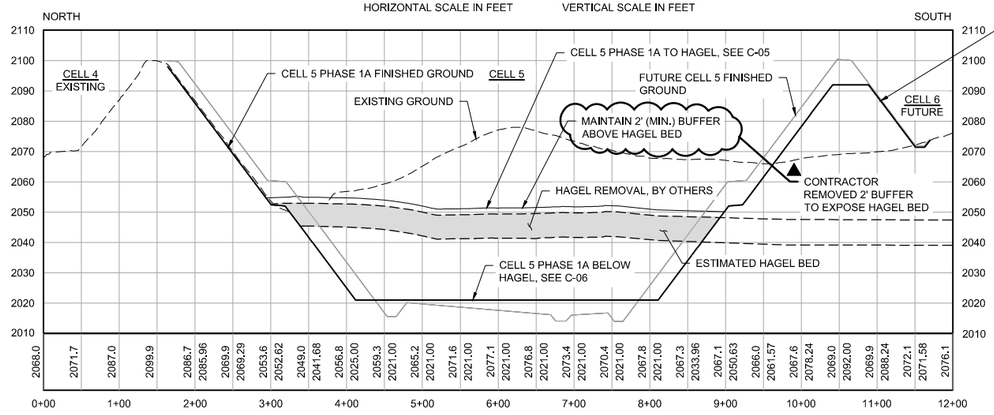


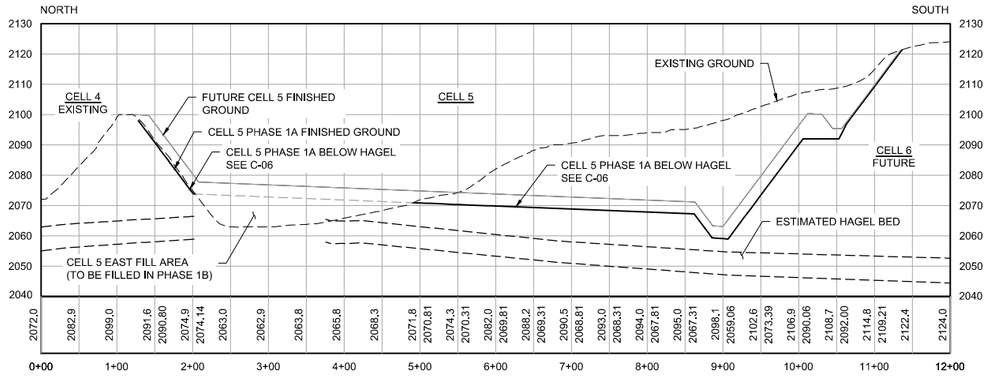

1 C-05, C-06 SECTION: OVERALL WEST - EAST

HORIZONTAL SCALE IN FEET 0 20 40 — VERTICAL SCALE IN FEET 0 5 10




2 C-05, C-06 SECTION: OVERALL NORTH - SOUTH - WEST SIDE

HORIZONTAL SCALE IN FEET 0 20 40 — VERTICAL SCALE IN FEET 0 5 10




3 C-06 SECTION: OVERALL NORTH - SOUTH - EAST SIDE

HORIZONTAL SCALE IN FEET 0 20 40 — VERTICAL SCALE IN FEET 0 5 10

LEGEND

- EXISTING GROUND
- CELL 5 PHASE 1A FINISHED GROUND
- TOP/BOTTOM HAGEL
- 2' ABOVE HAGEL BED
- CELL 5 PHASE 1A BELOW HAGEL
- HAGEL BED

2080.6 EXISTING GROUND — 2079.71 EXCAVATION BELOW HAGEL FINISHED GROUND

NOTES:

1. HAGEL EXCAVATION TO BE COMPLETED BY BNI, COORDINATE SCHEDULE WITH OWNER. EXCAVATION BELOW HAGEL TO BE COMPLETED AFTER REMOVAL OF HAGEL BED MATERIAL.
2. NO FILL MATERIAL WILL BE PLACED ON THE EAST FLOOR DURING CELL 5 PHASE 1A UNLESS OTHERWISE DIRECTED BY OWNER.
3. HAGEL BED CONTACTED APPROX. 4' ABOVE GRADES SHOWN.

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Minnkota Power COOPERATIVE
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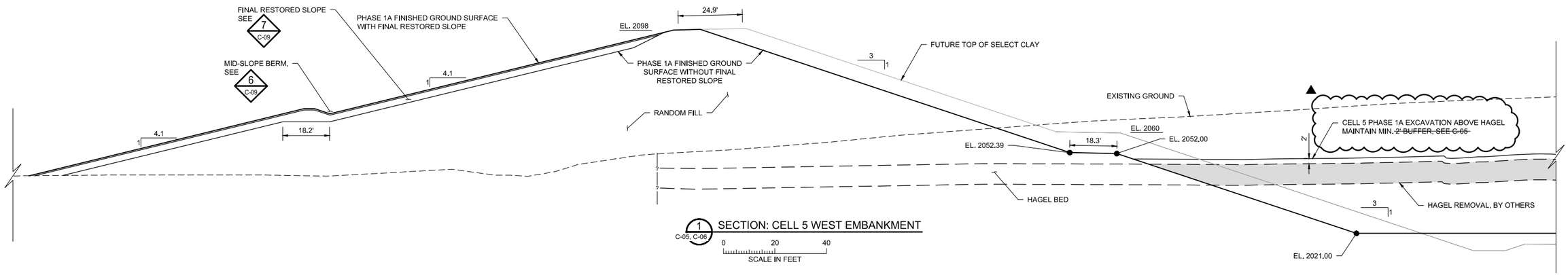
MINNKOTA FGD POND CELL 5 - PHASE 1A
CENTER, NORTH DAKOTA

CELL 5 EXCAVATION AND EMBANKMENT FILL
OVERALL SECTIONS

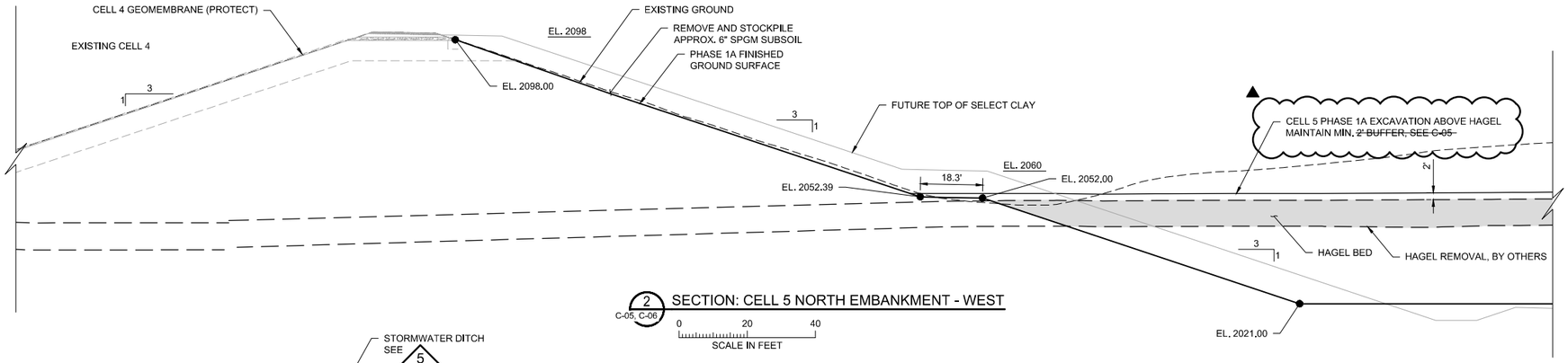
BARR PROJECT No. 34331014.51
CLIENT PROJECT No.
DWG. No. C-07
REV. No. 1

CADD USER: ANDERS W. TOLKINEN FILE: M:\DESIGN\34331014.51\34331014S1_PHASE 1A_C-07.DWG PLOT SCALE: 1:2 PLOT DATE: 12/8/2023 9:37 PM



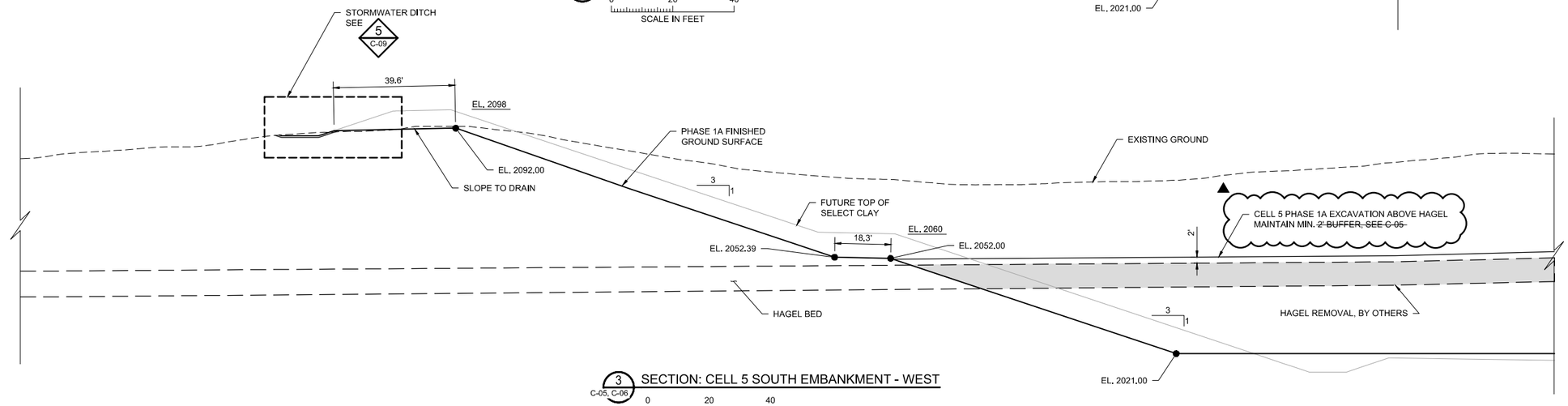

1 C-05, C-06 SECTION: CELL 5 WEST EMBANKMENT

0 20 40
SCALE IN FEET




2 C-05, C-06 SECTION: CELL 5 NORTH EMBANKMENT - WEST

0 20 40
SCALE IN FEET




3 C-05, C-06 SECTION: CELL 5 SOUTH EMBANKMENT - WEST

0 20 40
SCALE IN FEET

NOTES:

1. TOP OF HAGEL BED SURFACE IS APPROXIMATE. ACTUAL LOCATION AND ELEVATIONS WILL VARY. PHASE 1A EXCAVATION ABOVE HAGEL AND FINISHED GROUND SURFACES MAY NEED TO BE ADJUSTED TO ACCOMMODATE ACTUAL HAGEL BED SURFACE. ~~MAINTAIN 2' MINIMUM BUFFER ABOVE HAGEL BED OUTSIDE FEDERAL COAL LIMITS AND MAINTAIN 4' MINIMUM BUFFER ABOVE HAGEL BED WITHIN FEDERAL COAL LIMITS.~~

▲ HAGEL BED CONTACTED APPROX. 4' ABOVE GRADES SHOWN. 2' BUFFER WAS REMOVED BY CONTRACTOR PRIOR TO BNI HAGEL BED REMOVAL.

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MINNKOTA FGD POND CELL 5 - PHASE 1A
CENTER, NORTH DAKOTA

CELL 5 EXCAVATION AND EMBANKMENT FILL
SECTIONS 1 OF 2

| | |
|---|---|
| BARR PROJECT No. | 34331014.51 |
| CLIENT PROJECT No. | |
| DWG. No. | C-08 |
| REV. No. | 1 |

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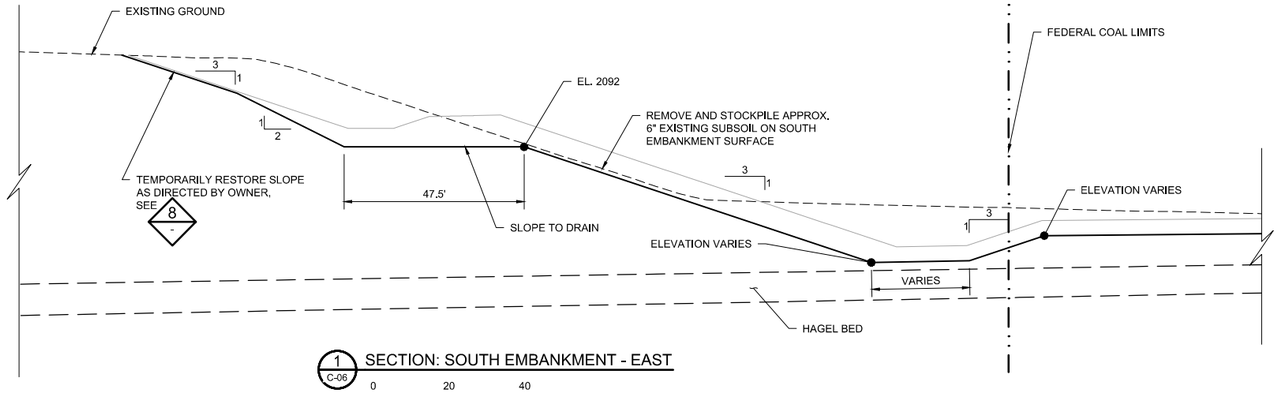
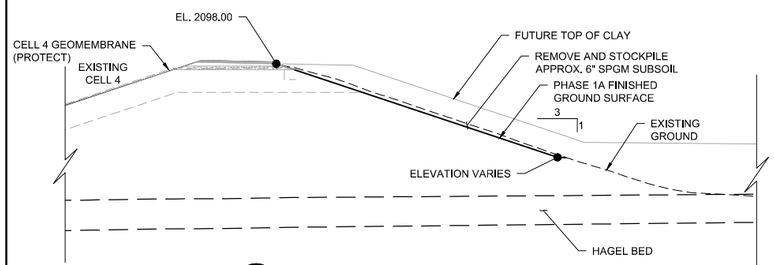


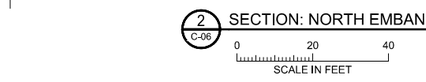

1 C-06 SECTION: SOUTH EMBANKMENT - EAST

0 20 40
SCALE IN FEET



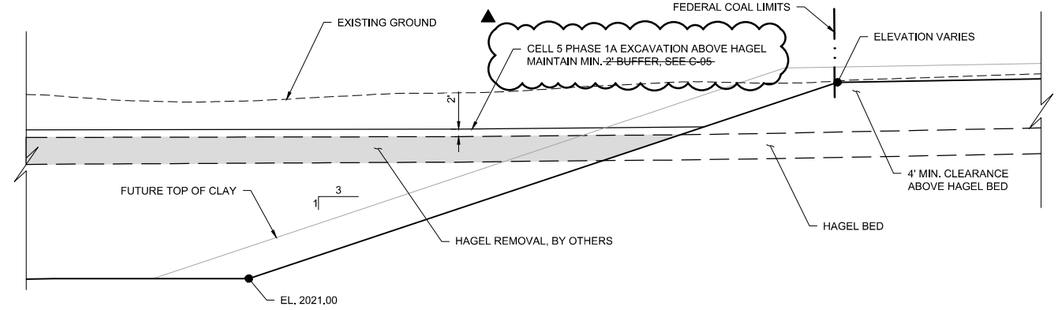

2 C-06 SECTION: NORTH EMBANKMENT - EAST

0 20 40
SCALE IN FEET



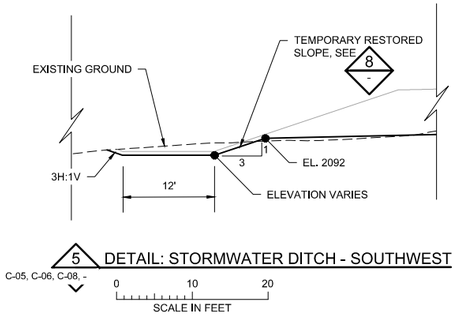

3 C-05,C-06 SECTION: EAST EMBANKMENT

0 20 40
SCALE IN FEET



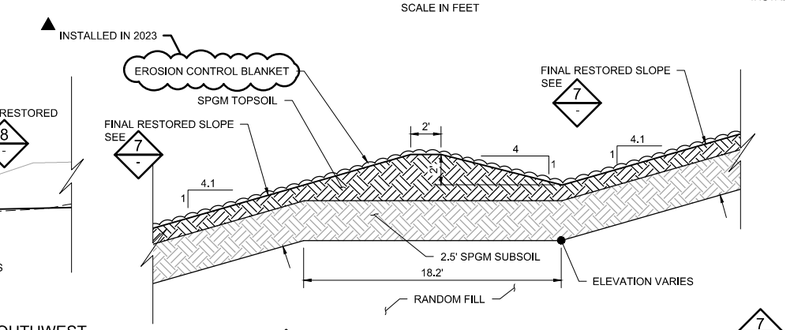

4 C-05,C-06 SECTION: EAST - WEST EMBANKMENT TRANSITION

0 20 40
SCALE IN FEET



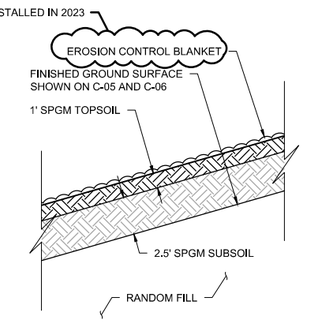

5 C-05, C-06, C-08, - DETAIL: STORMWATER DITCH - SOUTHWEST

0 10 20
SCALE IN FEET




6 C-08 DETAIL: WEST EMBANKMENT DRAINAGE SWALE

0 5 10
SCALE IN FEET

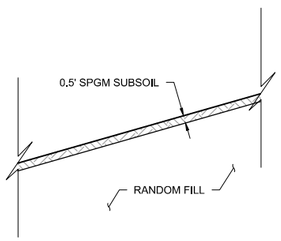



7 C-08, C-10, - DETAIL: FINAL RESTORED SLOPE (TYP.)

0 5 10
SCALE IN FEET

NOTE:

PLACE EROSION CONTROL BLANKET ON ENTIRE WEST EMBANKMENT OUTER SLOPE.

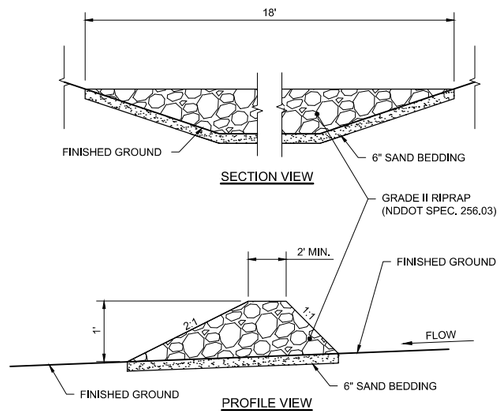



8 C-07, DETAIL: TEMPORARY RESTORED SLOPE (TYP.)

0 5 10
SCALE IN FEET

NOTES:

1. RESTORE SLOPES, SEED AND INSTALL EROSION CONTROL BLANKET AS DIRECTED BY OWNER.




NOTE:

AGGREGATE USED SHOULD BE RELATIVELY FREE OF SEDIMENT PRIOR TO INSTALLATION.

9 C-02 DETAIL: ROCK CHECK DAM
NOT TO SCALE

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MINNKOTA FGD POND CELL 5 - PHASE 1A
CENTER, NORTH DAKOTA

CELL 5 EXCAVATION AND EMBANKMENT FILL
SECTIONS 2 OF 2

| BARR PROJECT No. | |
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| DWG. No. | REV. No. |
| C-09 | 1 |


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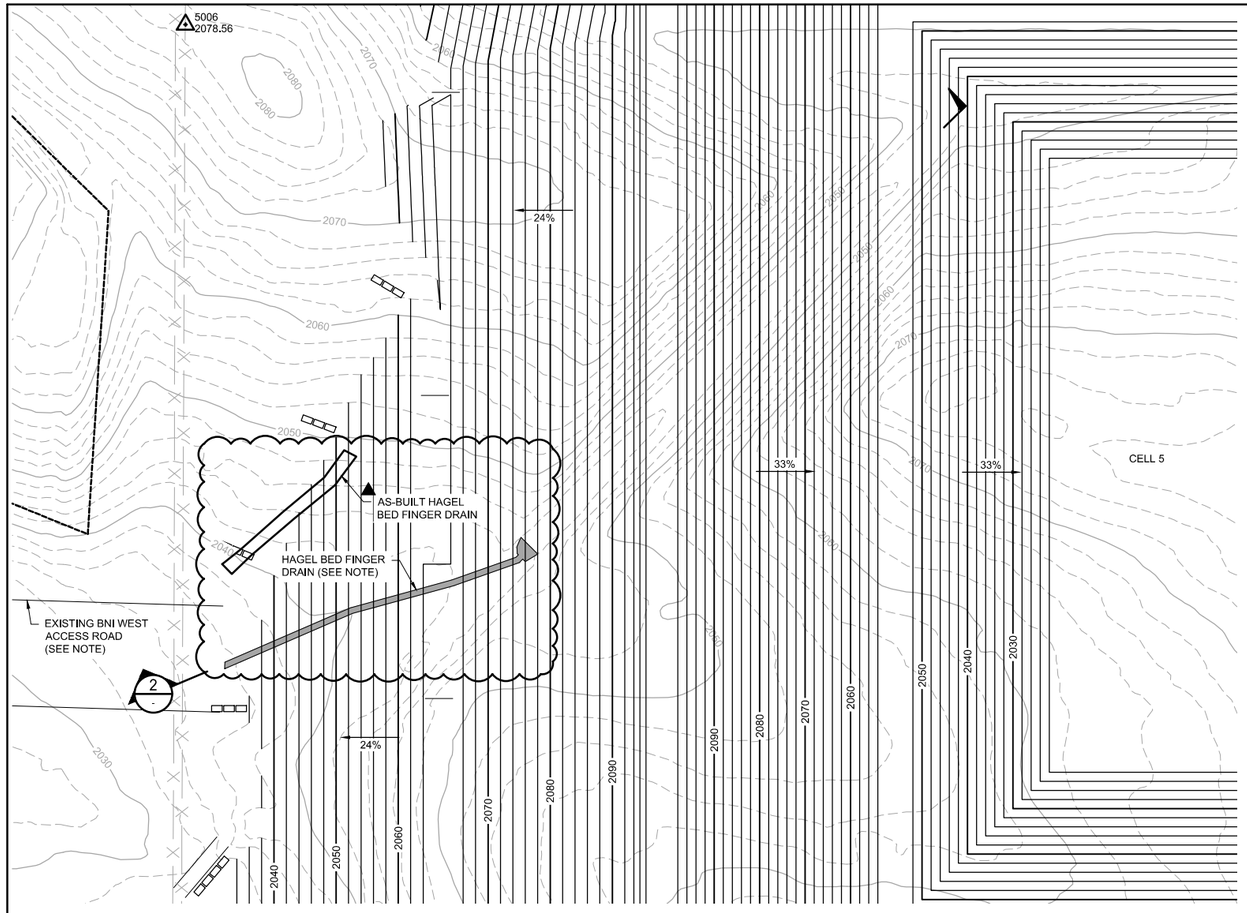
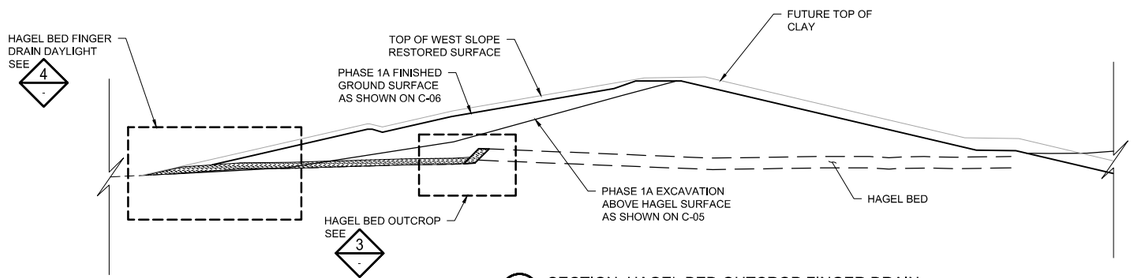



NOTE:

1. DETERMINE FINAL EXTENTS OF HAGEL BED DRAIN IN THE FIELD BASED ON LOCATION OF THE HAGEL BED OUTCROP (LOCATIONS ON DRAWINGS ARE ESTIMATED), PLACE DRAIN MATERIAL DIRECTLY AGAINST THE EXPOSED HAGEL BED ON THE WEST SLOPE AT A MINIMUM WIDTH OF 5-FEET. PLACE FINGER DRAINS 4' BY 4' IN NATURAL DRAINAGE AREAS AS SHOWN ON THE DRAWINGS, DO NOT INSTALL FINGER DRAIN BELOW BNI WEST ACCESS ROAD UNTIL AFTER HAGEL BED REMOVAL.

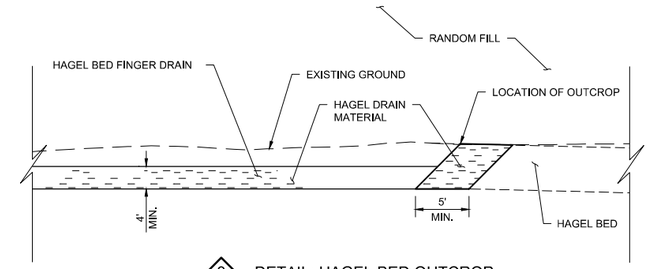
1 / C-05,C-06 PLAN: HAGEL BED OUTCROP FINGER DRAIN

0 50 100
SCALE IN FEET



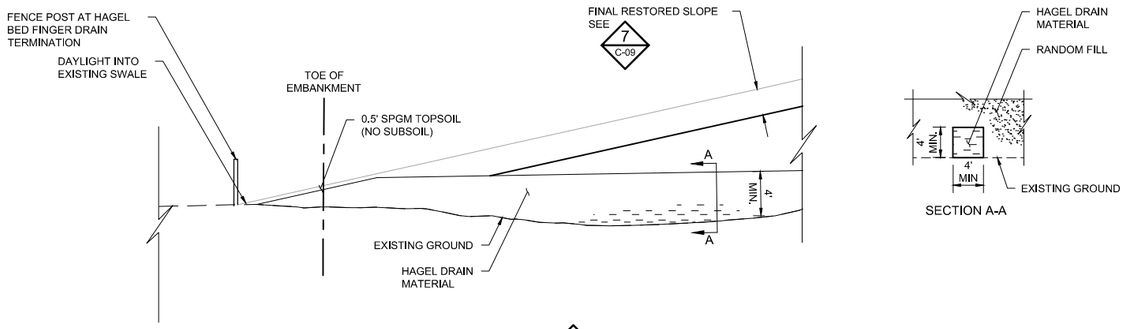

2 SECTION: HAGEL BED OUTCROP FINGER DRAIN

0 50 100
SCALE IN FEET




3 DETAIL: HAGEL BED OUTCROP

0 10 20
SCALE IN FEET




4 DETAIL: HAGEL BED FINGER DRAIN

0 10 20
SCALE IN FEET

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MINNKOTA FGD POND CELL 5 - PHASE 1A
CENTER, NORTH DAKOTA

HAGEL BED OUTCROP
PLAN, SECTION AND DETAILS

BARR PROJECT No. 34331014.51
CLIENT PROJECT No.
DWG. No. C-10
REV. No. 1

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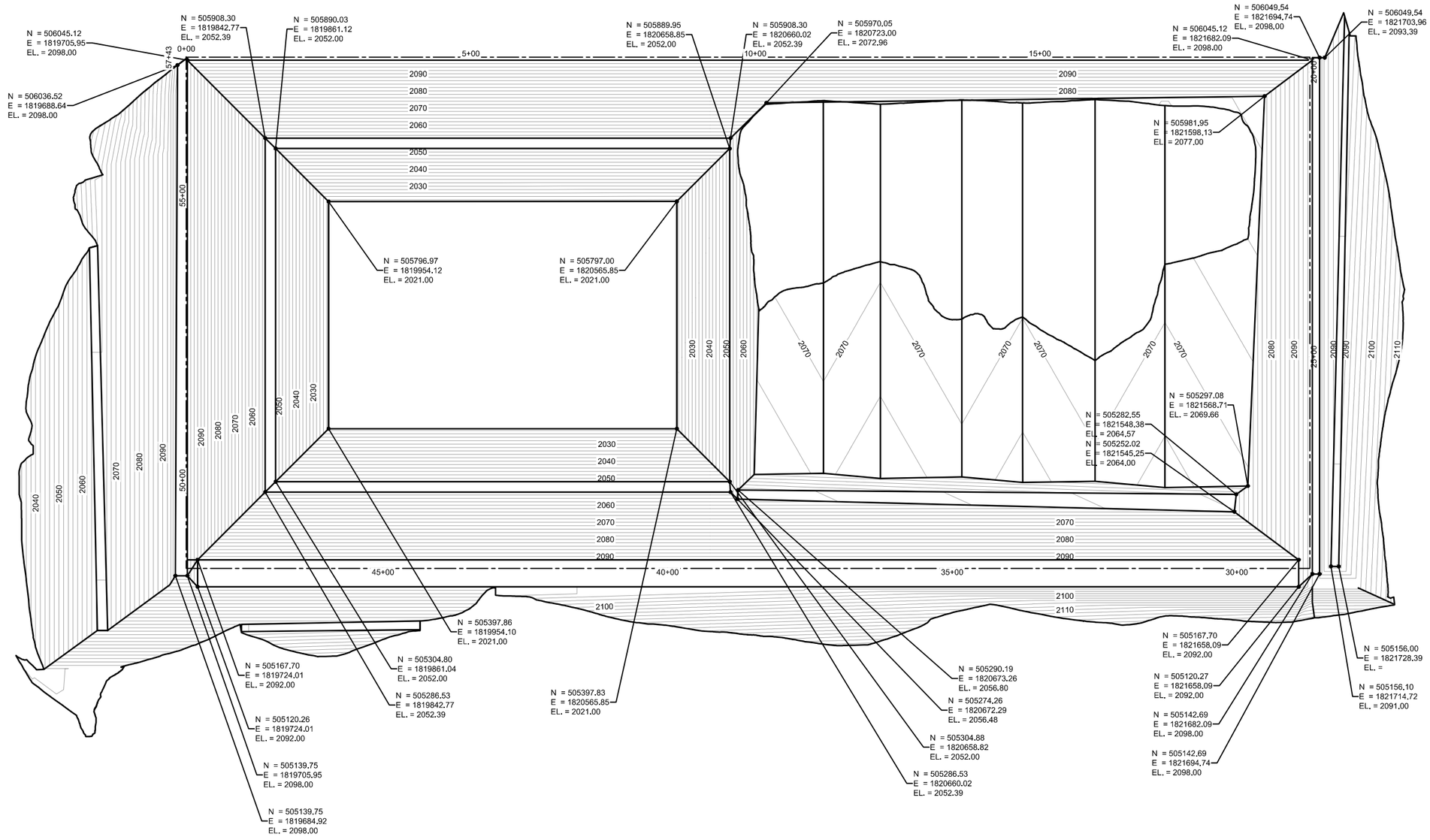


1 PLAN: CELL 5 - PHASE 1A EXCAVATION BELOW HAGEL

0 100 200

SCALE IN FEET

N

LEGEND

- 2000 — PROPOSED 10' MAJOR CONTOUR
- PROPOSED 2' MINOR CONTOUR
- BREAKLINE
- BASELINE ALIGNMENT

NOTE:

1. PROPOSED CONTOURS REPRESENT TOP OF RANDOM FILL.

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MINNKOTA FGD POND CELL 5 - PHASE 1A
CENTER, NORTH DAKOTA

ELEVATION AND COORDINATES
PLAN

BARR PROJECT No. 34331014.51
CLIENT PROJECT No.
DWG. No. C-11
REV. No. 1

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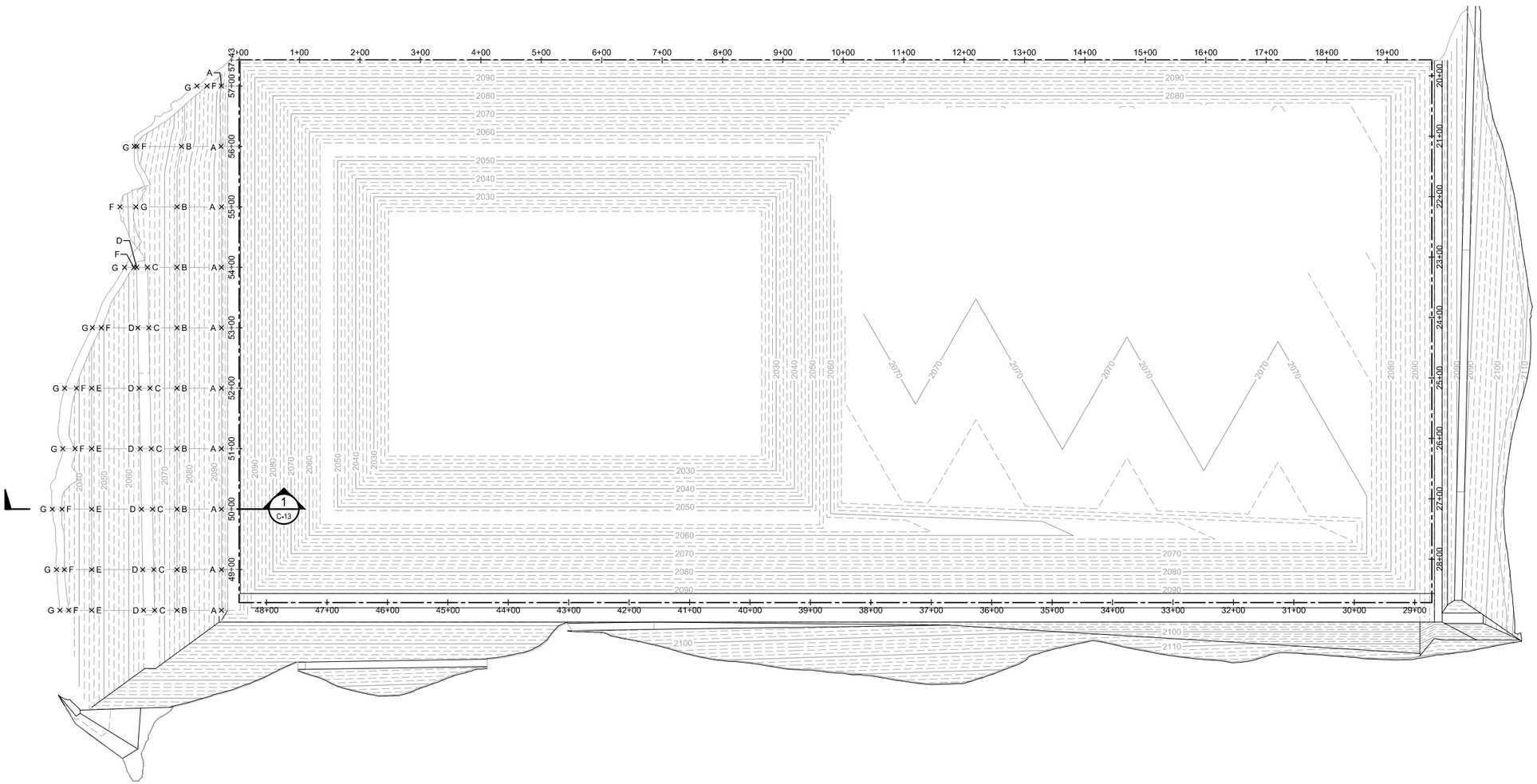


1 PLAN: CELL 5 - EMBANKMENT SURVEY VERIFICATION

0 100 200

SCALE IN FEET

N

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MINNKOTA FGD POND CELL 5 - PHASE 1A
CENTER, NORTH DAKOTA

SURVEY VERIFICATION
WEST EMBANKMENT

| BARR PROJECT No. | |
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| 34331014.51 | |
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| DWG. No. | REV. No. |
| C-12 | 1 |

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## ABBREVIATIONS

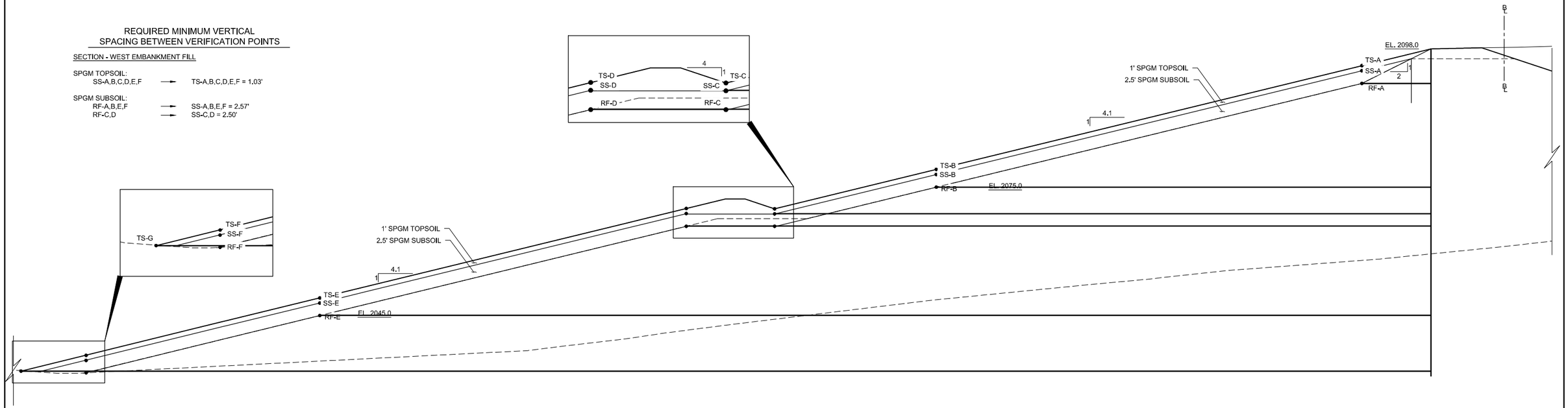
| | |
|---|---|
| RF-A | RANDOM FILL POINT A |
| TS-A | TOPSOIL POINT A |
| SS-A | SUBSOIL POINT A |
| ℄ | BASELINE |

## REQUIRED MINIMUM VERTICAL SPACING BETWEEN VERIFICATION POINTS

SECTION - WEST EMBANKMENT FILL

SPGM TOPSOIL:
SS-A,B,C,D,E,F → TS-A,B,C,D,E,F = 1.03'

SPGM SUBSOIL:
RF-A,B,E,F → SS-A,B,E,F = 2.57'
RF-C,D → SS-C,D = 2.50'




1 / C-12 SECTION: PHASE 1A WEST EMBANKMENT - GRADE VERIFICATION (TYP.)

0 10 20
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| Designed | JEK2 |
| Approved | SWH |

Minnkota Power COOPERATIVE
A Touchstone Energy® Cooperative

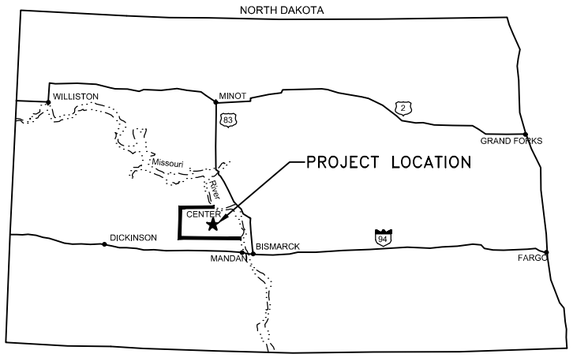
MINNKOTA FGD POND CELL 5 - PHASE 1A
CENTER, NORTH DAKOTA

SURVEY VERIFICATION
EMBANKMENT SECTION

| | |
|---|---|
| BARR PROJECT No. | 34331014.51 |
| CLIENT PROJECT No. | |
| DWG. No. | C-13 |
| REV. No. | 1 |


CADD USER: ANDERS W. TOLKKINEN FILE: M:\DESIGN\34331014.51\34331014.51_PHASE 1A_C-13.DWG PLOT SCALE: 1:2 PLOT DATE: 12/6/2023 1:51 PM

# RECORD DRAWINGS
# MINNKOTA POWER COOPERATIVE, INC.
# CELL 5 - PHASE 1B - WITH FEDERAL COAL REMOVED
# COAL COMBUSTION WASTE DISPOSAL FACILITY
# CENTER, NORTH DAKOTA




LOCATION MAP

LIMITS OF SECTION CUT

SECTION IDENTIFIER

SECTION REFERENCES
SHEET SECTION IS LOCATED ON

1 / C-02

SECTION VIEW CALL OUT

SECTION IDENTIFIER (TYP.)

1 / C-02 SECTION: GRAPHICS STANDARDS 1"=1'-0"

SECTION REFERENCES (TYP.)
SHEET SECTION IS CALLED-OUT ON

SECTION VIEW TITLE

DETAIL IDENTIFIER

1 / C-02

DETAIL REFERENCES
SHEET DETAIL IS LOCATED ON

DETAIL VIEW CALL OUT

DETAIL IDENTIFIER (TYP.)

1 / C-02 DETAIL: GRAPHICS STANDARDS 1"=1'-0"

DETAIL REFERENCES (TYP.)
SHEET DETAIL IS CALLED-OUT ON

DETAIL VIEW TITLE

Minnkota Power COOPERATIVE
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VICINITY MAP

## DRAWING INDEX


| DWG NO. | TITLE |
|---|---|
| G-01 | INDEX, LOCATION MAP, AND VICINITY MAP |
| C-01 | EXISTING CONDITIONS - PLAN |
| C-02 | CELL 5 - PHASE 1B - PROJECT PLAN |
| C-03 | SOIL BORINGS - PLAN AND CROSS SECTIONS |
| C-04 | EXCAVATION BELOW HAGEL - PLAN |
| C-05 | CELL 5 LAYOUT - PLAN |
| C-06 | CELL 5 LAYOUT - OVERALL SECTIONS |
| C-07 | CELL 5 WEST/EAST EMBANKMENT - SECTIONS |
| C-08 | CELL 5 NORTH/SOUTH EMBANKMENT - SECTIONS |
| C-09 | NOT USED |
| C-10 | CELL 5 EMBANKMENT AND LINER - DETAILS |
| C-11 | SANDBAG LAYOUT - PLAN AND DETAILS |
| C-12 | HAGEL BED GRADIENT CONTROL SYSTEM - PLAN AND PROFILE |
| C-13 | HAGEL BED GRADIENT CONTROL SYSTEM - SECTIONS AND DETAIL |
| C-14 | DEWATERING SUMP AND SIDEWALL RISER - SECTIONS AND DETAILS |
| C-15 | DEWATERING SYSTEM SUMP PLAN - AND DEWATERING TRENCH SECTIONS |
| C-16 | DEWATERING SUMP - SECTIONS AND DETAILS |
| C-17 | DEWATERING TRENCH - PLAN, SECTIONS AND DETAILS |
| C-18 | BLOWDOWN PIPELINES - PLAN AND PROFILE |
| C-19 | BLOWDOWN PIPELINES - SECTIONS |
| C-20 | BLOWDOWN PIPELINES - SECTIONS AND DETAIL |
| C-21 | RETURN PIPELINES - WEST ALTERNATIVE - PLAN AND PROFILE |
| C-22 | NOT USED |
| C-23 | RETURN PIPELINES SIPHON - SECTIONS AND DETAILS |
| C-24 | RETURN PIPELINES - SECTIONS AND DETAILS |
| C-25 | COORDINATE AND ELEVATIONS - SUBGRADE |
| C-26 | COORDINATE AND ELEVATIONS - TOP OF CLAY LINER AND FINISHED GROUND |
| C-27 | SURVEY VERIFICATION AND DENSITY TESTING - CELL 5 LINER LIMITS |
| C-28 | SURVEY VERIFICATION - EAST EMBANKMENT |
| C-29 | SURVEY VERIFICATION - SECTIONS 1 OF 2 |
| C-30 | SURVEY VERIFICATION - SECTIONS 2 OF 2 |
| C-31 | SURVEY VERIFICATION - EMBANKMENT SECTION |


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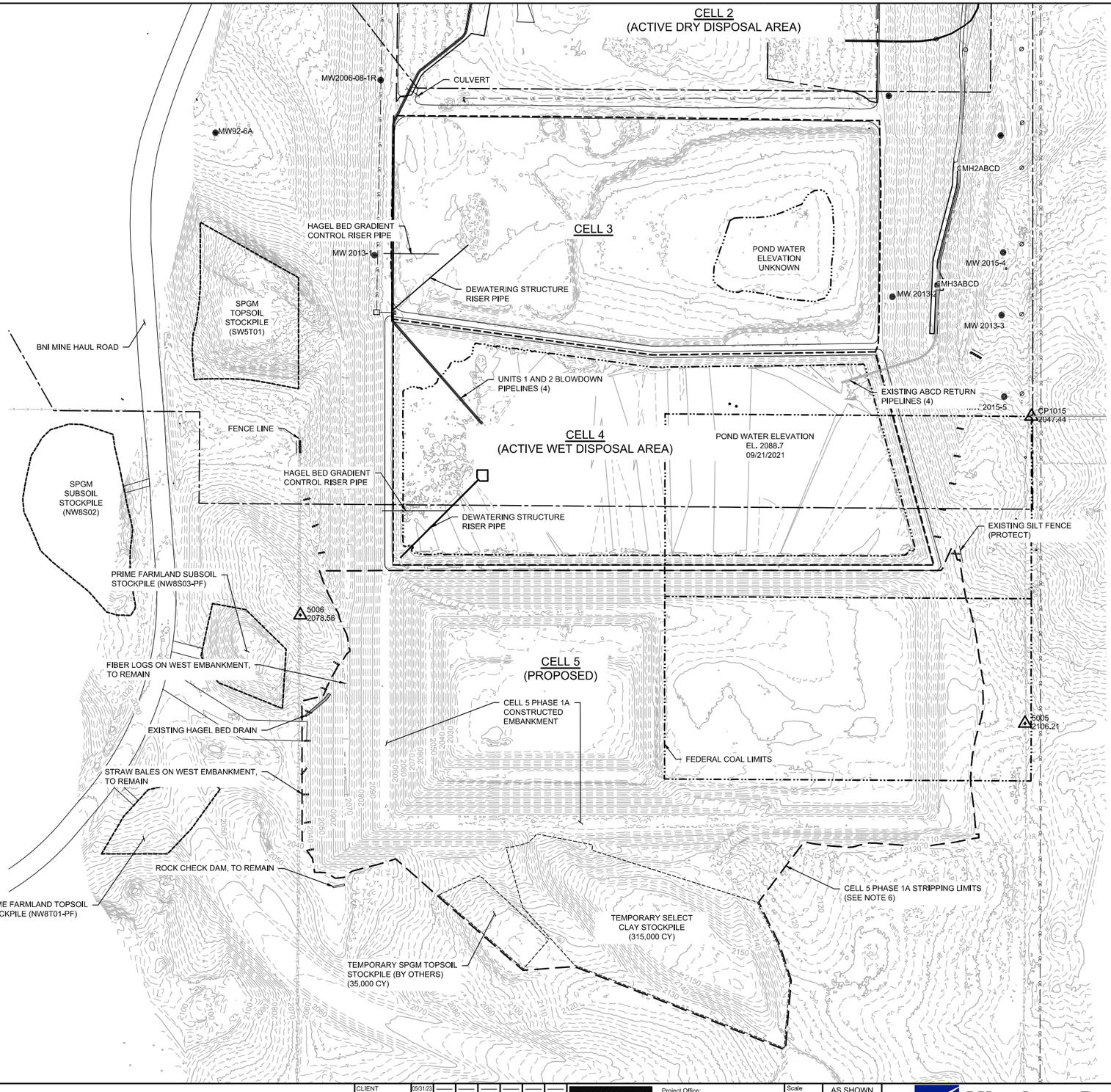
MINNKOTA FGD POND CELL 5 - PHASE 1B
CENTER, NORTH DAKOTA

INDEX, LOCATION MAP, AND VICINITY MAP

| | |
|---|---|
| BARR PROJECT No. | 34331014.59 |
| CLIENT PROJECT No. | |
| DWG. No. | G-01 |
| REV. No. | 1 |


CADD USER: ANDERS W. TOLKKINEN FILE: M:\DESIGN\34331014.59\34331014.59_G-01.DWG PLOT SCALE: 1:2 PLOT DATE: 12/11/2023 9:33 AM




## 1 PLAN: EXISTING CONDITIONS

0 200 400

SCALE IN FEET

### LEGEND

- EXISTING 10' MAJOR CONTOUR
- EXISTING 2' MINOR CONTOUR
- EXISTING ROAD
- EXISTING PIPE
- FENCE LINE
- FIELD LINE
- UNDERGROUND ELECTRIC
- OVERHEAD ELECTRIC
- STORM SEWER
- CELL BOUNDARY
- CELL 5 STRIPPING LIMITS
- STOCKPILE EXTENTS
- WATERLINE
- SHRUB EDGE
- FEDERAL COAL TRACT LIMITS
- HAGEL BED DRAIN
- STRAW BALE
- CULVERT
- BUILDING
- SINGLE TREES
- UTILITY POLE
- MH7AB — EXISTING MANHOLE, CATCH BASIN
- MW97-2 — MONITORING WELL
- CP10 2109.27 — CONTROL POINT

### CONTROL POINTS

| CONTROL POINT | NORTHING | EASTING | ELEVATION |
|---|---|---|---|
| CP13 | 508,526.39 | 1,821,517.66 | 2,092.74 |
| CP1015 | 506,603.78 | 1,822,015.47 | 2,047.44 |
| 5005 | 505,499.46 | 1,821,992.35 | 2,106.21 |
| 5006 | 505,889.21 | 1,819,384.71 | 2,078.56 |

NOTE:

CONTROL POINT CP13 OUTSIDE OF VIEWPORT EXTENTS. LOCATION SHOWN ON G-01.

NOTES:

1. INDEX CONTOURS OF EXISTING GROUND SURFACE SHOWN AT 10' INTERVALS, INTERMEDIATE CONTOURS SHOWN AT 2' INTERVALS
2. PROTECT ALL WELLS WITHIN THE CONSTRUCTION LIMITS, UNLESS OTHERWISE DIRECTED.
3. EXISTING GROUND TOPOGRAPHY SHOWN IS A COMBINATION OF THE FOLLOWING SURVEYS PROVIDED TO BARR AND COMBINED BY BARR:
   -NOVEMBER 2022 PERFORMED BY INTERSTATE ENGINEERING
4. COORDINATE SYSTEM IS NORTH DAKOTA STATE PLANE SOUTH ZONE, NAD 27 - US SURVEY FEET (HORIZONTAL): NVGD 1929 (VERTICAL)
5. MOVE AND REPLACE CONTROL POINTS AS DIRECTED BY OWNER.
6. AREA INSIDE CELL 5 PHASE 1A STRIPPING LIMITS WAS STRIPPED DURING PHASE 1A CONSTRUCTION.
7. COORDINATE CONTRACTOR STAGING AREA WITH OWNER.

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| BID | | | | | | | |
| CONSTRUCTION | | | | 08/09/23 | | | |
| RECORD | | | | | 12/15/23 | | |

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Minnkota Power COOPERATIVE
A Touchstone Energy® Cooperative

MINNKOTA FGD POND CELL 5 - PHASE 1B
CENTER, NORTH DAKOTA

EXISTING CONDITIONS PLAN

BARR PROJECT No. 34331014.59
CLIENT PROJECT No.
DWG. No. C-01
REV. No. 1

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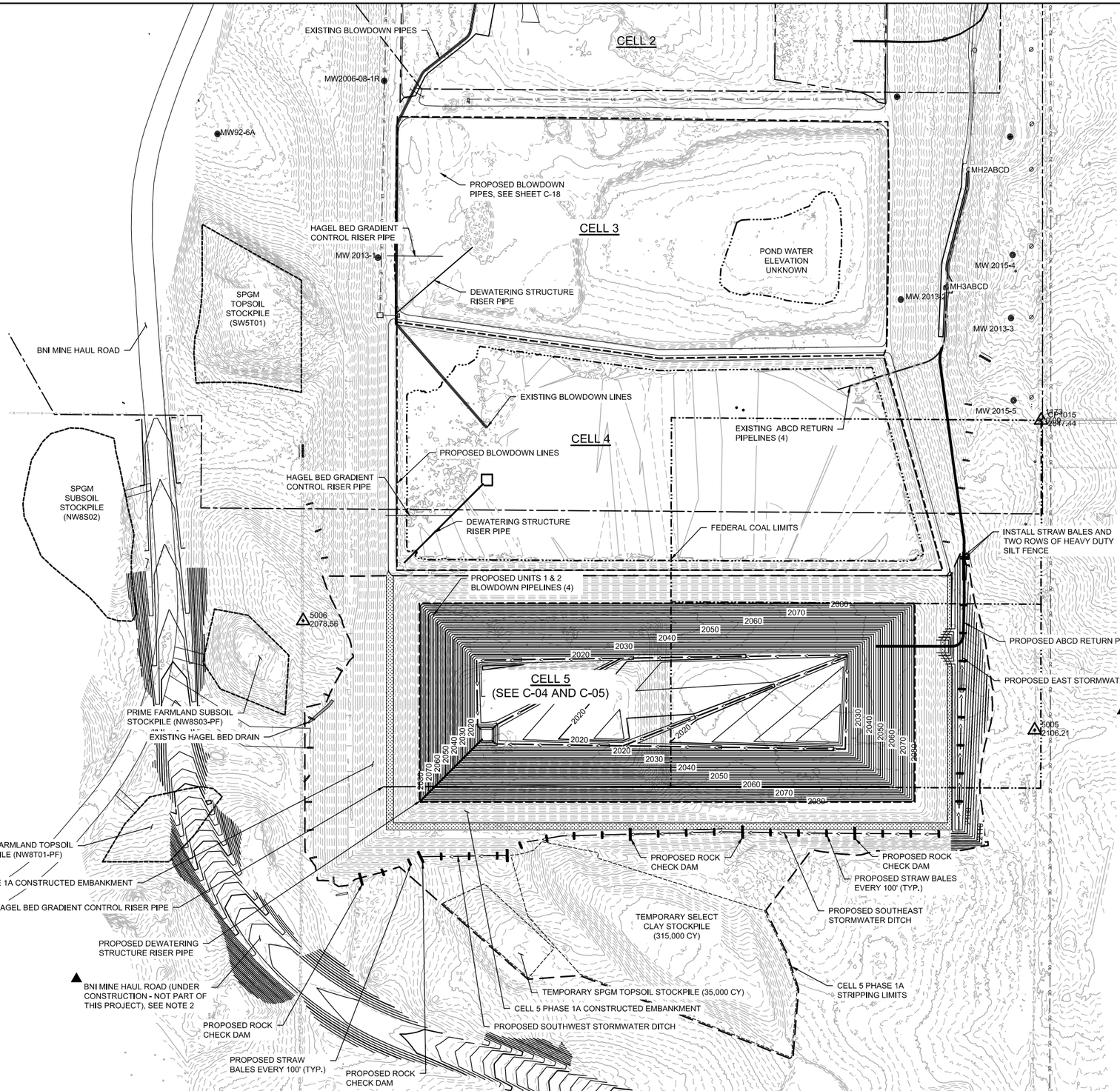


1 PLAN: CELL 5 - PHASE 1B

0 200 400

SCALE IN FEET

N

## LEGEND

- EXISTING 10' MAJOR CONTOUR
- EXISTING 2' MINOR CONTOUR
- PROPOSED 10' MAJOR CONTOUR
- PROPOSED 2' MINOR CONTOUR
- EXISTING ROAD
- EXISTING PIPE
- FENCE LINE
- FIELD LINE
- UNDERGROUND ELECTRIC
- OVERHEAD ELECTRIC
- STORM SEWER
- CELL 5 PHASE 1A STRIPPING LIMITS
- SILT FENCE
- STOCKPILE EXTENTS
- WATERLINE
- SHRUB EDGE
- FEDERAL COAL TRACT LIMITS
- STRAW BALE
- CULVERT
- BUILDING
- SINGLE TREES
- UTILITY POLE
- MH7AB — EXISTING MANHOLE, CATCH BASIN
- MW97-2 — MONITORING WELL
- CP10 2109.27 — CONTROL POINT

NOTES:

1. CONTOURS INSIDE CELL 5 BELOW ELEVATION 2080 SHOW THE SELECT CLAY LINER SURFACE. OUTER EMBANKMENT SHOWS TOP OF FINISHED GROUND.
2. BNI HAUL ROAD SHOWN PROVIDED BY BNI IN Haul Road Section 9 Design Contours.dwg, DATED OCT. 31, 2022.
3. EXCESS CUT TO BE PLACED IN CELL 2 AND 3 OR AS AGREED UPON BY OWNER.

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| CLIENT | 05/31/23 | | | | | | |
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Minnkota Power COOPERATIVE
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MINNKOTA FGD POND CELL 5 - PHASE 1B
CENTER, NORTH DAKOTA

CELL 5 - PHASE 1B
PROJECT PLAN

| BARR PROJECT No. | |
|---|---|
| 34331014.59 | |
| CLIENT PROJECT No. | |
| DWG. No. | REV. No. |
| C-02 | 1 |

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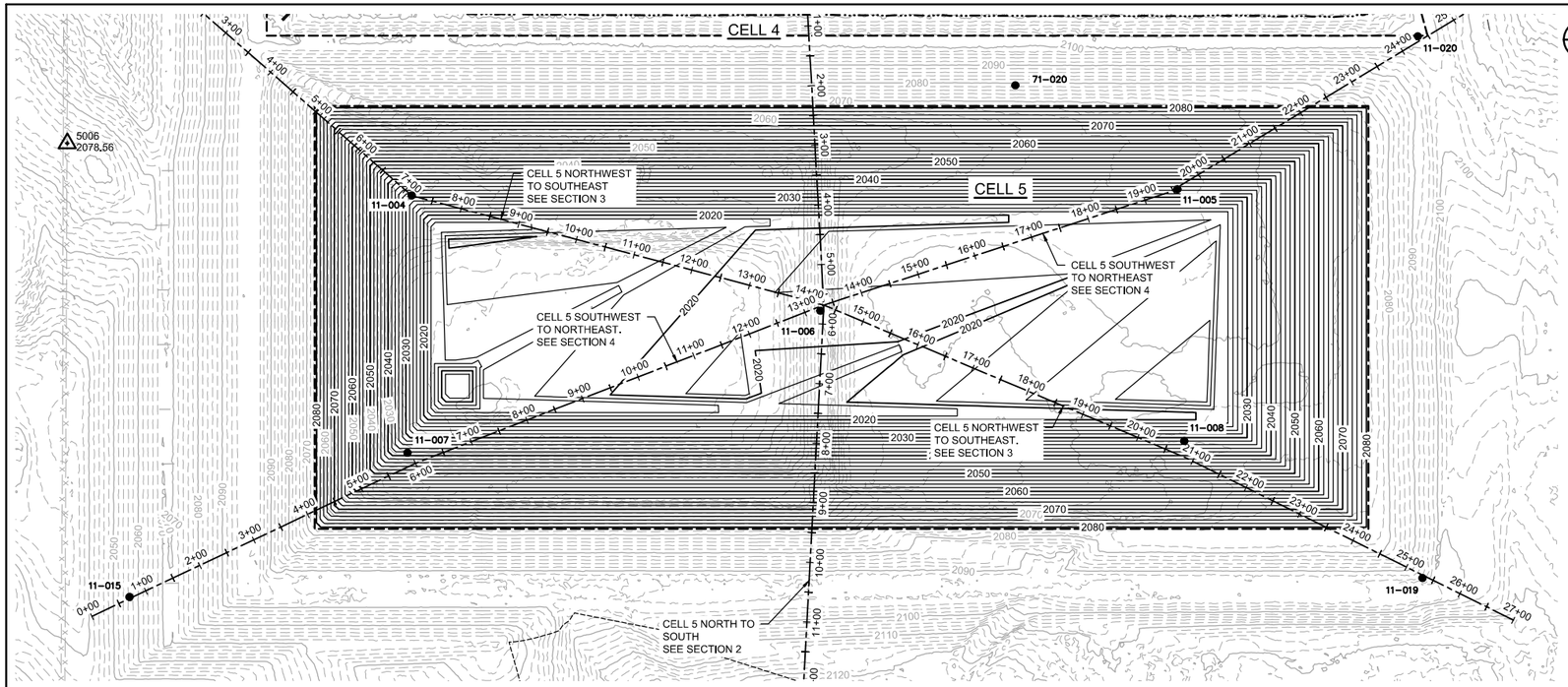



## 1 PLAN: 2011 BORING LOCATIONS

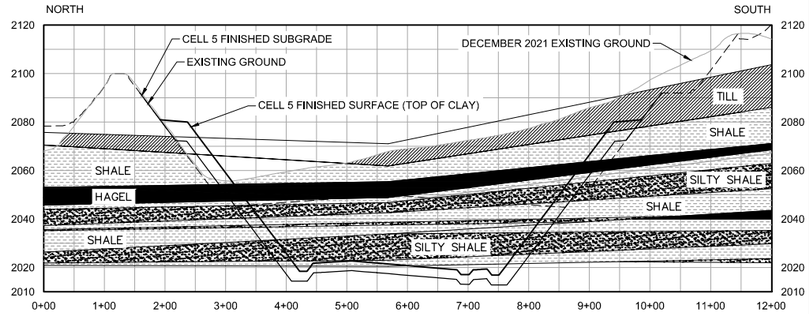
0 125 250
SCALE IN FEET

### LEGEND

- EXISTING 10' MAJOR CONTOUR
- EXISTING 2' MINOR CONTOUR
- PROPOSED 10' MAJOR CONTOUR
- PROPOSED 2' MINOR CONTOUR
- CROSS SECTION ALIGNMENT
- SOIL BORING

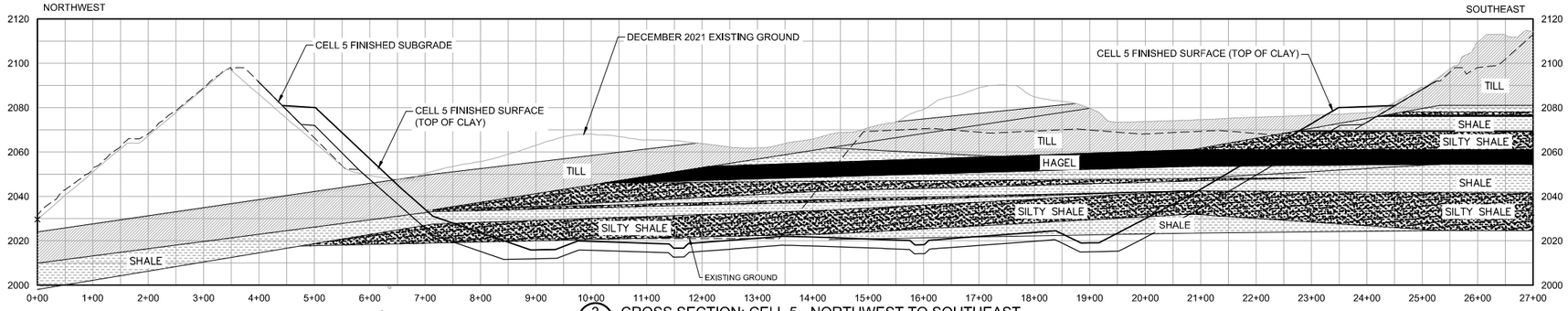
NOTES:

1. ALL EXCAVATED MATERIALS ARE ESTIMATED BASED ON THE SOIL INVESTIGATION WORK COMPLETED IN 2011. CONTRACTOR MUST FIELD VERIFY EACH MATERIAL PRIOR TO USE AS CONSTRUCTION MATERIAL. A COPY OF THE INFORMATION OBTAINED AS PART OF THE 2011 INVESTIGATION IS AVAILABLE UPON REQUEST.
2. INFORMATION ON THIS SHEET IS PROVIDED TO CONTRACTOR FOR INFORMATIONAL PURPOSES ONLY. CONTRACTOR SHALL MAKE ITS OWN DETERMINATION OF THE SUBSURFACE CONDITIONS BASED ON SOIL BORINGS PROVIDED.
3. MATERIAL SURFACES ARE INTERPOLATED BETWEEN BORING LOCATIONS.
4. PROPOSED CONTOURS INSIDE OF CELL 5 BELOW ELEVATION 2080 SHOW THE SELECT CLAY LINER SURFACE. OUTER EMBANKMENT SHOWS TOP OF FINISHED GROUND.
5. THE "DECEMBER 2021 EXISTING GROUND" SURFACE REPRESENTS THE GROUND PRIOR TO CELL 5 PHASE 1A CONSTRUCTION. THE "EXISTING GROUND" SURFACE REPRESENTS THE EXISTING GROUND SURFACE WITH THE CELL 5 PHASE 1A DESIGN.



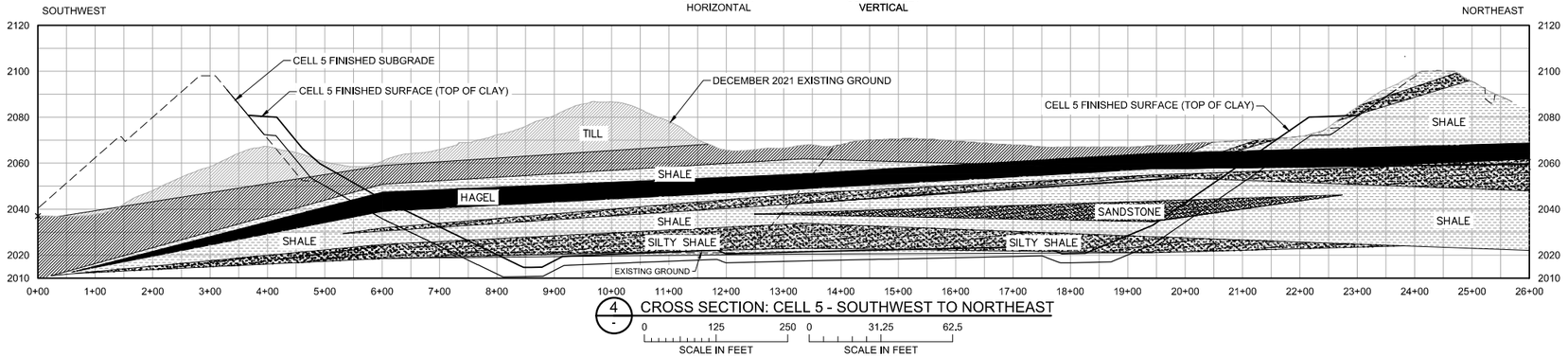

## 2 CROSS SECTION: CELL 5 - NORTH TO SOUTH

0 125 250 SCALE IN FEET HORIZONTAL
0 31.25 62.5 SCALE IN FEET VERTICAL




## 3 CROSS SECTION: CELL 5 - NORTHWEST TO SOUTHEAST

0 125 250 SCALE IN FEET HORIZONTAL
0 31.25 62.5 SCALE IN FEET VERTICAL




## 4 CROSS SECTION: CELL 5 - SOUTHWEST TO NORTHEAST

0 125 250 SCALE IN FEET HORIZONTAL
0 31.25 62.5 SCALE IN FEET VERTICAL

### EXCAVATED MATERIAL DESCRIPTION

| HATCH | LABEL | DESCRIPTION |
|---|---|---|
| | TILL | SANDY GRAVELLY CLAY. |
| | SHALE | UPPER SHALES - VERY WEAK TO WEAK IN STRENGTH, GENERALLY LIGHT YELLOWISH, BROWN TO LIGHT BROWN, OR GRAY IN COLOR, SLIGHTLY WEATHERED TO HIGHLY WEATHERED, FINE GRAINED, MEDIUM TO CLOSE FRACTURE SPACING, DRY OR DAMP.<br>LOWER SHALES - STRONG TO WEAK STRENGTH, GENERALLY GRAY TO LIGHT GRAY IN COLOR, HIGHLY TO MODERATELY WEATHERED, FINE GRAINED, THICK TO MEDIUM BEDDED, MEDIUM TO UNFRACTURED FRACTURE SPACING, DRY OR DAMP. OBSERVED WHITE LAMINATIONS IN SOME SAMPLES. |
| | HAGEL/COAL | LIGNITE COAL, CARBONACEOUS, BLACK IN COLOR. |
| | SILTSTONE | STRONG TO VERY WEAK STRENGTH, GENERALLY GRAY TO LIGHT GRAY IN COLOR, SLIGHTLY TO MODERATELY WEATHERED, FINE GRAINED, THINLY BEDDED, WIDE TO CLOSE FRACTURE SPACING, DAMP, SOMETIMES WITH NON SILTY/SANDY SHALE INTERBEDDED THROUGHOUT. |
| | SANDSTONE | SANDSTONE WITH SAND AND FINE CONTENT VARIABLE, GRAY IN COLOR |

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Minnkota Power COOPERATIVE
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MINNKOTA FGD POND CELL 5 - PHASE 1B
CENTER, NORTH DAKOTA

SOIL BORINGS
PLAN AND CROSS SECTIONS

| BARR PROJECT No. | |
|---|---|
| 34331014.59 | |
| CLIENT PROJECT No. | |
| DWG. No. | REV. No. |
| C-03 | 1 |

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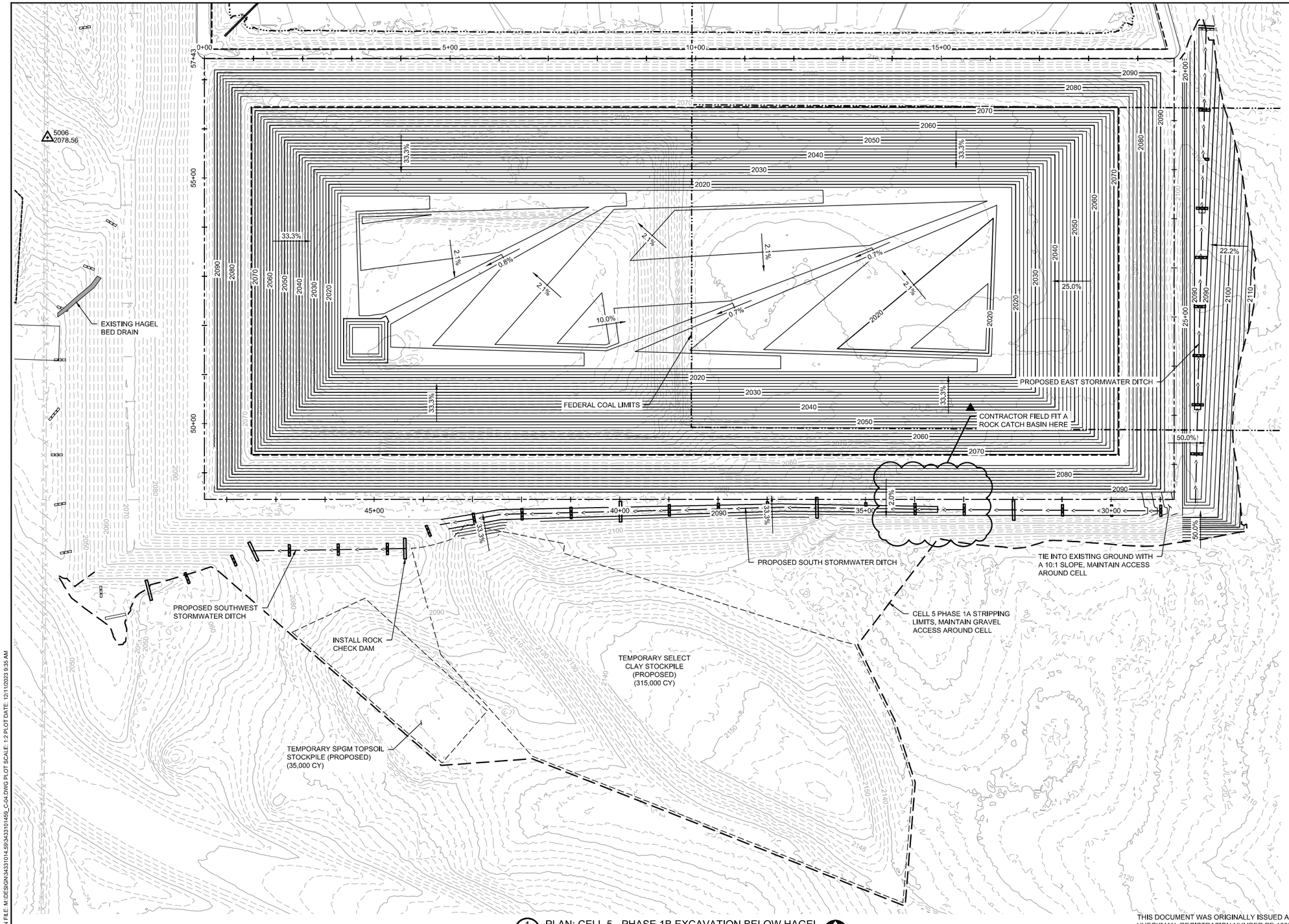


## LEGEND

- EXISTING 10' MAJOR CONTOUR
- EXISTING 2' MINOR CONTOUR
- PROPOSED 10' MAJOR CONTOUR
- PROPOSED 2' MINOR CONTOUR
- EXISTING ROAD
- EXISTING PIPE
- EXISTING GEOMEMBRANE LINER LIMITS
- FENCE LINE
- FIELD LINE
- UNDERGROUND ELECTRIC
- OVERHEAD ELECTRIC
- STORM SEWER
- PROPOSED CELL 5 STRIPPING LIMITS
- PROPOSED GRADING EXTENTS
- MINE STOCKPILE EXTENTS
- PROPOSED STOCKPILE EXTENTS
- STORMWATER DRAINAGE DITCH
- WATERLINE
- SHRUB EDGE
- FEDERAL COAL TRACT LIMITS
- MINE BOUNDARY
- STRAW BALE
- CULVERT
- BUILDING
- SINGLE TREES
- UTILITY POLE
- MH7AB — EXISTING MANHOLE, CATCH BASIN
- MW97-2 — MONITORING WELL
- CP10 2109.27 — CONTROL POINT

NOTES:

1. PROPOSED CONTOURS SHOWN REPRESENT TOP OF RANDOM FILL.
2. SEE SHEET C-25 FOR TOP OF SUBGRADE SURFACE COORDINATE AND ELEVATION DATA

| CELL 5 PHASE 1B SUBGRADE NEATLINE EARTHWORK QUANTITIES | |
|---|---|
| MATERIAL | ESTIMATED QUANTITIES (CY) |
| CUT | 998,000 |
| FILL | 43,000 |

NOTE: THE NEATLINE SUBGRADE EARTHWORK QUANTITIES ARE CALCULATED BASED ON A COMPARISON OF THE CELL 5 PHASE 1B DESIGN SURFACE TO THE NOVEMBER 2022 TOPOGRAPHIC SURVEY PERFORMED BY INTERSTATE ENGINEERING FOLLOWING CELL 5 PHASE 1A CONSTRUCTION. NEATLINE QUANTITIES ARE ROUNDED TO THE NEAREST ONE-THOUSAND CUBIC YARDS. NO WASTE, SHRINKAGE, OR SWELL IS ASSUMED.

1 PLAN: CELL 5 - PHASE 1B EXCAVATION BELOW HAGEL

0 100 200
SCALE IN FEET

N

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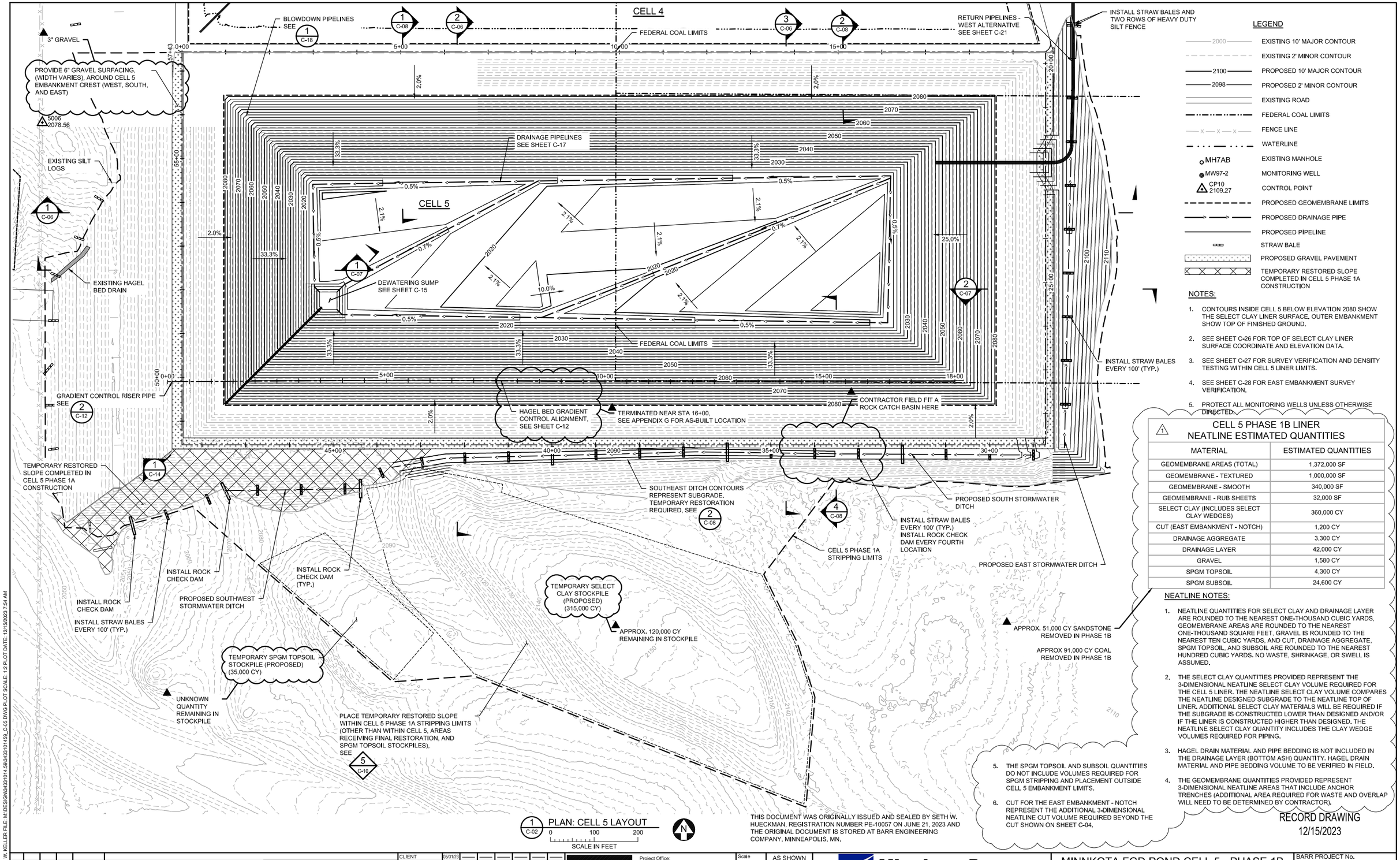
MINNKOTA FGD POND CELL 5 - PHASE 1B
CENTER, NORTH DAKOTA

EXCAVATION BELOW HAGEL
PLAN

BARR PROJECT No. 34331014.59
CLIENT PROJECT No.
DWG. No. C-04
REV. No. 1


CADD USER: ANDERS W. TOLKKINEN FILE: M:\DESIGN\34331014.59\34331014594_C-04.DWG PLOT SCALE: 1:2 PLOT DATE: 12/11/2023 9:35 AM




## LEGEND

- EXISTING 10' MAJOR CONTOUR
- EXISTING 2' MINOR CONTOUR
- PROPOSED 10' MAJOR CONTOUR
- PROPOSED 2' MINOR CONTOUR
- EXISTING ROAD
- FEDERAL COAL LIMITS
- FENCE LINE
- WATERLINE
- MH7AB — EXISTING MANHOLE
- MW97-2 — MONITORING WELL
- CP10 2109.27 — CONTROL POINT
- PROPOSED GEOMEMBRANE LIMITS
- PROPOSED DRAINAGE PIPE
- PROPOSED PIPELINE
- STRAW BALE
- PROPOSED GRAVEL PAVEMENT
- TEMPORARY RESTORED SLOPE COMPLETED IN CELL 5 PHASE 1A CONSTRUCTION

## NOTES:

1. CONTOURS INSIDE CELL 5 BELOW ELEVATION 2080 SHOW THE SELECT CLAY LINER SURFACE, OUTER EMBANKMENT SHOW TOP OF FINISHED GROUND.
2. SEE SHEET C-26 FOR TOP OF SELECT CLAY LINER SURFACE COORDINATE AND ELEVATION DATA.
3. SEE SHEET C-27 FOR SURVEY VERIFICATION AND DENSITY TESTING WITHIN CELL 5 LINER LIMITS.
4. SEE SHEET C-28 FOR EAST EMBANKMENT SURVEY VERIFICATION.
5. PROTECT ALL MONITORING WELLS UNLESS OTHERWISE DIRECTED.

## CELL 5 PHASE 1B LINER NEATLINE ESTIMATED QUANTITIES

| MATERIAL | ESTIMATED QUANTITIES |
|---|---|
| GEOMEMBRANE AREAS (TOTAL) | 1,372,000 SF |
| GEOMEMBRANE - TEXTURED | 1,000,000 SF |
| GEOMEMBRANE - SMOOTH | 340,000 SF |
| GEOMEMBRANE - RUB SHEETS | 32,000 SF |
| SELECT CLAY (INCLUDES SELECT CLAY WEDGES) | 360,000 CY |
| CUT (EAST EMBANKMENT - NOTCH) | 1,200 CY |
| DRAINAGE AGGREGATE | 3,300 CY |
| DRAINAGE LAYER | 42,000 CY |
| GRAVEL | 1,580 CY |
| SPGM TOPSOIL | 4,300 CY |
| SPGM SUBSOIL | 24,600 CY |

## NEATLINE NOTES:

1. NEATLINE QUANTITIES FOR SELECT CLAY AND DRAINAGE LAYER ARE ROUNDED TO THE NEAREST ONE-THOUSAND CUBIC YARDS, GEOMEMBRANE AREAS ARE ROUNDED TO THE NEAREST ONE-THOUSAND SQUARE FEET, GRAVEL IS ROUNDED TO THE NEAREST TEN CUBIC YARDS, AND CUT, DRAINAGE AGGREGATE, SPGM TOPSOIL, AND SUBSOIL ARE ROUNDED TO THE NEAREST HUNDRED CUBIC YARDS. NO WASTE, SHRINKAGE, OR SWELL IS ASSUMED.
2. THE SELECT CLAY QUANTITIES PROVIDED REPRESENT THE 3-DIMENSIONAL NEATLINE SELECT CLAY VOLUME REQUIRED FOR THE CELL 5 LINER. THE NEATLINE SELECT CLAY VOLUME COMPARES THE NEATLINE DESIGNED SUBGRADE TO THE NEATLINE TOP OF LINER. ADDITIONAL SELECT CLAY MATERIALS WILL BE REQUIRED IF THE SUBGRADE IS CONSTRUCTED LOWER THAN DESIGNED AND/OR IF THE LINER IS CONSTRUCTED HIGHER THAN DESIGNED. THE NEATLINE SELECT CLAY QUANTITY INCLUDES THE CLAY WEDGE VOLUMES REQUIRED FOR PIPING.
3. HAGEL DRAIN MATERIAL AND PIPE BEDDING IS NOT INCLUDED IN THE DRAINAGE LAYER (BOTTOM ASH) QUANTITY. HAGEL DRAIN MATERIAL AND PIPE BEDDING VOLUME TO BE VERIFIED IN FIELD.
4. THE GEOMEMBRANE QUANTITIES PROVIDED REPRESENT 3-DIMENSIONAL NEATLINE AREAS THAT INCLUDE ANCHOR TRENCHES (ADDITIONAL AREA REQUIRED FOR WASTE AND OVERLAP WILL NEED TO BE DETERMINED BY CONTRACTOR).
5. THE SPGM TOPSOIL AND SUBSOIL QUANTITIES DO NOT INCLUDE VOLUMES REQUIRED FOR SPGM STRIPPING AND PLACEMENT OUTSIDE CELL 5 EMBANKMENT LIMITS.
6. CUT FOR THE EAST EMBANKMENT - NOTCH REPRESENT THE ADDITIONAL 3-DIMENSIONAL NEATLINE CUT VOLUME REQUIRED BEYOND THE CUT SHOWN ON SHEET C-04.

RECORD DRAWING
12/15/2023

1/C-02 PLAN: CELL 5 LAYOUT
0 100 200
SCALE IN FEET

THIS DOCUMENT WAS ORIGINALLY ISSUED AND SEALED BY SETH W. HUECKMAN, REGISTRATION NUMBER PE-10057 ON JUNE 21, 2023 AND THE ORIGINAL DOCUMENT IS STORED AT BARR ENGINEERING COMPANY, MINNEAPOLIS, MN.

| NO. | BY | CHK. | APP. | DATE | REVISION DESCRIPTION |
|---|---|---|---|---|---|
| ▲ | AWT | SWH | SWH | 12/15/23 | RECORD DRAWING |
| 1 | BDP | SWH | SWH | 06/21/23 | QUANTITIES |

RELEASED TO/FOR

| | A | B | C | 0 | 1 | 2 | 3 |
|---|---|---|---|---|---|---|---|
| CLIENT | 05/31/23 | | | | | | |
| BID | | | | | | | |
| CONSTRUCTION | | | | 08/09/23 | 06/21/23 | | |
| RECORD | | | | | | 12/15/23 | |

DATE RELEASED


BARR
Corporate Headquarters: Minneapolis, Minnesota
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| | |
|---|---|
| Scale | AS SHOWN |
| Date | 08/04/2022 |
| Drawn | RLB2 |
| Checked | BDP |
| Designed | JAM6 |
| Approved | SWH |

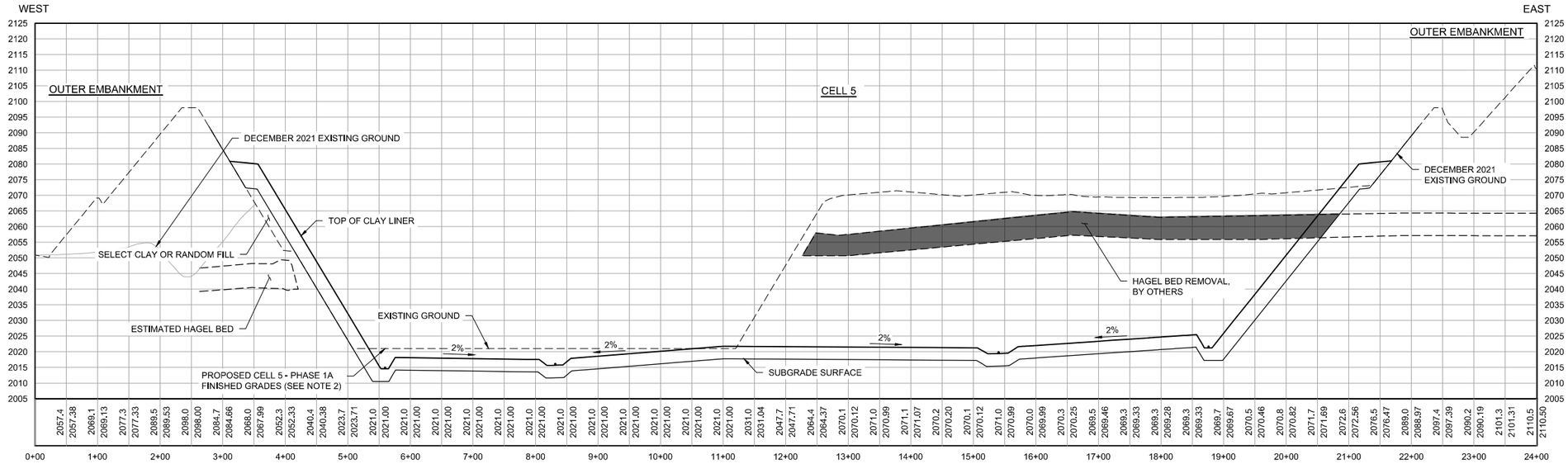
Minnkota Power COOPERATIVE
A Touchstone Energy® Cooperative

MINNKOTA FGD POND CELL 5 - PHASE 1B
CENTER, NORTH DAKOTA

CELL 5 LAYOUT
PLAN

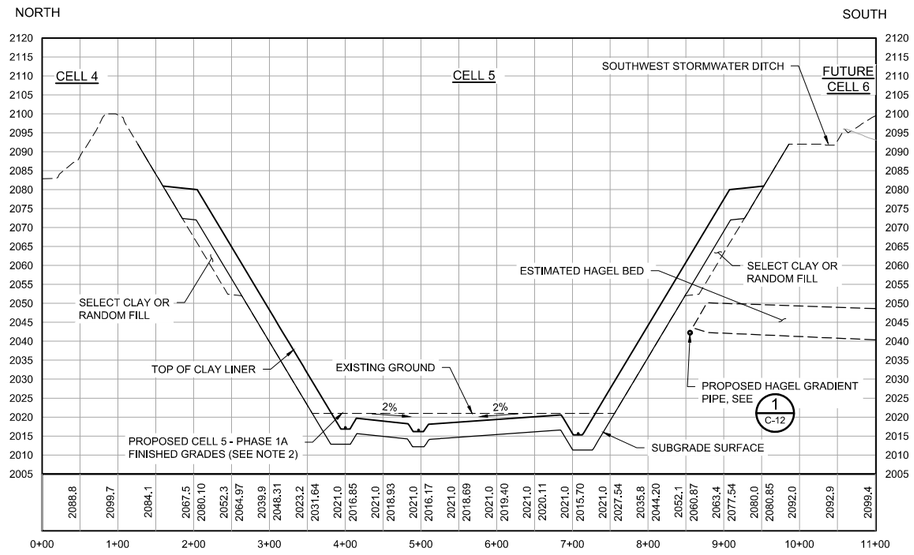
BARR PROJECT No. 34331014.59
CLIENT PROJECT No.
DWG. No. C-05
REV. No. 2

CADD USER: AUSTIN W. KELLER FILE: M:\DESIGN\34331014.59\34331014.59_C-05.DWG PLOT SCALE: 1:2 PLOT DATE: 12/15/2023 7:54 AM



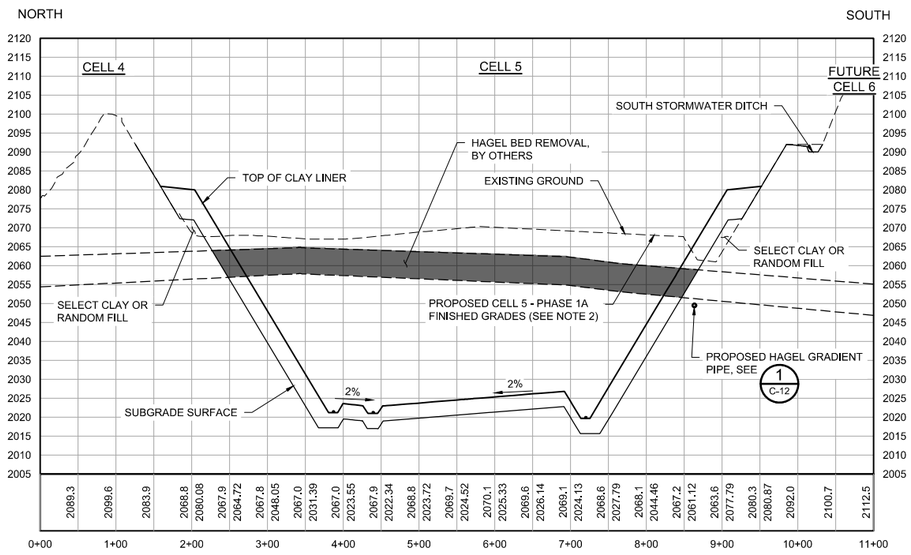

1 C-05 SECTION: OVERALL WEST - EAST

SCALE IN FEET HORIZONTAL: 0 100 200
SCALE IN FEET VERTICAL: 0 20 40




2 C-05 SECTION: OVERALL NORTH - SOUTH: WEST

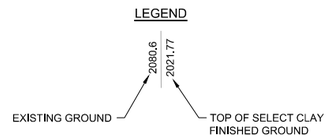
SCALE IN FEET HORIZONTAL: 0 100 200
SCALE IN FEET VERTICAL: 0 20 40




3 C-05 SECTION: OVERALL NORTH - SOUTH: EAST

SCALE IN FEET HORIZONTAL: 0 100 200
SCALE IN FEET VERTICAL: 0 20 40

LEGEND




NOTES:

1. THE AVAILABLE SOIL BORING LOGS AND SOIL TEST RESULTS FOR CELL 5 ARE AVAILABLE UPON REQUEST.
2. ACTUAL CELL 5 PHASE 1A DESIGN FINISHED GRADES COMPLETED IN 2022 WILL VARY.
3. HAGEL EXCAVATION TO BE COMPLETED BY BNI. COORDINATE SCHEDULE WITH OWNER. EXCAVATION BELOW HAGEL TO BE COMPLETED AFTER REMOVAL OF HAGEL BED MATERIAL.

RECORD DRAWING
12/15/2023

| NO. | BY | CHK. | APP. | DATE | REVISION DESCRIPTION |
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| ▲ | AWT | SWH | SWH | 12/15/23 | RECORD DRAWING |

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| CLIENT | 05/31/23 | | | | | | |
| BID | | | | | | | |
| CONSTRUCTION | | | | 06/09/23 | | | |
| RECORD | | | | | 12/15/23 | | |

DATE RELEASED


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| | |
|---|---|
| Scale | AS SHOWN |
| Date | 08/04/2022 |
| Drawn | RLB2 |
| Checked | BDP |
| Designed | JAM6 |
| Approved | SWH |

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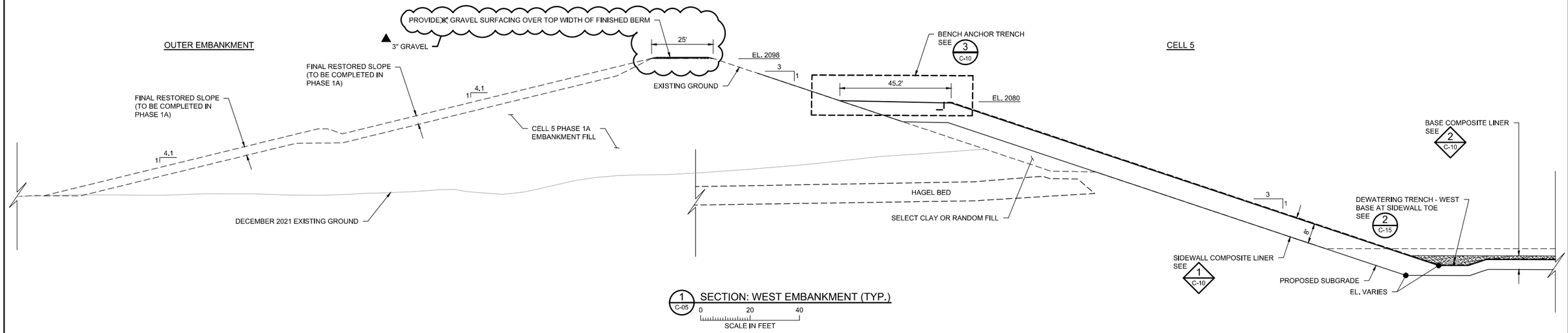
MINNKOTA FGD POND CELL 5 - PHASE 1B
CENTER, NORTH DAKOTA

CELL 5 LAYOUT
OVERALL SECTIONS

| BARR PROJECT No. | |
|---|---|
| 34331014.59 | |
| CLIENT PROJECT No. | |
| DWG. No. | REV. No. |
| C-06 | 1 |

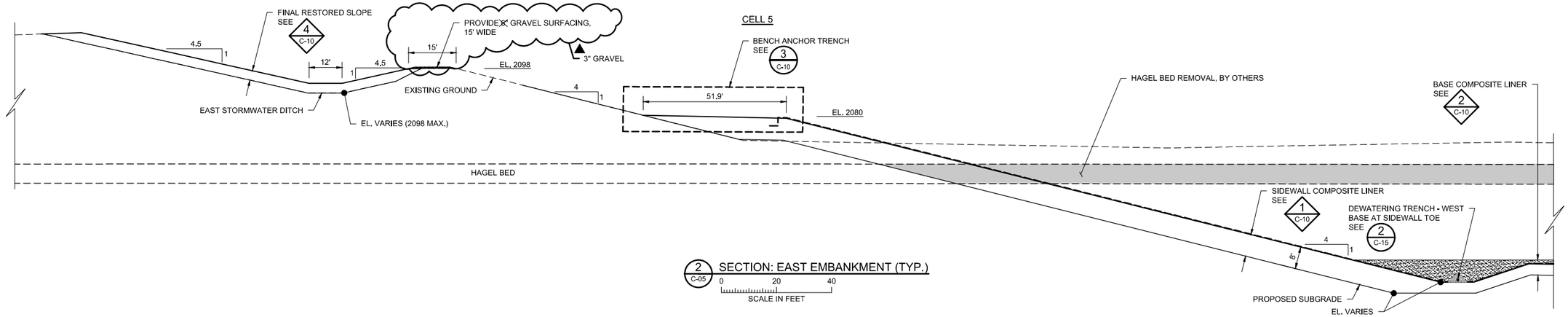
CADD USER: JENNA E. KOENIG FILE: M:\DESIGN\34331014.59\34331014.59_C-06.DWG PLOT SCALE: 1:2 PLOT DATE: 12/6/2023 12:45 PM




1 C-05 SECTION: WEST EMBANKMENT (TYP.)

0 20 40

SCALE IN FEET




2 C-05 SECTION: EAST EMBANKMENT (TYP.)

0 20 40

SCALE IN FEET

NOTES:

1. HAGEL EXCAVATION TO BE COMPLETED BY BNI. COORDINATE SCHEDULE WITH OWNER. EXCAVATION BELOW HAGEL TO BE COMPLETED AFTER REMOVAL OF HAGEL BED MATERIAL.

RECORD DRAWING
12/15/2023

| NO. | BY | CHK. | APP. | DATE | REVISION DESCRIPTION |
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|---|---|---|---|---|---|---|---|---|
| CLIENT | 05/31/23 | | | | | | | |
| BID | | | | | | | | |
| CONSTRUCTION | | | | 08/09/23 | | | | |
| RECORD | | | | | 12/15/23 | | | |
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|---|---|
| Scale | AS SHOWN |
| Date | 08/04/2022 |
| Drawn | RLB2 |
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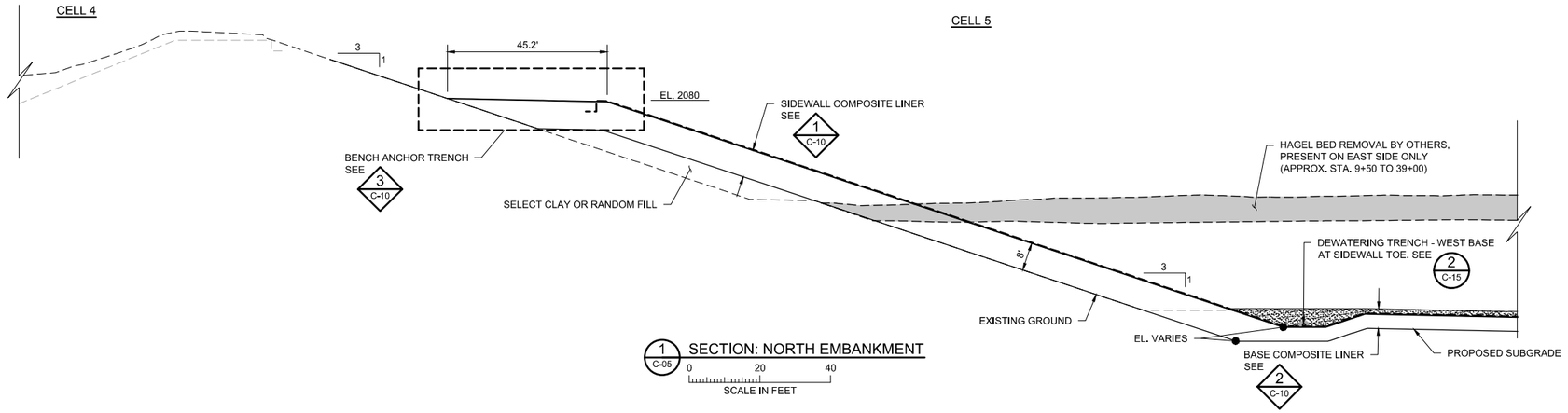
MINNKOTA FGD POND CELL 5 - PHASE 1B
CENTER, NORTH DAKOTA

CELL 5 WEST/EAST EMBANKMENT SECTIONS

| | |
|---|---|
| BARR PROJECT No. | 34331014.59 |
| CLIENT PROJECT No. | |
| DWG. No. | C-07 |
| REV. No. | 1 |

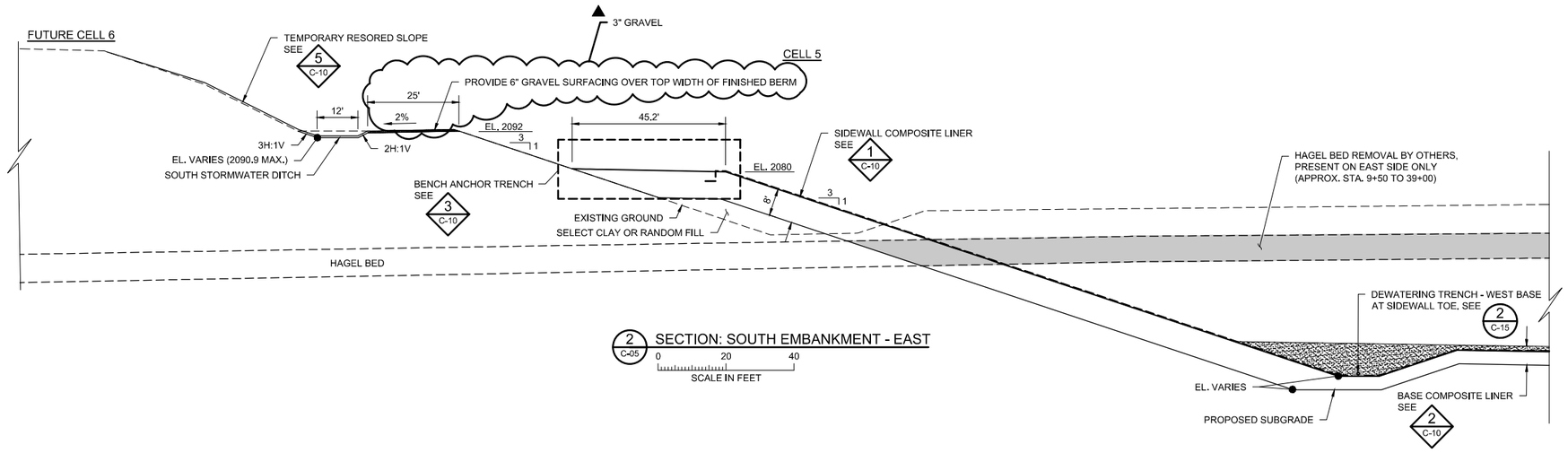
CADD USER: ANDERS W. TOLKKINEN FILE: M:\DESIGN\34331014.59\34331014594_C-07.DWG PLOT SCALE: 1:2 PLOT DATE: 12/11/2023 2:24 PM




1 C-05 SECTION: NORTH EMBANKMENT

0 20 40

SCALE IN FEET




2 C-05 SECTION: SOUTH EMBANKMENT - EAST

0 20 40

SCALE IN FEET

NOTES:

1. HAGEL EXCAVATION TO BE COMPLETED BY BNI. COORDINATE SCHEDULE WITH OWNER. EXCAVATION BELOW HAGEL TO BE COMPLETED AFTER REMOVAL OF HAGEL BED MATERIAL.

REVIEW DRAWING
12/15/2023

| NO. | BY | CHK. | APP. | DATE | REVISION DESCRIPTION |
|---|---|---|---|---|---|
| ▲ | AWT | SWH | SWH | 12/15/23 | RECORD DRAWING |

| | CLIENT | BID | CONSTRUCTION | RECORD |
|---|---|---|---|---|
| 05/31/23 | | | | |
| 08/09/23 | | | | |
| 12/15/23 | | | | |

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| A | B | C | 0 | 1 | 2 | 3 |
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| DATE RELEASED | | | | | | |

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|---|---|
| Scale | AS SHOWN |
| Date | 08/04/2022 |
| Drawn | RLB2 |
| Checked | BDP |
| Designed | JAM6 |
| Approved | SWH |

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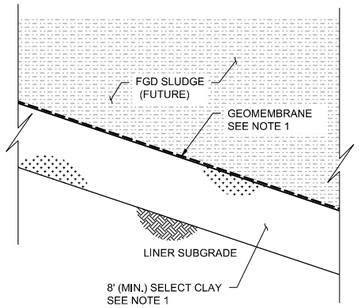
MINNKOTA FGD POND CELL 5 - PHASE 1B
CENTER, NORTH DAKOTA

CELL 5 NORTH/SOUTH EMBANKMENT SECTIONS

| BARR PROJECT No. | |
|---|---|
| 34331014.59 | |
| CLIENT PROJECT No. | |
| DWG. No. | REV. No. |
| C-08 | 1 |

CADD USER: ANDERS W. TOLKKINEN FILE: M:\DESIGN\34331014.59\34331014.59_C-08.DWG PLOT SCALE: 1:2 PLOT DATE: 12/11/2023 10:17 AM




1 DETAIL: SIDEWALL COMPOSITE LINER (TYP.)

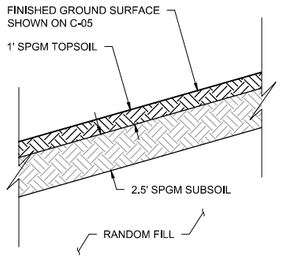
C-07,C-08,C-09,C-13,C-14,C-15, C-16,C-17,C-19,C-23

0 10 20

SCALE IN FEET

NOTES:

1. GEOMEMBRANE TO HAVE ONE SMOOTH SIDE AND ONE TEXTURED SIDE. INSTALL TEXTURED SIDE DIRECTLY AGAINST CLAY LINER.

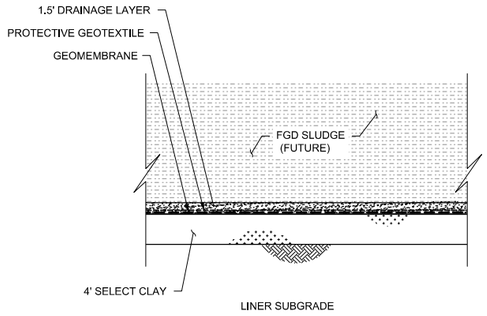



4 DETAIL: FINAL RESTORED SLOPE (TYP.)

C-07,C-09,C-21,C-22,C-23,-

0 5 10

SCALE IN FEET

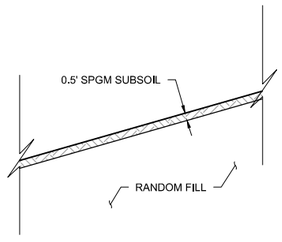



2 DETAIL: BASE COMPOSITE LINER (TYP.)

C-07,C-08,C-15,C-16,C-17, C-19,C-23

0 10 20

SCALE IN FEET

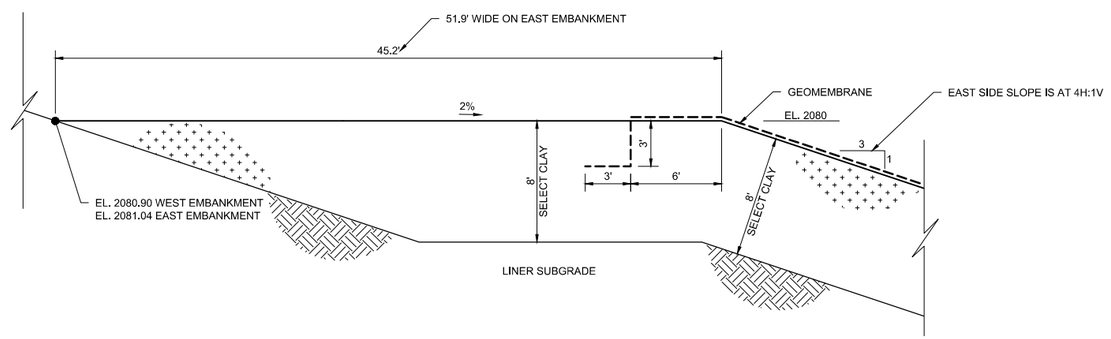



5 DETAIL: TEMPORARY RESTORED SLOPE (TYP.)

C-05, C-08,C-09,C-28

0 5 10

SCALE IN FEET




3 DETAIL: BENCH ANCHOR TRENCH

C-07, C-08

0 5 10

SCALE IN FEET

RECORD DRAWING
12/15/2023

CADD USER: ANDERS W. TOLKKINEN FILE: M:\DESIGN\34331014.59\34331014.59_C-10.DWG PLOT SCALE: 1:2 PLOT DATE: 12/5/2023 1:47 PM

| NO. | BY | CHK. | APP. | DATE | REVISION DESCRIPTION |
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| ▲ | AWT | SWH | SWH | 12/15/23 | RECORD DRAWING |

RELEASED TO/FOR

| | A | B | C | 0 | 1 | 2 | 3 |
|---|---|---|---|---|---|---|---|
| CLIENT | 05/31/23 | | | | | | |
| BID | | | | | | | |
| CONSTRUCTION | | | | 06/09/23 | | | |
| RECORD | | | | | 12/15/23 | | |

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| | |
|---|---|
| Scale | AS SHOWN |
| Date | 08/04/2022 |
| Drawn | RLB2 |
| Checked | BDP |
| Designed | JAM6 |
| Approved | SWH |

Minnkota Power COOPERATIVE
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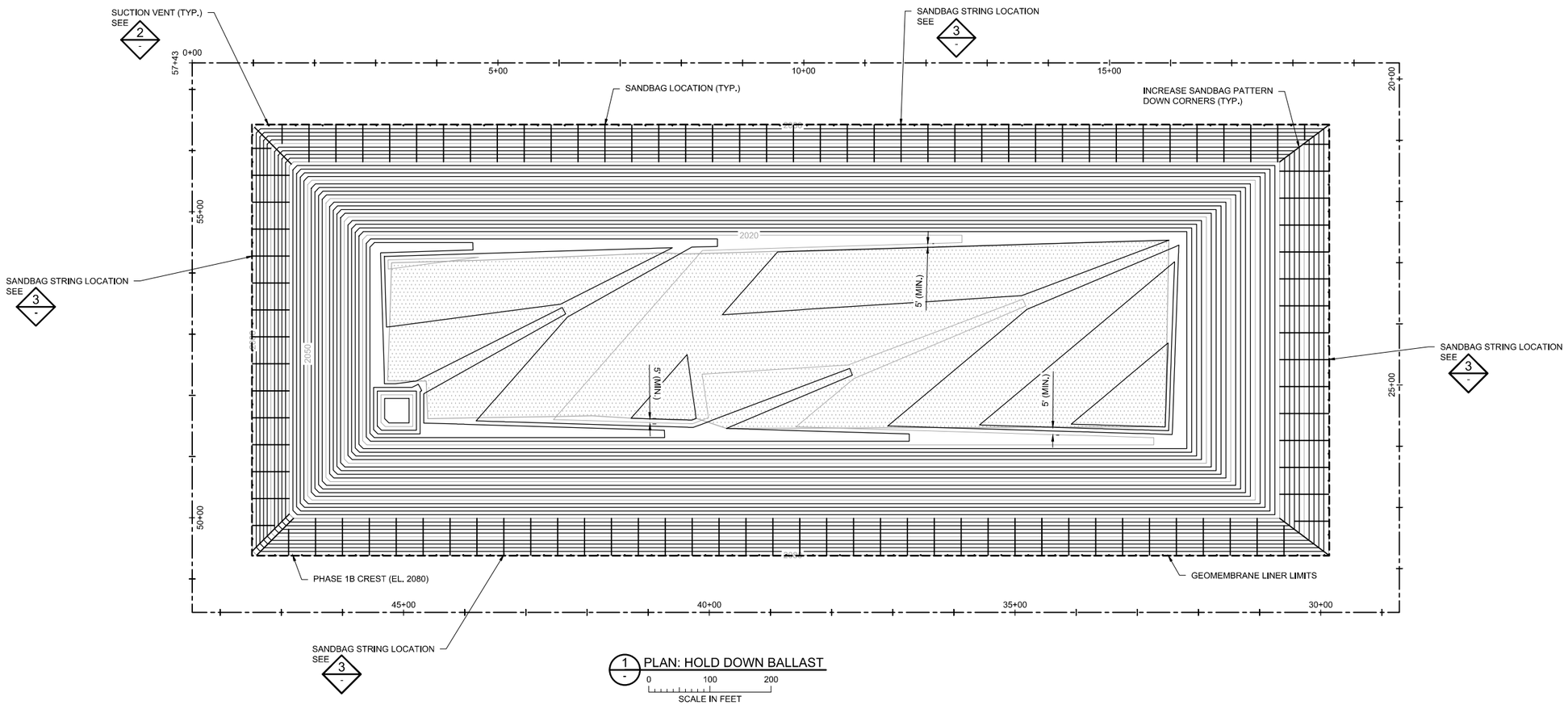
MINNKOTA FGD POND CELL 5 - PHASE 1B
CENTER, NORTH DAKOTA

CELL 5 EMBANKMENT AND LINER DETAILS

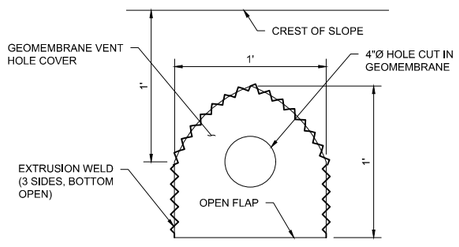
| | |
|---|---|
| BARR PROJECT No. | 34331014.59 |
| CLIENT PROJECT No. | |
| DWG. No. | C-10 |
| REV. No. | 1 |




1 - PLAN: HOLD DOWN BALLAST

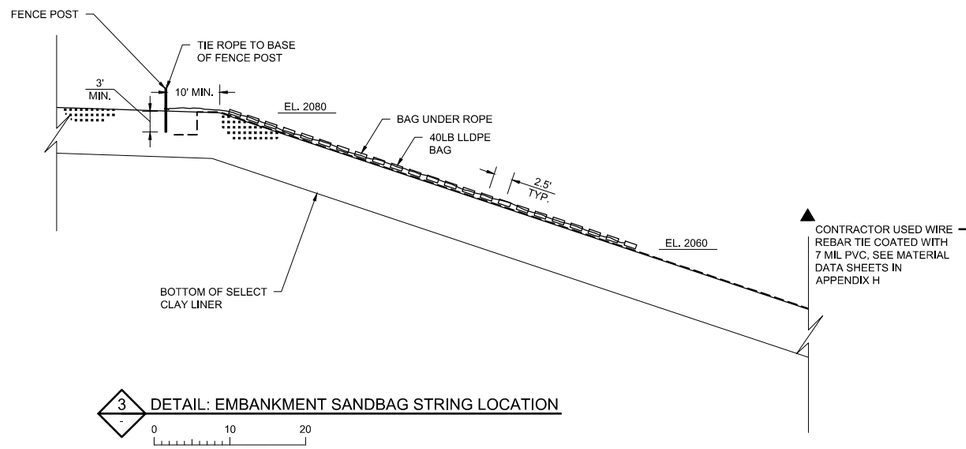
0 100 200

SCALE IN FEET




2 - DETAIL: SUCTION VENT

N.T.S.




3 - DETAIL: EMBANKMENT SANDBAG STRING LOCATION

0 10 20

SCALE IN FEET

NOTES:

1. PLACE SANDBAGS FROM AN ELEVATION OF 2080 TO 2060.
2. A MINIMUM 40LB LLDPE BAG, OR APPROVED EQUAL SPACED AT 44' INTERVALS ALONG A 3 STRAND 3/4" DIAMETER POLYPROPYLENE ROPE LAIN ALONG THE SLOPE.
3. ATTACH EACH BAG TO THE ROPE WITH A ULINE 120 LB BLACK UV STABILIZED NYLON CABLE TIE OR APPROVED EQUAL. SHORTEN ROPES AND REDUCE NUMBER OF SANDBAGS NEAR CORNERS AS NECESSARY.
4. DRIVE 1.33 LB/FT FRANKLIN INDUSTRIES STEEL FENCE POST OR APPROVED EQUAL INTO THE GROUND A MINIMUM OF 3' AND TIE (BOWLINE KNOT) EACH ROPE WITH BAGS TO EACH POST.

RECORD DRAWING
12/15/2023

| NO. | BY | CHK. | APP. | DATE | REVISION DESCRIPTION |
|---|---|---|---|---|---|
| ▲ | AWT | SWH | SWH | 12/15/23 | RECORD DRAWING |

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| CLIENT | 05/31/23 | | | | | | |
| BID | | | | | | | |
| CONSTRUCTION | | | | 06/09/23 | | | |
| RECORD | | | | | 12/15/23 | | |

DATE RELEASED

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www.barr.com

| | |
|---|---|
| Scale | AS SHOWN |
| Date | 05/10/2023 |
| Drawn | JEK2 |
| Checked | BDP |
| Designed | JAM6 |
| Approved | SWH |

Minnkota Power COOPERATIVE
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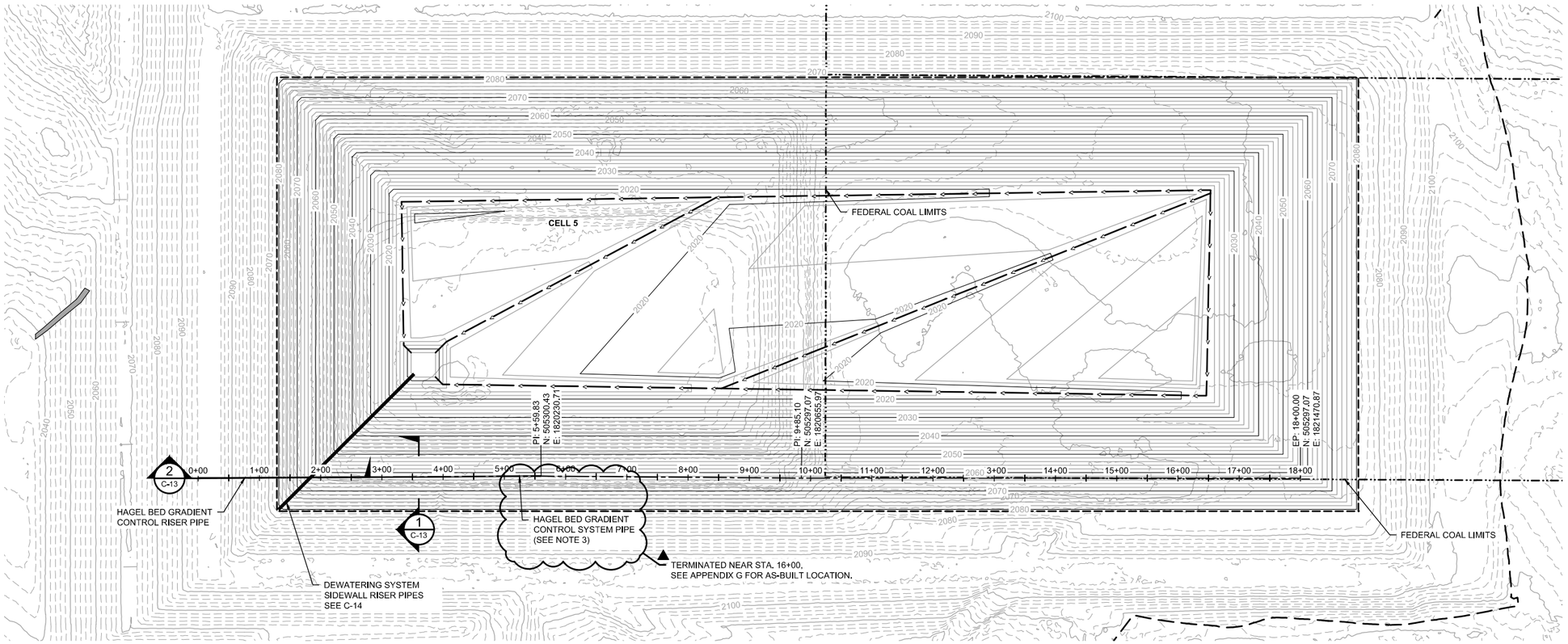
MINNKOTA FGD POND CELL 5 - PHASE 1B
CENTER, NORTH DAKOTA

SANDBAG LAYOUT
PLAN AND DETAILS

BARR PROJECT No. 34331014.59
CLIENT PROJECT No.
DWG. No. C-11
REV. No. 1

CADD USER: ANDERS W. TOLKKINEN FILE: M:\DESIGN\34331014.59\34331014599_C-11.DWG PLOT SCALE: 1:2 PLOT DATE: 12/11/2023 10:16 AM

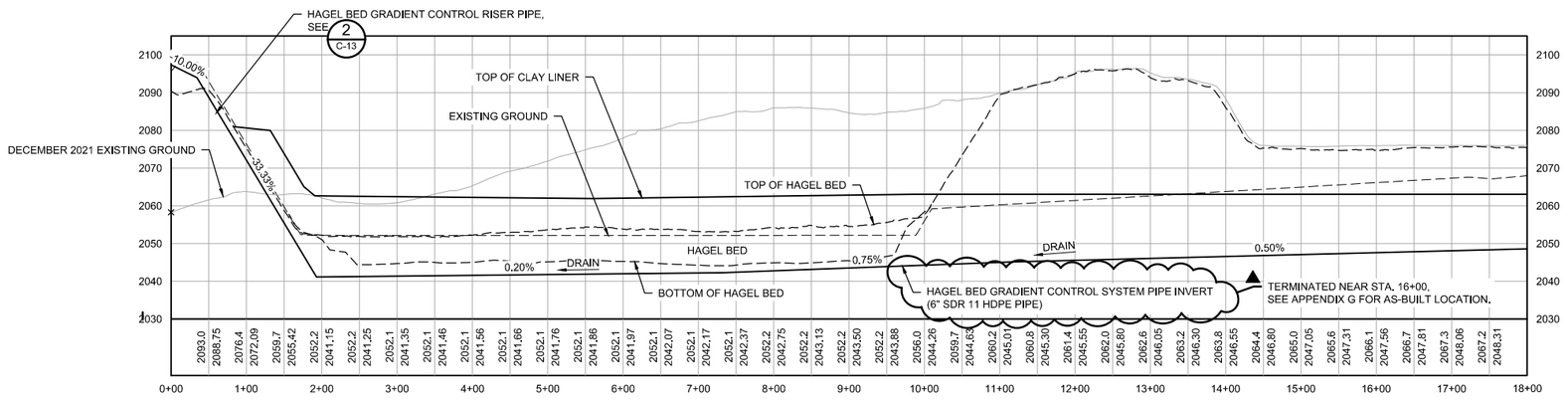



LEGEND

- EXISTING 10' MAJOR CONTOUR
- EXISTING 2' MINOR CONTOUR
- PROPOSED 10' MAJOR CONTOUR
- PROPOSED 2' MINOR CONTOUR
- FEDERAL COAL LIMITS
- FENCE LINE
- PROPOSED DRAINAGE COLLECTION PIPES
- PROPOSED GEOMEMBRANE LIMITS

## 1 C-05 PLAN: HAGEL BED GRADIENT CONTROL SYSTEM

0 100 200
SCALE IN FEET




LEGEND




NOTES:

1. GRADIENT CONTROL PIPE IS TO BE PLACED IN ACCORDANCE WITH DETAIL 3 C-13
2. PIPE INVERT SHALL BE SET A MINIMUM OF 16" BELOW BOTTOM OF HAGEL BED. SOME REACHES WILL BE LOWER TO ENSURE POSITIVE DRAINAGE TO GRADIENT CONTROL RISER PIPE.
3. GRADIENT CONTROL SYSTEM PIPE LOCATION MAY BE ADJUSTED BY CONTRACTOR TO FIT SITE CONDITIONS AS APPROVED BY OWNER'S ONSITE REPRESENTATIVE.

## 2 - PROFILE: HAGEL BED GRADIENT CONTROL SYSTEM

0 100 200
SCALE IN FEET HORIZONTAL

0 20 40
SCALE IN FEET VERTICAL

RECORD DRAWING
12/15/2023

| NO. | BY | CHK. | APP. | DATE | REVISION DESCRIPTION |
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| CLIENT | 05/31/23 | |
| BID | | |
| CONSTRUCTION | | 08/09/23 |
| RECORD | | 12/15/23 |


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| Date | 08/04/2022 |
| Drawn | RLB2 |
| Checked | BDP |
| Designed | AWT |
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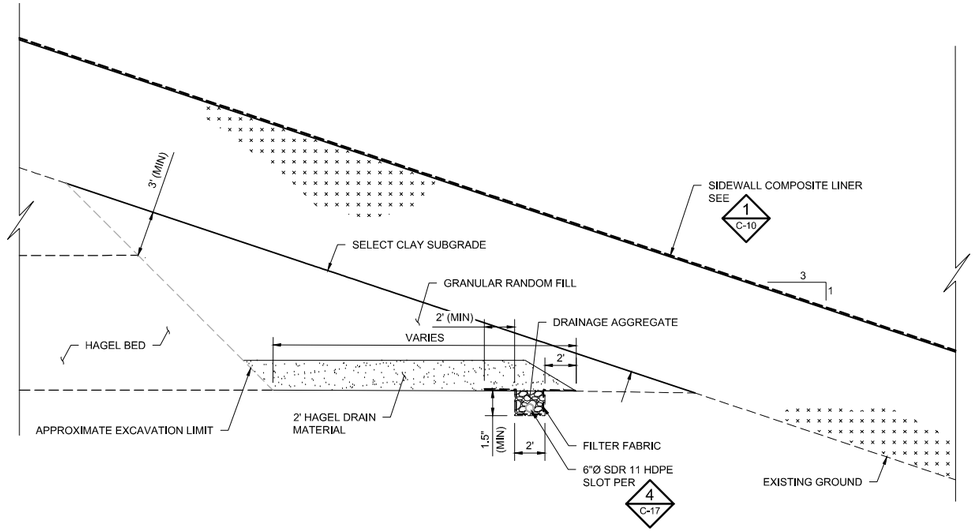
MINNKOTA FGD POND CELL 5 - PHASE 1B
CENTER, NORTH DAKOTA

HAGEL BED GRADIENT CONTROL SYSTEM
PLAN AND PROFILE

| | |
|---|---|
| BARR PROJECT No. | 34331014.59 |
| CLIENT PROJECT No. | |
| DWG. No. | C-12 |
| REV. No. | 1 |

CADD USER: ANDERS W. TOLKKINEN FILE: M:\DESIGN\34331014.59\34331014.59_C-12.DWG PLOT SCALE: 1:2 PLOT DATE: 12/11/2023 10:01 AM

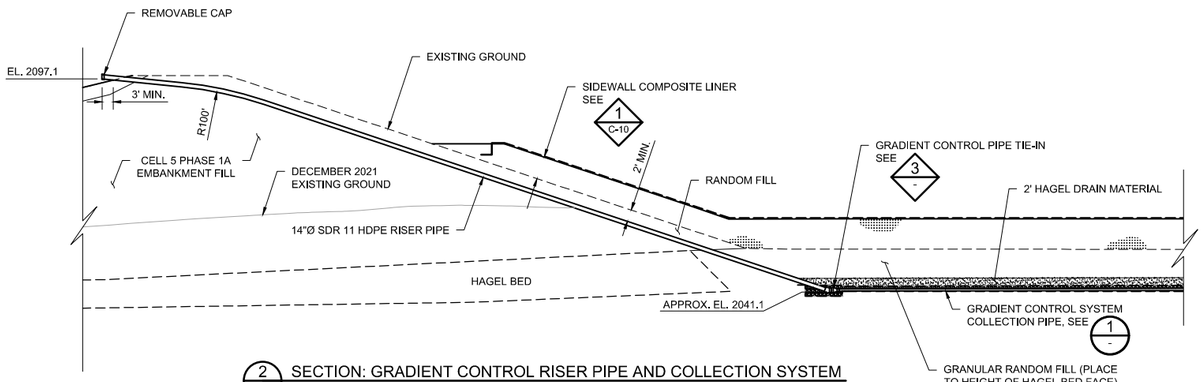



1 C-12 SECTION: GRADIENT CONTROL SYSTEM COLLECTION PIPE

0 5 10
SCALE IN FEET

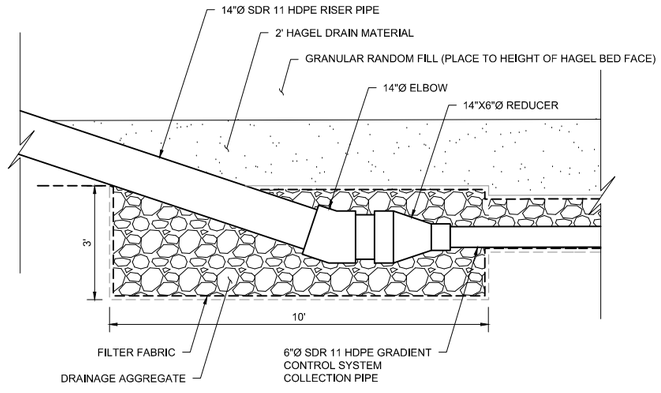
NOTES:

1. PLACE AT LEAST 2" OF DRAINAGE AGGREGATE BELOW PIPE.
2. SEE PROFILE ON SHEET C-12 FOR PIPE GRADE INFORMATION.
3. WASTE COAL TO BE PLACED IN CELL 2 OR CELL 3 AS DIRECTED BY OWNER.




2 C-12 SECTION: GRADIENT CONTROL RISER PIPE AND COLLECTION SYSTEM

0 20 40
SCALE IN FEET




3 C-12,- DETAIL: GRADIENT CONTROL PIPE TIE-IN

0 1 2 3 4
SCALE IN FEET

NOTE:

ADJUST COLLECTION PIPE ALIGNMENT AS NECESSARY TO MAKE TIE-IN TO RISER PIPE.

RECORD DRAWING
12/15/2023

| NO. | BY | CHK. | APP. | DATE | REVISION DESCRIPTION |
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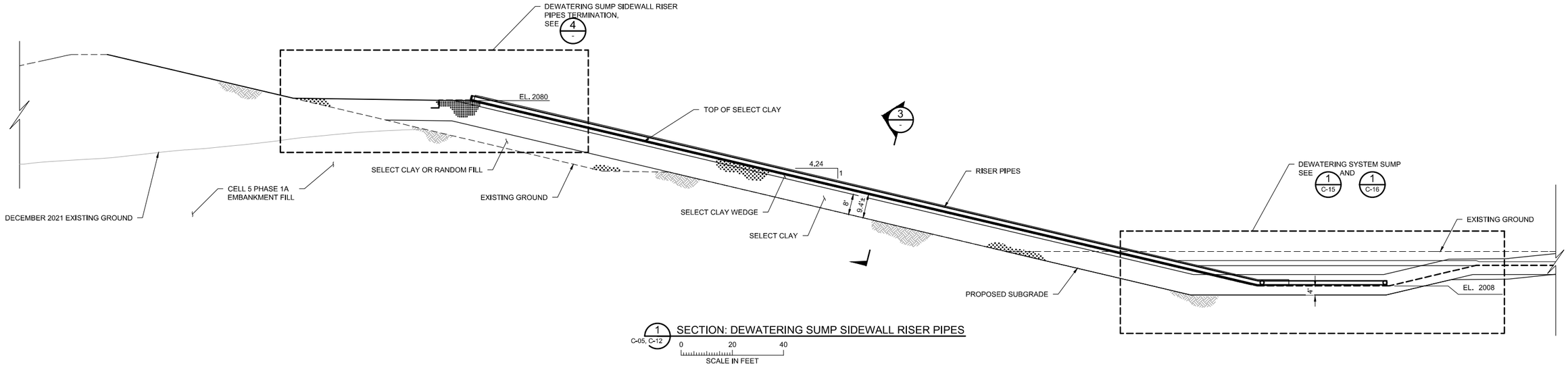
MINNKOTA FGD POND CELL 5 - PHASE 1B
CENTER, NORTH DAKOTA

HAGEL BED GRADIENT CONTROL SYSTEM
SECTION AND DETAIL

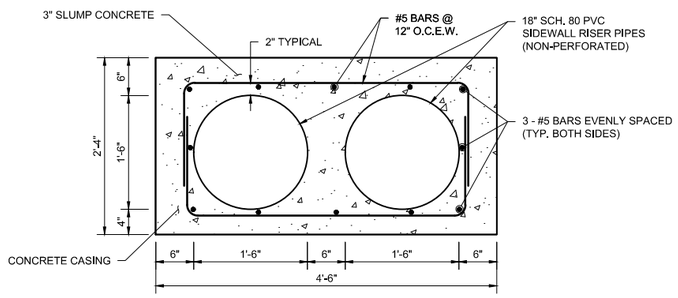
BARR PROJECT No. 34331014.59
CLIENT PROJECT No.
DWG. No. C-13
REV. No. 1

CADD USER: ANDERS W. TOLKINEN FILE: M:\DESIGN\34331014.59\34331014598_C-13.DWG PLOT SCALE: 1:2 PLOT DATE: 12/6/2023 8:30 AM



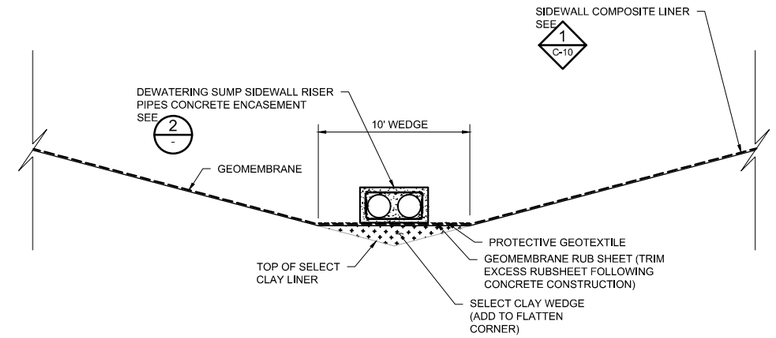

1 C-05, C-12 SECTION: DEWATERING SUMP SIDEWALL RISER PIPES

0 20 40
SCALE IN FEET




NOTES:

1. FORM CONCRETE BY MEANS AND METHODS THAT WILL NOT DAMAGE THE COMPOSITE LINER SYSTEM. CONCRETE FORMING SHALL BE APPROVED BY ENGINEER PRIOR TO CONSTRUCTION.
2. PROVIDE MIN. 3" CLEAR COVER FOR ALL REINFORCING STEEL.
3. ALL REINFORCING SHALL BE EPOXY COATED.
4. ALL CONCRETE SHALL BE SULFATE RESISTANT TYPE V. (TYPE V, EXPOSURE CLASS S3)
5. DEWATERING SYSTEM SIDEWALL RISER PIPES CAN LIE DIRECTLY ON BOTTOM MAT OF REINFORCEMENT.
6. CONTRACTOR TO SUBMIT CONCRETE MIX DESIGN (4,000 PSI MIN.) FOR REVIEW AND APPROVAL.

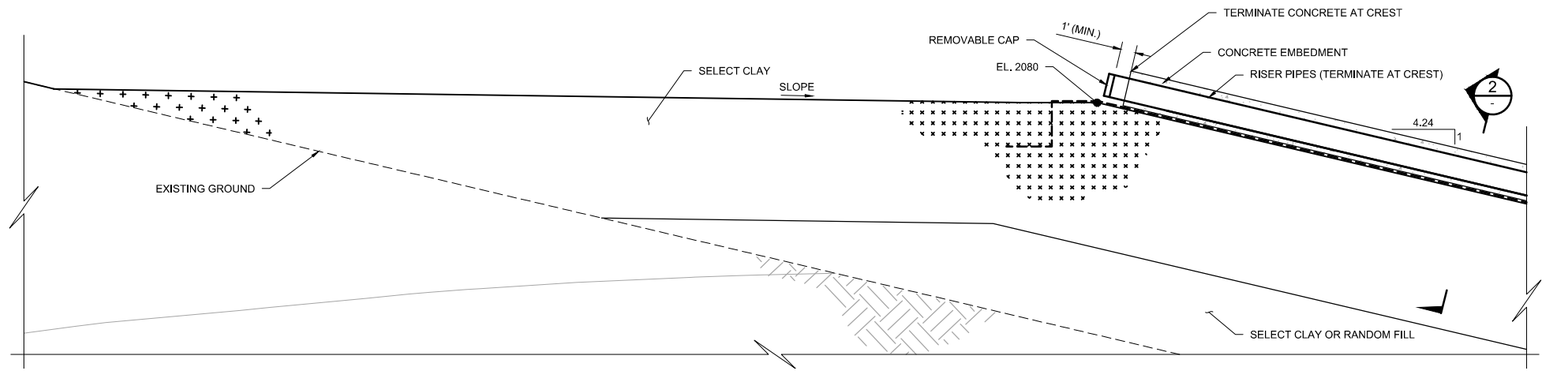



2 - SECTION: DEWATERING SUMP SIDEWALL RISER PIPES CONCRETE ENCASEMENT

0 1 2
SCALE IN FEET

3 C-16,- SECTION: DEWATERING SUMP SIDEWALL RISER PIPES BELOW BENCH

0 5 10
SCALE IN FEET




4 - SECTION: DEWATERING SUMP SIDEWALL RISER PIPES TERMINATION

0 5 10
SCALE IN FEET

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12/15/2023

| NO. | BY | CHK. | APP. | DATE | REVISION DESCRIPTION |
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Minnkota Power COOPERATIVE
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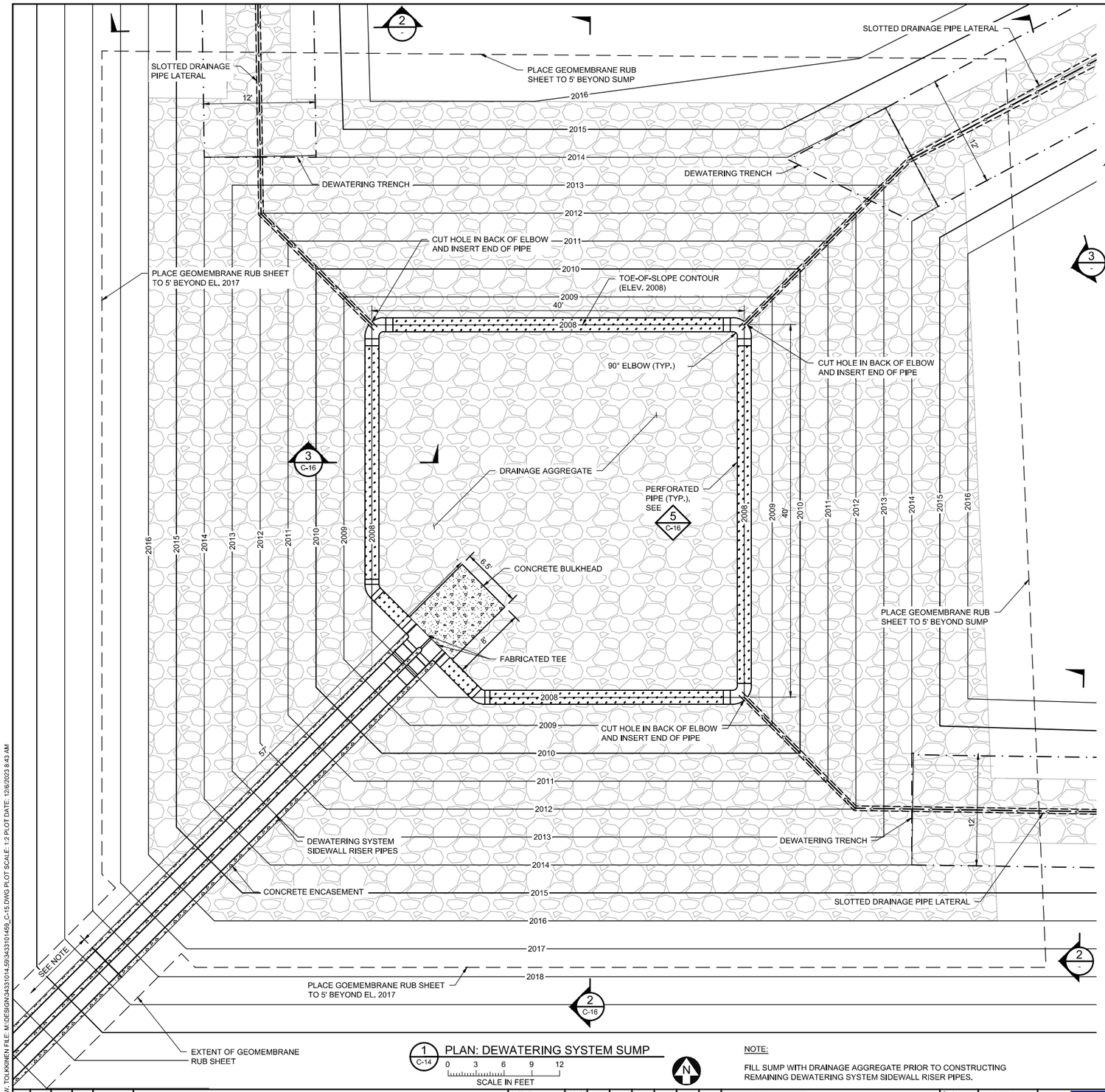
MINNKOTA FGD POND CELL 5 - PHASE 1B
CENTER, NORTH DAKOTA

DEWATERING SUMP AND SIDEWALL RISER SECTIONS

| | |
|---|---|
| BARR PROJECT No. | 34331014.59 |
| CLIENT PROJECT No. | |
| DWG. No. | C-14 |
| REV. No. | 1 |

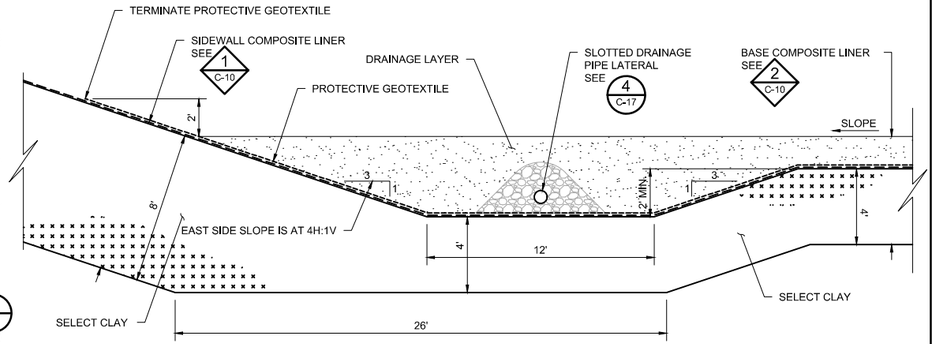
CADD USER: ANDERS W. TOLKKINEN FILE: M:\DESIGN\34331014.59\34331014.59_C-14.DWG PLOT SCALE: 1:2 PLOT DATE: 12/6/2023 4:21 PM




1 C-14 PLAN: DEWATERING SYSTEM SUMP

0 3 6 9 12

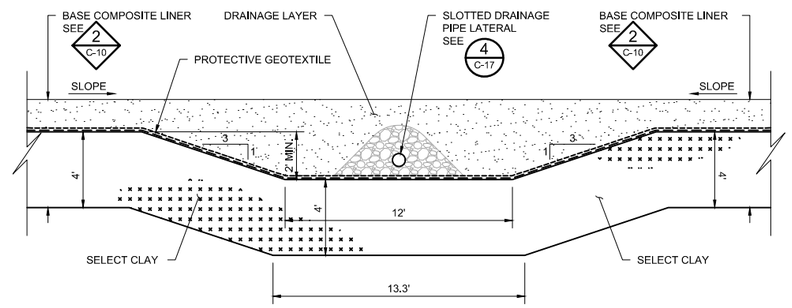
SCALE IN FEET




3 C-16,C-17,- SECTION: DEWATERING TRENCH - WEST BASE AT SIDEWALL TOE (TYP.)

0 2 4 6 8

SCALE IN FEET




2 C-07,C-08,C-17,- SECTION: DEWATERING TRENCH - WEST BASE AT SIDEWALL TOE (TYP.)

0 2 4 6 8

SCALE IN FEET

NOTE:

FILL SUMP WITH DRAINAGE AGGREGATE PRIOR TO CONSTRUCTING REMAINING DEWATERING SYSTEM SIDEWALL RISER PIPES.

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| CLIENT | 05/31/23 | | | | | | |
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| CONSTRUCTION | | | | 08/09/23 | | | |
| RECORD | | | | | 12/15/23 | | |

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| Designed | JAM6 |
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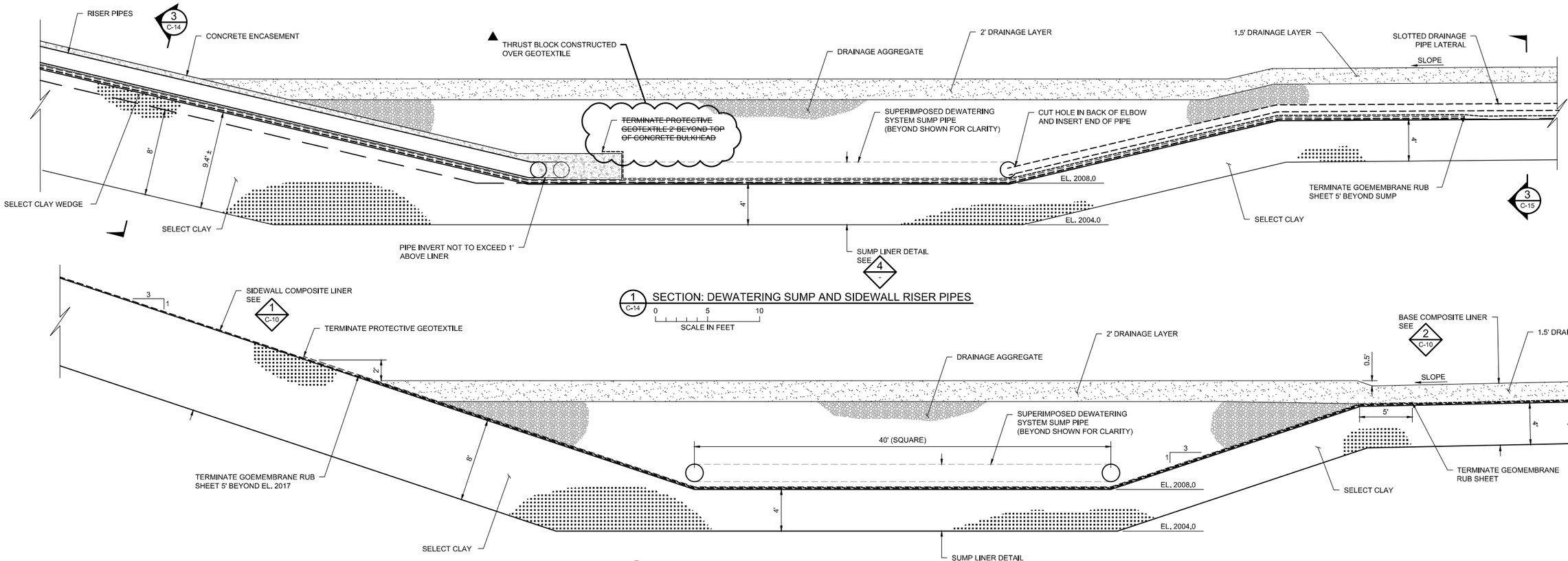
MINNKOTA FGD POND CELL 5 - PHASE 1B
CENTER, NORTH DAKOTA

DEWATERING SYSTEM SUMP PLAN AND DEWATERING TRENCH SECTIONS

BARR PROJECT No. 34331014.59
CLIENT PROJECT No.
DWG. No. C-15
REV. No. 1

CADD USER: ANDERS W. TOLKKINEN FILE: M:\DESIGN\34331014.59\34331014.59_C-15.DWG PLOT SCALE: 1:2 PLOT DATE: 12/6/2023 8:43 AM



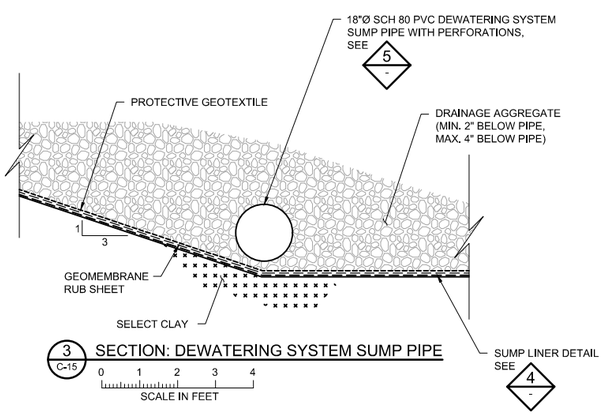

1 C-14 SECTION: DEWATERING SUMP AND SIDEWALL RISER PIPES

0 5 10
SCALE IN FEET



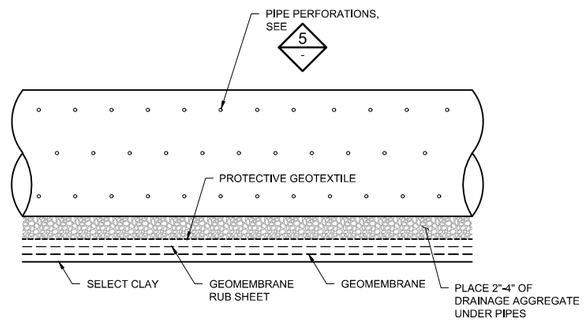

2 C-15 SECTION: DEWATERING SUMP AND INTAKE PIPE

0 5 10
SCALE IN FEET



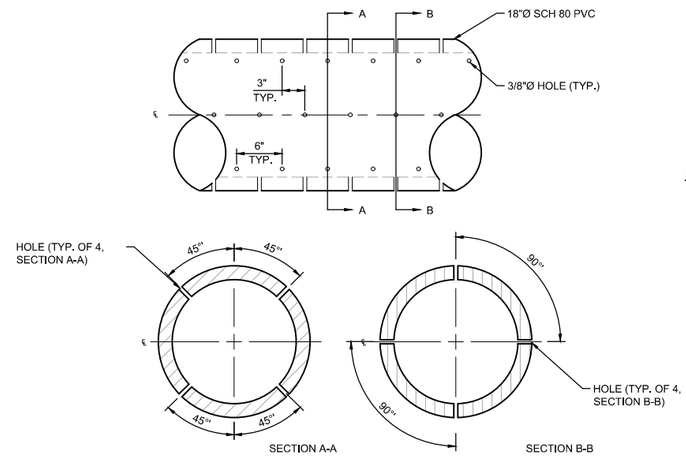

3 C-15 SECTION: DEWATERING SYSTEM SUMP PIPE

0 1 2 3 4
SCALE IN FEET




4 - DETAIL: SUMP LINER DETAIL

NOT TO SCALE




5 C-15, - DETAIL: SUMP PIPE PERFORATION

NOT TO SCALE

NOTES:

1. PLACE GEOMEMBRANE RUB SHEET AND PROTECTIVE GEOTEXTILE LAYER OVER SIDEWALL COMPOSITE LINER SYSTEM IN SUMP AREA.

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Minnkota Power COOPERATIVE
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MINNKOTA FGD POND CELL 5 - PHASE 1B
CENTER, NORTH DAKOTA

DEWATERING SUMP
SECTIONS AND DETAILS

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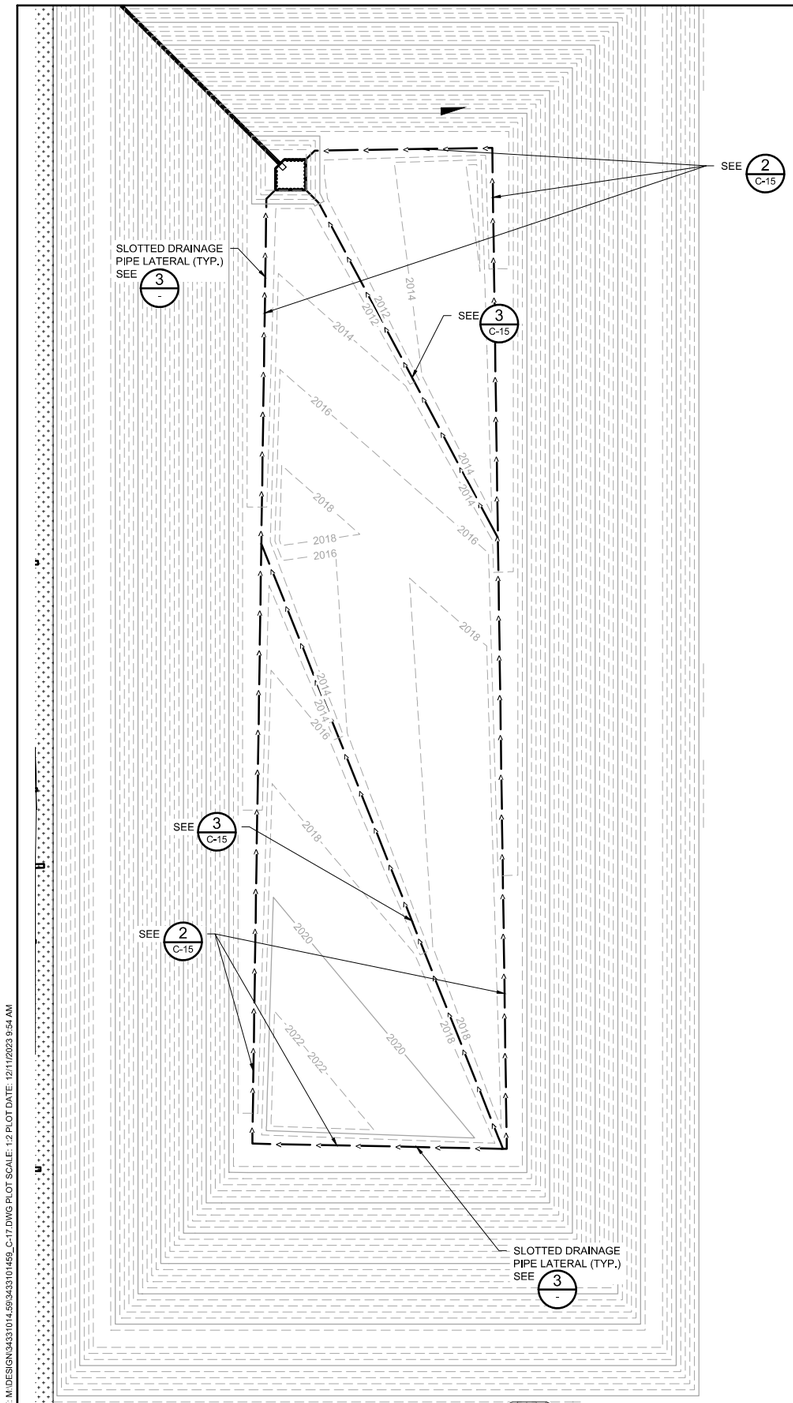
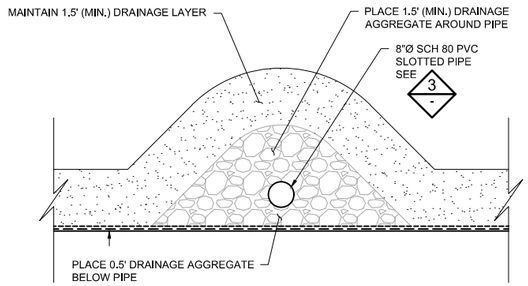
|---|---|
| BARR PROJECT No. | 34331014.59 |
| CLIENT PROJECT No. | |
| DWG. No. | C-16 |
| REV. No. | 1 |

CADD USER: ANDERS W. TOLKKINEN FILE: M:\DESIGN\34331014.59\34331014S9_C-16.DWG PLOT SCALE: 1:2 PLOT DATE: 12/11/2023 9:57 AM

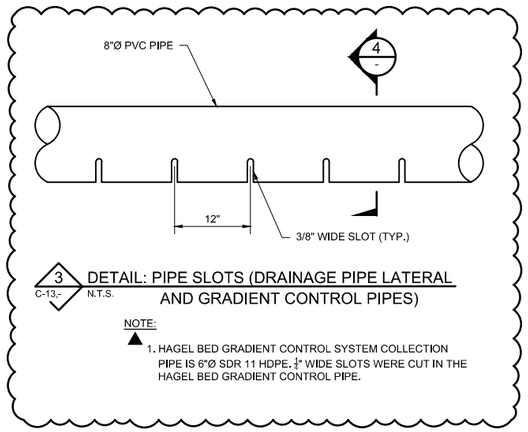



1 - PLAN: DEWATERING TRENCHES




2 C-15.- SECTION: PERFORATED DRAINAGE PIPE LATERAL

0 1 2 3 4
SCALE IN FEET

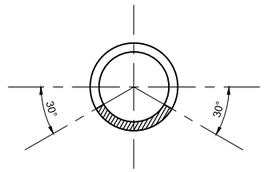



3 C-13.- DETAIL: PIPE SLOTS (DRAINAGE PIPE LATERAL AND GRADIENT CONTROL PIPES)

N.T.S.

NOTE:

1. HAGEL BED GRADIENT CONTROL SYSTEM COLLECTION PIPE IS 6"Ø SDR 11 HDPE. ¼" WIDE SLOTS WERE CUT IN THE HAGEL BED GRADIENT CONTROL PIPE.




4 - SECTION: PIPE SLOTS

N.T.S.

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| CONSTRUCTION | | | | 6/09/23 | | | |
| RECORD | | | | | 12/15/23 | | |

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| Drawn | RLB2 |
| Checked | BDP |
| Designed | JAM6 |
| Approved | SWH |

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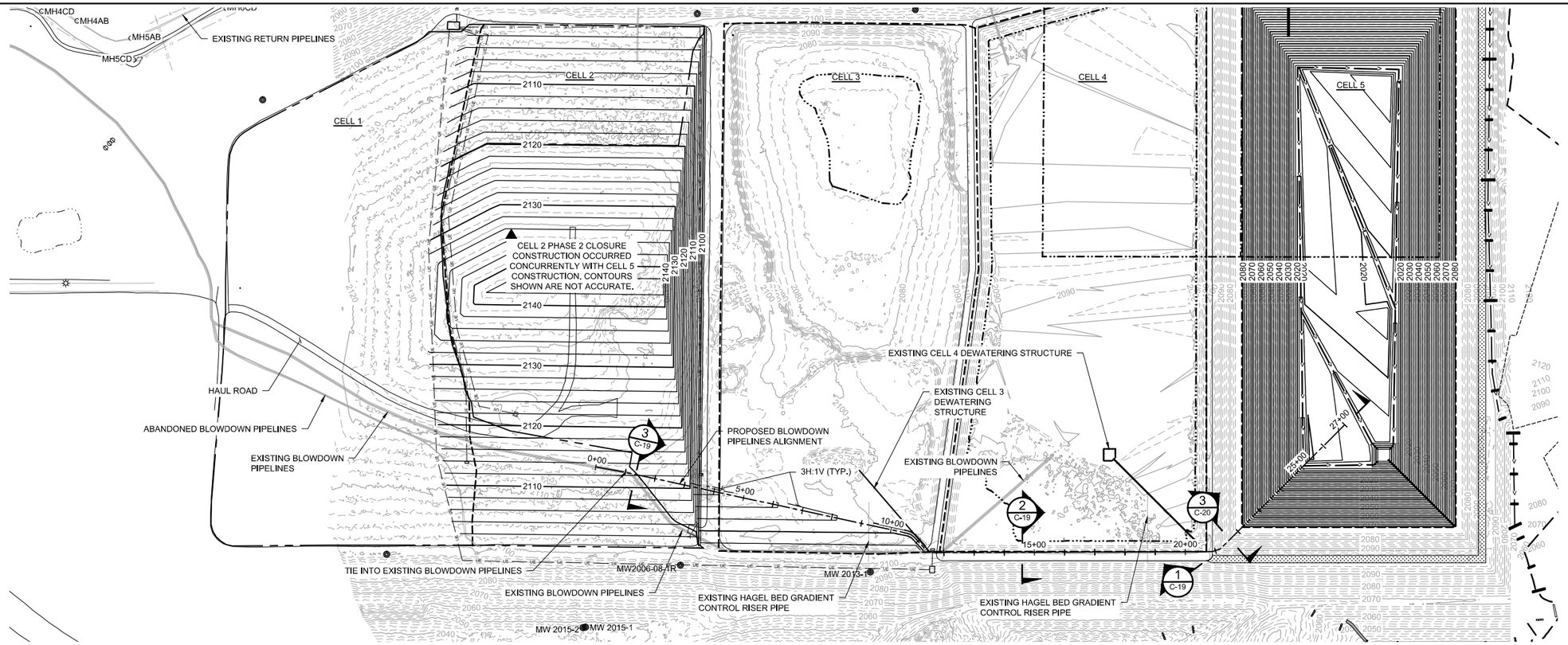
MINNKOTA FGD POND CELL 5 - PHASE 1B
CENTER, NORTH DAKOTA

DEWATERING TRENCH
PLAN, SECTIONS, AND DETAILS

| BARR PROJECT No. | |
|---|---|
| 34331014.59 | |
| CLIENT PROJECT No. | |
| DWG. No. | REV. No. |
| C-17 | 1 |

CADD USER: ANDERS W. TOLKKINEN FILE: M:\DESIGN\34331014.59\34331014.59_C-17.DWG PLOT SCALE: 1:2 PLOT DATE: 12/11/2023 9:54 AM




LEGEND

- EXISTING 10' MAJOR CONTOUR
- EXISTING 2' MINOR CONTOUR
- PROPOSED 10' MAJOR CONTOUR
- PROPOSED 2' MINOR CONTOUR
- PROPOSED PIPE
- EXISTING BLOWDOWN LINES
- EXISTING ROAD
- EXISTING PIPELINE
- STRIPPING LIMITS
- FENCE LINE
- WATERLINE
- MW97-2 MONITORING WELL

NOTES:

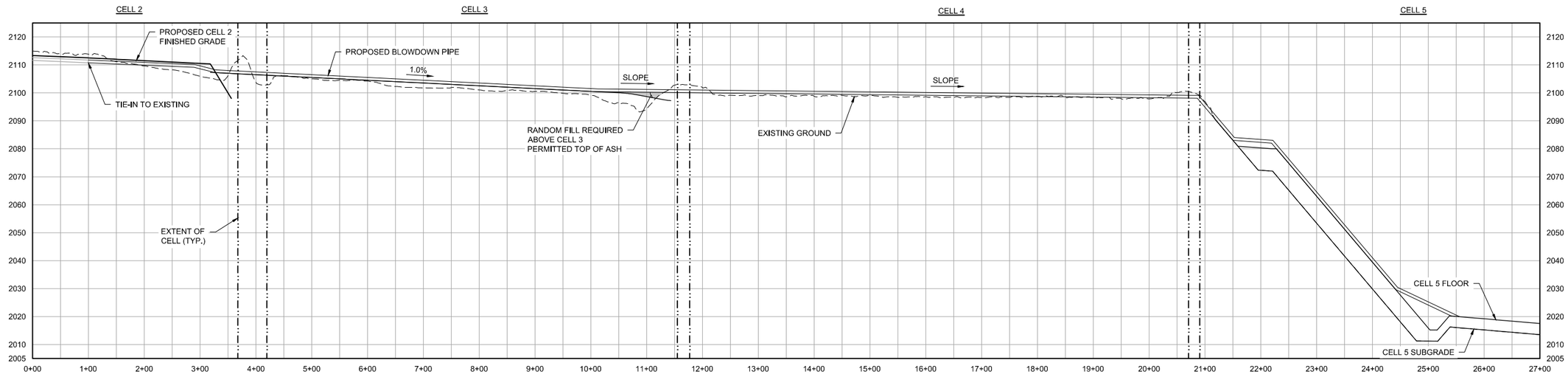
NET TOTAL FILL MATERIAL REQUIRED FOR BLOWDOWN PIPELINE IN CELL 3: 2,200 CY (WITH 100 CY ABOVE PERMITTED TOP OF ASH - RANDOM FILL ONLY)

TOTAL RANDOM FILL REQUIRED FOR ROAD RAISE IN CELL 4 EMBANKMENT: 1,500 CY

1 C-05 PLAN: BLOWDOWN PIPELINES

0 200 400

SCALE IN FEET




2 - PROFILE: BLOWDOWN PIPELINES

0 100 200

SCALE IN FEET

NOTES:

1. CELL 4 BLOWDOWN PIPELINES WILL BE ACTIVE UNTIL TRANSITION TO CELL 5. COORDINATE BLOWDOWN PIPELINES TRANSITION WITH OWNER PRIOR TO COMMENCING THE WORK.

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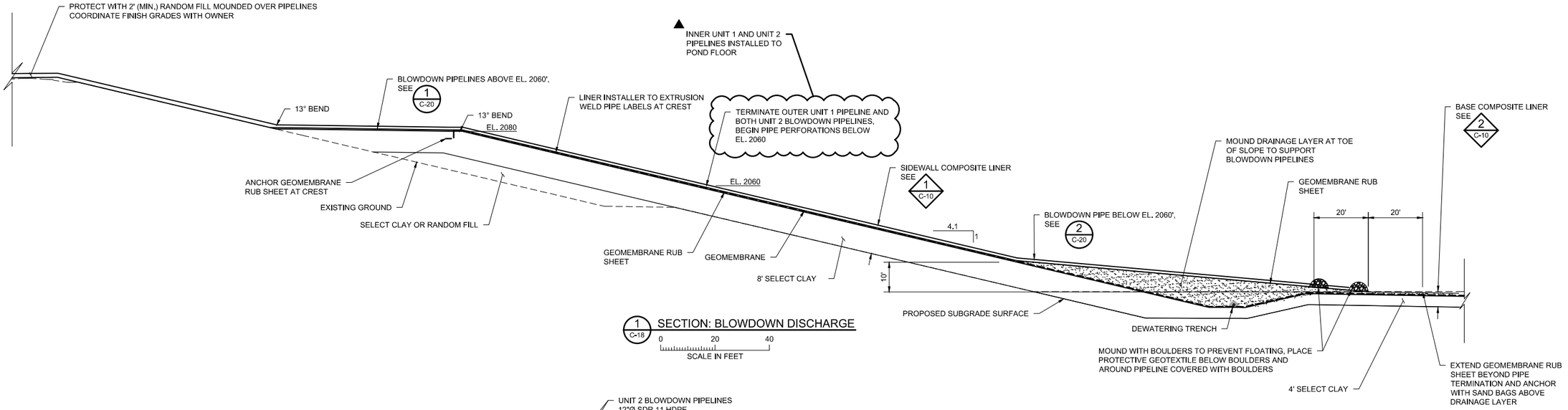
Minnkota Power COOPERATIVE
A Touchstone Energy® Cooperative

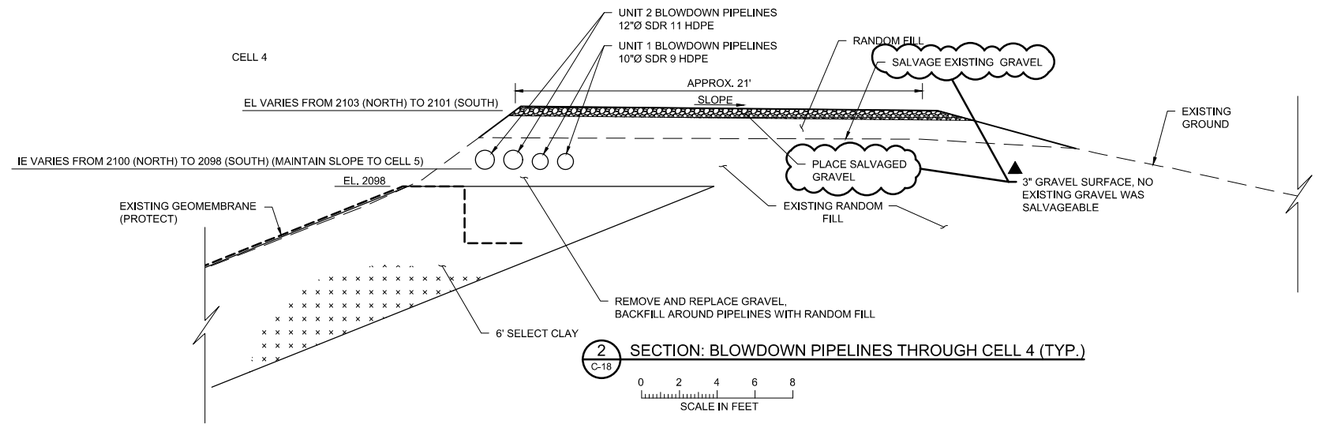
MINNKOTA FGD POND CELL 5 - PHASE 1B
CENTER, NORTH DAKOTA

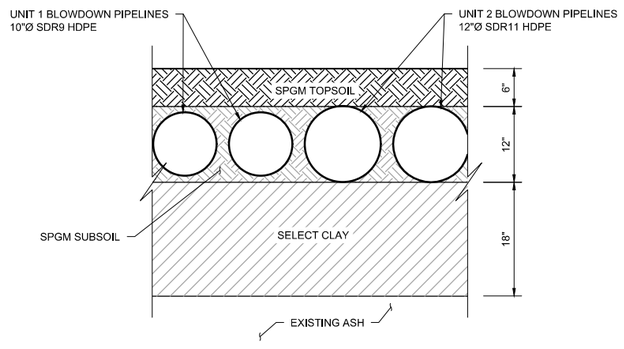
BLOWDOWN PIPELINES
PLAN AND PROFILE

| | |
|---|---|
| BARR PROJECT No. | 34331014.59 |
| CLIENT PROJECT No. | |
| DWG. No. | C-18 |
| REV. No. | 1 |

CADD USER: AUSTIN W. KELLER FILE: M:\DESIGN\34331014.59\34331014.59_C-18.DWG PLOT SCALE: 1:2 PLOT DATE: 12/13/2023 2:25 PM




RECORD DRAWING
12/15/2023

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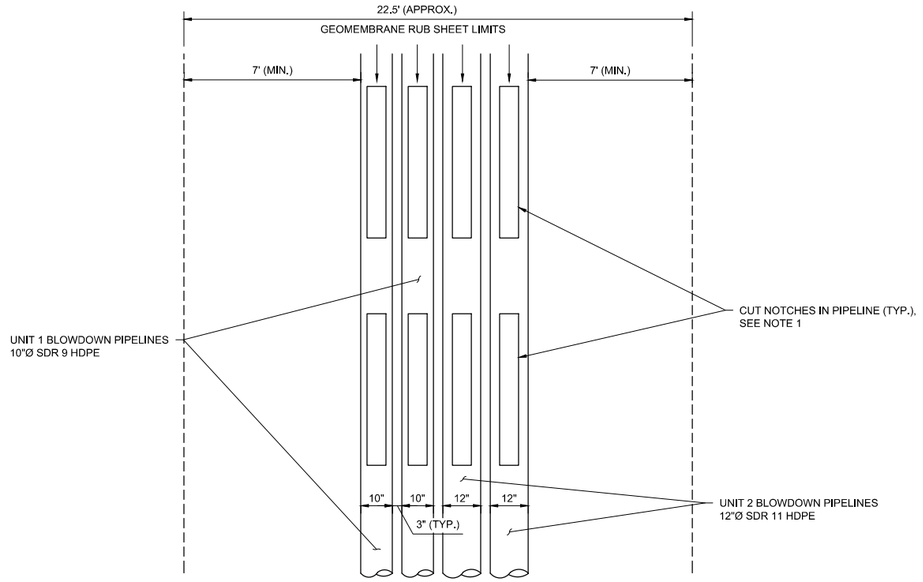
MINNKOTA FGD POND CELL 5 - PHASE 1B
CENTER, NORTH DAKOTA

BLOWDOWN PIPELINES
SECTIONS

| BARR PROJECT No. | |
|---|---|
| 34331014.59 | |
| CLIENT PROJECT No. | |
| DWG. No. | REV. No. |
| C-19 | 1 |

CADD USER: ANDERS W. TOLKKINEN FILE: M:\DESIGN\34331014.59\34331014599_C-19.DWG PLOT SCALE: 1:2 PLOT DATE: 12/11/2023 11:15 AM

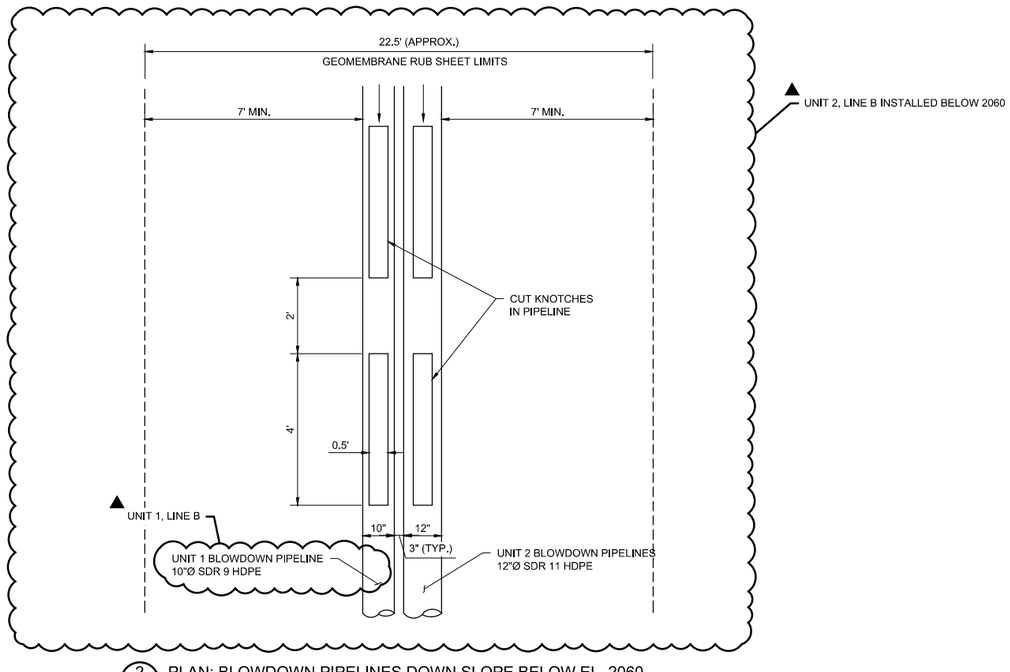



1 C-19 PLAN: BLOWDOWN PIPELINES DOWN SLOPE ABOVE EL. 2060

N.T.S.

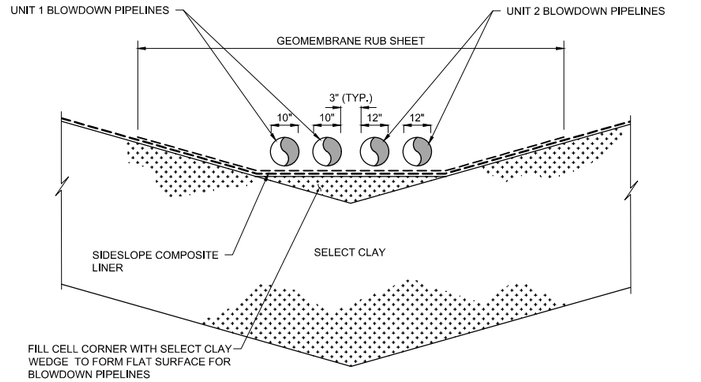
NOTE:

1. NOTCHED PIPE SHALL EXTEND UP TO EL. 2070'




2 C-19 PLAN: BLOWDOWN PIPELINES DOWN SLOPE BELOW EL. 2060

N.T.S.




3 C-18 SECTION: BLOWDOWN PIPELINES

0 2 4 6 8

SCALE IN FEET

NOTE:

ONLY ONE UNIT 1 BLOWDOWN PIPE PRESENT BELOW BENCH.

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MINNKOTA FGD POND CELL 5 - PHASE 1B
CENTER, NORTH DAKOTA

BLOWDOWN PIPELINES
SECTIONS AND DETAILS

| BARR PROJECT No. | |
|---|---|
| 34331014.59 | |
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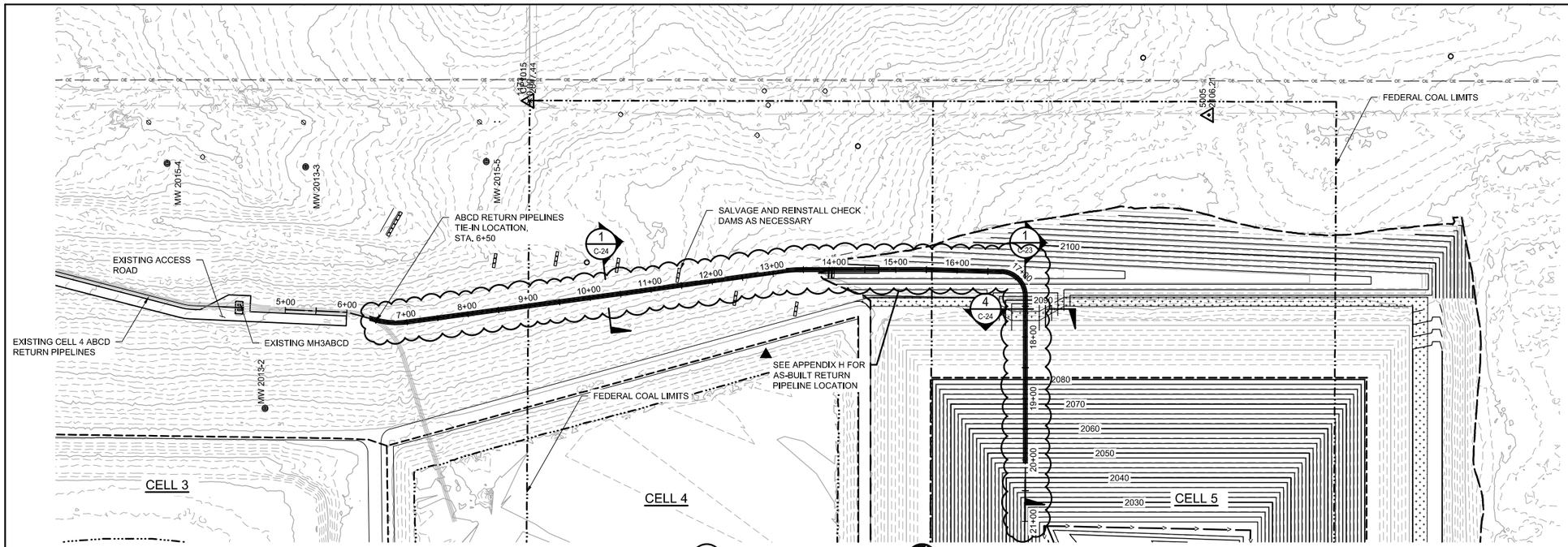
| DWG. No. | REV. No. |
| C-20 | 1 |

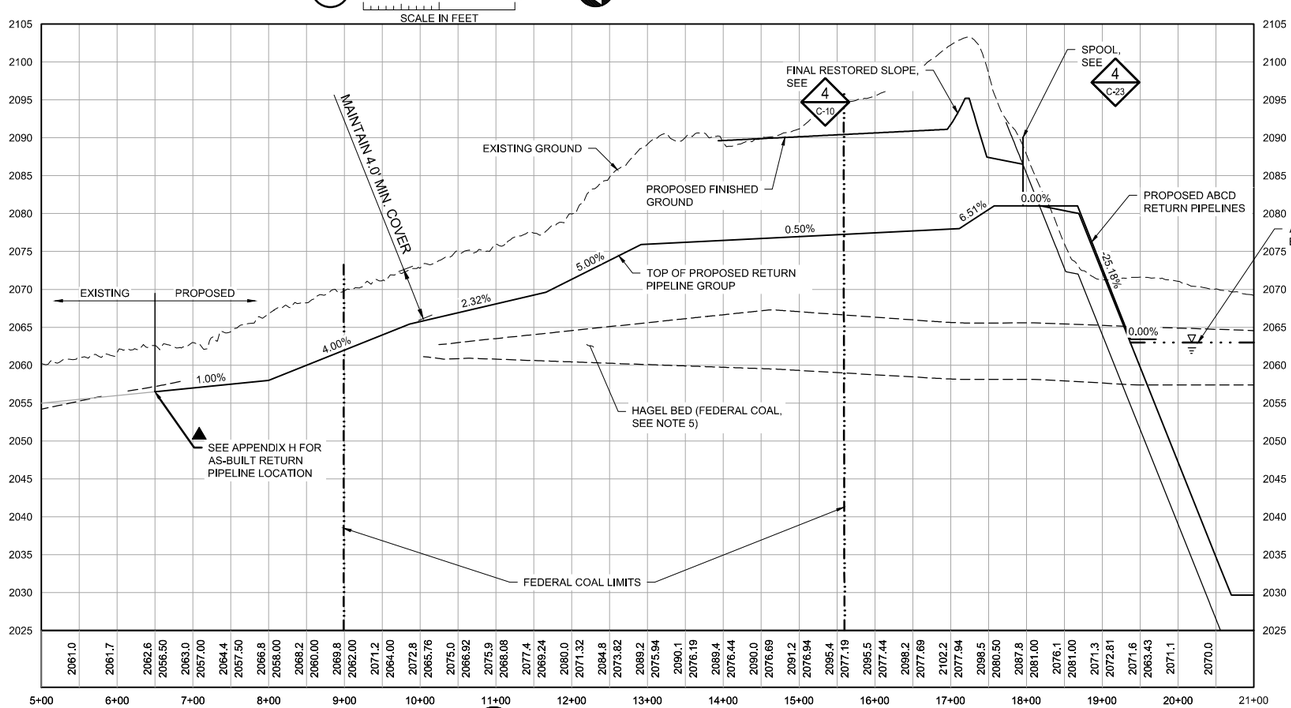
CADD USER: ANDERS W. TOLKINEN FILE: M:\DESIGN\34331014.59\34331014.59_C-20.DWG PLOT SCALE: 1:2 PLOT DATE: 12/11/2023 2:37 PM




1 C-05 PLAN: RETURN PIPELINES

0 100 200

SCALE IN FEET




2 PROFILE: RETURN PIPELINES

0 100 200 0 10 20

HORIZONTAL SCALE IN FEET VERTICAL SCALE IN FEET

LEGEND

- EXISTING 10' MAJOR CONTOUR
- EXISTING 2' MINOR CONTOUR
- PROPOSED 10' MAJOR CONTOUR
- PROPOSED 2' MINOR CONTOUR
- FEDERAL COAL LIMITS
- EXISTING OVERHEAD ELECTRIC
- EXISTING FENCE LINE
- EXISTING ROAD
- EXISTING PIPELINE
- WATERLINE
- MW 2013-2 MONITORING WELL

NOTES:

1. FIELD VERIFY EXISTING UTILITIES BEFORE CONSTRUCTION.
2. MAINTAIN 4.0' COVER (MIN.) OVER PIPELINES.
3. RESTORE DISTURBED ROAD SURFACES TO PRE-CONSTRUCTION CONDITIONS.
4. COORDINATE WITH OWNER FOR TRANSFER OF RETURN PIPELINES FROM CELL 4 TO CELL 5.
5. REMOVAL OF FEDERAL COAL IS STRICTLY PROHIBITED.

LEGEND

EXISTING GROUND — 2099.9 / 2083.00 — TOP OF RETURN PIPELINE GROUP

NOTES:

1. SPOOL MUST BE AT HIGHEST ELEVATION IN PIPELINES.

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MINNKOTA FGD POND CELL 5 - PHASE 1B
CENTER, NORTH DAKOTA

RETURN PIPELINES - WEST ALTERNATIVE
PLAN AND PROFILE

| | |
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| BARR PROJECT No. | 34331014.59 |
| CLIENT PROJECT No. | |
| DWG. No. | C-21 |
| REV. No. | 1 |

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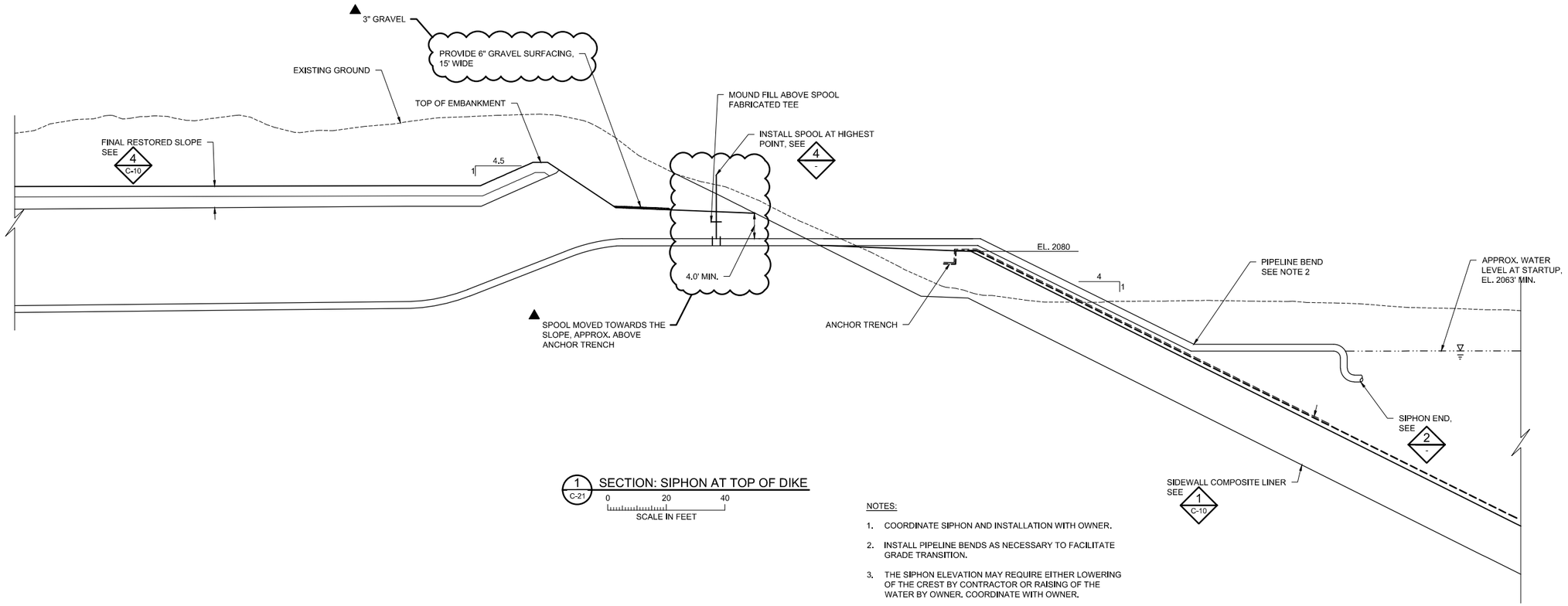


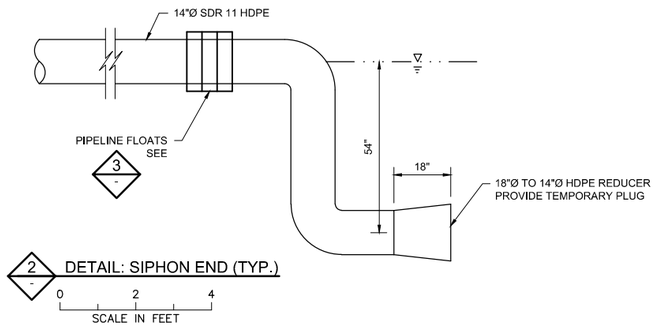

1 C-21 SECTION: SIPHON AT TOP OF DIKE

0 20 40

SCALE IN FEET

NOTES:

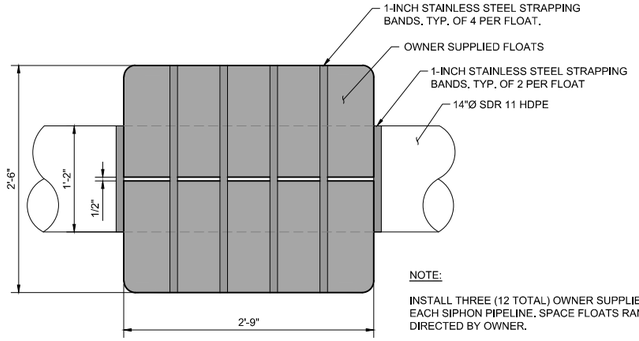
1. COORDINATE SIPHON AND INSTALLATION WITH OWNER.
2. INSTALL PIPELINE BENDS AS NECESSARY TO FACILITATE GRADE TRANSITION.
3. THE SIPHON ELEVATION MAY REQUIRE EITHER LOWERING OF THE CREST BY CONTRACTOR OR RAISING OF THE WATER BY OWNER. COORDINATE WITH OWNER.
4. INSTALL GEOMEMBRANE RUB SHEET BENEATH SIPHON RETURN PIPELINES.




2 - DETAIL: SIPHON END (TYP.)

0 2 4

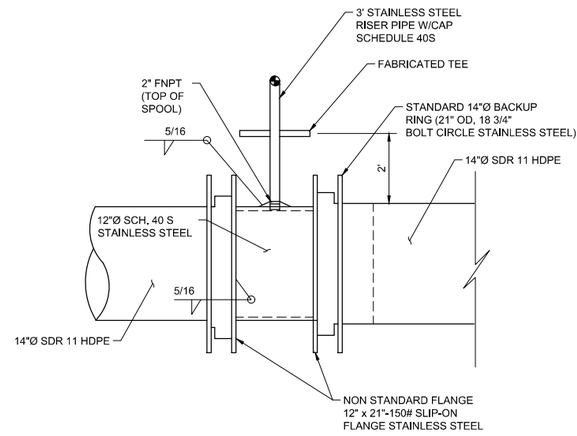
SCALE IN FEET




NOTE:

INSTALL THREE (12 TOTAL) OWNER SUPPLIED FLOATS ON EACH SIPHON PIPELINE. SPACE FLOATS RANDOMLY AS DIRECTED BY OWNER.

3 - DETAIL: FLOATS N.T.S.




4 C-21, - DETAIL: SPOOL N.T.S.

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Minnkota Power COOPERATIVE
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MINNKOTA FGD POND CELL 5 - PHASE 1B
CENTER, NORTH DAKOTA

RETURN PIPELINES SIPHON SECTION AND DETAILS

| | |
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| BARR PROJECT No. | 34331014.59 |
| CLIENT PROJECT No. | |
| DWG. No. | C-23 |
| REV. No. | 1 |


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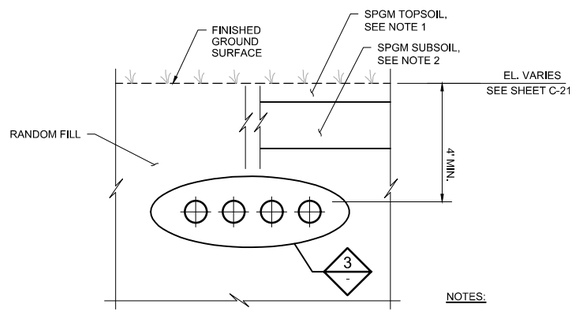
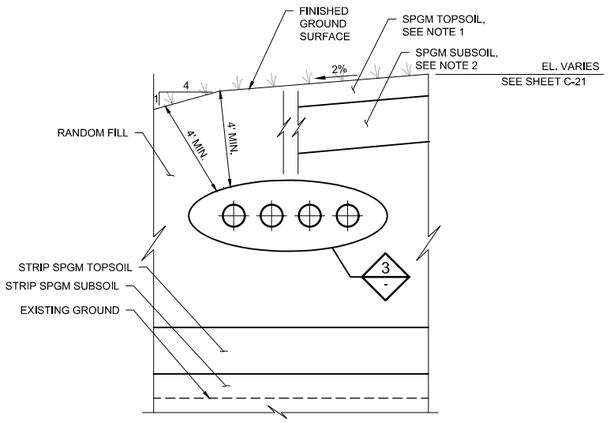


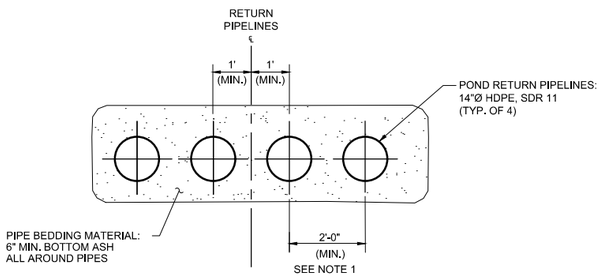

1 C-21 SECTION: RETURN PIPELINES
NOT TO SCALE

NOTES:

1. ON CELL EMBANKMENTS, SPGM TOPSOIL THICKNESS TO BE 1.0'. ELSEWHERE, SPGM TOPSOIL THICKNESS TO MATCH EXISTING REMOVAL THICKNESS.
2. ON CELL EMBANKMENTS, SPGM SUBSOIL THICKNESS TO BE 2.5'. ELSEWHERE, SPGM SUBSOIL THICKNESS TO MATCH EXISTING REMOVAL THICKNESS.



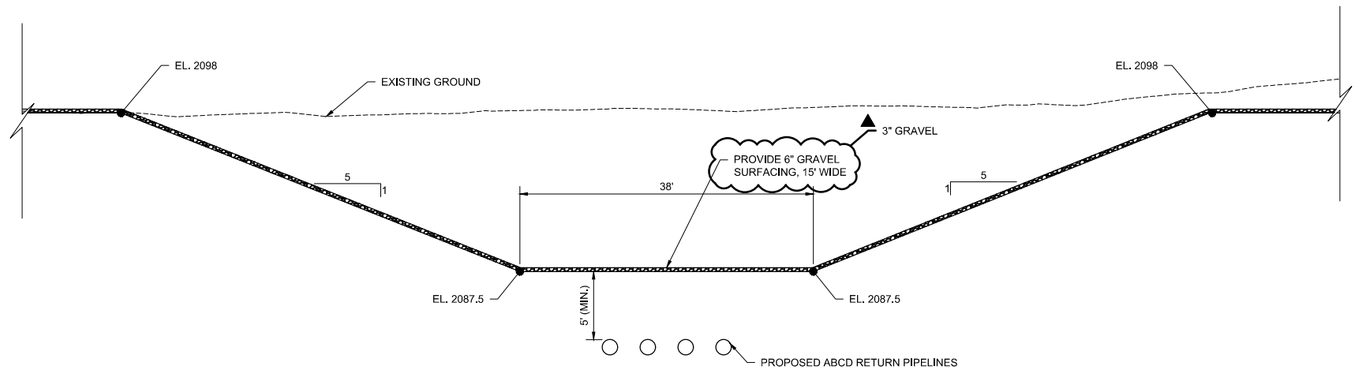

2 C-21 SECTION: RETURN PIPELINES IN FILL
NOT TO SCALE




NOTES:

1. SEE SPECIFICATION SECTION 31 23 00 FOR BEDDING AND COMPACTION REQUIREMENTS.

3 - DETAIL: RETURN/WATER SUPPLY PIPELINES
NOT TO SCALE




4 C-21 SECTION: PIPE COVER - RETURN LINES
NOT TO SCALE

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Minnkota Power COOPERATIVE
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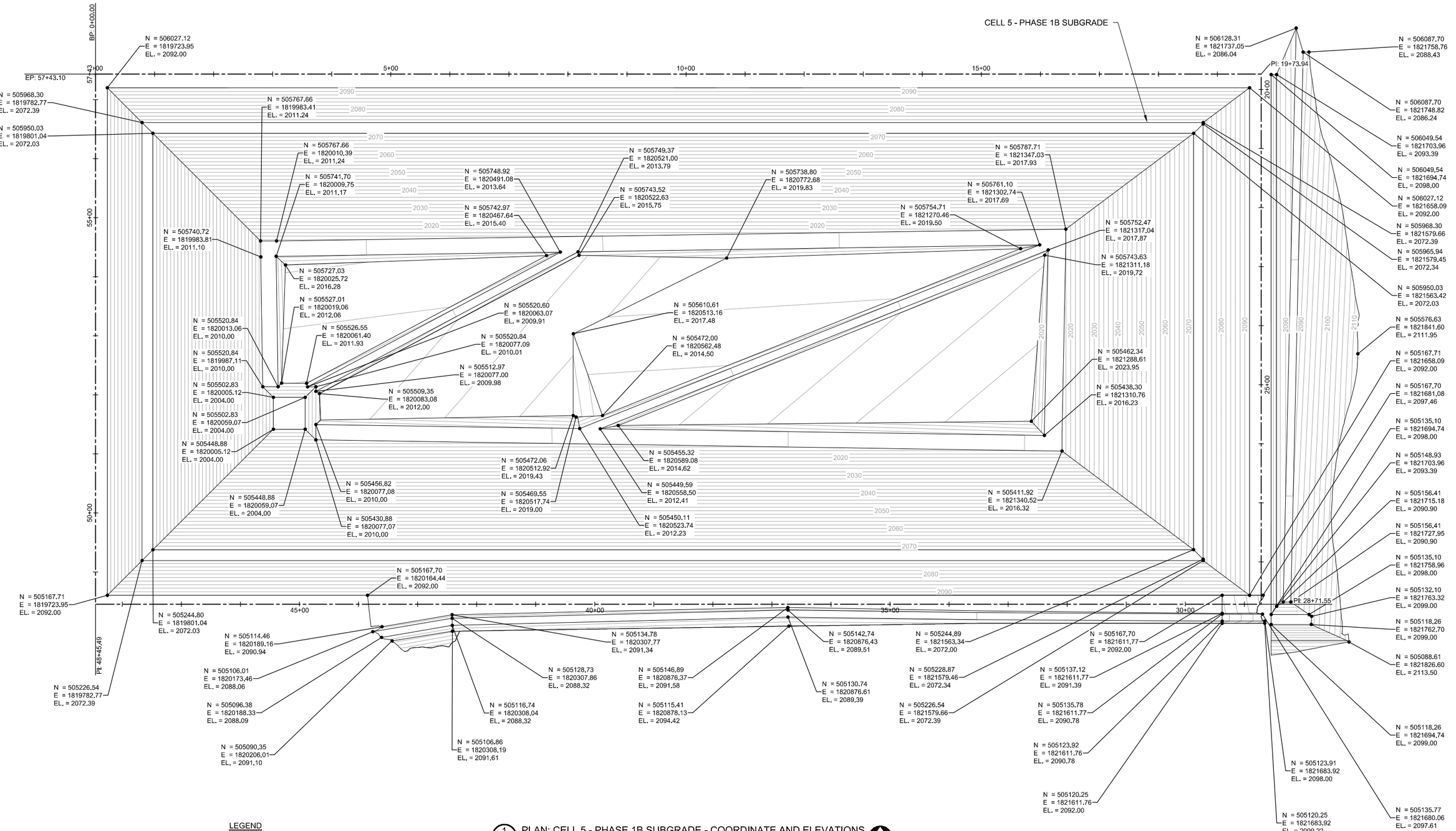
MINNKOTA FGD POND CELL 5 - PHASE 1B
CENTER, NORTH DAKOTA

RETURN PIPELINES
SECTION AND DETAILS

BARR PROJECT No. 34331014.59
CLIENT PROJECT No.
DWG. No. C-24
REV. No. 1

CADD USER: ANDERS W. TOLKKINEN FILE: M:\DESIGN\34331014.59\34331014.59_C-24.DWG PLOT SCALE: 1:2 PLOT DATE: 12/11/2023 11:30 AM




LEGEND

2000 — PROPOSED 10' MAJOR CONTOUR

PROPOSED 2' MINOR CONTOUR

BREAKLINE

BASELINE ALIGNMENT

1 - PLAN: CELL 5 - PHASE 1B SUBGRADE - COORDINATE AND ELEVATIONS

0 80 160

SCALE IN FEET

N

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NOTE:

1. PROPOSED CONTOURS REPRESENT TOP OF RANDOM FILL.

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MINNKOTA FGD POND CELL 5 - PHASE 1B
CENTER, NORTH DAKOTA

COORDINATE AND ELEVATIONS
SUBGRADE

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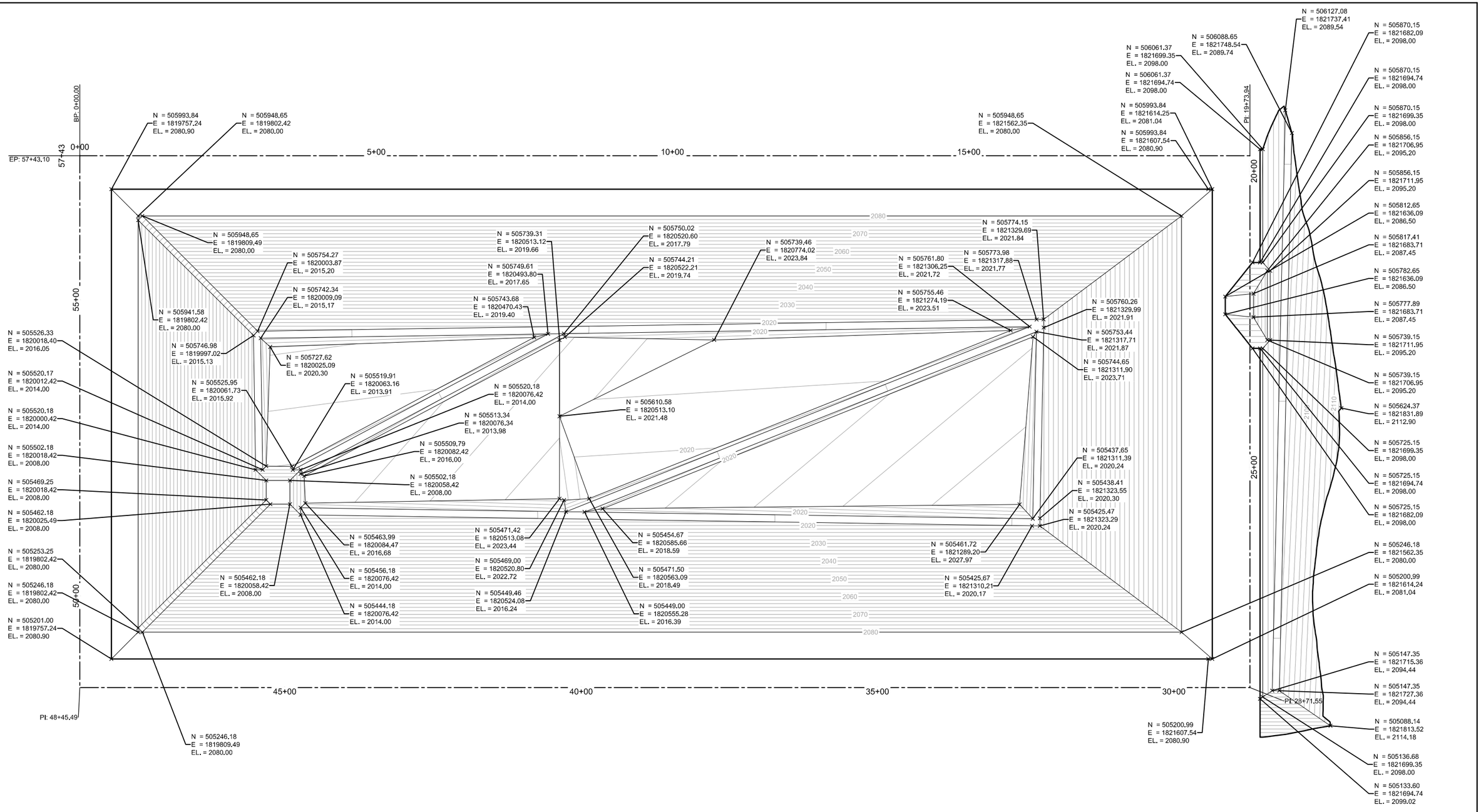
| REV. No. | 1 |




LEGEND

2000 — PROPOSED 10' MAJOR CONTOUR

PROPOSED 2' MINOR CONTOUR

BREAKLINE

BASELINE ALIGNMENT

1 — PLAN: CELL 5 - PHASE 1B TOP OF CLAY LINER AND FINISHED GROUND COORDINATE AND ELEVATIONS

0 80 160

SCALE IN FEET

NOTE:

1. CONTOURS INSIDE CELL 5 BELOW ELEVATION 2080 SHOW THE SELECT CLAY LINER SURFACE. OUTER EMBANKMENT SHOWS TOP OF FINISHED GROUND.

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MINNKOTA FGD POND CELL 5 - PHASE 1B
CENTER, NORTH DAKOTA

COORDINATE AND ELEVATIONS
TOP OF CLAY LINER AND FINISHED GROUND

| | |
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| BARR PROJECT No. | 34331014.59 |
| CLIENT PROJECT No. | |
| DWG. No. | C-26 |
| REV. No. | 1 |


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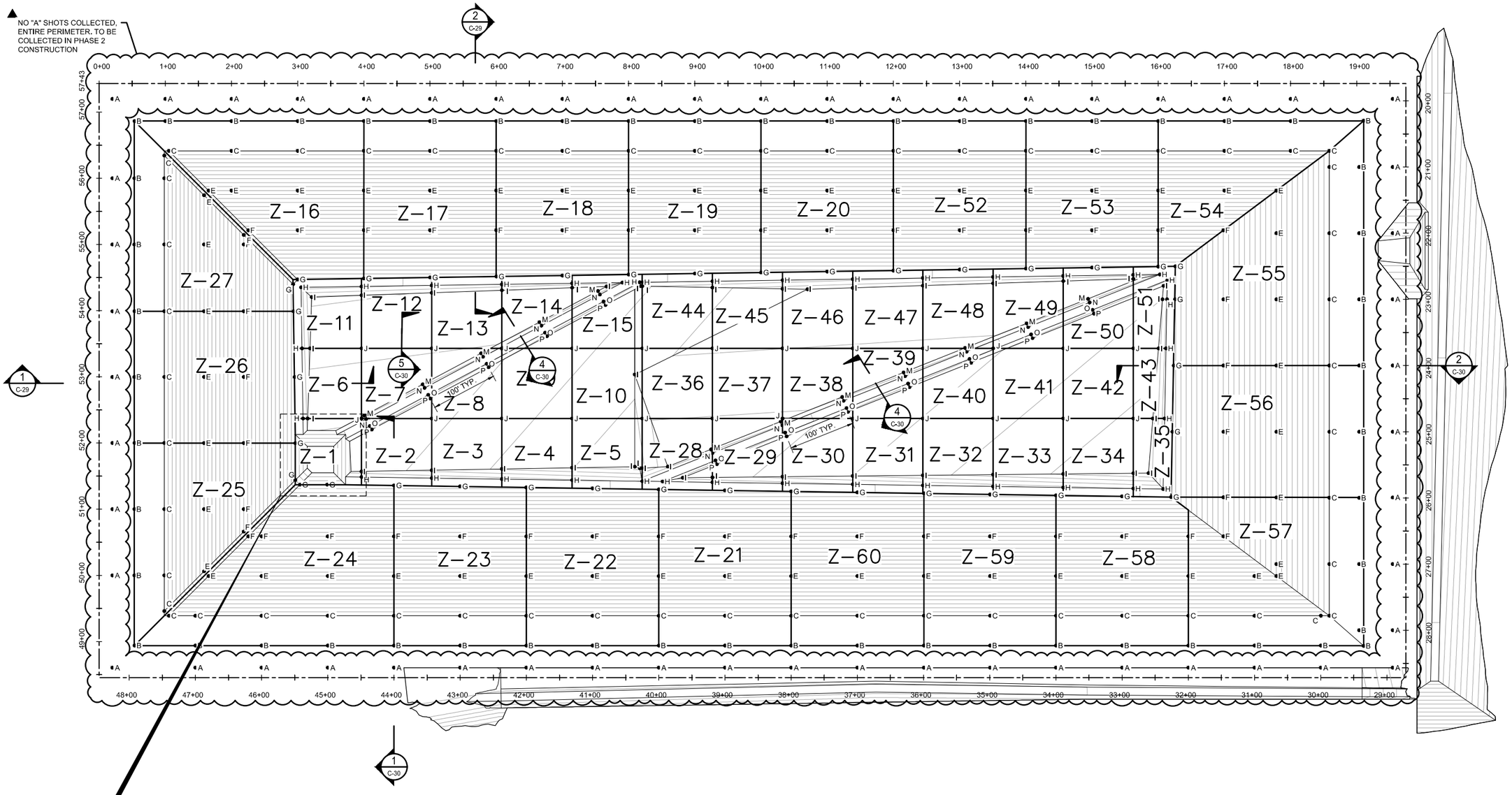
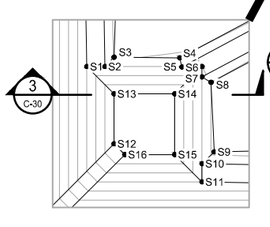
NO "A" SHOTS COLLECTED, ENTIRE PERIMETER. TO BE COLLECTED IN PHASE 2 CONSTRUCTION




1 - PLAN: LINER SURVEY VERIFICATION AND DENSITY TESTING GRID

0 80 160
SCALE IN FEET

N

LEGEND

| | |
|---|---|
| 2000 | PROPOSED 10' MAJOR CONTOUR |
| | PROPOSED 2' MINOR CONTOUR |
| | BREAKLINE |
| | SURVEY ZONE BOUNDARY |
| | BASELINE ALIGNMENT |
| | GEOMEMBRANE EXTENTS |
| ● A | SURVEY VERIFICATION SHOT |
| ● COR. X | CORNER NUMBER X |

NOTES:

1. CONTOURS SHOWN INSIDE OF GEOMEMBRANE LIMITS DEPICT FINAL SELECT CLAY SURFACE FOR PHASE 1B.
2. SET ALIGNMENT AND STATIONING AS SHOWN ABOVE.
3. DO NOT PLACE ANY LIFTS GREATER THAN 6 INCHES AFTER COMPACTION.
4. THE WORK AREA IN CELL 5 IS DIVIDED INTO 60 ZONES. OWNER WILL TEST CONTRACTOR'S WORK IN EACH ZONE. CONTRACTOR IS RESPONSIBLE FOR PASSING ALL TESTS AND WILL BE REQUIRED TO RE-WORK THE ZONES WHERE FAILED TESTS OCCUR. REFER TO THE TECHNICAL SPECIFICATIONS FOR TESTING THAT WILL TAKE PLACE IN EACH OF THE ZONES.
5. VERIFY ELEVATIONS AND MATERIAL THICKNESS AS CALLED OUT FOR ON THE PLANS AND SPECIFICATIONS. AT THE END OF EACH DAY AND THE END OF EACH PHASE OF CONSTRUCTION, THE CONTRACTOR IS REQUIRED TO SUBMIT DOCUMENTATION SHOWING ELEVATIONS AND MATERIAL THICKNESS AS DESCRIBED IN THE SPECIFICATIONS.

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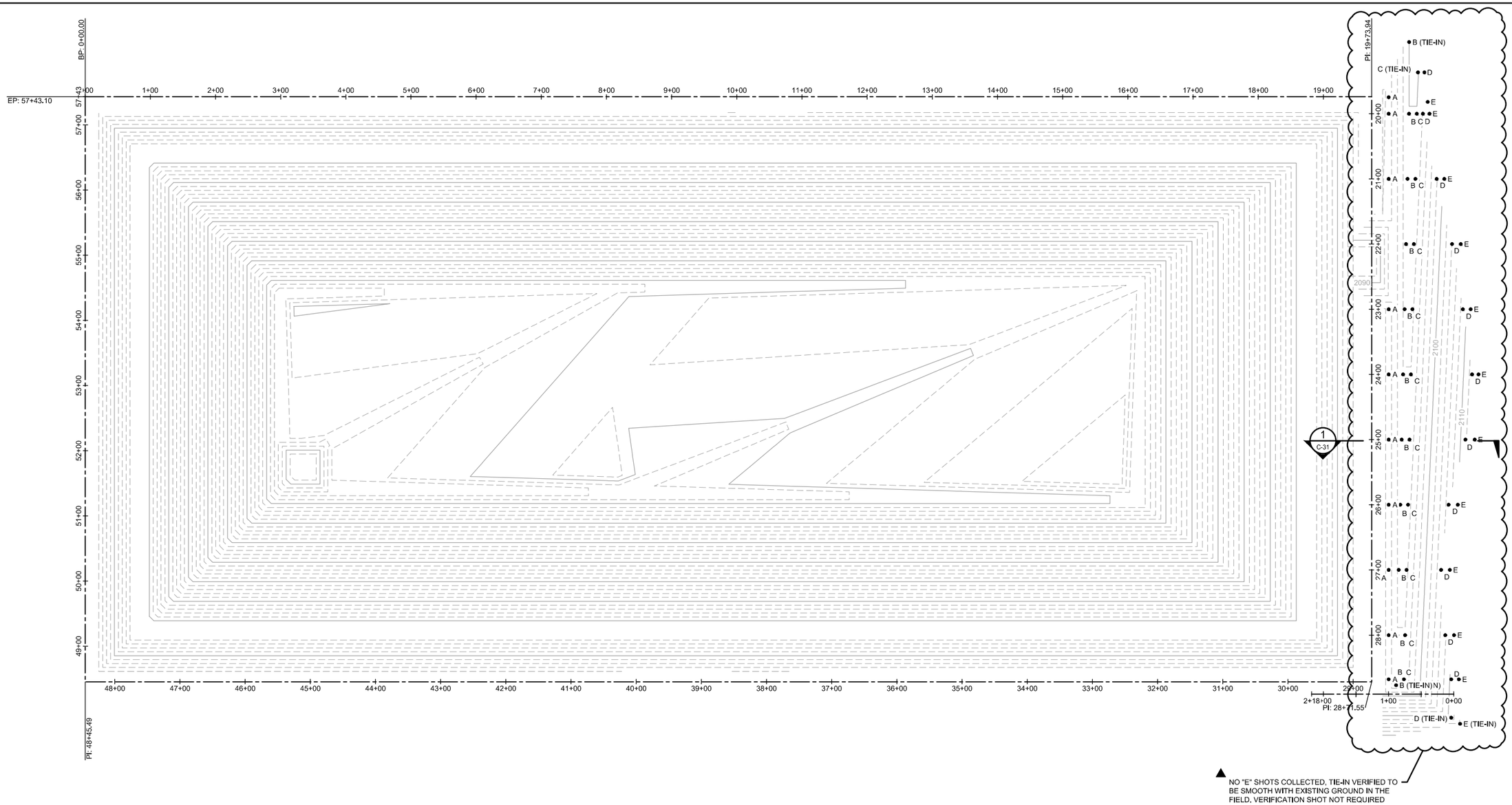
MINNKOTA FGD POND CELL 5 - PHASE 1B
CENTER, NORTH DAKOTA

SURVEY VERIFICATION AND DENSITY TESTING
CELL 5 LINER LIMITS

| | |
|---|---|
| BARR PROJECT No. | 34331014.59 |
| CLIENT PROJECT No. | |
| DWG. No. | C-27 |
| REV. No. | 1 |

CADD USER: ANDERS W. TOLKKINEN FILE: M:\DESIGN\34331014.59\34331014.59_C-27.DWG PLOT SCALE: 1:2 PLOT DATE: 12/11/2023 11:32 AM




LEGEND

- 2000 — PROPOSED 10' MAJOR CONTOUR
- PROPOSED 2' MINOR CONTOUR
- BASELINE ALIGNMENT
- ● A SURVEY VERIFICATION SHOT

1 - PLAN: CELL 5 - EMBANKMENT SURVEY VERIFICATION

0 80 160

SCALE IN FEET

N

NOTE:

1. PROPOSED CONTOURS REPRESENT TOP OF RANDOM FILL.

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MINNKOTA FGD POND CELL 5 - PHASE 1B
CENTER, NORTH DAKOTA

SURVEY VERIFICATION
EAST EMBANKMENT

| | |
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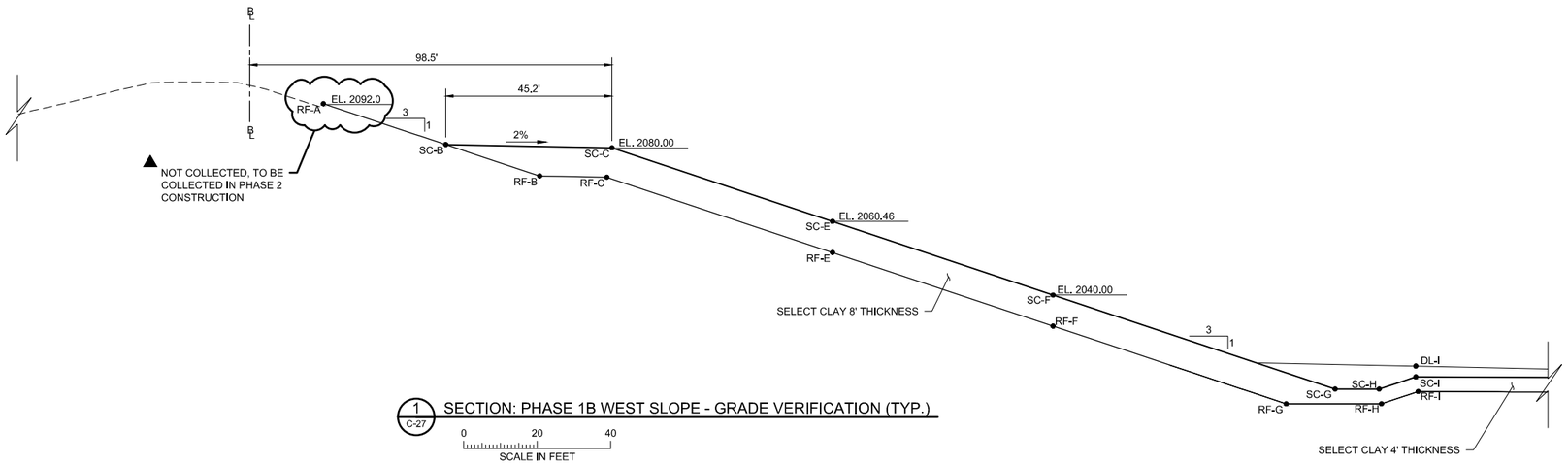
| BARR PROJECT No. | 34331014.59 |
| CLIENT PROJECT No. | |
| DWG. No. | C-28 |
| REV. No. | 1 |

CADD USER: AUSTIN W. KELLER FILE: M:\DESIGN\34331014.59\34331014.59_C-28.DWG PLOT SCALE: 1:2 PLOT DATE: 12/13/2023 2:22 PM




1 C-27 SECTION: PHASE 1B WEST SLOPE - GRADE VERIFICATION (TYP.)

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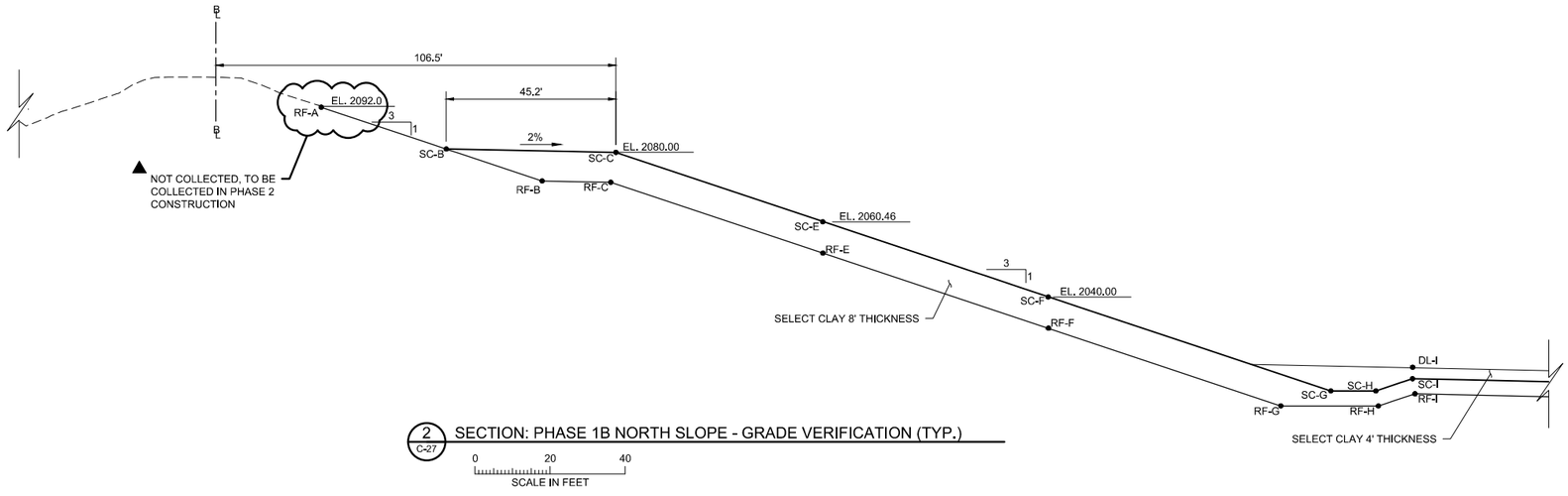
SCALE IN FEET




2 C-27 SECTION: PHASE 1B NORTH SLOPE - GRADE VERIFICATION (TYP.)

0 20 40
SCALE IN FEET

## ABBREVIATIONS

| | |
|---|---|
| RF-A | RANDOM FILL POINT A |
| T-RF-A | TOP OF RANDOM FILL POINT A |
| SC-A | SELECT CLAY POINT A |
| DL-A | DRAINAGE LAYER POINT A |
| B L | BASELINE |

## REQUIRED MINIMUM VERTICAL SPACING BETWEEN VERIFICATION POINTS

SECTION - WEST SLOPES

SELECT CLAY:
- RF-B → SC-B = 8.51'
- RF-C → SC-C = 7.97'
- RF-E,F → SC-E,F = 8.43'
- RF-G,H,I → SC-G,H,I = 4.00'

DRAINAGE LAYER:
- SC-I → DL-I = 1.50'

SECTION - NORTH SLOPE

SELECT CLAY:
- RF-B → SC-B = 8.51'
- RF-C → SC-C = 7.97'
- RF-E,F → SC-E,F = 8.43'
- RF-G,H,I → SC-G,H,I = 4.00'

DRAINAGE LAYER:
- SC-I → DL-I = 1.50'

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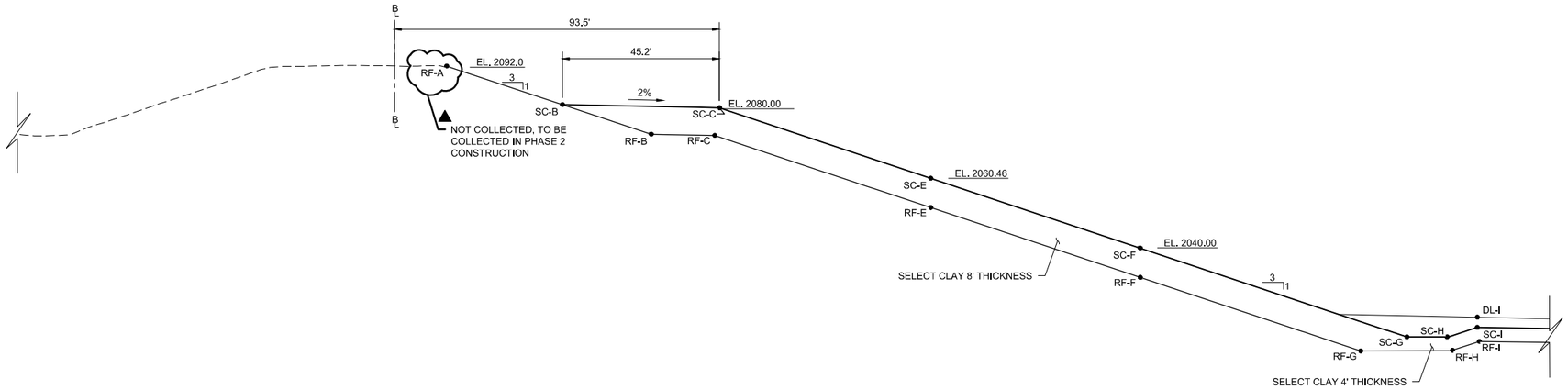
MINNKOTA FGD POND CELL 5 - PHASE 1B
CENTER, NORTH DAKOTA

SURVEY VERIFICATION SECTIONS

| | |
|---|---|
| BARR PROJECT No. | 34331014.59 |
| CLIENT PROJECT No. | |
| DWG. No. | C-29 |
| REV. No. | 1 |

CADD USER: ANDERS W. TOLKKINEN FILE: M:\DESIGN\34331014.59\34331014.59_C-29.DWG PLOT SCALE: 1:2 PLOT DATE: 12/11/2023 2:40 PM




1 C-27 SECTION: PHASE 1B SOUTH SLOPE - GRADE VERIFICATION (TYP.)

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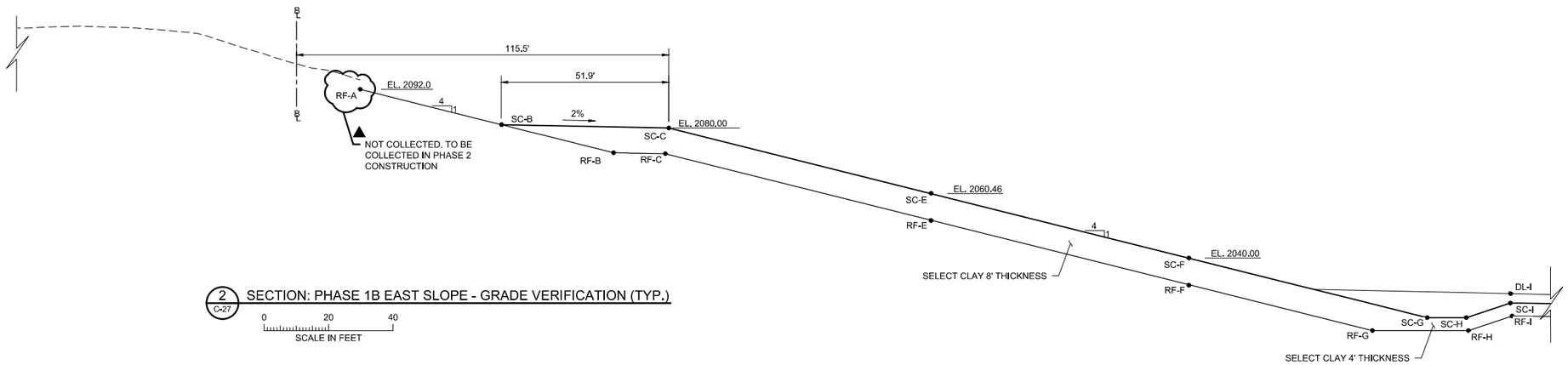


2 C-27 SECTION: PHASE 1B EAST SLOPE - GRADE VERIFICATION (TYP.)

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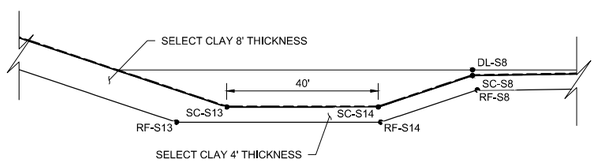
SCALE IN FEET




3 C-27 SECTION: PHASE 1B SUMP - GRADE VERIFICATION (TYP.)

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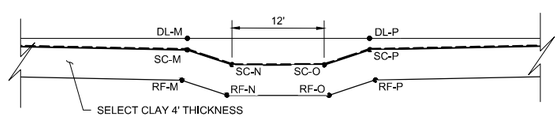


4 C-27 SECTION: PHASE 1B WEST BASE INTERIOR DRAINAGE DITCH - GRADE VERIFICATION (TYP.)

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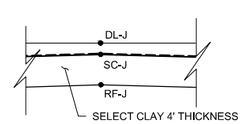
SCALE IN FEET




5 C-27 SECTION: PHASE 1B CELL 4 FLOOR - GRADE VERIFICATION (TYP.)

0 10 20
SCALE IN FEET

## ABBREVIATIONS

| | |
|---|---|
| RF-A | RANDOM FILL POINT A |
| T-RF-A | TOP OF RANDOM FILL POINT A |
| SC-A | SELECT CLAY POINT A |
| DL-A | DRAINAGE LAYER POINT A |
| B/L | BASELINE |

## REQUIRED MINIMUM VERTICAL SPACING BETWEEN VERIFICATION POINTS

SECTION - SOUTH SLOPE

SELECT CLAY:
- RF-B → SC-B = 8,51'
- RF-C → SC-C = 7,97'
- RF-E,F → SC-E,F = 8.43'
- RF-G,H,I → SC-G,H,I = 4.00'

DRAINAGE LAYER:
- SC-I → DL-I = 1.50'

SECTION - EAST SLOPE

SELECT CLAY:
- RF-B → SC-B = 8,70'
- RF-C → SC-C = 7.99'
- RF-E,F → SC-E,F = 8.25'
- RF-G,H,I → SC-G,H,I = 4.00'

DRAINAGE LAYER:
- SC-I → DL-I = 1.50'

SECTION - CELL SUMP

SELECT CLAY:
- RF-S# → SC-S# = 4.00'

DRAINAGE LAYER:
- SC-S8 → DL-S8 = 1.50"

SECTION - WEST BASE INTERIOR DRAINAGE DITCH

SELECT CLAY:
- RF-M,N,O,P → SC-M,N,O,P = 4.00'

DRAINAGE LAYER:
- SC-M,P → DL-M,P = 1.50'

SECTION - CELL FLOOR

SELECT CLAY:
- RF-J → SC-J = 4.01'

DRAINAGE LAYER:
- SC-J → DL-J = 1.50'

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MINNKOTA FGD POND CELL 5 - PHASE 1B
CENTER, NORTH DAKOTA

SURVEY VERIFICATION SECTIONS

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|---|---|
| BARR PROJECT No. | 34331014.59 |
| CLIENT PROJECT No. | |
| DWG. No. | C-30 |
| REV. No. | 1 |

CADD USER: ANDERS W. TOLKKINEN FILE: M:\DESIGN\34331014.59\34331014.59_C-30.DWG PLOT SCALE: 1:2 PLOT DATE: 12/11/2023 2:42 PM

## ABBREVIATIONS

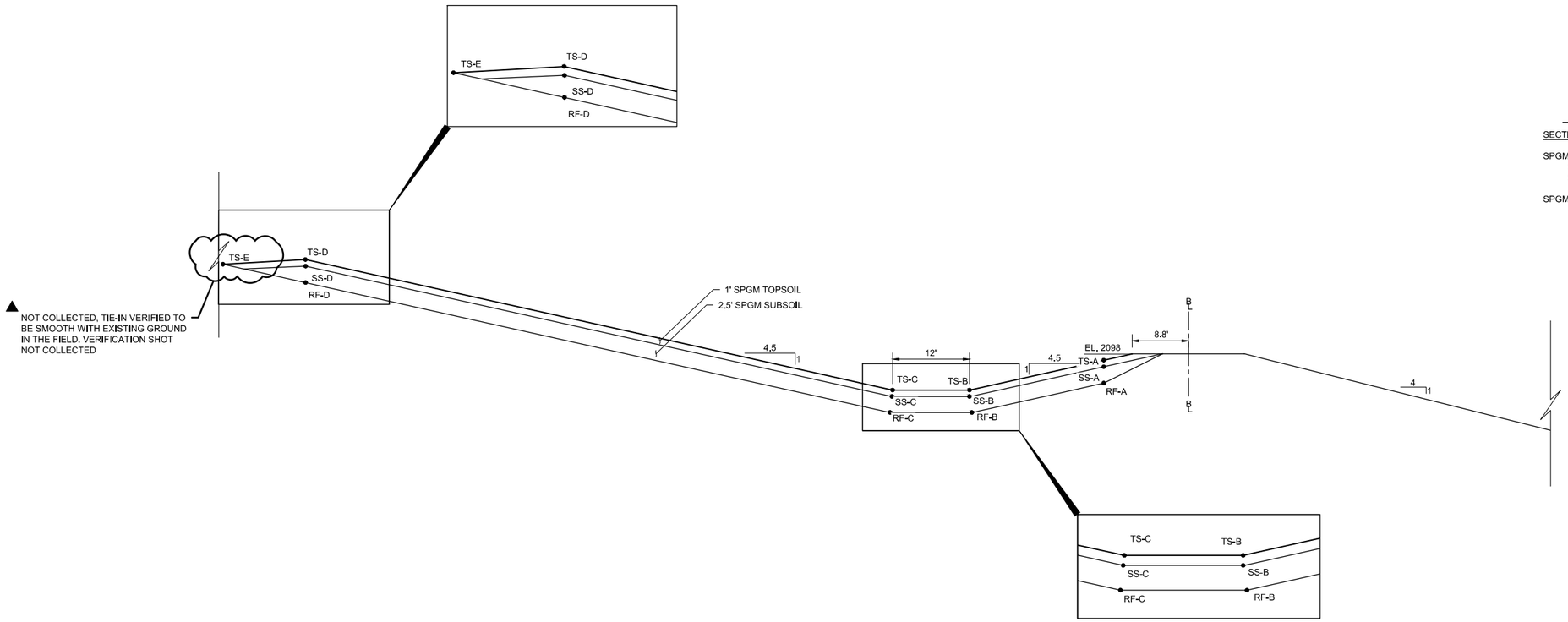
| | |
|---|---|
| RF-A | RANDOM FILL POINT A |
| TS-A | TOPSOIL POINT A |
| SS-A | SUBSOIL POINT A |
| ℄ | BASELINE |

## REQUIRED MINIMUM VERTICAL SPACING BETWEEN VERIFICATION POINTS

SECTION - WEST EMBANKMENT FILL

SPGM TOPSOIL:
SS-A,D → TS-A,D = 1.02'
SS-B,C → TS-B,C = 1.00'

SPGM SUBSOIL:
RF-A,D → SS-A,D = 2.56'
RF-B,C → SS-B,C = 2.50'




1 / C-28 SECTION: PHASE 1B EAST EMBANKMENT - GRADE VERIFICATION (TYP.)

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MINNKOTA FGD POND CELL 5 - PHASE 1B
CENTER, NORTH DAKOTA

SURVEY VERIFICATION
EMBANKMENT SECTION

| BARR PROJECT No. | |
|---|---|
| 34331014.59 | |
| CLIENT PROJECT No. | |
| DWG. No. | REV. No. |
| C-31 | 1 |


CADD USER: ANDERS W. TOLKKINEN FILE: M:\DESIGN\34331014.59\34331014.59_C-31.DWG PLOT SCALE: 1:2 PLOT DATE: 12/11/2023 11:45 AM

# Appendix B

## Construction Photographs

**6/18/22: Cell 5 excavation.**

**6/21/22: Geoserv performing nuclear moisture/density test on material used in the embankment.**

**7/6/22: Cell 5 excavation and embankment construction.**

**7/12/22: Tractor with disc processing random fill prior to placement.**

**7/19/22: Cell 5 west embankment construction.**

**7/19/22: Cell 5 excavation.**

**8/10/22: Cell 5 exposed lignite coal (hagel bed), western half.**

**10/12/22: Cell 5 excavation below hagel bed, western half.**

**10/13/22: Select clay material being stockpiled south of Cell 5 for use in Phase IB.**

**10/19/22: Cell 5 excavation, western half.**

**4/26/23: Resumed Cell 5 excavation, western half.**

**4/27/23: Cell 5 clay subgrade, western half.**

**5/1/23: Sheepsfoot compacting clay liner in the Cell 5 floor sump.**

**5/3/23: 14" HDPE pipe fused for pond return lines.**

**5/10/23: Baranko utilizing clay from select clay stockpile to build sidewalls.**

**5/10/23: Placed select clay on Cell 5 western half sidewalls.**

**5/16/23: Cell 5 excavation, eastern half.**

**5/19/23: Hagel bed exposed in Cell 5, eastern half.**

**5/19/23: Coconut liner placement on the west embankment exterior of Cell 5.**

**5/23/23: Excavation along the western slope for hagel gradient control riser pipe.**

**5/26/23: Installation of hagel gradient control pipe, Cell 5 south embankment.**

**5/26/23: BNI removing hagel bed from Cell 5, eastern half.**

**6/6/23: Hagel bed removal, Cell 5 eastern half.**

**6/12/23: In-place select clay processing in Cell 5 eastern half, for placement on western sidewalls.**

**6/12/23: Clay placement in the southeast half of the west floor.**

**6/21/23: In place select clay processing in Cell 5 eastern half, for placement on western sidewalls.**

**6/26/23: Sheepsfoot compacting placed select clay liner, Cell 5 western sidewalls.**

**6/28/23: Placed select clay liner, Cell 5 western sidewalls.**

**7/6/23: Waste rock removal, Cell 5 eastern half.**

**7/10/23: Dozer cutting placed select clay liner to grade, Cell 5 western sidewalls.**

**7/18/23: Excavator digging geomembrane anchor trench in the Cell 5, western sidewalls.**

**7/20/23: 60-mil Geomembrane liner deployment, Cell 5 western half.**

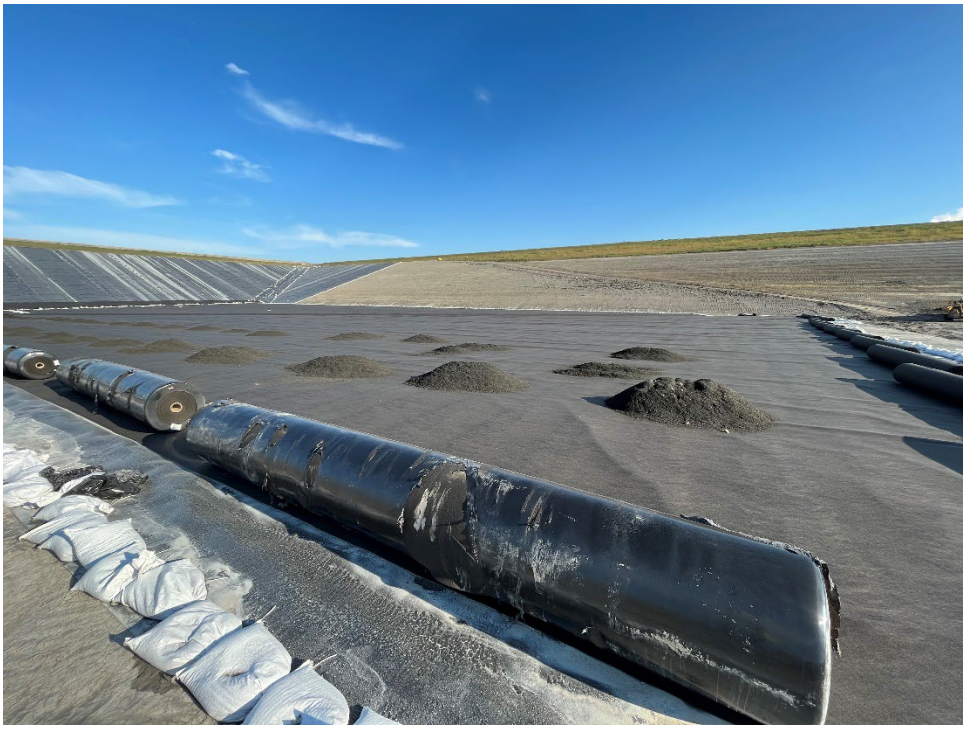
**7/21/23: Destructive sample marked for removal by ECA.**

**7/24/23: ECA trial completing trial welds with hot-wedge welder.**

**7/26/23: ECA vacuum testing extrusion weld.**

**7/27/23: Rub sheet placed in the southwest corner.**

**7/31/23: Sidewall select clay liner placement, Cell 5 eastern half.**



**8/1/23: Protective geotextile deployed over 60-mil geomembrane, Cell 5 western floor.**

**8/3/23: Braun nuclear moisture/density testing placed select clay liner, Cell 5 eastern sidewall.**

**8/8/23: Bottom ash screening for use as drainage layer material.**

**8/11/23: Select clay liner placement eastern sidewalls.**

**8/15/23: Sheepsfoot compacting placed select clay liner, Cell 5 western sidewall.**

**8/21/23: Cell 5 overall progress.**

**8/27/23: Excavator digging drainage ditch in the east floor.**

**8/30/23: Braun collecting screened bottom ash for testing.**

**8/30/23: Dewatering structure construction.**

**9/1/23: Concrete encasement around the dewatering structure sidewall riser pipes.**

**9/6/23: Placed select clay liner, Cell 5 eastern floor.**

**9/12/23: Extrusion welded cap over "Tee" intersection of hot-wedge welds.**

**9/13/23: 60-mil geomembrane deployment along the northern sidewall, eastern half.**

**9/14/23: Installation of drainage collection pipe laterals, eastern floor.**

**9/18/23: 60-mil geomembrane deployment along the eastern sidewall.**

**9/20/23: Compacting backfilled geomembrane anchor trench.**

**9/22/23: Drainage layer placement over western floor and drainage aggregate placement in the floor sump.**

**9/28/23: ECA using utility torch to fuse geotextile, eastern floor.**

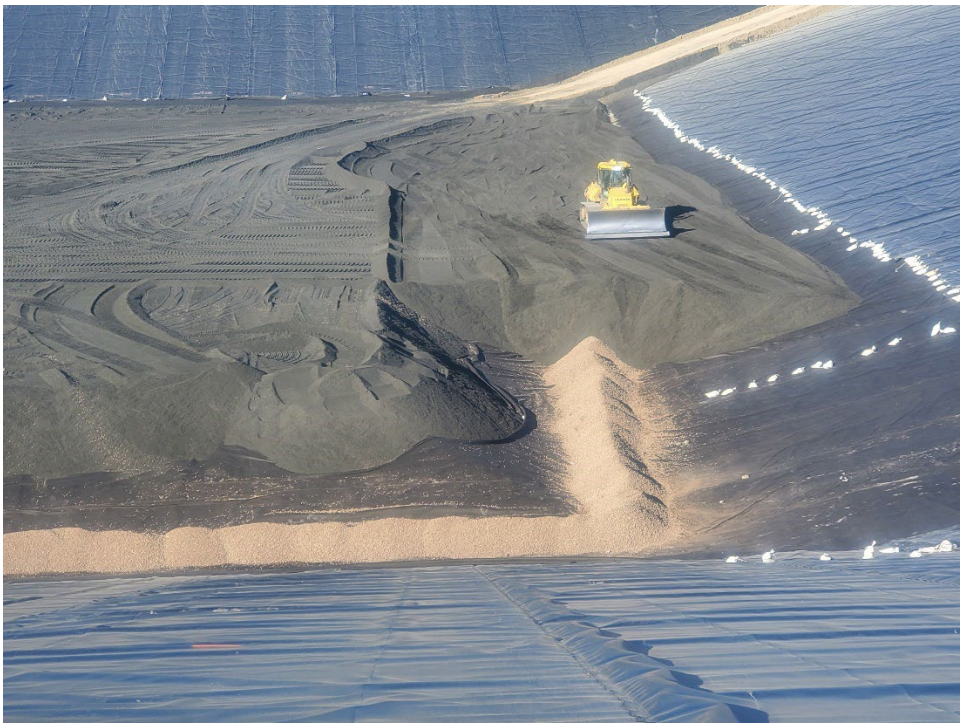
**9/30/23: ECA conducting air pressure tests of wedge welds.**

**9/30/23: Cell 5 geomembrane and geotextile progress on the eastern floor.**

**10/4/23: Detail repair work on deployed 60-mil geomembrane liner.**

**10/6/23: ECA placing ballast UV resistent sandbags on completed 60-mil geomembrane liner.**

**10/10/23: 60-mil geomembrane deployment on the southern sidewall.**



**10/20/23: Drainage layer material and drainage aggregate being spread over drainage collection pipe laterals in the eastern floor.**

**10/21/23: Rub sheet placed on the eastern slope for pond return lines.**

**10/23/23: Blowdown pipes placed in the northwest corner.**

**10/24/23: Drainage layer material being spread over deployed geomembrane liner on the Cell 5 floor.**

**11/17/23: Pond return lines in place on the eastern sidewall.**

**11/17/23: Pond return lines installation.**

# Appendix C

## Random Fill

### Random Fill Material Tests
### Random Fill Field Test Results

# Random Fill Material Tests

# Minnkota FGD Pond - Cell 5, Phase 1A

Sample Number 1

Reported To Baranko Bros. Inc.

Job No. GEO-062205 Date 6/12/2022

Location Center, ND

Copies To Minnkota Power Coop

Barr Engineering Co

Source of Material Sta 41 (south) & Sta 51 (west)

Description of Material (ASTM: D 2488 - Visual) Fat Clay, brown (CH) 0% +#4

Test Methods ASTM D698-12(2021) Method A

ASTM: D2216-19, ASTM: D4318-17e1

ASTM: D1140-17

TEST RESULTS

| | |
|---|---|
| Moisture Content As Received | 37.9% |
| Maximum Dry Density | 94.8 PCF |
| Optimum Water Content | 26.5% |
| Preperation Method | Moist |
| Rammer Type | Manual |

ATTERBERG LIMITS

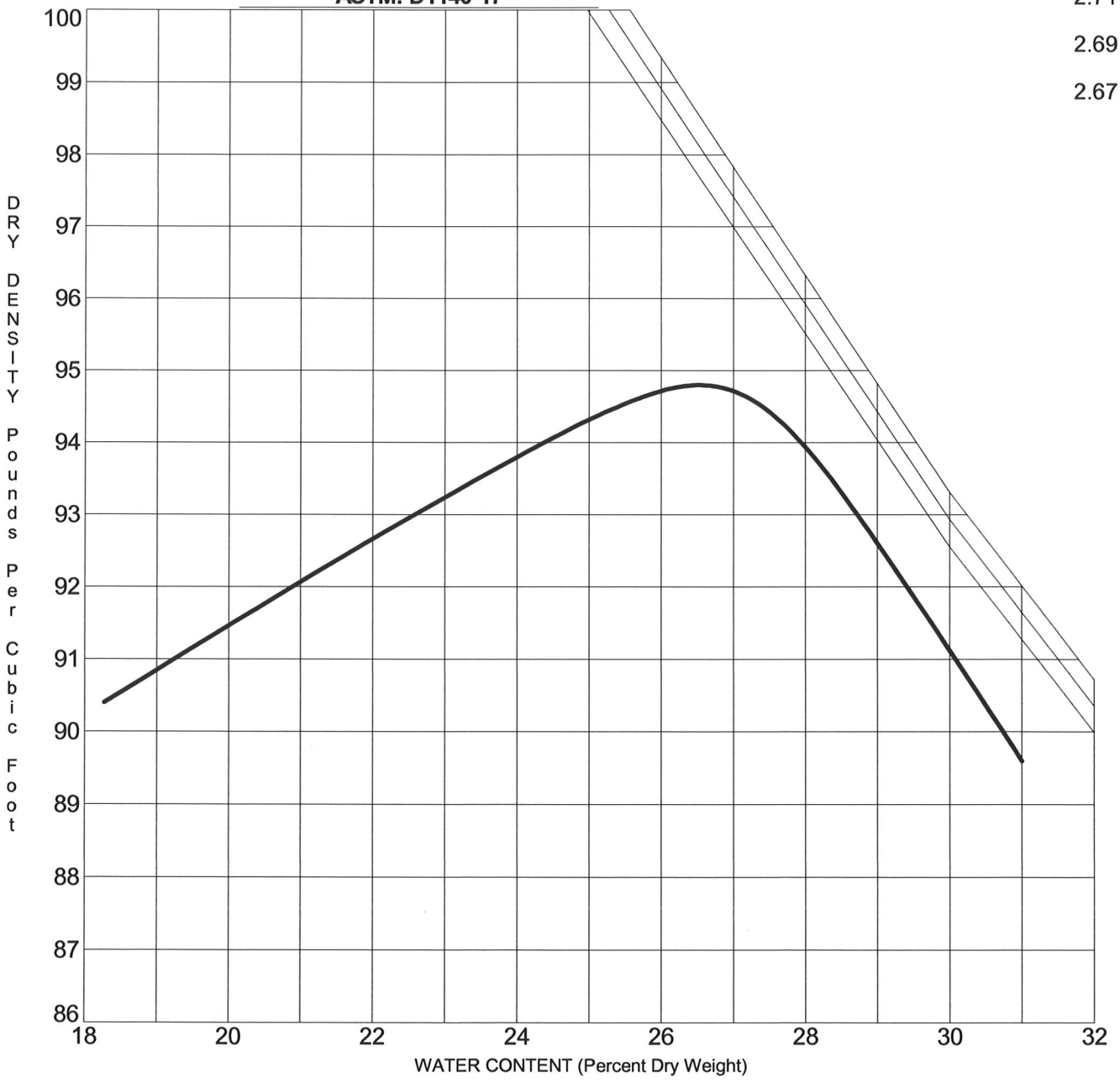
| LL | PL | PI |
|---|---|---|
| | | |

CURVES OF 100% SATURATION FOR SPECIFIC GRAVITY EQUAL TO:

2.71

2.69

2.67




## LABORATORY COMPACTION CHARACTERISTICS OF SOIL


*GEOSERV, INC. Testing - Exploration - Engineering*

3100 East Broadway Avenue, Bismarck, ND 58501

# Minnkota FGD Pond - Cell 5, Phase 1A

Sample Number 2

Reported To Baranko Bros. Inc.

Job No. GEO-062205 Date 6/12/2022

Location Center, ND

Copies To Minnkota Power Coop

Barr Engineering Co

Source of Material Sta 46 (south) & Sta 53 (west)

Description of Material (ASTM: D 2488 - Visual) Silty Sand, trace of sandstone, brown (SM) 6% +#4

Test Methods ASTM D698-12(2021) Method A

ASTM: D2216-19

ASTM: D4318-17e1

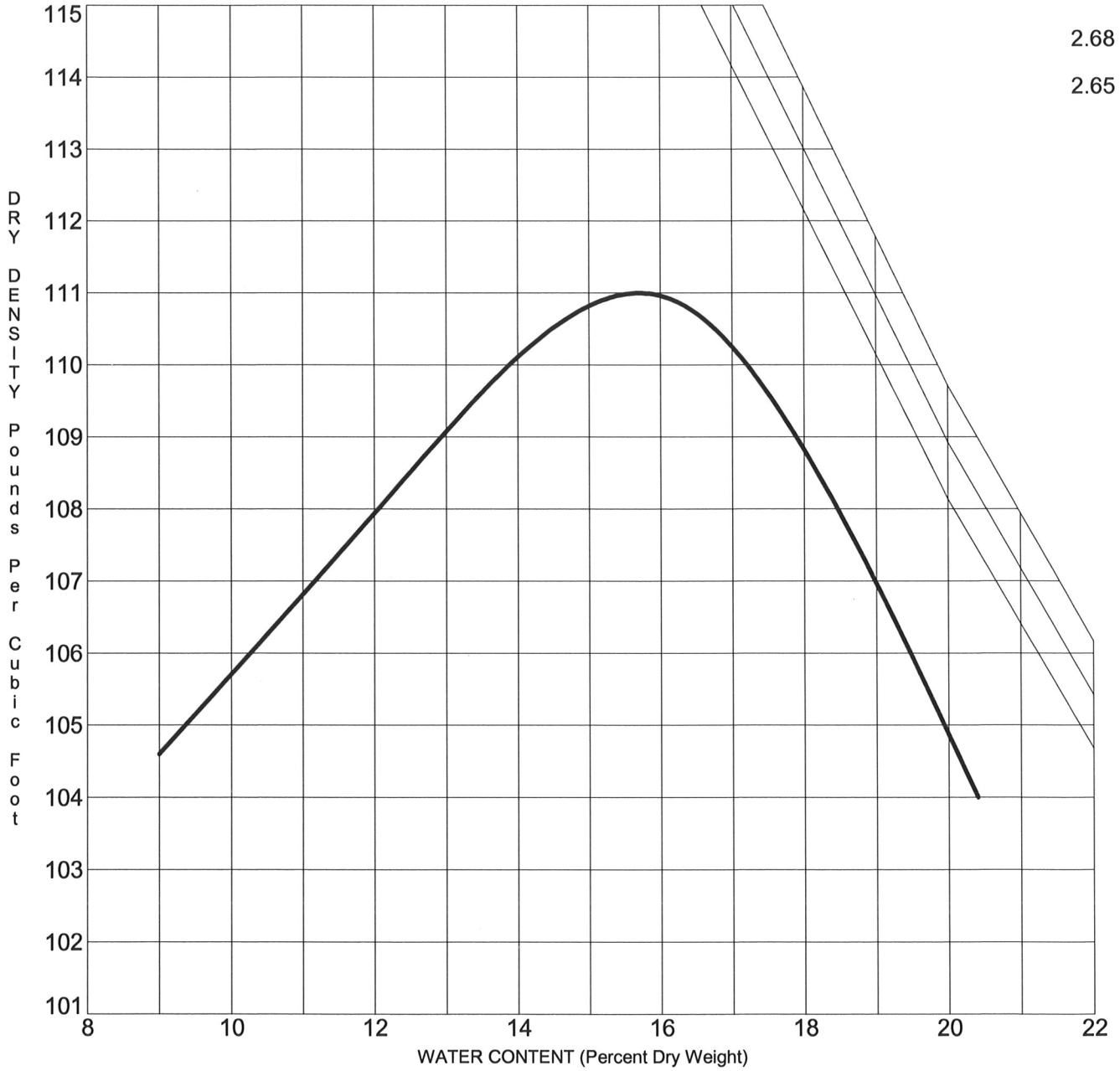
TEST RESULTS

| | |
|---|---|
| Moisture Content As Received | 6.6% |
| Maximum Dry Density | 111.0 PCF |
| Optimum Water Content | 15.7 % |
| Preperation Method | Moist |
| Rammer Type | Manual |

ATTERBERG LIMITS

| LL | PL | PI |
|---|---|---|
| | | |

CURVES OF 100% SATURATION FOR SPECIFIC GRAVITY EQUAL TO: 2.71, 2.68, 2.65




## LABORATORY COMPACTION CHARACTERISTICS OF SOIL

*GEOSERV, INC. Testing - Exploration - Engineering*
3100 East Broadway Avenue, Bismarck, ND 58501

# Minnkota FGD Pond - Cell 5, Phase 1A

Sample Number 3

Reported To Baranko Bros. Inc.

Job No. GEO-062205 Date 6/12/2022

Location Center, ND

Copies To Minnkota Power Coop

Barr Engineering Co

Source of Material Sta 44 (south) & Sta 50 (west)

Description of Material (ASTM: D 2488 - Visual) Silty Sand, brown (SM) 0% +#4

Test Methods ASTM D698-12(2021) Method A

ASTM: D2216-19

ASTM: D4318-17e1

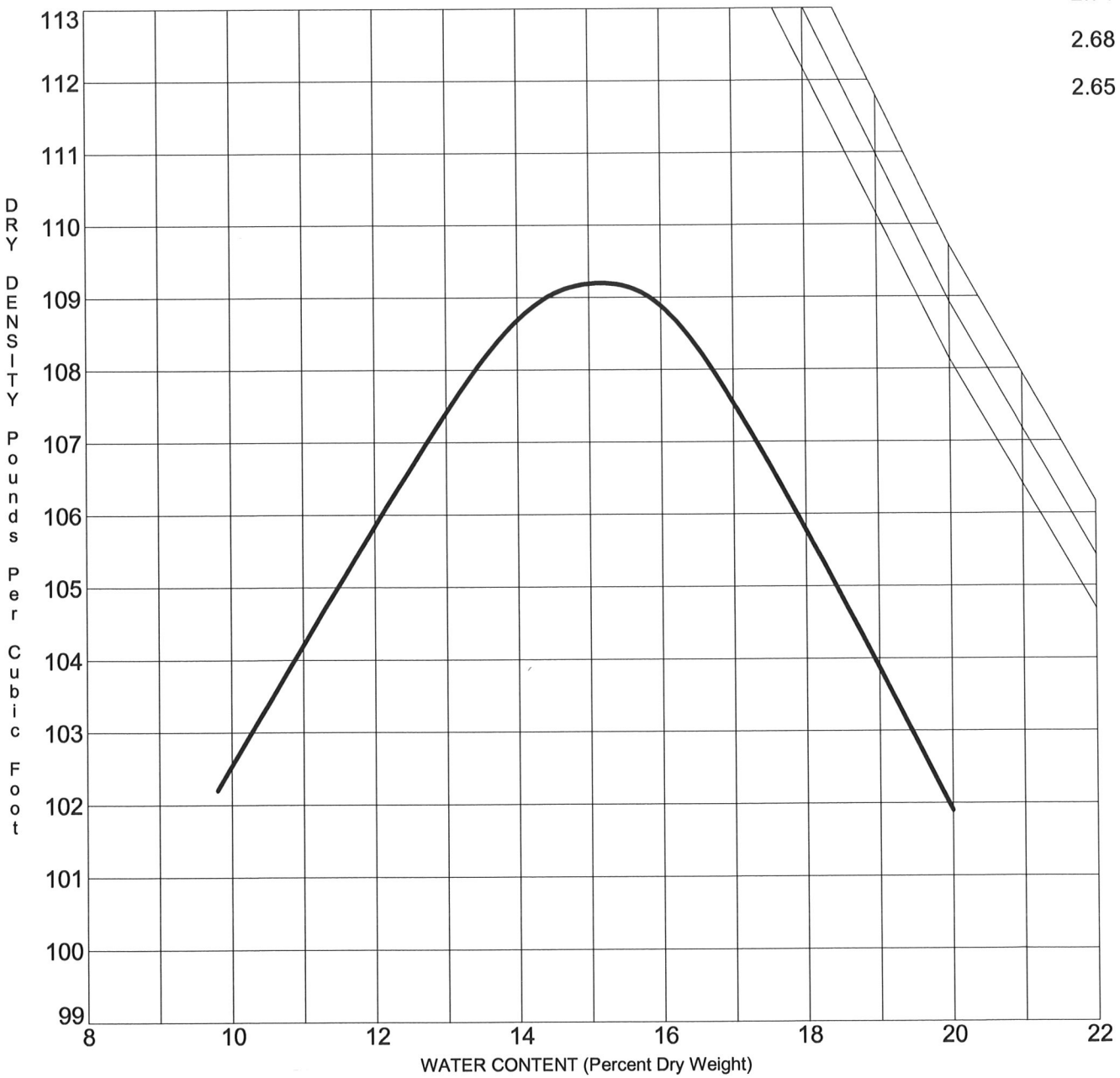
TEST RESULTS

| | |
|---|---|
| Moisture Content As Received | 7.0% |
| Maximum Dry Density | 109.2 PCF |
| Optimum Water Content | 15.1% |
| Preperation Method | Moist |
| Rammer Type | Manual |

ATTERBERG LIMITS

| LL | PL | PI |
|---|---|---|
| | | |

CURVES OF 100% SATURATION FOR SPECIFIC GRAVITY EQUAL TO: 2.71, 2.68, 2.65




## LABORATORY COMPACTION CHARACTERISTICS OF SOIL

*GEOSERV, INC.* ***Testing - Exploration - Engineering***

3100 East Broadway Avenue, Bismarck, ND 58501

# Minnkota FGD Pond - Cell 5, Phase 1A

Sample Number 4

Reported To Baranko Bros. Inc.

Job No. GEO-062205 Date 6/17/2022

Location Center, ND

Copies To Minnkota Power Coop

Barr Engineering Co

Source of Material Borrow Area

Description of Material (ASTM: D 2488 - Visual) Clayey Sand, trace of gravel, brown (SC) 3% +#4

Test Methods ASTM D698-12(2021) Method A

ASTM: D2216-19

ASTM: D4318-17e1

TEST RESULTS

| | |
|---|---|
| Moisture Content As Received | 17.1% |
| Maximum Dry Density | 106.2 PCF |
| Optimum Water Content | 19.1% |
| Preperation Method | Moist |
| Rammer Type | Manual |

ATTERBERG LIMITS

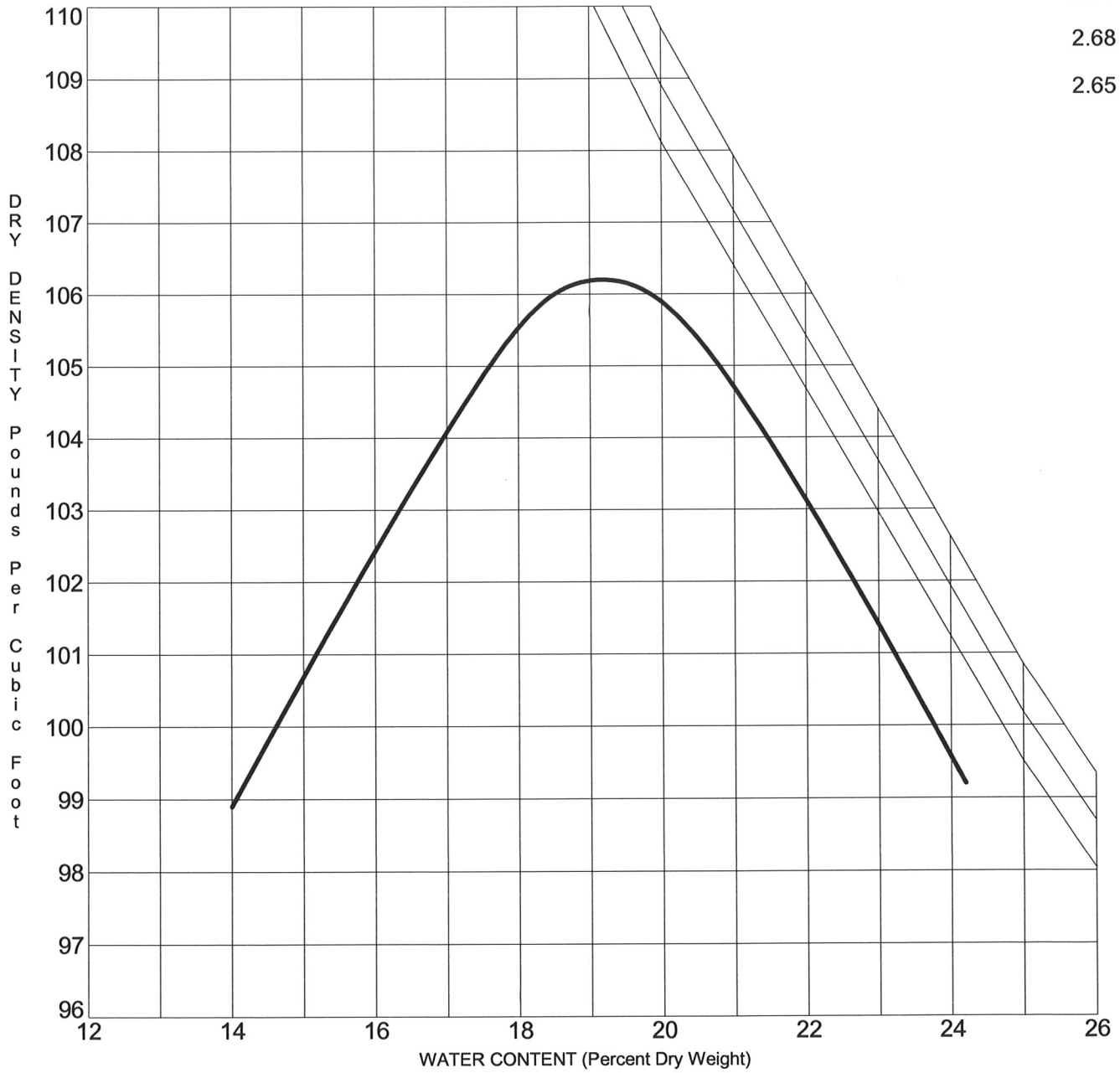
| LL | PL | PI |
|---|---|---|
| | | |

CURVES OF 100% SATURATION FOR SPECIFIC GRAVITY EQUAL TO:

2.71

2.68

2.65




## LABORATORY COMPACTION CHARACTERISTICS OF SOIL

*GEOSERV, INC.* *Testing - Exploration - Engineering*

3100 East Broadway Avenue, Bismarck, ND 58501

# Minnkota FGD Pond - Cell 5, Phase 1A

Sample Number 5

Reported To Baranko Bros. Inc.

Job No. GEO-062205 Date 6/27/2022

Location Center, ND

Copies To Minnkota Power Coop

Barr Engineering Co

Source of Material Borrow Area

Description of Material (ASTM: D 2488 - Visual) Clayey Sand, trace of gravel, brown (SC) 1% +#4

Test Methods ASTM D698-12(2021) Method A

ASTM: D2216-19

ASTM: D4318-17e1

TEST RESULTS

| | |
|---|---|
| Moisture Content As Received | 18.7% |
| Maximum Dry Density | 107.2 PCF |
| Optimum Water Content | 18.9% |
| Preperation Method | Moist |
| Rammer Type | Manual |

ATTERBERG LIMITS

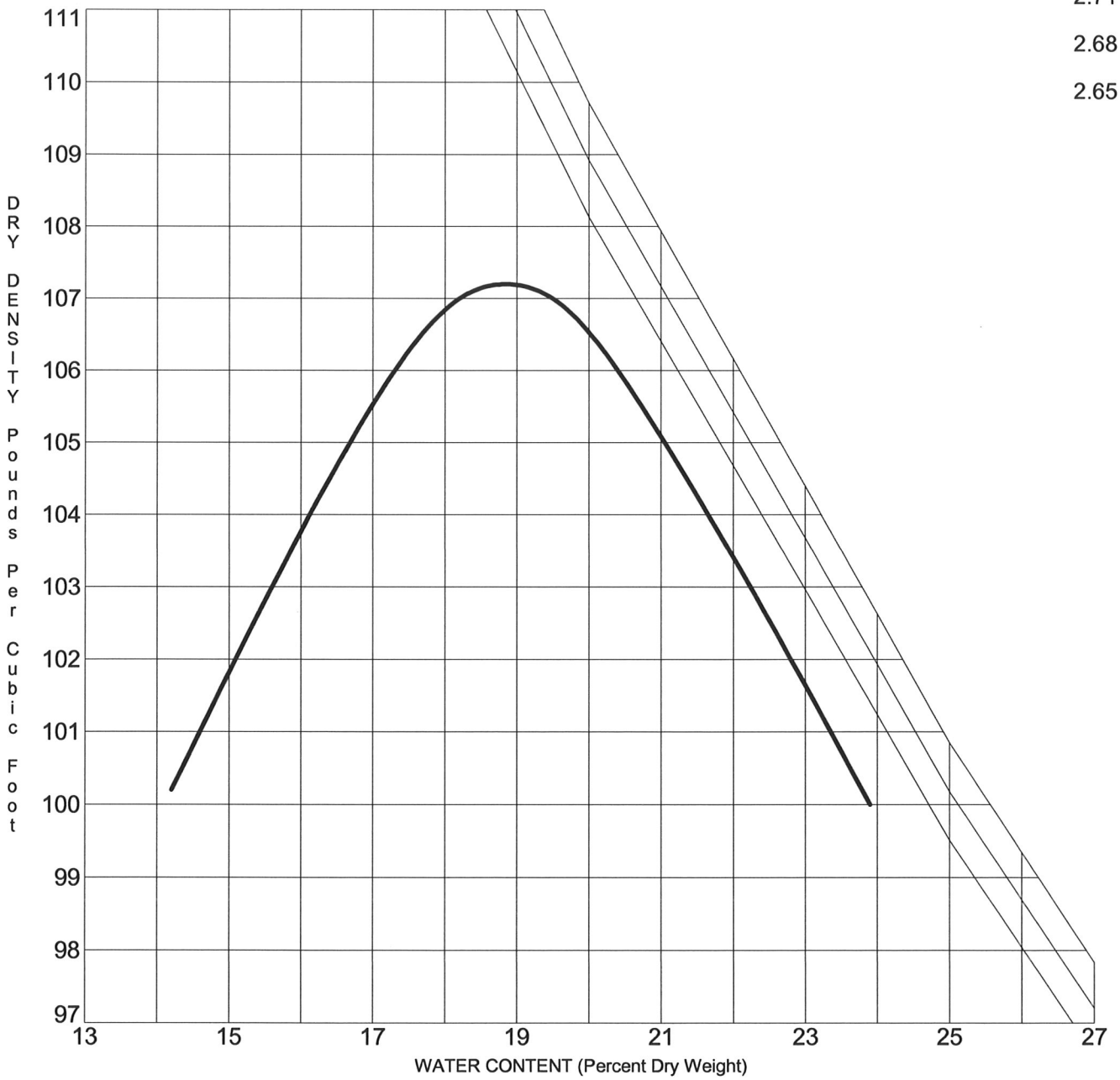
| LL | PL | PI |
|---|---|---|
| | | |

CURVES OF 100% SATURATION FOR SPECIFIC GRAVITY EQUAL TO:

2.71

2.68

2.65




## LABORATORY COMPACTION CHARACTERISTICS OF SOIL

*GEOSERV, INC.* *Testing - Exploration - Engineering*

3100 East Broadway Avenue, Bismarck, ND 58501

# Minnkota FGD Pond - Cell 5, Phase 1A

Sample Number 6

Reported To Baranko Bros. Inc.

Job No. GEO-062205 Date 7/1/2022

Location Center, ND

Copies To Minnkota Power Coop

Barr Engineering Co

Source of Material Borrow Area

Description of Material (ASTM: D 2488 - Visual) Lean Clay, trace of gravel, brown (CL) 1% +#4

Test Methods ASTM D698-12(2021) Method A
ASTM: D2216-19, ASTM: D4318-17e1
ASTM: D1140-17

TEST RESULTS

| | |
|---|---|
| Moisture Content As Received | 17.5% |
| Maximum Dry Density | 105.8 PCF |
| Optimum Water Content | 20.0% |
| Preperation Method | Moist |
| Rammer Type | Manual |

ATTERBERG LIMITS

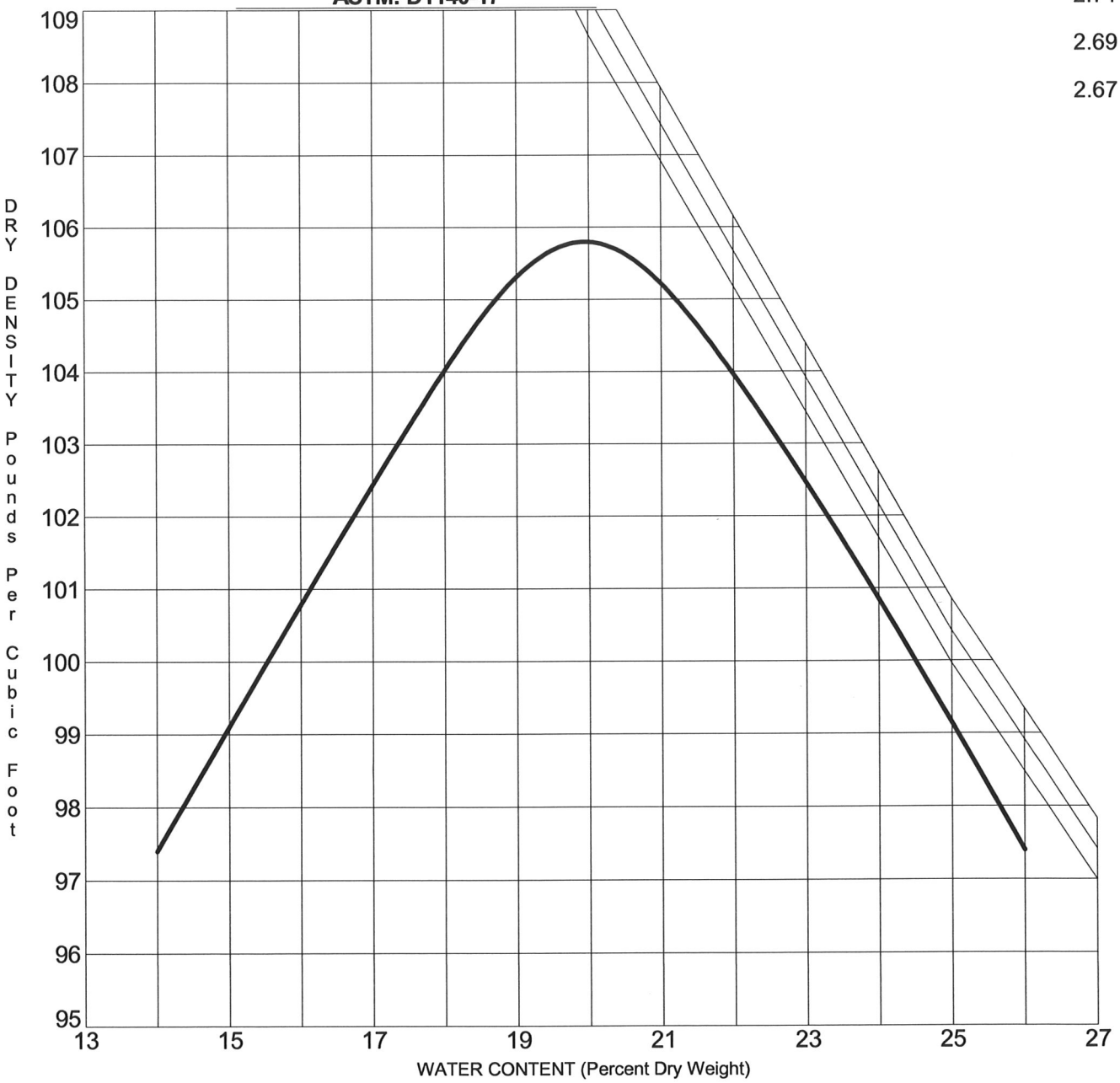
| LL | PL | PI |
|---|---|---|
| | | |

CURVES OF 100% SATURATION FOR SPECIFIC GRAVITY EQUAL TO:

2.71

2.69

2.67




## LABORATORY COMPACTION CHARACTERISTICS OF SOIL

*GEOSERV, INC. Testing - Exploration - Engineering*
3100 East Broadway Avenue, Bismarck, ND 58501

# Minnkota FGD Pond - Cell 5, Phase 1A

Sample Number 7

Reported To Baranko Bros. Inc.

Job No. GEO-062205 Date 10/5/2022

Location Center, ND

Copies To Minnkota Power Coop

Barr Engineering Co

Source of Material On-Site

Description of Material (ASTM: D 2488 - Visual) Fat Clay, gray (CH) 0% +#4

Test Methods ASTM D698-12(2021) Method A

ASTM: D2216-19, ASTM: D4318-17e1

ASTM: D1140-17

TEST RESULTS

| | |
|---|---|
| Moisture Content As Received | 13.1% |
| Maximum Dry Density | 98.1 PCF |
| Optimum Water Content | 23.9% |
| Preperation Method | Moist |
| Rammer Type | Manual |

ATTERBERG LIMITS

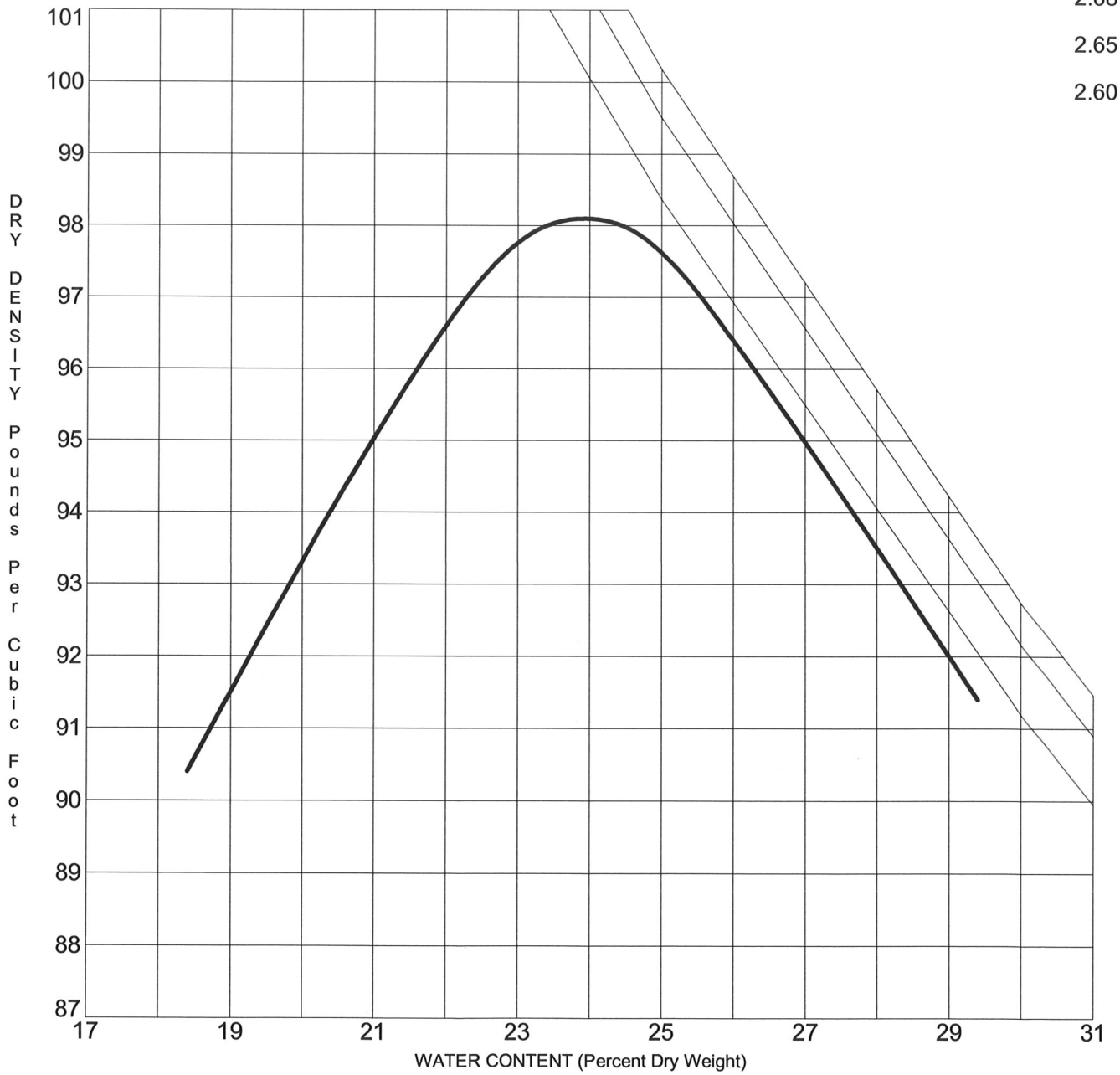
| LL | PL | PI |
|---|---|---|
| | | |

CURVES OF 100% SATURATION FOR SPECIFIC GRAVITY EQUAL TO:

2.68

2.65

2.60




## LABORATORY COMPACTION CHARACTERISTICS OF SOIL


*GEOSERV, INC. Testing - Exploration - Engineering*

3100 East Broadway Avenue, Bismarck, ND 58501

# Minnkota FGD Pond - Cell 5, Phase 1B

Sample Number 1

Reported To Baranko Bros. Inc.

Job No. GEO-052310 Date 6/7/2023

Location Center, ND

Copies To

Source of Material On-Site

Description of Material (ASTM: D 2488 - Visual) Fat Clay, gray (CH) 0% +#4

Test Methods ASTM D698-12(2021) Method A
ASTM: D2216-19
ASTM: D4318-17e1

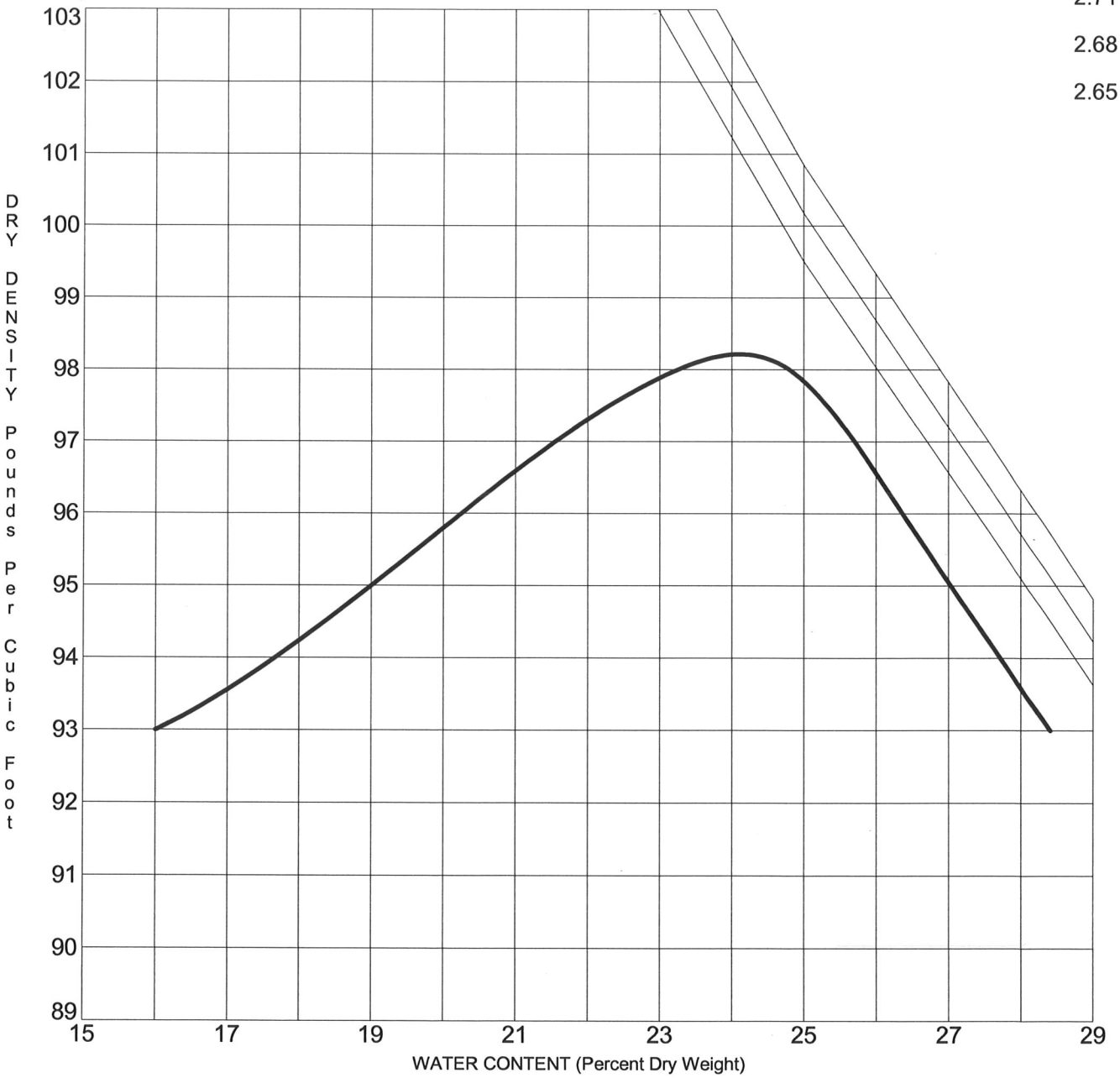
TEST RESULTS

| | |
|---|---|
| Moisture Content As Received | 14.4% |
| Maximum Dry Density | 98.2 PCF |
| Optimum Water Content | 24.1% |
| Preperation Method | Moist |
| Rammer Type | Manual |

ATTERBERG LIMITS

| LL | PL | PI |
|---|---|---|
| | | |

CURVES OF 100% SATURATION FOR SPECIFIC GRAVITY EQUAL TO:
2.71
2.68
2.65




## LABORATORY COMPACTION CHARACTERISTICS OF SOIL

*GEOSERV, INC.* *Testing - Exploration - Engineering*
3100 East Broadway Avenue, Bismarck, ND 58501

# Minnkota FGD Pond - Cell 5, Phase 1B

Sample Number 2

Reported To Baranko Bros. Inc.

Job No. GEO-052310 Date 6/7/2023

Location Center, ND

Copies To

Source of Material On-Site

Description of Material (ASTM: D 2488 - Visual) Fat Clay, gray (CH) 0% +#4

Test Methods ASTM D698-12(2021) Method A
ASTM: D2216-19
ASTM: D4318-17e1

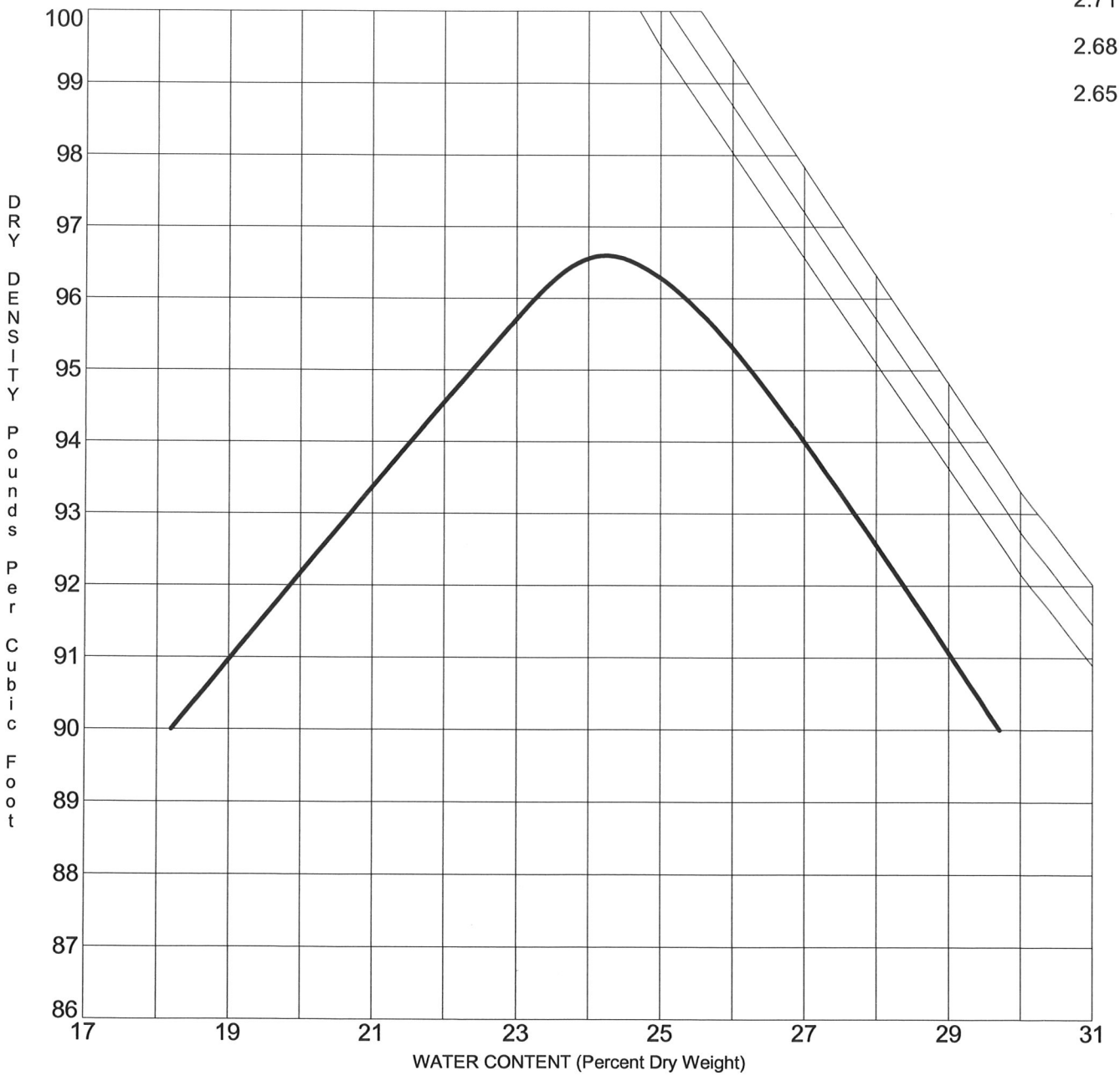
TEST RESULTS

| | |
|---|---|
| Moisture Content As Received | 18.9% |
| Maximum Dry Density | 96.6 PCF |
| Optimum Water Content | 24.2% |
| Preperation Method | Moist |
| Rammer Type | Manual |

ATTERBERG LIMITS

| LL | PL | PI |
|---|---|---|
| | | |

CURVES OF 100% SATURATION FOR SPECIFIC GRAVITY EQUAL TO:
2.71
2.68
2.65




## LABORATORY COMPACTION CHARACTERISTICS OF SOIL

*GEOSERV, INC. Testing - Exploration - Engineering*
3100 East Broadway Avenue, Bismarck, ND 58501

# Random Fill Field Test Results

Random Fill Field Test Results Summary
Cell 5 Phase 1A and 1B

| Test No. | Retest of | Date | Northing | Easting | Elevation | Proctor Ref No. | In-Place Moisture Content (%) | In-Place Dry Density (pcf) | Percent Compaction | Minimum Moisture % | Maximum Moisture % | Passing Test # (Overall) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Phase 1A - 2022 | | | | | | | | | | | | |
| RF-1 | - | 6/16/2022 | 505634.9 | 1819685.5 | 2056.0 | 3 | 16.4% | 107.6 | 99% | 10.8% | 19.0% | 1 |
| RF-2 | - | 6/16/2022 | 505728.0 | 1819766.3 | 2058.0 | 3 | 18.4% | 108.1 | 99% | 10.8% | 19.0% | 2 |
| RF-3 | - | 6/16/2022 | 505822.0 | 1819766.5 | 2059.5 | 3 | 15.9% | 106.3 | 97% | 10.8% | 19.0% | 3 |
| RF-4 | - | 6/16/2022 | 505835.7 | 1819692.5 | 2063.5 | 3 | 12.6% | 106.4 | 97% | 10.8% | 19.0% | 4 |
| RF-5 | - | 6/16/2022 | 505849.2 | 1819617.3 | 2066.8 | 3 | 14.9% | 108.9 | 100% | 10.8% | 19.0% | 5 |
| RF-6 | - | 6/16/2022 | 505888.6 | 1819631.5 | 2066.1 | 3 | 11.6% | 107.4 | 98% | 10.8% | 19.0% | 6 |
| RF-7 | - | 6/16/2022 | 505944.0 | 1819622.1 | 2067.5 | 3 | 14.5% | 106.8 | 98% | 10.8% | 19.0% | 7 |
| RF-8 | - | 6/16/2022 | 505932.7 | 1819705.9 | 2065.5 | 3 | 11.4% | 110.1 | 101% | 10.8% | 19.0% | 8 |
| RF-9 | - | 6/16/2022 | 505927.3 | 1819768.7 | 2062.6 | 3 | 11.3% | 106.1 | 97% | 10.8% | 19.0% | 9 |
| RF-10 | - | 6/16/2022 | 505861.0 | 1819765.0 | 2061.0 | 3 | 11.7% | 106.9 | 98% | 10.8% | 19.0% | 10 |
| RF-11 | - | 6/16/2022 | 505872.4 | 1819693.3 | 2064.5 | 3 | 11.6% | 107.3 | 98% | 10.8% | 19.0% | 11 |
| RF-12 | - | 6/17/2022 | 505951.5 | 1819646.0 | 2071.3 | 4 | 15.1% | 106.6 | 100% | 15.1% | 23.4% | 12 |
| RF-13 | - | 6/17/2022 | 505939.2 | 1819715.1 | 2069.4 | 4 | 19.6% | 102.8 | 97% | 15.1% | 23.4% | 13 |
| RF-14 | - | 6/17/2022 | 505876.5 | 1819715.7 | 2068.0 | 1 | 20.4% | 92.3 | 97% | 18.6% | 30.4% | 14 |
| RF-15 | - | 6/17/2022 | 505885.8 | 1819638.3 | 2071.0 | 1 | 18.9% | 94.1 | 99% | 18.6% | 30.4% | 15 |
| RF-16 | - | 6/17/2022 | 505863.7 | 1819784.5 | 2065.5 | 1 | 21.9% | 92.8 | 98% | 18.6% | 30.4% | 16 |
| RF-17 | - | 6/17/2022 | 505783.0 | 1819787.7 | 2064.5 | 1 | 20.0% | 91.2 | 96% | 18.6% | 30.4% | 17 |
| RF-18 | - | 6/17/2022 | 505692.1 | 1819785.7 | 2064.0 | 1 | 18.7% | 90.2 | 95% | 18.6% | 30.4% | 18 |
| RF-19 | - | 6/17/2022 | 505591.2 | 1819787.2 | 2064.0 | 4 | 15.2% | 105.8 | 100% | 15.1% | 23.4% | 19 |
| RF-20 | - | 6/20/2022 | 505663.5 | 1819654.3 | 2062.0 | 4 | 17.3% | 105.2 | 99% | 15.1% | 23.4% | 20 |
| RF-21 | - | 6/20/2022 | 505691.5 | 1819688.0 | 2065.0 | 4 | 16.3% | 103.0 | 97% | 15.1% | 23.4% | 21 |
| RF-22 | - | 6/20/2022 | 505714.5 | 1819714.0 | 2067.0 | 4 | 17.1% | 102.8 | 97% | 15.1% | 23.4% | 22 |
| RF-23 | - | 6/20/2022 | 505728.5 | 1819740.6 | 2066.0 | 4 | 16.3% | 105.7 | 100% | 15.1% | 23.4% | 23 |
| RF-24 | - | 6/20/2022 | 505926.3 | 1819747.5 | 2070.0 | 4 | 15.5% | 106.8 | 101% | 15.1% | 23.4% | 24 |
| RF-25 | - | 6/20/2022 | 505928.6 | 1819704.9 | 2072.0 | 4 | 15.9% | 102.8 | 97% | 15.1% | 23.4% | 25 |
| RF-26 | - | 6/20/2022 | 505929.4 | 181673.5 | 2072.5 | 4 | 15.5% | 102.8 | 97% | 15.1% | 23.4% | 26 |
| RF-27 | - | 6/20/2022 | 505926.1 | 1819644.1 | 2074.0 | 4 | 16.8% | 101.3 | 95% | 15.1% | 23.4% | 27 |
| RF-28 | - | 6/21/2022 | 505672.1 | 1819603.3 | 2062.0 | 2 | 10.6% | 109.8 | 99% | 9.9% | 17.7% | 28 |
| RF-29 | - | 6/21/2022 | 505749.0 | 1819627.1 | 2072.0 | 2 | 11.8% | 107.9 | 97% | 9.9% | 17.7% | 29 |
| RF-30 | - | 6/21/2022 | 505828.7 | 1819642.5 | 2077.0 | 4 | 16.2% | 102.5 | 97% | 15.1% | 23.4% | 30 |
| RF-31 | - | 6/21/2022 | 505906.8 | 1819652.6 | 2078.0 | 4 | 17.5% | 103.3 | 97% | 15.1% | 23.4% | 31 |
| RF-32 | - | 6/21/2022 | 505908.5 | 1819704.1 | 2076.0 | 4 | 15.8% | 104.8 | 99% | 15.1% | 23.4% | 32 |
| RF-33 | - | 6/21/2022 | 505929.3 | 1819696.1 | 2076.0 | 4 | 15.3% | 106.2 | 100% | 15.1% | 23.4% | 33 |
| RF-34 | - | 6/21/2022 | 505748.1 | 1819688.0 | 2073.0 | 4 | 16.0% | 105.3 | 99% | 15.1% | 23.4% | 34 |
| RF-35 | - | 6/21/2022 | 505661.9 | 1819679.5 | 2066.0 | 4 | 16.9% | 106.9 | 101% | 15.1% | 23.4% | 35 |
| RF-36 | - | 6/22/2022 | 505653.4 | 1819751.3 | 2072.0 | 4 | 15.1% | 103.7 | 98% | 15.1% | 23.4% | 36 |
| RF-37 | - | 6/22/2022 | 505734.1 | 1819737.1 | 2077.0 | 4 | 15.5% | 106.1 | 100% | 15.1% | 23.4% | 37 |
| RF-38 | - | 6/22/2022 | 505818.8 | 1819726.1 | 2080.0 | 4 | 15.8% | 102.2 | 96% | 15.1% | 23.4% | 38 |
| RF-39 | - | 6/22/2022 | 505895.6 | 1819725.9 | 2083.0 | 4 | 15.9% | 101.8 | 96% | 15.1% | 23.4% | 39 |
| RF-40 | - | 6/22/2022 | 505878.8 | 1819686.5 | 2083.0 | 4 | 16.8% | 101.3 | 95% | 15.1% | 23.4% | 40 |
| RF-41 | - | 6/22/2022 | 505818.1 | 1819683.2 | 2080.0 | 4 | 15.7% | 103.4 | 97% | 15.1% | 23.4% | 41 |
| RF-42 | - | 6/22/2022 | 505746.8 | 1819688.0 | 2076.0 | 4 | 18.1% | 106.2 | 100% | 15.1% | 23.4% | 42 |
| RF-43 | - | 6/22/2022 | 505676.1 | 1819699.3 | 2071.0 | 4 | 15.9% | 102.2 | 96% | 15.1% | 23.4% | 43 |
| RF-44 | - | 6/23/2022 | 505684.2 | 1819641.7 | 2071.0 | 4 | 15.4% | 106.3 | 100% | 15.1% | 23.4% | 44 |
| RF-45 | - | 6/23/2022 | 505742.9 | 1819655.1 | 2077.0 | 4 | 16.7% | 105.9 | 100% | 15.1% | 23.4% | 45 |
| RF-46 | - | 6/23/2022 | 505800.8 | 1819676.6 | 2083.0 | 4 | 19.0% | 101.9 | 96% | 15.1% | 23.4% | 46 |
| RF-47 | - | 6/23/2022 | 505879.0 | 1819687.0 | 2086.0 | 4 | 16.5% | 105.5 | 99% | 15.1% | 23.4% | 47 |
| RF-48 | - | 6/23/2022 | 505220.7 | 1819581.6 | 2048.0 | 4 | 15.9% | 102.9 | 97% | 15.1% | 23.4% | 48 |
| RF-49 | - | 6/23/2022 | 505183.2 | 1819605.7 | 2049.0 | 4 | 15.9% | 102.6 | 97% | 15.1% | 23.4% | 49 |
| RF-50 | - | 6/23/2022 | 505102.9 | 1819592.2 | 2049.0 | 4 | 15.6% | 103.2 | 97% | 15.1% | 23.4% | 50 |
| RF-51 | - | 6/23/2022 | 505066.1 | 1819614.8 | 2050.0 | 4 | 16.1% | 102.2 | 96% | 15.1% | 23.4% | 51 |
| RF-52 | - | 6/24/2022 | 505969.1 | 1819703.3 | 2090.0 | 4 | 15.2% | 105.6 | 99% | 15.1% | 23.4% | 52 |

Random Fill Field Test Results Summary
Cell 5 Phase 1A and 1B

| Test No. | Retest of | Date | Northing | Easting | Elevation | Proctor Ref No. | In-Place Moisture Content (%) | In-Place Dry Density (pcf) | Percent Compaction | Minimum Moisture % | Maximum Moisture % | Passing Test # (Overall) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RF-53 | - | 6/24/2022 | 505919.8 | 1819706.4 | 2089.0 | 4 | 16.0% | 104.4 | 98% | 15.1% | 23.4% | 53 |
| RF-54 | - | 6/24/2022 | 505879.8 | 1819708.2 | 2088.0 | 4 | 15.6% | 104.6 | 98% | 15.1% | 23.4% | 54 |
| RF-55 | - | 6/24/2022 | 505828.3 | 1819707.7 | 2086.0 | 4 | 18.2% | 102.7 | 97% | 15.1% | 23.4% | 55 |
| RF-56 | - | 6/24/2022 | 505257.1 | 1819653.2 | 2057.0 | 4 | 15.7% | 106.3 | 100% | 15.1% | 23.4% | 56 |
| RF-57 | - | 6/24/2022 | 505212.9 | 1819660.4 | 2058.0 | 4 | 15.9% | 106.5 | 100% | 15.1% | 23.4% | 57 |
| RF-58 | - | 6/24/2022 | 505168.2 | 1819664.2 | 2057.0 | 4 | 17.3% | 103.1 | 97% | 15.1% | 23.4% | 58 |
| RF-59 | - | 6/24/2022 | 505115.7 | 1819670.1 | 2057.0 | 4 | 15.3% | 104.1 | 98% | 15.1% | 23.4% | 59 |
| RF-60 | - | 6/27/2022 | 505072.4 | 1819538.6 | 2054.0 | 5 | 19.5% | 103.3 | 96% | 15.0% | 22.8% | 60 |
| RF-61 | - | 6/27/2022 | 505166.4 | 1819528.8 | 2054.0 | 1 | 21.0% | 96.3 | 102% | 18.6% | 30.4% | 61 |
| RF-62 | - | 6/27/2022 | 505261.6 | 1819519.1 | 2051.0 | 1 | 22.6% | 94.1 | 99% | 18.6% | 30.4% | 62 |
| RF-63 | - | 6/27/2022 | 505335.2 | 1819510.1 | 2048.0 | 1 | 21.0% | 93.9 | 99% | 18.6% | 30.4% | 63 |
| RF-64 | - | 6/27/2022 | 505325.2 | 1819410.1 | 2052.0 | 5 | 15.0% | 107.6 | 100% | 15.0% | 22.8% | 64 |
| RF-65 | - | 6/27/2022 | 505234.0 | 1819641.6 | 2059.0 | 1 | 19.1% | 94.3 | 99% | 18.6% | 30.4% | 65 |
| RF-66 | - | 6/27/2022 | 505175.6 | 1819642.6 | 2051.0 | 1 | 24.9% | 92.2 | 97% | 18.6% | 30.4% | 66 |
| RF-67 | - | 6/27/2022 | 505113.2 | 1819644.8 | 2059.0 | 1 | 22.5% | 91.4 | 96% | 18.6% | 30.4% | 67 |
| RF-68 | - | 6/28/2022 | 505109.9 | 1819558.7 | 2059.0 | 5 | 18.0% | 104.1 | 97% | 15.0% | 22.8% | 68 |
| RF-69 | - | 6/28/2022 | 505161.8 | 1819559.7 | 2059.0 | 5 | 18.5% | 106.9 | 100% | 15.0% | 22.8% | 69 |
| RF-70 | - | 6/28/2022 | 505220.3 | 1819559.3 | 2058.0 | 5 | 19.1% | 104.8 | 98% | 15.0% | 22.8% | 70 |
| RF-71 | - | 6/28/2022 | 505278.8 | 1819557.9 | 2057.0 | 5 | 18.4% | 103.2 | 96% | 15.0% | 22.8% | 71 |
| RF-72 | - | 6/28/2022 | 505274.2 | 1819704.1 | 2065.0 | 5 | 16.5% | 104.4 | 97% | 15.0% | 22.8% | 72 |
| RF-73 | - | 6/28/2022 | 505229.2 | 1819710.3 | 2065.0 | 5 | 15.1% | 107.7 | 100% | 15.0% | 22.8% | 73 |
| RF-74 | - | 6/28/2022 | 505180.2 | 1819705.2 | 2064.0 | 1 | 19.4% | 92.9 | 98% | 18.6% | 30.4% | 74 |
| RF-75 | - | 6/28/2022 | 505121.7 | 1819701.4 | 2063.0 | 5 | 15.9% | 106.9 | 100% | 15.0% | 22.8% | 75 |
| RF-76 | - | 6/29/2022 | 505320.2 | 1819611.3 | 2059.0 | 5 | 20.0% | 103.5 | 97% | 15.0% | 22.8% | 76 |
| RF-77 | - | 6/29/2022 | 505269.5 | 1819613.6 | 2060.8 | 5 | 17.7% | 107.5 | 100% | 15.0% | 22.8% | 77 |
| RF-78 | - | 6/29/2022 | 505227.0 | 1819612.8 | 2062.0 | 5 | 16.2% | 103.5 | 97% | 15.0% | 22.8% | 78 |
| RF-79 | - | 6/29/2022 | 505182.9 | 1819611.5 | 2062.0 | 5 | 15.2% | 104.0 | 97% | 15.0% | 22.8% | 79 |
| RF-80 | - | 6/29/2022 | 505131.0 | 1819610.4 | 2062.0 | 5 | 15.5% | 105.4 | 98% | 15.0% | 22.8% | 80 |
| RF-81 | - | 6/29/2022 | 505094.3 | 1819640.5 | 2062.0 | 5 | 16.5% | 107.3 | 100% | 15.0% | 22.8% | 81 |
| RF-82 | - | 7/8/2022 | 505175.5 | 1819627.1 | 2073.0 | 4 | 17.3% | 102.3 | 96% | 15.1% | 23.4% | 82 |
| RF-83 | - | 7/8/2022 | 505203.0 | 1819616.7 | 2072.0 | 4 | 16.6% | 106.2 | 100% | 15.1% | 23.4% | 83 |
| RF-84 | - | 7/8/2022 | 505227.2 | 1819613.5 | 2072.0 | 4 | 16.6% | 104.7 | 99% | 15.1% | 23.4% | 84 |
| RF-85 | - | 7/8/2022 | 505250.4 | 1819609.6 | 2070.0 | 4 | 16.3% | 106.1 | 100% | 15.1% | 23.4% | 85 |
| RF-86 | - | 7/8/2022 | 505278.3 | 1819677.0 | 2071.0 | 6 | 16.0% | 101.2 | 96% | 15.9% | 24.1% | 86 |
| RF-87 | - | 7/8/2022 | 505258.7 | 1819676.2 | 2071.0 | 6 | 20.9% | 102.7 | 97% | 15.9% | 24.1% | 87 |
| RF-88 | - | 7/8/2022 | 505224.5 | 1819671.1 | 2073.0 | 6 | 17.0% | 102.1 | 97% | 15.9% | 24.1% | 88 |
| RF-89 | - | 7/8/2022 | 505181.0 | 1819677.7 | 2074.0 | 3 | 11.2% | 108.3 | 99% | 10.8% | 19.0% | 89 |
| RF-90 | - | 7/8/2022 | 505146.1 | 1810051.2 | 2071.0 | 3 | 14.6% | 106.1 | 97% | 10.8% | 19.0% | 90 |
| RF-91 | - | 7/8/2022 | 505146.7 | 1820085.1 | 2072.0 | 3 | 13.3% | 107.2 | 98% | 10.8% | 19.0% | 91 |
| RF-92 | - | 7/8/2022 | 505149.5 | 1820121.7 | 2074.0 | 3 | 11.0% | 106.4 | 97% | 10.8% | 19.0% | 92 |
| RF-93 | - | 7/12/2022 | 505180.3 | 1819821.4 | 2079.0 | 4 | 18.1% | 102.8 | 97% | 15.1% | 23.4% | 93 |
| RF-94 | - | 7/12/2022 | 505183.4 | 1819750.6 | 2082.0 | 4 | 16.3% | 103.3 | 97% | 15.1% | 23.4% | 94 |
| RF-95 | - | 7/12/2022 | 505240.4 | 1819715.5 | 2083.0 | 4 | 16.3% | 102.7 | 97% | 15.1% | 23.4% | 95 |
| RF-96 | - | 7/12/2022 | 505256.9 | 1819647.8 | 2082.0 | 1 | 24.7% | 94.2 | 99% | 18.6% | 30.4% | 96 |
| RF-97 | - | 7/12/2022 | 505190.1 | 1819660.9 | 2083.0 | 4 | 15.9% | 102.9 | 97% | 15.1% | 23.4% | 97 |
| RF-98 | - | 7/12/2022 | 505129.4 | 1819681.9 | 2084.0 | 4 | 16.9% | 104.4 | 98% | 15.1% | 23.4% | 98 |
| RF-99 | - | 7/12/2022 | 505114.6 | 1819749.0 | 2085.0 | 4 | 17.1% | 103.7 | 98% | 15.1% | 23.4% | 99 |
| RF-100 | - | 7/12/2022 | 505119.4 | 1819797.0 | 2084.0 | 4 | 15.5% | 103.5 | 97% | 15.1% | 23.4% | 100 |
| RF-101 | - | 7/13/2022 | 505127.5 | 1819771.1 | 2087.0 | 6 | 21.9% | 102.7 | 97% | 15.9% | 24.1% | 101 |
| RF-102 | - | 7/13/2022 | 505127.4 | 1819698.2 | 2088.0 | 6 | 19.6% | 102.9 | 97% | 15.9% | 24.1% | 102 |
| RF-103 | - | 7/13/2022 | 505200.1 | 1819677.9 | 2088.0 | 6 | 20.1% | 103.6 | 98% | 15.9% | 24.1% | 103 |
| RF-104 | - | 7/13/2022 | 505274.7 | 1819675.7 | 2087.0 | 6 | 18.6% | 102.9 | 97% | 15.9% | 24.1% | 104 |
| RF-105 | - | 7/13/2022 | 505276.3 | 1819721.1 | 2088.0 | 6 | 17.9% | 101.7 | 96% | 15.9% | 24.1% | 105 |

Random Fill Field Test Results Summary
Cell 5 Phase 1A and 1B

| Test No. | Retest of | Date | Northing | Easting | Elevation | Proctor Ref No. | In-Place Moisture Content (%) | In-Place Dry Density (pcf) | Percent Compaction | Minimum Moisture % | Maximum Moisture % | Passing Test # (Overall) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RF-106 | - | 7/13/2022 | 505210.5 | 1819716.1 | 2088.0 | 6 | 20.4% | 103.3 | 98% | 15.9% | 24.1% | 106 |
| RF-107 | - | 7/13/2022 | 505153.9 | 1819732.8 | 2088.0 | 6 | 19.4% | 104.4 | 99% | 15.9% | 24.1% | 107 |
| RF-108 | - | 7/13/2022 | 505159.2 | 1819792.9 | 2085.0 | 6 | 18.4% | 101.1 | 96% | 15.9% | 24.1% | 108 |
| RF-109 | - | 7/14/2022 | 505222.8 | 1819708.5 | 2089.5 | 6 | 17.4% | 102.3 | 97% | 15.9% | 24.1% | 109 |
| RF-110 | - | 7/14/2022 | 505157.1 | 1819685.0 | 2091.0 | 6 | 17.9% | 101.1 | 96% | 15.9% | 24.1% | 110 |
| RF-111 | - | 7/14/2022 | 505169.5 | 1819728.5 | 2089.0 | 6 | 19.6% | 101.0 | 95% | 15.9% | 24.1% | 111 |
| RF-112 | - | 7/14/2022 | 505131.9 | 1819745.6 | 2090.0 | 6 | 19.8% | 100.9 | 95% | 15.9% | 24.1% | 112 |
| RF-113 | - | 7/14/2022 | 505167.2 | 1819785.0 | 2086.0 | 6 | 19.4% | 100.8 | 95% | 15.9% | 24.1% | 113 |
| RF-114 | - | 7/14/2022 | 505127.8 | 1819836.7 | 2084.0 | 6 | 19.5% | 101.2 | 96% | 15.9% | 24.1% | 114 |
| RF-115 | - | 7/14/2022 | 505114.6 | 1819976.5 | 2079.0 | 6 | 19.8% | 102.6 | 97% | 15.9% | 24.1% | 115 |
| RF-116 | - | 7/14/2022 | 505105.8 | 1820044.2 | 2079.0 | 6 | 19.1% | 103.2 | 98% | 15.9% | 24.1% | 116 |
| RF-117 | - | 7/22/2022 | 505136.0 | 1820160.7 | 2090.0 | 6 | 22.5% | 101.8 | 96% | 15.9% | 24.1% | 117 |
| RF-118 | - | 7/22/2022 | 505136.5 | 1820118.6 | 2090.0 | 6 | 19.1% | 102.9 | 97% | 15.9% | 24.1% | 118 |
| RF-119 | - | 7/22/2022 | 505139.2 | 1820081.8 | 2088.0 | 6 | 20.5% | 101.8 | 96% | 15.9% | 24.1% | 119 |
| RF-120 | - | 7/22/2022 | 505133.1 | 1820052.9 | 2088.0 | 6 | 19.7% | 102.2 | 97% | 15.9% | 24.1% | 120 |
| RF-121 | - | 7/22/2022 | 505132.7 | 1820020.6 | 2088.0 | 6 | 21.9% | 102.7 | 97% | 15.9% | 24.1% | 121 |
| RF-122 | - | 7/22/2022 | 505132.4 | 1819987.5 | 2088.0 | 6 | 19.7% | 103.1 | 97% | 15.9% | 24.1% | 122 |
| RF-123 | - | 7/22/2022 | 505134.1 | 1819942.2 | 2088.0 | 6 | 20.2% | 103.3 | 98% | 15.9% | 24.1% | 123 |
| RF-124 | - | 7/22/2022 | 505126.6 | 1819887.9 | 2089.0 | 6 | 21.2% | 101.1 | 96% | 15.9% | 24.1% | 124 |
| RF-125 | - | 7/25/2022 | 505144.5 | 1820187.1 | 2092.0 | 6 | 19.7% | 102.4 | 97% | 15.9% | 24.1% | 125 |
| RF-126 | - | 7/25/2022 | 505146.7 | 1820110.9 | 2092.0 | 6 | 19.6% | 102.9 | 97% | 15.9% | 24.1% | 126 |
| RF-127 | - | 7/25/2022 | 505148.6 | 1820050.5 | 2092.0 | 6 | 19.8% | 102.4 | 97% | 15.9% | 24.1% | 127 |
| RF-128 | - | 7/25/2022 | 505150.5 | 1819981.4 | 2092.0 | 6 | 16.5% | 105.2 | 99% | 15.9% | 24.1% | 128 |
| RF-129 | - | 7/25/2022 | 505150.6 | 1819900.7 | 2092.0 | 6 | 21.3% | 103.1 | 97% | 15.9% | 24.1% | 129 |
| RF-130 | - | 7/25/2022 | 505151.9 | 1819801.2 | 2092.0 | 6 | 18.8% | 101.6 | 96% | 15.9% | 24.1% | 130 |
| RF-131 | - | 7/26/2022 | 505671.4 | 1819615.6 | 2070.0 | 6 | 21.7% | 101.6 | 96% | 15.9% | 24.1% | 131 |
| RF-132 | - | 7/26/2022 | 505601.1 | 1819613.3 | 2065.0 | 6 | 22.9% | 102.1 | 97% | 15.9% | 24.1% | 132 |
| RF-133 | - | 9/16/2022 | 505396.6 | 1819748.0 | 2060.0 | 6 | 23.2% | 101.9 | 96% | 15.9% | 24.1% | 133 |
| RF-134 | - | 9/16/2022 | 505394.9 | 1819701.3 | 2061.0 | 6 | 22.6% | 102.8 | 97% | 15.9% | 24.1% | 134 |
| RF-135 | - | 9/16/2022 | 505397.5 | 1819611.5 | 2059.0 | 6 | 23.2% | 103.6 | 98% | 15.9% | 24.1% | 135 |
| RF-136 | - | 9/16/2022 | 505436.2 | 1819592.1 | 2058.0 | 6 | 20.2% | 102.2 | 97% | 15.9% | 24.1% | 136 |
| RF-137 | - | 9/16/2022 | 505435.0 | 1819666.2 | 2061.0 | 6 | 21.7% | 101.4 | 96% | 15.9% | 24.1% | 137 |
| RF-138 | - | 9/16/2022 | 505431.7 | 1819754.6 | 2060.0 | 6 | 20.9% | 104.1 | 98% | 15.9% | 24.1% | 138 |
| RF-139 | - | 9/29/2022 | 505426.9 | 1819593.8 | 2065.0 | 1 | 21.3% | 94.7 | 100% | 18.6% | 30.4% | 139 |
| RF-140 | - | 9/29/2022 | 505383.9 | 1819736.4 | 2065.0 | 1 | 21.8% | 94.2 | 99% | 18.6% | 30.4% | 140 |
| RF-141 | - | 9/29/2022 | 505524.3 | 1819693.0 | 2065.0 | 6 | 18.6% | 102.4 | 97% | 15.9% | 24.1% | 141 |
| RF-142 | - | 10/7/2022 | 505509.3 | 1819709.2 | 2071.0 | 7 | 20.5% | 94.1 | 96% | 20.0% | 28.0% | 142 |
| RF-143 | - | 10/7/2022 | 505440.8 | 1819718.9 | 2072.0 | 7 | 20.1% | 98.0 | 100% | 20.0% | 28.0% | 143 |
| RF-144 | - | 10/7/2022 | 505468.0 | 1819684.7 | 2072.0 | 7 | 21.9% | 96.6 | 98% | 20.0% | 28.0% | 144 |
| RF-145 | - | 10/7/2022 | 505544.7 | 1819626.5 | 2071.0 | 7 | 20.0% | 96.5 | 98% | 20.0% | 28.0% | 145 |
| RF-146 | - | 10/7/2022 | 505568.0 | 1819695.0 | 2071.0 | 7 | 21.0% | 98.6 | 101% | 20.0% | 28.0% | 146 |
| RF-147 | - | 10/11/2022 | 505461.7 | 1819719.0 | 2075.0 | 7 | 21.0% | 99.3 | 101% | 20.0% | 28.0% | 147 |
| RF-148 | - | 10/11/2022 | 505503.7 | 1819719.0 | 2074.0 | 7 | 20.2% | 98.2 | 100% | 20.0% | 28.0% | 148 |
| RF-149 | - | 10/11/2022 | 505552.8 | 1819715.3 | 2075.0 | 7 | 20.3% | 99.5 | 101% | 20.0% | 28.0% | 149 |
| RF-150 | - | 10/11/2022 | 505615.0 | 1819714.9 | 2074.5 | 7 | 20.7% | 97.4 | 99% | 20.0% | 28.0% | 150 |
| RF-151 | - | 10/25/2023 | 505732.9 | 1819696.7 | 2092.0 | 6 | 19.9% | 101.1 | 96% | 15.9% | 24.1% | 151 |
| RF-152 | - | 10/25/2023 | 505670.6 | 1819694.5 | 2093.0 | 6 | 19.7% | 102.9 | 97% | 15.9% | 24.1% | 152 |
| RF-153 | - | 10/25/2023 | 505598.3 | 1819687.3 | 2093.0 | 6 | 19.2% | 101.5 | 96% | 15.9% | 24.1% | 153 |
| RF-154 | - | 10/25/2023 | 505508.6 | 1819687.1 | 2093.0 | 6 | 18.6% | 102.1 | 97% | 15.9% | 24.1% | 154 |
| RF-155 | - | 10/25/2023 | 505385.2 | 1819685.8 | 2093.0 | 6 | 16.6% | 105.5 | 100% | 15.9% | 24.1% | 155 |
| RF-156 | - | 10/27/2023 | 505889.2 | 1819693.6 | 2098.0 | 7 | 20.9% | 98.8 | 101% | 20.0% | 28.0% | 156 |
| RF-157 | - | 10/27/2023 | 505791.0 | 1819698.6 | 2098.0 | 7 | 20.3% | 100.4 | 102% | 20.0% | 28.0% | 157 |
| RF-158 | - | 10/27/2023 | 505692.5 | 1819698.0 | 2098.0 | 7 | 20.4% | 96.1 | 98% | 20.0% | 28.0% | 158 |

Random Fill Field Test Results Summary
Cell 5 Phase 1A and 1B

| Test No. | Retest of | Date | Northing | Easting | Elevation | Proctor Ref No. | In-Place Moisture Content (%) | In-Place Dry Density (pcf) | Percent Compaction | Minimum Moisture % | Maximum Moisture % | Passing Test # (Overall) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RF-159 | - | 10/27/2023 | 505514.4 | 1819698.3 | 2098.0 | 7 | 21.8% | 98.4 | 100% | 20.0% | 28.0% | 159 |
| RF-160 | - | 10/27/2023 | 505416.2 | 1819697.5 | 2098.0 | 7 | 21.5% | 99.1 | 101% | 20.0% | 28.0% | 160 |
| Phase 1B - 2023 | | | | | | | | | | | | |
| RF-1 | - | 6/9/2023 | 505961.5 | 1820936.4 | 2072.0 | 1 | 17.1% | 100.0 | 102% | 16.9% | 27.4% | 161 |
| RF-2 | - | 6/9/2023 | 505966.0 | 1821122.0 | 2072.0 | 1 | 17.6% | 98.6 | 100% | 16.9% | 27.4% | 162 |
| RF-3 | - | 6/9/2023 | 505251.2 | 1821567.6 | 2071.0 | 1 | 24.2% | 95.9 | 98% | 16.9% | 27.4% | 163 |
| RF-4 | - | 6/9/2023 | 505231.3 | 1821521.3 | 2071.0 | 1 | 17.7% | 95.1 | 97% | 16.9% | 27.4% | 164 |
| RF-5 | - | 6/9/2023 | 505292.5 | 1820391.3 | 2048.0 | 1 | 19.0% | 99.4 | 101% | 16.9% | 27.4% | 165 |
| RF-6 | - | 6/9/2023 | 505294.5 | 1820171.3 | 2048.0 | 1 | 20.1% | 94.1 | 96% | 16.9% | 27.4% | 166 |
| RF-7 | - | 6/9/2023 | 505294.8 | 1819944.0 | 2050.0 | 1 | 17.8% | 99.9 | 102% | 16.9% | 27.4% | 167 |
| RF-8 | - | 6/12/2023 | 505277.4 | 1820597.0 | 2057.0 | 1 | 17.4% | 96.4 | 98% | 16.9% | 27.4% | 168 |
| RF-9 | - | 6/12/2023 | 505261.8 | 1819910.7 | 2062.0 | 1 | 18.9% | 95.6 | 97% | 16.9% | 27.4% | 169 |
| RF-10 | - | 6/12/2023 | 505366.1 | 1819818.5 | 2062.0 | 1 | 19.8% | 97.1 | 99% | 16.9% | 27.4% | 170 |
| RF-11 | - | 6/12/2023 | 505796.3 | 1819824.8 | 2060.0 | 1 | 19.1% | 98.4 | 100% | 16.9% | 27.4% | 171 |
| RF-12 | - | 6/12/2023 | 505931.4 | 1819880.8 | 2061.0 | 1 | 18.9% | 96.6 | 98% | 16.9% | 27.4% | 172 |
| RF-13 | - | 6/12/2023 | 505222.2 | 1820412.0 | 2057.0 | 1 | 17.2% | 98.9 | 101% | 16.9% | 27.4% | 173 |
| RF-14 | - | 6/13/2023 | 505937.1 | 1819958.4 | 2064.0 | 1 | 17.5% | 93.7 | 95% | 16.9% | 27.4% | 174 |
| RF-15 | - | 6/13/2023 | 505934.1 | 1820374.0 | 2062.0 | 1 | 19.5% | 98.9 | 101% | 16.9% | 27.4% | 175 |
| RF-16 | - | 6/13/2023 | 505253.9 | 1820379.8 | 2065.0 | 1 | 17.4% | 98.1 | 100% | 16.9% | 27.4% | 176 |
| RF-17 | - | 6/13/2023 | 505256.0 | 1820201.1 | 2064.0 | 1 | 17.0% | 97.4 | 99% | 16.9% | 27.4% | 177 |
| RF-18 | - | 6/13/2023 | 505356.7 | 1819804.9 | 2066.0 | 1 | 17.2% | 99.0 | 101% | 16.9% | 27.4% | 178 |
| RF-19 | - | 6/13/2023 | 505528.0 | 1819808.8 | 2065.0 | 1 | 17.0% | 98.3 | 100% | 16.9% | 27.4% | 179 |
| RF-20 | - | 6/15/2023 | 505233.2 | 18203478.8 | 2072.0 | 1 | 17.8% | 99.1 | 101% | 16.9% | 27.4% | 180 |
| RF-21 | - | 6/15/2023 | 505233.9 | 1820191.4 | 2072.0 | 1 | 18.5% | 98.1 | 100% | 16.9% | 27.4% | 181 |
| RF-22 | - | 6/15/2023 | 505318.0 | 1819787.7 | 2072.0 | 1 | 18.1% | 98.1 | 100% | 16.9% | 27.4% | 182 |
| RF-23 | - | 6/15/2023 | 505495.5 | 1819787.8 | 2072.0 | 1 | 17.7% | 98.9 | 101% | 16.9% | 27.4% | 183 |
| RF-24 | - | 6/15/2023 | 505962.6 | 1819922.7 | 2072.0 | 1 | 18.5% | 95.4 | 97% | 16.9% | 27.4% | 184 |
| RF-25 | - | 6/15/2023 | 505962.4 | 1820174.2 | 2072.0 | 1 | 18.5% | 96.6 | 98% | 16.9% | 27.4% | 185 |
| RF-26 | - | 7/20/2023 | 505230.6 | 1820757.5 | 2071.0 | 1 | 18.6% | 99.2 | 101% | 16.9% | 27.4% | 186 |
| RF-27 | - | 7/20/2023 | 505226.7 | 1820693.8 | 2072.0 | 1 | 18.9% | 97.9 | 100% | 16.9% | 27.4% | 187 |
| RF-28 | - | 7/20/2023 | 505235.5 | 1820591.2 | 2071.0 | 1 | 17.9% | 97.3 | 99% | 16.9% | 27.4% | 188 |

**GEOSERV, INC.** *Testing - Exploration - Engineering*
*Construction Materials Testing, Geotechnical, Geosynthetics, Geoenvironmental, Drilling*

**TO:** Mr. Joe Kessel
Baranko Bros, Inc.
P.O. Box 0820
Dickinson, ND 58602-0820

**DATE:** June 16, 2022
**PROJECT NO:** GEO-062205
**COPIES TO:** Minnkota Power Coop
Barr Engineering Co

**PROJECT:** Minnkota FGD Pond – Cell 5 Phase 1A
Center, ND

## DENSITY TESTS OF COMPACTED FILL

| TEST NUMBER: | RF-1 | RF-2 | RF-3 | RF-4 |
|---|---|---|---|---|
| DATE TAKEN | 6/16/22 | 6/16/22 | 6/16/22 | 6/16/22 |
| ASTM: D2488-00 DESCRIPTION AND IDENTIFICATION OF SOILS (Visual-Manual Procedure): | Silty Sand, brown. (SM)-3 | Silty Sand, brown. (SM)-3 | Silty Sand, brown. (SM)-3 | Silty Sand, brown. (SM)-3 |
| LOCATION: | Embankment fill, N 505634.9 E 1819685.5 | Embankment fill, N 505728.0 E 1819766.3 | Embankment fill, N 505822.0 E 1819766.5.5 | Embankment fill, N 505835.7 E 1819692.5 |
| ELEVATION OF TEST: | 2056.0' | 2058.0' | 2059.5' | 2063.5' |
| DEPTH BELOW FINAL GRADE: | 40.0' | 20.0' | 15.9' | 34.0' |
| DEPTH BELOW EXISTING GRADE: | 8" | 8" | 8" | 8" |

**FIELD DENSITY DETERMINATION:**

ASTM: D6938-17 Density of Soil-Aggregate in Place by Nuclear Density Methods (Shallow Depth), Direct Transmission

| | | | | |
|---|---|---|---|---|
| Dry Density (pcf) | 107.6 | 108.1 | 106.3 | 106.4 |
| Moisture Content (%) | 16.4 | 18.4 | 15.9 | 12.6 |
| Plus #4 Material (%) | None | None | None | None |
| Probe Depth (inches) | 12 | 12 | 12 | 12 |
| Operator | M. J. Tschosik | M. J. Tschosik | M. J. Tschosik | M. J. Tschosik |

**LABORATORY MOISTURE-DENSITY RELATION OF SOIL:**

| Method | ASTM:D698-12a, Method "A" | | | |
|---|---|---|---|---|
| Maximum Dry Density (pcf) | 109.2 | 109.2 | 109.2 | 109.2 |
| Optimum Moisture (%) | 15.1 | 15.1 | 15.1 | 15.1 |

**COMPACTION TEST RESULTS:**

| | | | | |
|---|---|---|---|---|
| Compaction (%) | 98.1 | 99.0 | 97.3 | 97.4 |
| Specified Compaction (%) | 95 | 95 | 95 | 95 |
| Specified Moisture (%) | 10.8 – 19.0 | 10.8 – 19.0 | 10.8 – 19.0 | 10.8 – 19.0 |

**ATTENTION:** Density tests are valid at the location and elevation of the test only. No representation is made as to the adequacy of fill and compaction at locations and elevations other than those tested. The test locations and number of tests were selected by Baranko Brothers. Compaction and moisture content meet project specification in the above test areas.

GEOSERV, INC.

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**GEOSERV, INC.** *Testing - Exploration - Engineering*
*Construction Materials Testing, Geotechnical, Geosynthetics, Geoenvironmental, Drilling*

**TO:** Mr. Joe Kessel
Baranko Bros, Inc.
P.O. Box 0820
Dickinson, ND 58602-0820

**DATE:** June 16, 2022
**PROJECT NO:** GEO-062205
**COPIES TO:** Minnkota Power Coop
Barr Engineering Co

**PROJECT:** Minnkota FGD Pond – Cell 5 Phase 1A
Center, ND

## DENSITY TESTS OF COMPACTED FILL

| | | | | |
|---|---|---|---|---|
| **TEST NUMBER:** | RF-5 | RF-6 | RF-7 | RF-8 |
| **DATE TAKEN** | 6/16/22 | 6/16/22 | 6/16/22 | 6/16/22 |
| **ASTM: D2488-00 DESCRIPTION AND IDENTIFICATION OF SOILS (Visual-Manual Procedure):** | Silty Sand, brown. (SM)-3 | Silty Sand, brown. (SM)-3 | Silty Sand, brown. (SM)-3 | Silty Sand, brown. (SM)-3 |
| **LOCATION:** | Embankment fill, N 505849.2 E 1819617.3 | Embankment fill, N 505888.6 E 1819631.5 | Embankment fill, N 505944.0 E 1819622.1 | Embankment fill, N 5058932.7 E 1819705.9 |
| **ELEVATION OF TEST:** | 2066.8' | 2066.1' | 2067.5' | 2065.5' |
| **DEPTH BELOW FINAL GRADE:** | 12.0' | 15.0' | 10.0' | 32.0' |
| **DEPTH BELOW EXISTING GRADE:** | 8" | 8" | 8" | 8" |

**FIELD DENSITY DETERMINATION:**

ASTM: D6938-17 Density of Soil-Aggregate in Place by Nuclear Density Methods (Shallow Depth), Direct Transmission

| | | | | |
|---|---|---|---|---|
| Dry Density (pcf) | 108.9 | 107.4 | 106.8 | 110.1 |
| Moisture Content (%) | 14.9 | 11.6 | 14.5 | 11.4 |
| Plus #4 Material (%) | None | None | None | None |
| Probe Depth (inches) | 12 | 12 | 12 | 12 |
| Operator | M. J. Tschosik | M. J. Tschosik | M. J. Tschosik | M. J. Tschosik |

**LABORATORY MOISTURE-DENSITY RELATION OF SOIL:**

| | | | | |
|---|---|---|---|---|
| Method | ASTM:D698-12a, Method "A" | | | |
| Maximum Dry Density (pcf) | 109.2 | 109.2 | 109.2 | 109.2 |
| Optimum Moisture (%) | 15.1 | 15.1 | 15.1 | 15.1 |

**COMPACTION TEST RESULTS:**

| | | | | |
|---|---|---|---|---|
| Compaction (%) | 99.7 | 98.4 | 97.8 | 100.8 |
| Specified Compaction (%) | 95 | 95 | 95 | 95 |
| Specified Moisture (%) | 10.8 – 19.0 | 10.8 – 19.0 | 10.8 – 19.0 | 10.8 – 19.0 |

**ATTENTION:** Density tests are valid at the location and elevation of the test only. No representation is made as to the adequacy of fill and compaction at locations and elevations other than those tested. The test locations and number of tests were selected by Baranko Brothers. Compaction and moisture content meet project specification in the above test areas.

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**GEOSERV, INC.** *Testing - Exploration - Engineering*
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**TO:** Mr. Joe Kessel
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P.O. Box 0820
Dickinson, ND 58602-0820

**DATE:** June 16, 2022
**PROJECT NO:** GEO-062205
**COPIES TO:** Minnkota Power Coop
Barr Engineering Co

**PROJECT:** Minnkota FGD Pond – Cell 5 Phase 1A
Center, ND

## DENSITY TESTS OF COMPACTED FILL

| | | | |
|---|---|---|---|
| **TEST NUMBER:** | RF-9 | RF-10 | RF-11 |
| **DATE TAKEN** | 6/16/22 | 6/16/22 | 6/16/22 |
| **ASTM: D2488-00 DESCRIPTION AND IDENTIFICATION OF SOILS (Visual-Manual Procedure):** | Silty Sand, brown. (SM)-3 | Silty Sand, brown. (SM)-3 | Silty Sand, brown. (SM)-3 |
| **LOCATION:** | Embankment fill, N 505927.3 E 1819768.7 | Embankment fill, N 505861.0 E 1819765.0 | Embankment fill, N 505872.4 E 1819693.3 |
| **ELEVATION OF TEST:** | 2062.6' | 2061.0' | 2064.5' |
| **DEPTH BELOW FINAL GRADE:** | 14.0' | 17.0' | 33.0' |
| **DEPTH BELOW EXISTING GRADE:** | 8" | 8" | 8" |

**FIELD DENSITY DETERMINATION:**

ASTM: D6938-17 Density of Soil-Aggregate in Place by Nuclear Density Methods (Shallow Depth), Direct Transmission

| | | | |
|---|---|---|---|
| Dry Density (pcf) | 106.1 | 106.9 | 107.3 |
| Moisture Content (%) | 11.3 | 11.7 | 11.6 |
| Plus #4 Material (%) | None | None | None |
| Probe Depth (inches) | 12 | 12 | 12 |
| Operator | M. J. Tschosik | M. J. Tschosik | M. J. Tschosik |

**LABORATORY MOISTURE-DENSITY RELATION OF SOIL:**

| | | | |
|---|---|---|---|
| Method | ASTM:D698-12a, Method "A" | | |
| Maximum Dry Density (pcf) | 109.2 | 109.2 | 109.2 |
| Optimum Moisture (%) | 15.1 | 15.1 | 15.1 |

**COMPACTION TEST RESULTS:**

| | | | |
|---|---|---|---|
| Compaction (%) | 97.2 | 97.9 | 98.3 |
| Specified Compaction (%) | 95 | 95 | 95 |
| Specified Moisture (%) | 10.8 – 19.0 | 10.8 – 19.0 | 10.8 – 19.0 |

**ATTENTION:** Density tests are valid at the location and elevation of the test only. No representation is made as to the adequacy of fill and compaction at locations and elevations other than those tested. The test locations and number of tests were selected by Baranko Brothers. Compaction and moisture content meet project specification in the above test areas.

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**GEOSERV, INC.** *Testing - Exploration - Engineering*
*Construction Materials Testing, Geotechnical, Geosynthetics, Geoenvironmental, Drilling*

**TO:** Mr. Joe Kessel
Baranko Bros, Inc.
P.O. Box 0820
Dickinson, ND 58602-0820

**DATE:** June 17, 2022
**PROJECT NO:** GEO-062205
**COPIES TO:** Minnkota Power Coop
Barr Engineering Co

**PROJECT:** Minnkota FGD Pond – Cell 5 Phase 1A
Center, ND

## DENSITY TESTS OF COMPACTED FILL

| **TEST NUMBER:** | RF-12 | RF-13 | RF-14 | RF-15 |
|---|---|---|---|---|
| **DATE TAKEN** | 6/17/22 | 6/17/22 | 6/17/22 | 6/17/22 |
| **ASTM: D2488-00 DESCRIPTION AND IDENTIFICATION OF SOILS (Visual-Manual Procedure):** | Clayey Sand, trace of gravel, brown. (SC)-4 | Clayey Sand, trace of gravel, brown. (SC)-4 | Fat Clay, brown. (CH)-1 | Fat Clay, brown. (CH)-1 |
| **LOCATION:** | Embankment fill, N 505951.5 E 1819646.0 | Embankment fill, N 505939.2 E 1819715.1 | Embankment fill, N 505876.5 E 1819715.7 | Embankment fill, N 505885.8 E 1819638.3 |
| **ELEVATION OF TEST:** | 2071.3' | 2069.4' | 2068.0' | 2071.0' |
| **DEPTH BELOW FINAL GRADE:** | 13.0' | 25.5' | 26.0' | 12.0' |
| **DEPTH BELOW EXISTING GRADE:** | 8" | 8" | 8" | 8" |

**FIELD DENSITY DETERMINATION:**

ASTM: D6938-17 Density of Soil-Aggregate in Place by Nuclear Density Methods (Shallow Depth), Direct Transmission

| | | | | |
|---|---|---|---|---|
| Dry Density (pcf) | 106.6 | 102.8 | 92.3 | 94.1 |
| Moisture Content (%) | 15.1 | 19.6 | 20.4 | 18.9 |
| Plus #4 Material (%) | 3 | 3 | None | None |
| Probe Depth (inches) | 12 | 12 | 12 | 12 |
| Operator | M. J. Tschosik | M. J. Tschosik | M. J. Tschosik | M. J. Tschosik |

**LABORATORY MOISTURE-DENSITY RELATION OF SOIL:**

| Method | ASTM:D698-12a, Method "A" | | | |
|---|---|---|---|---|
| Maximum Dry Density (pcf) | 106.2 | 106.2 | 94.8 | 94.8 |
| Optimum Moisture (%) | 19.1 | 19.1 | 26.5 | 26.5 |

**COMPACTION TEST RESULTS:**

| | | | | |
|---|---|---|---|---|
| Compaction (%) | 100.6 | 96.8 | 97.4 | 99.3 |
| Specified Compaction (%) | 95 | 95 | 95 | 95 |
| Specified Moisture (%) | 15.1 – 23.4 | 15.1 – 23.4 | 18.6 – 30.4 | 18.6 – 30.4 |

**ATTENTION:** Density tests are valid at the location and elevation of the test only. No representation is made as to the adequacy of fill and compaction at locations and elevations other than those tested. The test locations and number of tests were selected by Baranko Brothers. Compaction and moisture content meet project specification in the above test areas.

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**GEOSERV, INC.** *Testing - Exploration - Engineering*
*Construction Materials Testing, Geotechnical, Geosynthetics, Geoenvironmental, Drilling*

**TO:** Mr. Joe Kessel
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P.O. Box 0820
Dickinson, ND 58602-0820

**DATE:** June 17, 2022
**PROJECT NO:** GEO-062205
**COPIES TO:** Minnkota Power Coop
Barr Engineering Co

**PROJECT:** Minnkota FGD Pond – Cell 5 Phase 1A
Center, ND

## DENSITY TESTS OF COMPACTED FILL

| **TEST NUMBER:** | RF-16 | RF-17 | RF-18 | RF-19 |
|---|---|---|---|---|
| **DATE TAKEN** | 6/17/22 | 6/17/22 | 6/17/22 | 6/17/22 |
| **ASTM: D2488-00 DESCRIPTION AND IDENTIFICATION OF SOILS (Visual-Manual Procedure):** | Fat Clay, brown. (CH)-1 | Fat Clay, brown. (CH)-1 | Fat Clay, brown. (CH)-1 | Clayey Sand, trace of gravel, brown. (SC)-4 |
| **LOCATION:** | Embankment fill, N 505863.7 E 1819784.5 | Embankment fill, N 505783.0 E 1819787.7 | Embankment fill, N 505692.1 E 1819785.7 | Embankment fill, N 505591.2 E 1819787.2 |
| **ELEVATION OF TEST:** | 2065.5' | 2064.5' | 2064.0' | 2064.0' |
| **DEPTH BELOW FINAL GRADE:** | 6.0' | 6.0' | 7.5' | 7.0' |
| **DEPTH BELOW EXISTING GRADE:** | 8" | 8" | 8" | 8" |

**FIELD DENSITY DETERMINATION:**

ASTM: D6938-17 Density of Soil-Aggregate in Place by Nuclear Density Methods (Shallow Depth), Direct Transmission

| | | | | |
|---|---|---|---|---|
| Dry Density (pcf) | 92.8 | 91.2 | 90.2 | 105.8 |
| Moisture Content (%) | 21.9 | 20.0 | 18.7 | 15.2 |
| Plus #4 Material (%) | None | None | None | 3 |
| Probe Depth (inches) | 12 | 12 | 12 | 12 |
| Operator | M. J. Tschosik | M. J. Tschosik | M. J. Tschosik | M. J. Tschosik |

**LABORATORY MOISTURE-DENSITY RELATION OF SOIL:**

| Method | ASTM:D698-12a, Method "A" | | | |
|---|---|---|---|---|
| Maximum Dry Density (pcf) | 94.8 | 94.8 | 94.8 | 106.2 |
| Optimum Moisture (%) | 26.1 | 26.1 | 26.5 | 19.1 |

**COMPACTION TEST RESULTS:**

| | | | | |
|---|---|---|---|---|
| Compaction (%) | 97.9 | 96.2 | 95.2 | 99.6 |
| Specified Compaction (%) | 95 | 95 | 95 | 95 |
| Specified Moisture (%) | 18.6 – 30.4 | 18.6 – 30.4 | 18.6 – 30.4 | 15.1 – 23.4 |

**ATTENTION:** Density tests are valid at the location and elevation of the test only. No representation is made as to the adequacy of fill and compaction at locations and elevations other than those tested. The test locations and number of tests were selected by Baranko Brothers. Compaction and moisture content meet project specification in the above test areas.

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**GEOSERV, INC.** *Testing - Exploration - Engineering*
*Construction Materials Testing, Geotechnical, Geosynthetics, Geoenvironmental, Drilling*

**TO:** Mr. Joe Kessel
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P.O. Box 0820
Dickinson, ND 58602-0820

**DATE:** June 20, 2022
**PROJECT NO:** GEO-062205
**COPIES TO:** Minnkota Power Coop
Barr Engineering Co

**PROJECT:** Minnkota FGD Pond – Cell 5 Phase 1A
Center, ND

## DENSITY TESTS OF COMPACTED FILL

| **TEST NUMBER:** | RF-20 | RF-21 | RF-22 | RF-23 |
|---|---|---|---|---|
| **DATE TAKEN** | 6/20/22 | 6/20/22 | 6/20/22 | 6/20/22 |
| **ASTM: D2488-00 DESCRIPTION AND IDENTIFICATION OF SOILS (Visual-Manual Procedure):** | Clayey Sand, trace of gravel, brown. (SC)-4 | Clayey Sand, trace of gravel, brown. (SC)-4 | Clayey Sand, trace of gravel, brown. (SC)-4 | Clayey Sand, trace of gravel, brown. (SC)-4 |
| **LOCATION:** | Embankment fill, N 505663.5 E 1819654.3 | Embankment fill, N 505691.5 E 1819688.0 | Embankment fill, N 505714.5 E 1819714.0 | Embankment fill, N 505728.5 E 1819740.6 |
| **ELEVATION OF TEST:** | 2062.0' | 2065.0' | 2067.0' | 2066.0' |
| **DEPTH BELOW FINAL GRADE:** | 26.0' | 33.0' | 28.0' | 20.0' |
| **DEPTH BELOW EXISTING GRADE:** | 8" | 8" | 8" | 8" |

**FIELD DENSITY DETERMINATION:**

ASTM: D6938-17 Density of Soil-Aggregate in Place by Nuclear Density Methods (Shallow Depth), Direct Transmission

| | | | | |
|---|---|---|---|---|
| Dry Density (pcf) | 105.2 | 103.0 | 102.8 | 105.7 |
| Moisture Content (%) | 17.3 | 16.3 | 17.1 | 16.3 |
| Plus #4 Material (%) | 3 | 3 | 3 | 3 |
| Probe Depth (inches) | 12 | 12 | 12 | 12 |
| Operator | M. J. Tschosik | M. J. Tschosik | M. J. Tschosik | M. J. Tschosik |

**LABORATORY MOISTURE-DENSITY RELATION OF SOIL:**

| Method | ASTM:D698-12a, Method "A" | | | |
|---|---|---|---|---|
| Maximum Dry Density (pcf) | 106.2 | 106.2 | 106.2 | 106.2 |
| Optimum Moisture (%) | 19.1 | 19.1 | 19.1 | 19.1 |

**COMPACTION TEST RESULTS:**

| | | | | |
|---|---|---|---|---|
| Compaction (%) | 99.1 | 97.0 | 96.8 | 99.5 |
| Specified Compaction (%) | 95 | 95 | 95 | 95 |
| Specified Moisture (%) | 15.1 – 23.4 | 15.1 – 23.4 | 15.1 – 23.4 | 15.1 – 23.4 |

**ATTENTION:** Density tests are valid at the location and elevation of the test only. No representation is made as to the adequacy of fill and compaction at locations and elevations other than those tested. The test locations and number of tests were selected by Baranko Brothers. Compaction and moisture content meet project specification in the above test areas.

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**GEOSERV, INC.** *Testing - Exploration - Engineering*
*Construction Materials Testing, Geotechnical, Geosynthetics, Geoenvironmental, Drilling*

**TO:** Mr. Joe Kessel
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P.O. Box 0820
Dickinson, ND 58602-0820

**DATE:** June 20, 2022
**PROJECT NO:** GEO-062205
**COPIES TO:** Minnkota Power Coop
Barr Engineering Co

**PROJECT:** Minnkota FGD Pond – Cell 5 Phase 1A
Center, ND

## DENSITY TESTS OF COMPACTED FILL

| **TEST NUMBER:** | RF-24 | RF-25 | RF-26 | RF-27 |
|---|---|---|---|---|
| **DATE TAKEN** | 6/20/22 | 6/20/22 | 6/20/22 | 6/20/22 |
| **ASTM: D2488-00 DESCRIPTION AND IDENTIFICATION OF SOILS (Visual-Manual Procedure):** | Clayey Sand, trace of gravel, brown. (SC)-4 | Clayey Sand, trace of gravel, brown. (SC)-4 | Clayey Sand, trace of gravel, brown. (SC)-4 | Clayey Sand, trace of gravel, brown. (SC)-4 |
| **LOCATION:** | Embankment fill, N 505926.3 E 1819747.5 | Embankment fill, N 505928.6 E 1819704.9 | Embankment fill, N 505929.4 E 1819673.5 | Embankment fill, N 505926.1 E 1819644.1 |
| **ELEVATION OF TEST:** | 2070.0' | 2072.0' | 2072.5' | 2074.0' |
| **DEPTH BELOW FINAL GRADE:** | 14.0' | 26.0' | 20.0' | 10.0' |
| **DEPTH BELOW EXISTING GRADE:** | 8" | 8" | 8" | 8" |

**FIELD DENSITY DETERMINATION:**

ASTM: D6938-17 Density of Soil-Aggregate in Place by Nuclear Density Methods (Shallow Depth), Direct Transmission

| | | | | |
|---|---|---|---|---|
| Dry Density (pcf) | 106.8 | 102.8 | 102.8 | 101.3 |
| Moisture Content (%) | 15.5 | 15.9 | 15.5 | 16.8 |
| Plus #4 Material (%) | 3 | 3 | 3 | 3 |
| Probe Depth (inches) | 12 | 12 | 12 | 12 |
| Operator | M. J. Tschosik | M. J. Tschosik | M. J. Tschosik | M. J. Tschosik |

**LABORATORY MOISTURE-DENSITY RELATION OF SOIL:**

Method ASTM:D698-12a, Method "A"

| | | | | |
|---|---|---|---|---|
| Maximum Dry Density (pcf) | 106.2 | 106.2 | 106.2 | 106.2 |
| Optimum Moisture (%) | 19.1 | 19.1 | 19.1 | 19.1 |

**COMPACTION TEST RESULTS:**

| | | | | |
|---|---|---|---|---|
| Compaction (%) | 100.6 | 96.8 | 96.8 | 95.4 |
| Specified Compaction (%) | 95 | 95 | 95 | 95 |
| Specified Moisture (%) | 15.1 – 23.4 | 15.1 – 23.4 | 15.1 – 23.4 | 15.1 – 23.4 |

**ATTENTION:** Density tests are valid at the location and elevation of the test only. No representation is made as to the adequacy of fill and compaction at locations and elevations other than those tested. The test locations and number of tests were selected by Baranko Brothers. Compaction and moisture content meet project specification in the above test areas.

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**GEOSERV, INC.** *Testing - Exploration - Engineering*
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**TO:** Mr. Joe Kessel
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Dickinson, ND 58602-0820

**DATE:** June 21, 2022
**PROJECT NO:** GEO-062205
**COPIES TO:** Minnkota Power Coop
Barr Engineering Co

**PROJECT:** Minnkota FGD Pond – Cell 5 Phase 1A
Center, ND

## DENSITY TESTS OF COMPACTED FILL

| **TEST NUMBER:** | RF-28 | RF-29 | RF-30 | RF-31 |
|---|---|---|---|---|
| **DATE TAKEN** | 6/21/22 | 6/21/22 | 6/21/22 | 6/21/22 |
| **ASTM: D2488-00 DESCRIPTION AND IDENTIFICATION OF SOILS (Visual-Manual Procedure):** | Silty Sand, trace of gravel brown. (SM)-2 | Silty Sand, trace of gravel brown. (SM)-2 | Clayey Sand, trace of gravel, brown. (SC)-4 | Clayey Sand, trace of gravel, brown. (SC)-4 |
| **LOCATION:** | Embankment fill, N 505672.1 E 1819603.3 | Embankment fill, N 505749.0 E 1819627.1 | Embankment fill, N 505828.7 E 1819642.5 | Embankment fill, N 505908.6 E 1819652.6 |
| **ELEVATION OF TEST:** | 2062.0' | 2072.0' | 2077.0' | 2078.0' |
| **DEPTH BELOW FINAL GRADE:** | 13.0' | 9.0' | 8.0' | 8.0' |
| **DEPTH BELOW EXISTING GRADE:** | 8" | 8" | 8" | 8" |

**FIELD DENSITY DETERMINATION:**

ASTM: D6938-17 Density of Soil-Aggregate in Place by Nuclear Density Methods (Shallow Depth), Direct Transmission

| | | | | |
|---|---|---|---|---|
| Dry Density (pcf) | 109.8 | 107.9 | 102.5 | 103.3 |
| Moisture Content (%) | 10.6 | 11.8 | 16.2 | 17.5 |
| Plus #4 Material (%) | 6 | 6 | 3 | 3 |
| Probe Depth (inches) | 12 | 12 | 12 | 12 |
| Operator | M. J. Tschosik | M. J. Tschosik | M. J. Tschosik | M. J. Tschosik |

**LABORATORY MOISTURE-DENSITY RELATION OF SOIL:**

| Method | ASTM:D698-12a, Method "A" | | | |
|---|---|---|---|---|
| Maximum Dry Density (pcf) | 111.0 | 111.0 | 106.2 | 106.2 |
| Optimum Moisture (%) | 15.7 | 15.7 | 19.1 | 19.1 |

**COMPACTION TEST RESULTS:**

| | | | | |
|---|---|---|---|---|
| Compaction (%) | 98.9 | 97.2 | 96.5 | 97.3 |
| Specified Compaction (%) | 95 | 95 | 95 | 95 |
| Specified Moisture (%) | 9.9 – 17.7 | 9.9 – 17.7 | 15.1 – 23.4 | 15.1 – 23.4 |

**ATTENTION:** Density tests are valid at the location and elevation of the test only. No representation is made as to the adequacy of fill and compaction at locations and elevations other than those tested. The test locations and number of tests were selected by Baranko Brothers. Compaction and moisture content meet project specification in the above test areas.

GEOSERV, INC.

3100 EAST BROADWAY AVENUE • BISMARCK, ND 58501 PHONE 701-223-6149
P.O. BOX 3159 • BISMARCK, ND 58502-3159 FAX 701-223-2372

**GEOSERV, INC.** *Testing - Exploration - Engineering*
*Construction Materials Testing, Geotechnical, Geosynthetics, Geoenvironmental, Drilling*

**TO:** Mr. Joe Kessel
Baranko Bros, Inc.
P.O. Box 0820
Dickinson, ND 58602-0820

**DATE:** June 21, 2022
**PROJECT NO:** GEO-062205
**COPIES TO:** Minnkota Power Coop
Barr Engineering Co

**PROJECT:** Minnkota FGD Pond – Cell 5 Phase 1A
Center, ND

## DENSITY TESTS OF COMPACTED FILL

| **TEST NUMBER:** | RF-32 | RF-33 | RF-34 | RF-35 |
|---|---|---|---|---|
| **DATE TAKEN** | 6/21/22 | 6/21/22 | 6/21/22 | 6/21/22 |
| **ASTM: D2488-00 DESCRIPTION AND IDENTIFICATION OF SOILS (Visual-Manual Procedure):** | Clayey Sand, trace of gravel, brown. (SC)-4 | Clayey Sand, trace of gravel, brown. (SC)-4 | Clayey Sand, trace of gravel, brown. (SC)-4 | Clayey Sand, trace of gravel, brown. (SC)-4 |
| **LOCATION:** | Embankment fill, N 505908.5 E 1819704.1 | Embankment fill, N 505929.3 E 1819696.1 | Embankment fill, N 505748.1 E 1819688.0 | Embankment fill, N 505661.9 E 1819679.5 |
| **ELEVATION OF TEST:** | 2076.0' | 2076.0' | 2073.0' | 2066.0' |
| **DEPTH BELOW FINAL GRADE:** | 21.0' | 22.0' | 25.0' | 29.0' |
| **DEPTH BELOW EXISTING GRADE:** | 8" | 8" | 8" | 8" |

**FIELD DENSITY DETERMINATION:**

ASTM: D6938-17 Density of Soil-Aggregate in Place by Nuclear Density Methods (Shallow Depth), Direct Transmission

| | | | | |
|---|---|---|---|---|
| Dry Density (pcf) | 104.8 | 106.2 | 105.3 | 106.9 |
| Moisture Content (%) | 15.8 | 15.3 | 16.0 | 16.9 |
| Plus #4 Material (%) | 3 | 3 | 3 | 3 |
| Probe Depth (inches) | 12 | 12 | 12 | 12 |
| Operator | M. J. Tschosik | M. J. Tschosik | M. J. Tschosik | M. J. Tschosik |

**LABORATORY MOISTURE-DENSITY RELATION OF SOIL:**

| Method | ASTM:D698-12a, Method "A" | | | |
|---|---|---|---|---|
| Maximum Dry Density (pcf) | 106.2 | 106.2 | 106.2 | 106.2 |
| Optimum Moisture (%) | 19.1 | 19.1 | 19.1 | 19.1 |

**COMPACTION TEST RESULTS:**

| | | | | |
|---|---|---|---|---|
| Compaction (%) | 98.7 | 100.0 | 99.2 | 100.7 |
| Specified Compaction (%) | 95 | 95 | 95 | 95 |
| Specified Moisture (%) | 15.1 – 23.4 | 15.1 – 23.4 | 15.1 – 23.4 | 15.1 – 23.4 |

**ATTENTION:** Density tests are valid at the location and elevation of the test only. No representation is made as to the adequacy of fill and compaction at locations and elevations other than those tested. The test locations and number of tests were selected by Baranko Brothers. Compaction and moisture content meet project specification in the above test areas.

GEOSERV, INC.

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**GEOSERV, INC.** *Testing - Exploration - Engineering*
*Construction Materials Testing, Geotechnical, Geosynthetics, Geoenvironmental, Drilling*

**TO:** Mr. Joe Kessel
Baranko Bros, Inc.
P.O. Box 0820
Dickinson, ND 58602-0820

**DATE:** June 22, 2022
**PROJECT NO:** GEO-062205
**COPIES TO:** Minnkota Power Coop
Barr Engineering Co

**PROJECT:** Minnkota FGD Pond – Cell 5 Phase 1A
Center, ND

## DENSITY TESTS OF COMPACTED FILL

| **TEST NUMBER:** | RF-36 | RF-37 | RF-38 | RF-39 |
|---|---|---|---|---|
| **DATE TAKEN** | 6/22/22 | 6/22/22 | 6/22/22 | 6/22/22 |
| **ASTM: D2488-00 DESCRIPTION AND IDENTIFICATION OF SOILS (Visual-Manual Procedure):** | Clayey Sand, trace of gravel, brown. (SC)-4 | Clayey Sand, trace of gravel, brown. (SC)-4 | Clayey Sand, trace of gravel, brown. (SC)-4 | Clayey Sand, trace of gravel, brown. (SC)-4 |
| **LOCATION:** | Embankment fill, N 505653.4 E 1819751.3 | Embankment fill, N 505734.1 E 1819737.1 | Embankment fill, N 505818.8 E 1819726.1 | Embankment fill, N 505895.6 E 1819725.9 |
| **ELEVATION OF TEST:** | 2072.0' | 2077.0' | 2080.0' | 2083.0' |
| **DEPTH BELOW FINAL GRADE:** | 11.0' | 11.0' | 11.0' | 8.0' |
| **DEPTH BELOW EXISTING GRADE:** | 8" | 8" | 8" | 8" |

**FIELD DENSITY DETERMINATION:**

ASTM: D6938-17 Density of Soil-Aggregate in Place by Nuclear Density Methods (Shallow Depth), Direct Transmission

| | | | | |
|---|---|---|---|---|
| Dry Density (pcf) | 103.7 | 106.1 | 102.2 | 101.8 |
| Moisture Content (%) | 15.1 | 15.5 | 15.8 | 15.9 |
| Plus #4 Material (%) | 3 | 3 | 3 | 3 |
| Probe Depth (inches) | 12 | 12 | 12 | 12 |
| Operator | M. J. Tschosik | M. J. Tschosik | M. J. Tschosik | M. J. Tschosik |

**LABORATORY MOISTURE-DENSITY RELATION OF SOIL:**

| Method | ASTM:D698-12a, Method "A" | | | |
|---|---|---|---|---|
| Maximum Dry Density (pcf) | 106.2 | 106.2 | 106.2 | 106.2 |
| Optimum Moisture (%) | 19.1 | 19.1 | 19.1 | 19.1 |

**COMPACTION TEST RESULTS:**

| | | | | |
|---|---|---|---|---|
| Compaction (%) | 97.6 | 99.9 | 96.2 | 95.6 |
| Specified Compaction (%) | 95 | 95 | 95 | 95 |
| Specified Moisture (%) | 15.1 – 23.4 | 15.1 – 23.4 | 15.1 – 23.4 | 15.1 – 23.4 |

**ATTENTION:** Density tests are valid at the location and elevation of the test only. No representation is made as to the adequacy of fill and compaction at locations and elevations other than those tested. The test locations and number of tests were selected by Baranko Brothers. Compaction and moisture content meet project specification in the above test areas.

GEOSERV, INC.

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**GEOSERV, INC.** *Testing - Exploration - Engineering*
*Construction Materials Testing, Geotechnical, Geosynthetics, Geoenvironmental, Drilling*

**TO:** Mr. Joe Kessel
Baranko Bros, Inc.
P.O. Box 0820
Dickinson, ND 58602-0820

**DATE:** June 22, 2022
**PROJECT NO:** GEO-062205
**COPIES TO:** Minnkota Power Coop
Barr Engineering Co

**PROJECT:** Minnkota FGD Pond – Cell 5 Phase 1A
Center, ND

## DENSITY TESTS OF COMPACTED FILL

| | | | | |
|---|---|---|---|---|
| **TEST NUMBER:** | RF-40 | RF-41 | RF-42 | RF-43 |
| **DATE TAKEN** | 6/22/22 | 6/22/22 | 6/22/22 | 6/22/22 |
| **ASTM: D2488-00 DESCRIPTION AND IDENTIFICATION OF SOILS (Visual-Manual Procedure):** | Clayey Sand, trace of gravel, brown. (SC)-4 | Clayey Sand, trace of gravel, brown. (SC)-4 | Clayey Sand, trace of gravel, brown. (SC)-4 | Clayey Sand, trace of gravel, brown. (SC)-4 |
| **LOCATION:** | Embankment fill, N 505878.8 E 1819686.5 | Embankment fill, N 505818.1 E 1819683.2 | Embankment fill, N 505746.8 E 1819688.0 | Embankment fill, N 505676.1 E 1819699.3 |
| **ELEVATION OF TEST:** | 2083.0' | 2080.0' | 2076.0' | 2071.0' |
| **DEPTH BELOW FINAL GRADE:** | 15.0' | 17.0' | 21.0' | 26.0' |
| **DEPTH BELOW EXISTING GRADE:** | 8" | 8" | 8" | 8" |

**FIELD DENSITY DETERMINATION:**

ASTM: D6938-17 Density of Soil-Aggregate in Place by Nuclear Density Methods (Shallow Depth), Direct Transmission

| | | | | |
|---|---|---|---|---|
| Dry Density (pcf) | 101.3 | 103.4 | 106.2 | 102.2 |
| Moisture Content (%) | 16.8 | 15.7 | 18.1 | 15.9 |
| Plus #4 Material (%) | 3 | 3 | 3 | 3 |
| Probe Depth (inches) | 12 | 12 | 12 | 12 |
| Operator | M. J. Tschosik | M. J. Tschosik | M. J. Tschosik | M. J. Tschosik |

**LABORATORY MOISTURE-DENSITY RELATION OF SOIL:**

Method ASTM:D698-12a, Method "A"

| | | | | |
|---|---|---|---|---|
| Maximum Dry Density (pcf) | 106.2 | 106.2 | 106.2 | 106.2 |
| Optimum Moisture (%) | 19.1 | 19.1 | 19.1 | 19.1 |

**COMPACTION TEST RESULTS:**

| | | | | |
|---|---|---|---|---|
| Compaction (%) | 95.4 | 97.4 | 100.0 | 96.2 |
| Specified Compaction (%) | 95 | 95 | 95 | 95 |
| Specified Moisture (%) | 15.1 – 23.4 | 15.1 – 23.4 | 15.1 – 23.4 | 15.1 – 23.4 |

**ATTENTION:** Density tests are valid at the location and elevation of the test only. No representation is made as to the adequacy of fill and compaction at locations and elevations other than those tested. The test locations and number of tests were selected by Baranko Brothers. Compaction and moisture content meet project specification in the above test areas.

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**GEOSERV, INC.** *Testing - Exploration - Engineering*
*Construction Materials Testing, Geotechnical, Geosynthetics, Geoenvironmental, Drilling*

**TO:** Mr. Joe Kessel
Baranko Bros, Inc.
P.O. Box 0820
Dickinson, ND 58602-0820

**DATE:** June 23, 2022
**PROJECT NO:** GEO-062205
**COPIES TO:** Minnkota Power Coop
Barr Engineering Co

**PROJECT:** Minnkota FGD Pond – Cell 5 Phase 1A
Center, ND

## DENSITY TESTS OF COMPACTED FILL

| **TEST NUMBER:** | RF-44 | RF-45 | RF-46 | RF-47 |
|---|---|---|---|---|
| **DATE TAKEN** | 6/23/22 | 6/23/22 | 6/23/22 | 6/23/22 |
| **ASTM: D2488-00 DESCRIPTION AND IDENTIFICATION OF SOILS (Visual-Manual Procedure):** | Clayey Sand, trace of gravel, brown. (SC)-4 | Clayey Sand, trace of gravel, brown. (SC)-4 | Clayey Sand, trace of gravel, brown. (SC)-4 | Clayey Sand, trace of gravel, brown. (SC)-4 |
| **LOCATION:** | Embankment fill, N 505684.2 E 1819641.7 | Embankment fill, N 505742.9 E 1819655.1 | Embankment fill, N 505800.8 E 1819676.6 | Embankment fill, N 505879.0 E 1819687.0 |
| **ELEVATION OF TEST:** | 2071.0' | 2077.0' | 2083.0' | 2086.0' |
| **DEPTH BELOW FINAL GRADE:** | 14.0' | 11.0' | 11.0' | 12.0' |
| **DEPTH BELOW EXISTING GRADE:** | 8" | 8" | 8" | 8" |

**FIELD DENSITY DETERMINATION:**

ASTM: D6938-17 Density of Soil-Aggregate in Place by Nuclear Density Methods (Shallow Depth), Direct Transmission

| | | | | |
|---|---|---|---|---|
| Dry Density (pcf) | 106.3 | 105.9 | 101.9 | 105.5 |
| Moisture Content (%) | 15.4 | 16.7 | 19.0 | 16.5 |
| Plus #4 Material (%) | 3 | 3 | 3 | 3 |
| Probe Depth (inches) | 12 | 12 | 12 | 12 |
| Operator | M. J. Tschosik | M. J. Tschosik | M. J. Tschosik | M. J. Tschosik |

**LABORATORY MOISTURE-DENSITY RELATION OF SOIL:**

| Method | ASTM:D698-12a, Method "A" | | | |
|---|---|---|---|---|
| Maximum Dry Density (pcf) | 106.2 | 106.2 | 106.2 | 106.2 |
| Optimum Moisture (%) | 19.1 | 19.1 | 19.1 | 19.1 |

**COMPACTION TEST RESULTS:**

| | | | | |
|---|---|---|---|---|
| Compaction (%) | 100.1 | 99.7 | 96.0 | 99.3 |
| Specified Compaction (%) | 95 | 95 | 95 | 95 |
| Specified Moisture (%) | 15.1 – 23.4 | 15.1 – 23.4 | 15.1 – 23.4 | 15.1 – 23.4 |

**ATTENTION:** Density tests are valid at the location and elevation of the test only. No representation is made as to the adequacy of fill and compaction at locations and elevations other than those tested. The test locations and number of tests were selected by Baranko Brothers. Compaction and moisture content meet project specification in the above test areas.

GEOSERV, INC.

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**GEOSERV, INC.** *Testing - Exploration - Engineering*
*Construction Materials Testing, Geotechnical, Geosynthetics, Geoenvironmental, Drilling*

**TO:** Mr. Joe Kessel
Baranko Bros, Inc.
P.O. Box 0820
Dickinson, ND 58602-0820

**DATE:** June 23, 2022
**PROJECT NO:** GEO-062205
**COPIES TO:** Minnkota Power Coop
Barr Engineering Co

**PROJECT:** Minnkota FGD Pond – Cell 5 Phase 1A
Center, ND

## DENSITY TESTS OF COMPACTED FILL

| **TEST NUMBER:** | RF-48 | RF-49 | RF-50 | RF-51 |
|---|---|---|---|---|
| **DATE TAKEN** | 6/23/22 | 6/23/22 | 6/23/22 | 6/23/22 |
| **ASTM: D2488-00 DESCRIPTION AND IDENTIFICATION OF SOILS (Visual-Manual Procedure):** | Clayey Sand, trace of gravel, brown. (SC)-4 | Clayey Sand, trace of gravel, brown. (SC)-4 | Clayey Sand, trace of gravel, brown. (SC)-4 | Clayey Sand, trace of gravel, brown. (SC)-4 |
| **LOCATION:** | Embankment fill, N 505220.7 E 1819581.6 | Embankment fill, N 505183.2 E 1819605.7 | Embankment fill, N 505102.9 E 1819592.2 | Embankment fill, N 505066.1 E 1819614.8 |
| **ELEVATION OF TEST:** | 2048.0' | 2049.0' | 2049.0' | 2050.0' |
| **DEPTH BELOW FINAL GRADE:** | 22.0' | 27.0' | 24.0' | 24.0' |
| **DEPTH BELOW EXISTING GRADE:** | 8" | 8" | 8" | 8" |

**FIELD DENSITY DETERMINATION:**

ASTM: D6938-17 Density of Soil-Aggregate in Place by Nuclear Density Methods (Shallow Depth), Direct Transmission

| | | | | |
|---|---|---|---|---|
| Dry Density (pcf) | 102.9 | 102.6 | 103.2 | 102.2 |
| Moisture Content (%) | 15.9 | 15.9 | 15.6 | 16.1 |
| Plus #4 Material (%) | 3 | 3 | 3 | 3 |
| Probe Depth (inches) | 12 | 12 | 12 | 12 |
| Operator | M. J. Tschosik | M. J. Tschosik | M. J. Tschosik | M. J. Tschosik |

**LABORATORY MOISTURE-DENSITY RELATION OF SOIL:**

| Method | ASTM:D698-12a, Method "A" | | | |
|---|---|---|---|---|
| Maximum Dry Density (pcf) | 106.2 | 106.2 | 106.2 | 106.2 |
| Optimum Moisture (%) | 19.1 | 19.1 | 19.1 | 19.1 |

**COMPACTION TEST RESULTS:**

| | | | | |
|---|---|---|---|---|
| Compaction (%) | 96.9 | 96.6 | 97.2 | 96.2 |
| Specified Compaction (%) | 95 | 95 | 95 | 95 |
| Specified Moisture (%) | 15.1 – 23.4 | 15.1 – 23.4 | 15.1 – 23.4 | 15.1 – 23.4 |

**ATTENTION:** Density tests are valid at the location and elevation of the test only. No representation is made as to the adequacy of fill and compaction at locations and elevations other than those tested. The test locations and number of tests were selected by Baranko Brothers. Compaction and moisture content meet project specification in the above test areas.

GEOSERV, INC.

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**GEOSERV, INC.** *Testing - Exploration - Engineering*
*Construction Materials Testing, Geotechnical, Geosynthetics, Geoenvironmental, Drilling*

**TO:** Mr. Joe Kessel
Baranko Bros, Inc.
P.O. Box 0820
Dickinson, ND 58602-0820

**DATE:** June 24, 2022
**PROJECT NO:** GEO-062205
**COPIES TO:** Minnkota Power Coop
Barr Engineering Co

**PROJECT:** Minnkota FGD Pond – Cell 5 Phase 1A
Center, ND

## DENSITY TESTS OF COMPACTED FILL

| **TEST NUMBER:** | RF-52 | RF-53 | RF-54 | RF-55 |
|---|---|---|---|---|
| **DATE TAKEN** | 6/24/22 | 6/24/22 | 6/24/22 | 6/24/22 |
| **ASTM: D2488-00 DESCRIPTION AND IDENTIFICATION OF SOILS (Visual-Manual Procedure):** | Clayey Sand, trace of gravel, brown. (SC)-4 | Clayey Sand, trace of gravel, brown. (SC)-4 | Clayey Sand, trace of gravel, brown. (SC)-4 | Clayey Sand, trace of gravel, brown. (SC)-4 |
| **LOCATION:** | Embankment fill, N 505969.1 E 1819703.3 | Embankment fill, N 505919.8 E 1819706.4 | Embankment fill, N 505879.8 E 1819708.2 | Embankment fill, N 505828.3 E 1819707.7 |
| **ELEVATION OF TEST:** | 2090.0' | 2089.0' | 2088.0' | 2086.0' |
| **DEPTH BELOW FINAL GRADE:** | 8.0' | 8.0' | 10.0' | 11.0' |
| **DEPTH BELOW EXISTING GRADE:** | 8" | 8" | 8" | 8" |

**FIELD DENSITY DETERMINATION:**

ASTM: D6938-17 Density of Soil-Aggregate in Place by Nuclear Density Methods (Shallow Depth), Direct Transmission

| | | | | |
|---|---|---|---|---|
| Dry Density (pcf) | 105.6 | 104.4 | 104.6 | 102.7 |
| Moisture Content (%) | 15.2 | 16.0 | 15.6 | 18.2 |
| Plus #4 Material (%) | 3 | 3 | 3 | 3 |
| Probe Depth (inches) | 12 | 12 | 12 | 12 |
| Operator | M. J. Tschosik | M. J. Tschosik | M. J. Tschosik | M. J. Tschosik |

**LABORATORY MOISTURE-DENSITY RELATION OF SOIL:**

| | | | | |
|---|---|---|---|---|
| Method | ASTM:D698-12a, Method "A" | | | |
| Maximum Dry Density (pcf) | 106.2 | 106.2 | 106.2 | 106.2 |
| Optimum Moisture (%) | 19.1 | 19.1 | 19.1 | 19.1 |

**COMPACTION TEST RESULTS:**

| | | | | |
|---|---|---|---|---|
| Compaction (%) | 99.4 | 98.3 | 98.4 | 96.7 |
| Specified Compaction (%) | 95 | 95 | 95 | 95 |
| Specified Moisture (%) | 15.1 – 23.4 | 15.1 – 23.4 | 15.1 – 23.4 | 15.1 – 23.4 |

**ATTENTION:** Density tests are valid at the location and elevation of the test only. No representation is made as to the adequacy of fill and compaction at locations and elevations other than those tested. The test locations and number of tests were selected by Baranko Brothers. Compaction and moisture content meet project specification in the above test areas.

GEOSERV, INC.

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**GEOSERV, INC.** *Testing - Exploration - Engineering*
*Construction Materials Testing, Geotechnical, Geosynthetics, Geoenvironmental, Drilling*

**TO:** Mr. Joe Kessel
Baranko Bros, Inc.
P.O. Box 0820
Dickinson, ND 58602-0820

**DATE:** June 24, 2022
**PROJECT NO:** GEO-062205
**COPIES TO:** Minnkota Power Coop
Barr Engineering Co

**PROJECT:** Minnkota FGD Pond – Cell 5 Phase 1A
Center, ND

## DENSITY TESTS OF COMPACTED FILL

| **TEST NUMBER:** | RF-56 | RF-57 | RF-58 | RF-59 |
|---|---|---|---|---|
| **DATE TAKEN** | 6/24/22 | 6/24/22 | 6/24/22 | 6/24/22 |
| **ASTM: D2488-00 DESCRIPTION AND IDENTIFICATION OF SOILS (Visual-Manual Procedure):** | Clayey Sand, trace of gravel, brown. (SC)-4 | Clayey Sand, trace of gravel, brown. (SC)-4 | Clayey Sand, trace of gravel, brown. (SC)-4 | Clayey Sand, trace of gravel, brown. (SC)-4 |
| **LOCATION:** | Embankment fill, N 505257.1 E 1819653.2 | Embankment fill, N 505212.9 E 1819660.4 | Embankment fill, N 505168.2 E 1819664.2 | Embankment fill, N 505115.7 E 1819670.1 |
| **ELEVATION OF TEST:** | 2057.0' | 2058.0' | 2057.0' | 2057.0' |
| **DEPTH BELOW FINAL GRADE:** | 31.0' | 31.0' | 33.0' | 33.0' |
| **DEPTH BELOW EXISTING GRADE:** | 8" | 8" | 8" | 8" |

**FIELD DENSITY DETERMINATION:**

ASTM: D6938-17 Density of Soil-Aggregate in Place by Nuclear Density Methods (Shallow Depth), Direct Transmission

| | | | | |
|---|---|---|---|---|
| Dry Density (pcf) | 106.3 | 106.5 | 103.1 | 104.1 |
| Moisture Content (%) | 15.7 | 15.9 | 17.3 | 15.3 |
| Plus #4 Material (%) | 3 | 3 | 3 | 3 |
| Probe Depth (inches) | 12 | 12 | 12 | 12 |
| Operator | M. J. Tschosik | M. J. Tschosik | M. J. Tschosik | M. J. Tschosik |

**LABORATORY MOISTURE-DENSITY RELATION OF SOIL:**

| | | | | |
|---|---|---|---|---|
| Method | ASTM:D698-12a, Method "A" | | | |
| Maximum Dry Density (pcf) | 106.2 | 106.2 | 106.2 | 106.2 |
| Optimum Moisture (%) | 19.1 | 19.1 | 19.1 | 19.1 |

**COMPACTION TEST RESULTS:**

| | | | | |
|---|---|---|---|---|
| Compaction (%) | 100.1 | 100.3 | 97.1 | 98.0 |
| Specified Compaction (%) | 95 | 95 | 95 | 95 |
| Specified Moisture (%) | 15.1 – 23.4 | 15.1 – 23.4 | 15.1 – 23.4 | 15.1 – 23.4 |

**ATTENTION:** Density tests are valid at the location and elevation of the test only. No representation is made as to the adequacy of fill and compaction at locations and elevations other than those tested. The test locations and number of tests were selected by Baranko Brothers. Compaction and moisture content meet project specification in the above test areas.

Mark Tschosik

GEOSERV, INC.

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**GEOSERV, INC.** *Testing - Exploration - Engineering*
*Construction Materials Testing, Geotechnical, Geosynthetics, Geoenvironmental, Drilling*

**TO:** Mr. Joe Kessel
Baranko Bros, Inc.
P.O. Box 0820
Dickinson, ND 58602-0820

**DATE:** June 27, 2022
**PROJECT NO:** GEO-062205
**COPIES TO:** Minnkota Power Coop
Barr Engineering Co

**PROJECT:** Minnkota FGD Pond – Cell 5 Phase 1A
Center, ND

## DENSITY TESTS OF COMPACTED FILL

| **TEST NUMBER:** | RF-60 | RF-61 | RF-62 | RF-63 |
|---|---|---|---|---|
| **DATE TAKEN** | 6/27/22 | 6/27/22 | 6/27/22 | 6/27/22 |
| **ASTM: D2488-00 DESCRIPTION AND IDENTIFICATION OF SOILS (Visual-Manual Procedure):** | Clayey Sand trace of gravel brown. (SC)-5 | Fat Clay, brown. (CH)-1 | Fat Clay, brown. (CH)-1 | Fat Clay, brown. (CH)-1 |
| **LOCATION:** | Embankment fill, N 505072.4 E 1819538.6 | Embankment fill, N 505166.4 E 1819528.8 | Embankment fill, N 505261.6 E 1819519.1 | Embankment fill, N 505335.2 E 1819510.1 |
| **ELEVATION OF TEST:** | 2054.0' | 2054.0' | 2051.0' | 2048.0' |
| **DEPTH BELOW FINAL GRADE:** | 10.0' | 8.0' | 8.0' | 9.0' |
| **DEPTH BELOW EXISTING GRADE:** | 8" | 8" | 8" | 8" |

**FIELD DENSITY DETERMINATION:**

ASTM: D6938-17 Density of Soil-Aggregate in Place by Nuclear Density Methods (Shallow Depth), Direct Transmission

| | | | | |
|---|---|---|---|---|
| Dry Density (pcf) | 103.3 | 96.3 | 94.1 | 93.9 |
| Moisture Content (%) | 19.5 | 21.0 | 22.6 | 21.0 |
| Plus #4 Material (%) | 1 | None | None | None |
| Probe Depth (inches) | 12 | 12 | 12 | 12 |
| Operator | M. J. Tschosik | M. J. Tschosik | M. J. Tschosik | M. J. Tschosik |

**LABORATORY MOISTURE-DENSITY RELATION OF SOIL:**

| Method | ASTM:D698-12a, Method "A" | | | |
|---|---|---|---|---|
| Maximum Dry Density (pcf) | 107.2 | 94.8 | 94.8 | 94.8 |
| Optimum Moisture (%) | 18.9 | 26.5 | 26.5 | 26.5 |

**COMPACTION TEST RESULTS:**

| | | | | |
|---|---|---|---|---|
| Compaction (%) | 96.4 | 101.5 | 99.3 | 99.1 |
| Specified Compaction (%) | 95 | 95 | 95 | 95 |
| Specified Moisture (%) | 15.0 – 22.8 | 18.6 – 30.4 | 18.6 – 30.4 | 18.6 – 30.4 |

**ATTENTION:** Density tests are valid at the location and elevation of the test only. No representation is made as to the adequacy of fill and compaction at locations and elevations other than those tested. The test locations and number of tests were selected by Baranko Brothers. Compaction and moisture content meet project specification in the above test areas.

GEOSERV, INC.

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**GEOSERV, INC.** *Testing - Exploration - Engineering*
*Construction Materials Testing, Geotechnical, Geosynthetics, Geoenvironmental, Drilling*

**TO:** Mr. Joe Kessel
Baranko Bros, Inc.
P.O. Box 0820
Dickinson, ND 58602-0820

**DATE:** June 27, 2022
**PROJECT NO:** GEO-062205
**COPIES TO:** Minnkota Power Coop
Barr Engineering Co

**PROJECT:** Minnkota FGD Pond – Cell 5 Phase 1A
Center, ND

## DENSITY TESTS OF COMPACTED FILL

| | | | | |
|---|---|---|---|---|
| **TEST NUMBER:** | RF-64 | RF-65 | RF-66 | RF-67 |
| **DATE TAKEN** | 6/27/22 | 6/27/22 | 6/27/22 | 6/27/22 |
| **ASTM: D2488-00 DESCRIPTION AND IDENTIFICATION OF SOILS (Visual-Manual Procedure):** | Clayey Sand trace of gravel brown. (SC)-5 | Fat Clay, brown. (CH)-1 | Fat Clay, brown. (CH)-1 | Fat Clay, brown. (CH)-1 |
| **LOCATION:** | Embankment fill, N 505325.2 E 1819410.1 | Embankment fill, N 505234.0 E 1819641.6 | Embankment fill, N 505175.6 E 1819642.6 | Embankment fill, N 505113.2 E 1819644.8 |
| **ELEVATION OF TEST:** | 2052.0' | 2059.0' | 2051.0' | 2059.0' |
| **DEPTH BELOW FINAL GRADE:** | 27.0' | 26.0' | 26.0' | 28.0' |
| **DEPTH BELOW EXISTING GRADE:** | 8" | 8" | 8" | 8" |
| **FIELD DENSITY DETERMINATION:** | | | | |
| ASTM: D6938-17 Density of Soil-Aggregate in Place by Nuclear Density Methods (Shallow Depth), Direct Transmission | | | | |
| Dry Density (pcf) | 107.6 | 94.3 | 92.2 | 91.4 |
| Moisture Content (%) | 15.0 | 19.1 | 24.9 | 22.5 |
| Plus #4 Material (%) | 1 | None | None | None |
| Probe Depth (inches) | 12 | 12 | 12 | 12 |
| Operator | M. J. Tschosik | M. J. Tschosik | M. J. Tschosik | M. J. Tschosik |
| **LABORATORY MOISTURE-DENSITY RELATION OF SOIL:** | | | | |
| Method ASTM:D698-12a, Method "A" | | | | |
| Maximum Dry Density (pcf) | 107.2 | 94.8 | 94.8 | 94.8 |
| Optimum Moisture (%) | 18.9 | 26.5 | 26.5 | 26.5 |
| **COMPACTION TEST RESULTS:** | | | | |
| Compaction (%) | 100.4 | 99.5 | 97.3 | 96.4 |
| Specified Compaction (%) | 95 | 95 | 95 | 95 |
| Specified Moisture (%) | 15.0 – 22.8 | 18.6 – 30.4 | 18.6 – 30.4 | 18.6 – 30.4 |

**ATTENTION:** Density tests are valid at the location and elevation of the test only. No representation is made as to the adequacy of fill and compaction at locations and elevations other than those tested. The test locations and number of tests were selected by Baranko Brothers. Compaction and moisture content meet project specification in the above test areas.

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**GEOSERV, INC.** *Testing - Exploration - Engineering*
*Construction Materials Testing, Geotechnical, Geosynthetics, Geoenvironmental, Drilling*

**TO:** Mr. Joe Kessel
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P.O. Box 0820
Dickinson, ND 58602-0820

**DATE:** June 28, 2022
**PROJECT NO:** GEO-062205
**COPIES TO:** Minnkota Power Coop
Barr Engineering Co

**PROJECT:** Minnkota FGD Pond – Cell 5 Phase 1A
Center, ND

## DENSITY TESTS OF COMPACTED FILL

| | | | | |
|---|---|---|---|---|
| **TEST NUMBER:** | RF-68 | RF-69 | RF-70 | RF-71 |
| **DATE TAKEN** | 6/28/22 | 6/28/22 | 6/28/22 | 6/28/22 |
| **ASTM: D2488-00 DESCRIPTION AND IDENTIFICATION OF SOILS (Visual-Manual Procedure):** | Clayey Sand trace of gravel brown. (SC)-5 | Clayey Sand trace of gravel brown. (SC)-5 | Clayey Sand trace of gravel brown. (SC)-5 | Clayey Sand trace of gravel brown. (SC)-5 |
| **LOCATION:** | Embankment fill, N 505109.9 E 1819558.7 | Embankment fill, N 505161.8 E 1819559.7 | Embankment fill, N 505220.3 E 1819559.3 | Embankment fill, N 505278.8 E 1819557.9 |
| **ELEVATION OF TEST:** | 2059.0' | 2059.0' | 2058.0' | 2057.0' |
| **DEPTH BELOW FINAL GRADE:** | 7.0' | 7.0' | 8.0' | 8.0' |
| **DEPTH BELOW EXISTING GRADE:** | 8" | 8" | 8" | 8" |

**FIELD DENSITY DETERMINATION:**

ASTM: D6938-17 Density of Soil-Aggregate in Place by Nuclear Density Methods (Shallow Depth), Direct Transmission

| | | | | |
|---|---|---|---|---|
| Dry Density (pcf) | 104.1 | 106.9 | 104.8 | 103.2 |
| Moisture Content (%) | 18.0 | 18.5 | 19.1 | 18.4 |
| Plus #4 Material (%) | 1 | 1 | 1 | 1 |
| Probe Depth (inches) | 12 | 12 | 12 | 12 |
| Operator | M. J. Tschosik | M. J. Tschosik | M. J. Tschosik | M. J. Tschosik |

**LABORATORY MOISTURE-DENSITY RELATION OF SOIL:**

Method ASTM:D698-12a, Method "A"

| | | | | |
|---|---|---|---|---|
| Maximum Dry Density (pcf) | 107.2 | 107.2 | 107.2 | 107.2 |
| Optimum Moisture (%) | 18.9 | 18.9 | 18.9 | 18.9 |

**COMPACTION TEST RESULTS:**

| | | | | |
|---|---|---|---|---|
| Compaction (%) | 97.1 | 99.7 | 97.8 | 96.3 |
| Specified Compaction (%) | 95 | 95 | 95 | 95 |
| Specified Moisture (%) | 15.0 – 22.8 | 15.0 – 22.8 | 15.0 – 22.8 | 15.0 – 22.8 |

**ATTENTION:** Density tests are valid at the location and elevation of the test only. No representation is made as to the adequacy of fill and compaction at locations and elevations other than those tested. The test locations and number of tests were selected by Baranko Brothers. Compaction and moisture content meet project specification in the above test areas.

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**GEOSERV, INC.** *Testing - Exploration - Engineering*
*Construction Materials Testing, Geotechnical, Geosynthetics, Geoenvironmental, Drilling*

**TO:** Mr. Joe Kessel
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P.O. Box 0820
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**DATE:** June 28, 2022
**PROJECT NO:** GEO-062205
**COPIES TO:** Minnkota Power Coop
Barr Engineering Co

**PROJECT:** Minnkota FGD Pond – Cell 5 Phase 1A
Center, ND

## DENSITY TESTS OF COMPACTED FILL

| **TEST NUMBER:** | RF-72 | RF-73 | RF-74 | RF-75 |
|---|---|---|---|---|
| **DATE TAKEN** | 6/28/22 | 6/28/22 | 6/28/22 | 6/28/22 |
| **ASTM: D2488-00 DESCRIPTION AND IDENTIFICATION OF SOILS (Visual-Manual Procedure):** | Clayey Sand trace of gravel brown. (SC)-5 | Clayey Sand trace of gravel brown. (SC)-5 | Fat Clay, brown. (CH)-1 | Clayey Sand trace of gravel brown. (SC)-5 |
| **LOCATION:** | Embankment fill, N 505274.2 E 1819704.1 | Embankment fill, N 505229.2 E 1819710.3 | Embankment fill, N 505180.2 E 1819705.2 | Embankment fill, N 505121.7 E 1819701.4 |
| **ELEVATION OF TEST:** | 2065.0' | 2065.0' | 2064.0' | 2063.0' |
| **DEPTH BELOW FINAL GRADE:** | 33.0' | 31.0' | 34.0' | 29.0' |
| **DEPTH BELOW EXISTING GRADE:** | 8" | 8" | 8" | 8" |

**FIELD DENSITY DETERMINATION:**

ASTM: D6938-17 Density of Soil-Aggregate in Place by Nuclear Density Methods (Shallow Depth), Direct Transmission

| | | | | |
|---|---|---|---|---|
| Dry Density (pcf) | 104.4 | 107.7 | 92.9 | 106.9 |
| Moisture Content (%) | 16.5 | 15.1 | 19.4 | 15.9 |
| Plus #4 Material (%) | 1 | 1 | None | 1 |
| Probe Depth (inches) | 12 | 12 | 12 | 12 |
| Operator | M. J. Tschosik | M. J. Tschosik | M. J. Tschosik | M. J. Tschosik |

**LABORATORY MOISTURE-DENSITY RELATION OF SOIL:**

| Method | ASTM:D698-12a, Method "A" | | | |
|---|---|---|---|---|
| Maximum Dry Density (pcf) | 107.2 | 107.2 | 94.8 | 107.2 |
| Optimum Moisture (%) | 18.9 | 18.9 | 26.5 | 18.9 |

**COMPACTION TEST RESULTS:**

| | | | | |
|---|---|---|---|---|
| Compaction (%) | 97.4 | 99.5 | 98.0 | 99.7 |
| Specified Compaction (%) | 95 | 95 | 95 | 95 |
| Specified Moisture (%) | 15.0 – 22.8 | 15.0 – 22.8 | 18.6 – 30.4 | 15.0 – 22.8 |

**ATTENTION:** Density tests are valid at the location and elevation of the test only. No representation is made as to the adequacy of fill and compaction at locations and elevations other than those tested. The test locations and number of tests were selected by Baranko Brothers. Compaction and moisture content meet project specification in the above test areas.

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**GEOSERV, INC.** *Testing - Exploration - Engineering*
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**TO:** Mr. Joe Kessel
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P.O. Box 0820
Dickinson, ND 58602-0820

**DATE:** June 29, 2022
**PROJECT NO:** GEO-062205
**COPIES TO:** Minnkota Power Coop
Barr Engineering Co

**PROJECT:** Minnkota FGD Pond – Cell 5 Phase 1A
Center, ND

## DENSITY TESTS OF COMPACTED FILL

| | | | | |
|---|---|---|---|---|
| **TEST NUMBER:** | RF-76 | RF-77 | RF-78 | RF-79 |
| **DATE TAKEN** | 6/29/22 | 6/29/22 | 6/29/22 | 6/29/22 |
| **ASTM: D2488-00 DESCRIPTION AND IDENTIFICATION OF SOILS (Visual-Manual Procedure):** | Clayey Sand trace of gravel brown. (SC)-5 | Clayey Sand trace of gravel brown. (SC)-5 | Clayey Sand trace of gravel brown. (SC)-5 | Clayey Sand trace of gravel brown. (SC)-5 |
| **LOCATION:** | Embankment fill, N 505320.2 E 1819611.3 | Embankment fill, N 505269.5 E 1819613.6 | Embankment fill, N 505227.0 E 1819612.8 | Embankment fill, N 505182.9 E 1819611.5 |
| **ELEVATION OF TEST:** | 2059.0' | 2060.8' | 2062.0' | 2062.0' |
| **DEPTH BELOW FINAL GRADE:** | 17.0' | 17.0' | 17.0' | 16.0' |
| **DEPTH BELOW EXISTING GRADE:** | 8" | 8" | 8" | 8" |

**FIELD DENSITY DETERMINATION:**

ASTM: D6938-17 Density of Soil-Aggregate in Place by Nuclear Density Methods (Shallow Depth), Direct Transmission

| | | | | |
|---|---|---|---|---|
| Dry Density (pcf) | 103.5 | 107.5 | 103.5 | 104.0 |
| Moisture Content (%) | 20.0 | 17.7 | 16.2 | 15.2 |
| Plus #4 Material (%) | 1 | 1 | 1 | 1 |
| Probe Depth (inches) | 12 | 12 | 12 | 12 |
| Operator | M. J. Tschosik | M. J. Tschosik | M. J. Tschosik | M. J. Tschosik |

**LABORATORY MOISTURE-DENSITY RELATION OF SOIL:**

| | | | | |
|---|---|---|---|---|
| Method | ASTM:D698-12a, Method "A" | | | |
| Maximum Dry Density (pcf) | 107.2 | 107.2 | 107.2 | 107.2 |
| Optimum Moisture (%) | 18.9 | 18.9 | 18.9 | 18.9 |

**COMPACTION TEST RESULTS:**

| | | | | |
|---|---|---|---|---|
| Compaction (%) | 96.5 | 100.3 | 96.5 | 97.0 |
| Specified Compaction (%) | 95 | 95 | 95 | 95 |
| Specified Moisture (%) | 15.0 – 22.8 | 15.0 – 22.8 | 15.0 – 22.8 | 15.0 – 22.8 |

**ATTENTION:** Density tests are valid at the location and elevation of the test only. No representation is made as to the adequacy of fill and compaction at locations and elevations other than those tested. The test locations and number of tests were selected by Baranko Brothers. Compaction and moisture content meet project specification in the above test areas.

Mary Tschosik

GEOSERV, INC.

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**GEOSERV, INC.** *Testing - Exploration - Engineering*
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**TO:** Mr. Joe Kessel
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P.O. Box 0820
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**DATE:** June 29, 2022
**PROJECT NO:** GEO-062205
**COPIES TO:** Minnkota Power Coop
Barr Engineering Co

**PROJECT:** Minnkota FGD Pond – Cell 5 Phase 1A
Center, ND

## DENSITY TESTS OF COMPACTED FILL

| | | |
|---|---|---|
| **TEST NUMBER:** | RF-80 | RF-81 |
| **DATE TAKEN** | 6/29/22 | 6/29/22 |
| **ASTM: D2488-00 DESCRIPTION AND IDENTIFICATION OF SOILS (Visual-Manual Procedure):** | Clayey Sand trace of gravel brown. (SC)-5 | Clayey Sand trace of gravel brown. (SC)-5 |
| **LOCATION:** | Embankment fill, N 505131042 E 1819610.4 | Embankment fill, N 505094.3 E 1819640.5 |
| **ELEVATION OF TEST:** | 2062.0' | 2062.0' |
| **DEPTH BELOW FINAL GRADE:** | 15.0' | 21.0' |
| **DEPTH BELOW EXISTING GRADE:** | 8" | 8" |

**FIELD DENSITY DETERMINATION:**

ASTM: D6938-17 Density of Soil-Aggregate in Place by Nuclear Density Methods (Shallow Depth), Direct Transmission

| | | |
|---|---|---|
| Dry Density (pcf) | 105.4 | 107.3 |
| Moisture Content (%) | 15.5 | 16.5 |
| Plus #4 Material (%) | 1 | 1 |
| Probe Depth (inches) | 12 | 12 |
| Operator | M. J. Tschosik | M. J. Tschosik |

**LABORATORY MOISTURE-DENSITY RELATION OF SOIL:**

| | | |
|---|---|---|
| Method | ASTM:D698-12a, Method "A" | |
| Maximum Dry Density (pcf) | 107.2 | 107.2 |
| Optimum Moisture (%) | 18.9 | 18.9 |

**COMPACTION TEST RESULTS:**

| | | |
|---|---|---|
| Compaction (%) | 98.3 | 101.1 |
| Specified Compaction (%) | 95 | 95 |
| Specified Moisture (%) | 15.0 – 22.8 | 15.0 – 22.8 |

**ATTENTION:** Density tests are valid at the location and elevation of the test only. No representation is made as to the adequacy of fill and compaction at locations and elevations other than those tested. The test locations and number of tests were selected by Baranko Brothers. Compaction and moisture content meet project specification in the above test areas.

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**TO:** Mr. Joe Kessel
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P.O. Box 0820
Dickinson, ND 58602-0820

**DATE:** July 8, 2022
**PROJECT NO:** GEO-062205
**COPIES TO:** Minnkota Power Coop
Barr Engineering Co

**PROJECT:** Minnkota FGD Pond – Cell 5 Phase 1A
Center, ND

## DENSITY TESTS OF COMPACTED FILL

| **TEST NUMBER:** | RF-82 | RF-83 | RF-84 | RF-85 |
|---|---|---|---|---|
| **DATE TAKEN** | 7/8/22 | 7/8/22 | 7/8/22 | 7/8/22 |
| **ASTM: D2488-00 DESCRIPTION AND IDENTIFICATION OF SOILS (Visual-Manual Procedure):** | Clayey Sand, trace of gravel, brown. (SC)-4 | Clayey Sand, trace of gravel, brown. (SC)-4 | Clayey Sand, trace of gravel, brown. (SC)-4 | Clayey Sand, trace of gravel, brown. (SC)-4 |
| **LOCATION:** | Embankment fill, N 505175.5 E 1819627.1 | Embankment fill, N 505203.0 E 1819616.7 | Embankment fill, N 505227.2 E 1819613.5 | Embankment fill, N 505250.4 E 1819609.6 |
| **ELEVATION OF TEST:** | 2073.0' | 2072.0' | 2072.0' | 2070.0' |
| **DEPTH BELOW FINAL GRADE:** | 9.0' | 6.0' | 6.0' | 7.0' |
| **DEPTH BELOW EXISTING GRADE:** | 8" | 8" | 8" | 8" |

**FIELD DENSITY DETERMINATION:**

ASTM: D6938-17 Density of Soil-Aggregate in Place by Nuclear Density Methods (Shallow Depth), Direct Transmission

| | | | | |
|---|---|---|---|---|
| Dry Density (pcf) | 102.3 | 106.2 | 104.7 | 106.1 |
| Moisture Content (%) | 17.3 | 16.6 | 16.6 | 16.3 |
| Plus #4 Material (%) | 3 | 3 | 3 | 3 |
| Probe Depth (inches) | 12 | 12 | 12 | 12 |
| Operator | M. J. Tschosik | M. J. Tschosik | M. J. Tschosik | M. J. Tschosik |

**LABORATORY MOISTURE-DENSITY RELATION OF SOIL:**

| | | | | |
|---|---|---|---|---|
| Method | ASTM:D698-12a, Method "A" | | | |
| Maximum Dry Density (pcf) | 106.2 | 106.2 | 106.2 | 106.2 |
| Optimum Moisture (%) | 19.1 | 19.1 | 19.1 | 19.1 |

**COMPACTION TEST RESULTS:**

| | | | | |
|---|---|---|---|---|
| Compaction (%) | 96.3 | 100.0 | 98.6 | 99.9 |
| Specified Compaction (%) | 95 | 95 | 95 | 95 |
| Specified Moisture (%) | 15.1 – 23.4 | 15.1 – 23.4 | 15.1 – 23.4 | 15.1 – 23.4 |

**ATTENTION:** Density tests are valid at the location and elevation of the test only. No representation is made as to the adequacy of fill and compaction at locations and elevations other than those tested. The test locations and number of tests were selected by Baranko Brothers. Compaction and moisture content meet project specification in the above test areas.

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**TO:** Mr. Joe Kessel
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Dickinson, ND 58602-0820

**DATE:** July 8, 2022
**PROJECT NO:** GEO-062205
**COPIES TO:** Minnkota Power Coop
Barr Engineering Co

**PROJECT:** Minnkota FGD Pond – Cell 5 Phase 1A
Center, ND

## DENSITY TESTS OF COMPACTED FILL

| **TEST NUMBER:** | RF-86 | RF-87 | RF-88 | RF-89 |
|---|---|---|---|---|
| **DATE TAKEN** | 7/8/22 | 7/8/22 | 7/8/22 | 7/8/22 |
| **ASTM: D2488-00 DESCRIPTION AND IDENTIFICATION OF SOILS (Visual-Manual Procedure):** | Lean Clay trace of gravel brown. (CL)-6 | Lean Clay trace of gravel brown. (CL)-6 | Lean Clay trace of gravel brown. (CL)-6 | Silty Sand brown. (SM)-3 |
| **LOCATION:** | Embankment fill, N 505278.3 E 1819677.0 | Embankment fill, N 505258.7 E 1819676.2 | Embankment fill, N 505224.5 E 1819671.1 | Embankment fill, N 505181.0 E 1819677.7 |
| **ELEVATION OF TEST:** | 2071.0' | 2071.0' | 2073.0' | 2074.0' |
| **DEPTH BELOW FINAL GRADE:** | 23.0' | 22.0' | 19.0' | 20.0' |
| **DEPTH BELOW EXISTING GRADE:** | 8" | 8" | 8" | 8" |

**FIELD DENSITY DETERMINATION:**

ASTM: D6938-17 Density of Soil-Aggregate in Place by Nuclear Density Methods (Shallow Depth), Direct Transmission

| | | | | |
|---|---|---|---|---|
| Dry Density (pcf) | 101.2 | 102.7 | 102.1 | 108.3 |
| Moisture Content (%) | 16.0 | 20.9 | 17.0 | 11.2 |
| Plus #4 Material (%) | 1 | 1 | 1 | None |
| Probe Depth (inches) | 12 | 12 | 12 | 12 |
| Operator | M. J. Tschosik | M. J. Tschosik | M. J. Tschosik | M. J. Tschosik |

**LABORATORY MOISTURE-DENSITY RELATION OF SOIL:**

| Method | ASTM:D698-12a, Method "A" | | | |
|---|---|---|---|---|
| Maximum Dry Density (pcf) | 105.8 | 105.8 | 105.8 | 109.2 |
| Optimum Moisture (%) | 20.1 | 20.1 | 20.1 | 15.1 |

**COMPACTION TEST RESULTS:**

| | | | | |
|---|---|---|---|---|
| Compaction (%) | 95.7 | 97.1 | 96.5 | 99.1 |
| Specified Compaction (%) | 95 | 95 | 95 | 95 |
| Specified Moisture (%) | 15.9 – 24.1 | 15.9 – 24.1 | 15.9 – 24.1 | 10.8 – 19.0 |

**ATTENTION:** Density tests are valid at the location and elevation of the test only. No representation is made as to the adequacy of fill and compaction at locations and elevations other than those tested. The test locations and number of tests were selected by Baranko Brothers. Compaction and moisture content meet project specification in the above test areas.

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P.O. Box 0820
Dickinson, ND 58602-0820

**DATE:** July 8, 2022
**PROJECT NO:** GEO-062205
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Barr Engineering Co

**PROJECT:** Minnkota FGD Pond – Cell 5 Phase 1A
Center, ND

## DENSITY TESTS OF COMPACTED FILL

| | | | |
|---|---|---|---|
| **TEST NUMBER:** | RF-90 | RF-91 | RF-92 |
| **DATE TAKEN** | 7/8/22 | 7/8/22 | 7/8/22 |
| **ASTM: D2488-00 DESCRIPTION AND IDENTIFICATION OF SOILS (Visual-Manual Procedure):** | Silty Sand brown. (SM)-3 | Silty Sand brown. (SM)-3 | Silty Sand brown. (SM)-3 |
| **LOCATION:** | Embankment fill, N 505146.1 E 1810051.2 | Embankment fill, N 505146.7 E 1820085.1 | Embankment fill, N 505149.5 E 1820121.7 |
| **ELEVATION OF TEST:** | 2071.0' | 2072.0' | 2074.0' |
| **DEPTH BELOW FINAL GRADE:** | 21.0' | 20.0' | 18.0' |
| **DEPTH BELOW EXISTING GRADE:** | 8" | 8" | 8" |

**FIELD DENSITY DETERMINATION:**

ASTM: D6938-17 Density of Soil-Aggregate in Place by Nuclear Density Methods (Shallow Depth), Direct Transmission

| | | | |
|---|---|---|---|
| Dry Density (pcf) | 106.1 | 107.2 | 106.4 |
| Moisture Content (%) | 14.6 | 13.3 | 11.0 |
| Plus #4 Material (%) | None | None | None |
| Probe Depth (inches) | 12 | 12 | 12 |
| Operator | M. J. Tschosik | M. J. Tschosik | M. J. Tschosik |

**LABORATORY MOISTURE-DENSITY RELATION OF SOIL:**

| | | | |
|---|---|---|---|
| Method | ASTM:D698-12a, Method "A" | | |
| Maximum Dry Density (pcf) | 109.2 | 109.2 | 109.2 |
| Optimum Moisture (%) | 15.1 | 15.1 | 15.1 |

**COMPACTION TEST RESULTS:**

| | | | |
|---|---|---|---|
| Compaction (%) | 97.2 | 98.2 | 97.4 |
| Specified Compaction (%) | 95 | 95 | 95 |
| Specified Moisture (%) | 10.8 – 19.0 | 10.8 – 19.0 | 10.8 – 19.0 |

**ATTENTION:** Density tests are valid at the location and elevation of the test only. No representation is made as to the adequacy of fill and compaction at locations and elevations other than those tested. The test locations and number of tests were selected by Baranko Brothers. Compaction and moisture content meet project specification in the above test areas.

GEOSERV, INC.

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**GEOSERV, INC.** *Testing - Exploration - Engineering*
*Construction Materials Testing, Geotechnical, Geosynthetics, Geoenvironmental, Drilling*

**TO:** Mr. Joe Kessel
Baranko Bros, Inc.
P.O. Box 0820
Dickinson, ND 58602-0820

**DATE:** July 12, 2022
**PROJECT NO:** GEO-062205
**COPIES TO:** Minnkota Power Coop
Barr Engineering Co

**PROJECT:** Minnkota FGD Pond – Cell 5 Phase 1A
Center, ND

## DENSITY TESTS OF COMPACTED FILL

| **TEST NUMBER:** | RF-93 | RF-94 | RF-95 | RF-96 |
|---|---|---|---|---|
| **DATE TAKEN** | 7/12/22 | 7/12/22 | 7/12/22 | 7/12/22 |
| **ASTM: D2488-00 DESCRIPTION AND IDENTIFICATION OF SOILS (Visual-Manual Procedure):** | Clayey Sand, trace of gravel, brown. (SC)-4 | Clayey Sand, trace of gravel, brown. (SC)-4 | Clayey Sand, trace of gravel, brown. (SC)-4 | Fat Clay, brown. (CH)-1 |
| **LOCATION:** | Embankment fill, N 505180.3 E 1819821.4 | Embankment fill, N 505183.4 E 1819750.6 | Embankment fill, N 505240.4 E 1819715.5 | Embankment fill, N 505256.9 E 1819647.8 |
| **ELEVATION OF TEST:** | 2079.0' | 2082.0' | 2083.0' | 2082.0' |
| **DEPTH BELOW FINAL GRADE:** | 9.0' | 5.0' | 12.0' | 4.0' |
| **DEPTH BELOW EXISTING GRADE:** | 8" | 8" | 8" | 8" |

**FIELD DENSITY DETERMINATION:**

ASTM: D6938-17 Density of Soil-Aggregate in Place by Nuclear Density Methods (Shallow Depth), Direct Transmission

| | | | | |
|---|---|---|---|---|
| Dry Density (pcf) | 102.8 | 103.3 | 102.7 | 94.2 |
| Moisture Content (%) | 18.1 | 16.3 | 16.3 | 24.7 |
| Plus #4 Material (%) | 3 | 3 | 3 | None |
| Probe Depth (inches) | 12 | 12 | 12 | 12 |
| Operator | M. J. Tschosik | M. J. Tschosik | M. J. Tschosik | M. J. Tschosik |

**LABORATORY MOISTURE-DENSITY RELATION OF SOIL:**

| Method | ASTM:D698-12a, Method "A" | | | |
|---|---|---|---|---|
| Maximum Dry Density (pcf) | 106.2 | 106.2 | 106.2 | 94.8 |
| Optimum Moisture (%) | 19.1 | 19.1 | 19.1 | 26.5 |

**COMPACTION TEST RESULTS:**

| | | | | |
|---|---|---|---|---|
| Compaction (%) | 96.8 | 97.3 | 96.7 | 99.4 |
| Specified Compaction (%) | 95 | 95 | 95 | 95 |
| Specified Moisture (%) | 15.1 – 23.4 | 15.1 – 23.4 | 15.1 – 23.4 | 18.6 – 30.4 |

**ATTENTION:** Density tests are valid at the location and elevation of the test only. No representation is made as to the adequacy of fill and compaction at locations and elevations other than those tested. The test locations and number of tests were selected by Baranko Brothers. Compaction and moisture content meet project specification in the above test areas.

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**GEOSERV, INC.** *Testing - Exploration - Engineering*
*Construction Materials Testing, Geotechnical, Geosynthetics, Geoenvironmental, Drilling*

**TO:** Mr. Joe Kessel
Baranko Bros, Inc.
P.O. Box 0820
Dickinson, ND 58602-0820

**DATE:** July 12, 2022
**PROJECT NO:** GEO-062205
**COPIES TO:** Minnkota Power Coop
Barr Engineering Co

**PROJECT:** Minnkota FGD Pond – Cell 5 Phase 1A
Center, ND

## DENSITY TESTS OF COMPACTED FILL

| **TEST NUMBER:** | RF-97 | RF-98 | RF-99 | RF-100 |
|---|---|---|---|---|
| **DATE TAKEN** | 7/12/22 | 7/12/22 | 7/12/22 | 7/12/22 |
| **ASTM: D2488-00 DESCRIPTION AND IDENTIFICATION OF SOILS (Visual-Manual Procedure):** | Clayey Sand, trace of gravel, brown. (SC)-4 | Clayey Sand, trace of gravel, brown. (SC)-4 | Clayey Sand, trace of gravel, brown. (SC)-4 | Clayey Sand, trace of gravel, brown. (SC)-4 |
| **LOCATION:** | Embankment fill, N 505190.1 E 1819660.9 | Embankment fill, N 505129.4 E 1819681.9 | Embankment fill, N 505114.6 E 1819749.0 | Embankment fill, N 505119.4 E 1819797.0 |
| **ELEVATION OF TEST:** | 2083.0' | 2084.0' | 2085.0' | 2084.0' |
| **DEPTH BELOW FINAL GRADE:** | 7.0' | 11.0' | 5.0' | 8.0' |
| **DEPTH BELOW EXISTING GRADE:** | 8" | 8" | 8" | 8" |

**FIELD DENSITY DETERMINATION:**

ASTM: D6938-17 Density of Soil-Aggregate in Place by Nuclear Density Methods (Shallow Depth), Direct Transmission

| | | | | |
|---|---|---|---|---|
| Dry Density (pcf) | 102.9 | 104.4 | 103.7 | 103.5 |
| Moisture Content (%) | 15.9 | 16.9 | 17.1 | 15.5 |
| Plus #4 Material (%) | 3 | 3 | 3 | 3 |
| Probe Depth (inches) | 12 | 12 | 12 | 12 |
| Operator | M. J. Tschosik | M. J. Tschosik | M. J. Tschosik | M. J. Tschosik |

**LABORATORY MOISTURE-DENSITY RELATION OF SOIL:**

| Method | ASTM:D698-12a, Method "A" | | | |
|---|---|---|---|---|
| Maximum Dry Density (pcf) | 106.2 | 106.2 | 106.2 | 106.2 |
| Optimum Moisture (%) | 19.1 | 19.1 | 19.1 | 19.1 |

**COMPACTION TEST RESULTS:**

| | | | | |
|---|---|---|---|---|
| Compaction (%) | 96.7 | 98.3 | 97.6 | 97.5 |
| Specified Compaction (%) | 95 | 95 | 95 | 95 |
| Specified Moisture (%) | 15.1 – 23.4 | 15.1 – 23.4 | 15.1 – 23.4 | 15.1 – 23.4 |

**ATTENTION:** Density tests are valid at the location and elevation of the test only. No representation is made as to the adequacy of fill and compaction at locations and elevations other than those tested. The test locations and number of tests were selected by Baranko Brothers. Compaction and moisture content meet project specification in the above test areas.

Mark Tschosik

GEOSERV, INC.

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**GEOSERV, INC.** *Testing - Exploration - Engineering*
*Construction Materials Testing, Geotechnical, Geosynthetics, Geoenvironmental, Drilling*

**TO:** Mr. Joe Kessel
Baranko Bros, Inc.
P.O. Box 0820
Dickinson, ND 58602-0820

**DATE:** July 13, 2022
**PROJECT NO:** GEO-062205
**COPIES TO:** Minnkota Power Coop
Barr Engineering Co

**PROJECT:** Minnkota FGD Pond – Cell 5 Phase 1A
Center, ND

## DENSITY TESTS OF COMPACTED FILL

| | | | | |
|---|---|---|---|---|
| **TEST NUMBER:** | RF-101 | RF-102 | RF-103 | RF-104 |
| **DATE TAKEN** | 7/13/22 | 7/13/22 | 7/13/22 | 7/13/22 |
| **ASTM: D2488-00 DESCRIPTION AND IDENTIFICATION OF SOILS (Visual-Manual Procedure):** | Lean Clay trace of gravel brown. (CL)-6 | Lean Clay trace of gravel brown. (CL)-6 | Lean Clay trace of gravel brown. (CL)-6 | Lean Clay trace of gravel brown. (CL)-6 |
| **LOCATION:** | Embankment fill, N 505127.5 E 1819771.1 | Embankment fill, N 505127.4 E 1819698.2 | Embankment fill, N 505200.1 E 1819677.9 | Embankment fill, N 505274.7 E 1819675.7 |
| **ELEVATION OF TEST:** | 2087.0' | 2088.0' | 2088.0' | 2087.0' |
| **DEPTH BELOW FINAL GRADE:** | 5.0' | 6.0' | 6.0' | 6.0' |
| **DEPTH BELOW EXISTING GRADE:** | 8" | 8" | 8" | 8" |

**FIELD DENSITY DETERMINATION:**

ASTM: D6938-17 Density of Soil-Aggregate in Place by Nuclear Density Methods (Shallow Depth), Direct Transmission

| | | | | |
|---|---|---|---|---|
| Dry Density (pcf) | 102.7 | 102.9 | 103.6 | 102.9 |
| Moisture Content (%) | 21.9 | 19.6 | 20.1 | 18.6 |
| Plus #4 Material (%) | 1 | 1 | 1 | 1 |
| Probe Depth (inches) | 12 | 12 | 12 | 12 |
| Operator | M. J. Tschosik | M. J. Tschosik | M. J. Tschosik | M. J. Tschosik |

**LABORATORY MOISTURE-DENSITY RELATION OF SOIL:**

| | | | | |
|---|---|---|---|---|
| Method | ASTM:D698-12a, Method "A" | | | |
| Maximum Dry Density (pcf) | 105.8 | 105.8 | 105.8 | 105.8 |
| Optimum Moisture (%) | 20.1 | 20.1 | 20.1 | 20.1 |

**COMPACTION TEST RESULTS:**

| | | | | |
|---|---|---|---|---|
| Compaction (%) | 97.1 | 97.3 | 97.9 | 97.3 |
| Specified Compaction (%) | 95 | 95 | 95 | 95 |
| Specified Moisture (%) | 15.9 – 24.1 | 15.9 – 24.1 | 15.9 – 24.1 | 15.9 – 24.1 |

**ATTENTION:** Density tests are valid at the location and elevation of the test only. No representation is made as to the adequacy of fill and compaction at locations and elevations other than those tested. The test locations and number of tests were selected by Baranko Brothers. Compaction and moisture content meet project specification in the above test areas.

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**GEOSERV, INC.** *Testing - Exploration - Engineering*
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**TO:** Mr. Joe Kessel
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P.O. Box 0820
Dickinson, ND 58602-0820

**DATE:** July 13, 2022
**PROJECT NO:** GEO-062205
**COPIES TO:** Minnkota Power Coop
Barr Engineering Co

**PROJECT:** Minnkota FGD Pond – Cell 5 Phase 1A
Center, ND

## DENSITY TESTS OF COMPACTED FILL

| | | | | |
|---|---|---|---|---|
| **TEST NUMBER:** | RF-105 | RF-106 | RF-107 | RF-108 |
| **DATE TAKEN** | 7/13/22 | 7/13/22 | 7/13/22 | 7/13/22 |
| **ASTM: D2488-00 DESCRIPTION AND IDENTIFICATION OF SOILS (Visual-Manual Procedure):** | Lean Clay trace of gravel brown. (CL)-6 | Lean Clay trace of gravel brown. (CL)-6 | Lean Clay trace of gravel brown. (CL)-6 | Lean Clay trace of gravel brown. (CL)-6 |
| **LOCATION:** | Embankment fill, N 505276.3 E 1819721.1 | Embankment fill, N 505210.5 E 1819716.1 | Embankment fill, N 505153.9 E 1819732.8 | Embankment fill, N 505159.2 E 1819792.9 |
| **ELEVATION OF TEST:** | 2088.0' | 2088.0' | 2088.0' | 2085.0' |
| **DEPTH BELOW FINAL GRADE:** | 5.0' | 6.0' | 4.0' | 7.0' |
| **DEPTH BELOW EXISTING GRADE:** | 8" | 8" | 8" | 8" |

**FIELD DENSITY DETERMINATION:**

ASTM: D6938-17 Density of Soil-Aggregate in Place by Nuclear Density Methods (Shallow Depth), Direct Transmission

| | | | | |
|---|---|---|---|---|
| Dry Density (pcf) | 101.7 | 103.3 | 104.4 | 101.1 |
| Moisture Content (%) | 17.9 | 20.4 | 19.4 | 18.4 |
| Plus #4 Material (%) | 1 | 1 | 1 | 1 |
| Probe Depth (inches) | 12 | 12 | 12 | 12 |
| Operator | M. J. Tschosik | M. J. Tschosik | M. J. Tschosik | M. J. Tschosik |

**LABORATORY MOISTURE-DENSITY RELATION OF SOIL:**

| | | | | |
|---|---|---|---|---|
| Method | ASTM:D698-12a, Method "A" | | | |
| Maximum Dry Density (pcf) | 105.8 | 105.8 | 105.8 | 105.8 |
| Optimum Moisture (%) | 20.1 | 20.1 | 20.1 | 20.1 |

**COMPACTION TEST RESULTS:**

| | | | | |
|---|---|---|---|---|
| Compaction (%) | 96.1 | 97.6 | 98.7 | 95.6 |
| Specified Compaction (%) | 95 | 95 | 95 | 95 |
| Specified Moisture (%) | 15.9 – 24.1 | 15.9 – 24.1 | 15.9 – 24.1 | 15.9 – 24.1 |

**ATTENTION:** Density tests are valid at the location and elevation of the test only. No representation is made as to the adequacy of fill and compaction at locations and elevations other than those tested. The test locations and number of tests were selected by Baranko Brothers. Compaction and moisture content meet project specification in the above test areas.

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**GEOSERV, INC.** *Testing - Exploration - Engineering*
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**TO:** Mr. Joe Kessel
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P.O. Box 0820
Dickinson, ND 58602-0820

**DATE:** July 14, 2022
**PROJECT NO:** GEO-062205
**COPIES TO:** Minnkota Power Coop
Barr Engineering Co

**PROJECT:** Minnkota FGD Pond – Cell 5 Phase 1A
Center, ND

## DENSITY TESTS OF COMPACTED FILL

| | | | | |
|---|---|---|---|---|
| **TEST NUMBER:** | RF-109 | RF-110 | RF-111 | RF-112 |
| **DATE TAKEN** | 7/14/22 | 7/14/22 | 7/14/22 | 7/14/22 |
| **ASTM: D2488-00 DESCRIPTION AND IDENTIFICATION OF SOILS (Visual-Manual Procedure):** | Lean Clay trace of gravel brown. (CL)-6 | Lean Clay trace of gravel brown. (CL)-6 | Lean Clay trace of gravel brown. (CL)-6 | Lean Clay trace of gravel brown. (CL)-6 |
| **LOCATION:** | Embankment fill, N 505222.8 E 1819708.5 | Embankment fill, N 505157.1 E 1819685.0 | Embankment fill, N 505169.5 E 1819728.5 | Embankment fill, N 505131.9 E 1819745.6 |
| **ELEVATION OF TEST:** | 2089.5' | 2091.0' | 2089.0' | 2090.0' |
| **DEPTH BELOW FINAL GRADE:** | 7.0' | 7.0' | 2.0' | 2.0' |
| **DEPTH BELOW EXISTING GRADE:** | 8" | 8" | 8" | 8" |

**FIELD DENSITY DETERMINATION:**

ASTM: D6938-17 Density of Soil-Aggregate in Place by Nuclear Density Methods (Shallow Depth), Direct Transmission

| | | | | |
|---|---|---|---|---|
| Dry Density (pcf) | 102.3 | 101.1 | 101.0 | 100.9 |
| Moisture Content (%) | 17.4 | 17.9 | 19.6 | 19.8 |
| Plus #4 Material (%) | 1 | 1 | 1 | 1 |
| Probe Depth (inches) | 12 | 12 | 12 | 12 |
| Operator | M. J. Tschosik | M. J. Tschosik | M. J. Tschosik | M. J. Tschosik |

**LABORATORY MOISTURE-DENSITY RELATION OF SOIL:**

| | | | | |
|---|---|---|---|---|
| Method | ASTM:D698-12a, Method "A" | | | |
| Maximum Dry Density (pcf) | 105.8 | 105.8 | 105.8 | 105.8 |
| Optimum Moisture (%) | 20.1 | 20.1 | 20.1 | 20.1 |

**COMPACTION TEST RESULTS:**

| | | | | |
|---|---|---|---|---|
| Compaction (%) | 96.7 | 95.6 | 95.5 | 95.4 |
| Specified Compaction (%) | 95 | 95 | 95 | 95 |
| Specified Moisture (%) | 15.9 – 24.1 | 15.9 – 24.1 | 15.9 – 24.1 | 15.9 – 24.1 |

**ATTENTION:** Density tests are valid at the location and elevation of the test only. No representation is made as to the adequacy of fill and compaction at locations and elevations other than those tested. The test locations and number of tests were selected by Baranko Brothers. Compaction and moisture content meet project specification in the above test areas.

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**GEOSERV, INC.** *Testing - Exploration - Engineering*
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**TO:** Mr. Joe Kessel
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P.O. Box 0820
Dickinson, ND 58602-0820

**DATE:** July 14, 2022
**PROJECT NO:** GEO-062205
**COPIES TO:** Minnkota Power Coop
Barr Engineering Co

**PROJECT:** Minnkota FGD Pond – Cell 5 Phase 1A
Center, ND

## DENSITY TESTS OF COMPACTED FILL

| | | | | |
|---|---|---|---|---|
| **TEST NUMBER:** | RF-113 | RF-114 | RF-115 | RF-116 |
| **DATE TAKEN** | 7/14/22 | 7/14/22 | 7/14/22 | 7/14/22 |
| **ASTM: D2488-00 DESCRIPTION AND IDENTIFICATION OF SOILS (Visual-Manual Procedure):** | Lean Clay trace of gravel brown. (CL)-6 | Lean Clay trace of gravel brown. (CL)-6 | Lean Clay trace of gravel brown. (CL)-6 | Lean Clay trace of gravel brown. (CL)-6 |
| **LOCATION:** | Embankment fill, N 505167.2 E 1819785.0 | Embankment fill, N 505127.8 E 1819836.7 | Embankment fill, N 505114.6 E 1819976.5 | Embankment fill, N 505105.8 E 1820044.2 |
| **ELEVATION OF TEST:** | 2086.0' | 2084.0' | 2079.0' | 2079.0' |
| **DEPTH BELOW FINAL GRADE:** | 6.0' | 8.0' | 11.0' | 8.0' |
| **DEPTH BELOW EXISTING GRADE:** | 8" | 8" | 8" | 8" |

**FIELD DENSITY DETERMINATION:**

ASTM: D6938-17 Density of Soil-Aggregate in Place by Nuclear Density Methods (Shallow Depth), Direct Transmission

| | | | | |
|---|---|---|---|---|
| Dry Density (pcf) | 100.8 | 101.2 | 102.6 | 103.2 |
| Moisture Content (%) | 19.4 | 19.5 | 19.8 | 19.1 |
| Plus #4 Material (%) | 1 | 1 | 1 | 1 |
| Probe Depth (inches) | 12 | 12 | 12 | 12 |
| Operator | M. J. Tschosik | M. J. Tschosik | M. J. Tschosik | M. J. Tschosik |

**LABORATORY MOISTURE-DENSITY RELATION OF SOIL:**

| | | | | |
|---|---|---|---|---|
| Method | ASTM:D698-12a, Method "A" | | | |
| Maximum Dry Density (pcf) | 105.8 | 105.8 | 105.8 | 105.8 |
| Optimum Moisture (%) | 20.1 | 20.1 | 20.1 | 20.1 |

**COMPACTION TEST RESULTS:**

| | | | | |
|---|---|---|---|---|
| Compaction (%) | 95.3 | 95.7 | 97.0 | 97.5 |
| Specified Compaction (%) | 95 | 95 | 95 | 95 |
| Specified Moisture (%) | 15.9 – 24.1 | 15.9 – 24.1 | 15.9 – 24.1 | 15.9 – 24.1 |

**ATTENTION:** Density tests are valid at the location and elevation of the test only. No representation is made as to the adequacy of fill and compaction at locations and elevations other than those tested. The test locations and number of tests were selected by Baranko Brothers. Compaction and moisture content meet project specification in the above test areas.

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**GEOSERV, INC.** *Testing - Exploration - Engineering*
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**TO:** Mr. Joe Kessel
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Dickinson, ND 58602-0820

**DATE:** July 22, 2022
**PROJECT NO:** GEO-062205
**COPIES TO:** Minnkota Power Coop
Barr Engineering Co

**PROJECT:** Minnkota FGD Pond – Cell 5 Phase 1A
Center, ND

## DENSITY TESTS OF COMPACTED FILL

| | | | | |
|---|---|---|---|---|
| **TEST NUMBER:** | RF-117 | RF-118 | RF-119 | RF-120 |
| **DATE TAKEN** | 7/22/22 | 7/22/22 | 7/22/22 | 7/22/22 |
| **ASTM: D2488-00 DESCRIPTION AND IDENTIFICATION OF SOILS (Visual-Manual Procedure):** | Lean Clay trace of gravel brown. (CL)-6 | Lean Clay trace of gravel brown. (CL)-6 | Lean Clay trace of gravel brown. (CL)-6 | Lean Clay trace of gravel brown. (CL)-6 |
| **LOCATION:** | Embankment fill, N 505136.0 E 1820160.7 | Embankment fill, N 505136.5 E 1820118.6 | Embankment fill, N 505139.2 E 1820081.8 | Embankment fill, N 505133.1 E 1820052.9 |
| **ELEVATION OF TEST:** | 2090.0' | 2090.0' | 2088.0' | 2088.0' |
| **DEPTH BELOW FINAL GRADE:** | 2.0' | 2.0' | 3.0' | 4.0' |
| **DEPTH BELOW EXISTING GRADE:** | 8" | 8" | 8" | 8" |

**FIELD DENSITY DETERMINATION:**

ASTM: D6938-17 Density of Soil-Aggregate in Place by Nuclear Density Methods (Shallow Depth), Direct Transmission

| | | | | |
|---|---|---|---|---|
| Dry Density (pcf) | 101.8 | 102.9 | 101.8 | 102.2 |
| Moisture Content (%) | 22.5 | 19.1 | 20.5 | 19.7 |
| Plus #4 Material (%) | 1 | 1 | 1 | 1 |
| Probe Depth (inches) | 12 | 12 | 12 | 12 |
| Operator | M. J. Tschosik | M. J. Tschosik | M. J. Tschosik | M. J. Tschosik |

**LABORATORY MOISTURE-DENSITY RELATION OF SOIL:**

| | | | | |
|---|---|---|---|---|
| Method | ASTM:D698-12a, Method "A" | | | |
| Maximum Dry Density (pcf) | 105.8 | 105.8 | 105.8 | 105.8 |
| Optimum Moisture (%) | 20.1 | 20.1 | 20.1 | 20.1 |

**COMPACTION TEST RESULTS:**

| | | | | |
|---|---|---|---|---|
| Compaction (%) | 96.2 | 97.3 | 96.2 | 96.6 |
| Specified Compaction (%) | 95 | 95 | 95 | 95 |
| Specified Moisture (%) | 15.9 – 24.1 | 15.9 – 24.1 | 15.9 – 24.1 | 15.9 – 24.1 |

**ATTENTION:** Density tests are valid at the location and elevation of the test only. No representation is made as to the adequacy of fill and compaction at locations and elevations other than those tested. The test locations and number of tests were selected by Baranko Brothers. Compaction and moisture content meet project specification in the above test areas.

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**GEOSERV, INC.** *Testing - Exploration - Engineering*
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**TO:** Mr. Joe Kessel
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Dickinson, ND 58602-0820

**DATE:** July 22, 2022
**PROJECT NO:** GEO-062205
**COPIES TO:** Minnkota Power Coop
Barr Engineering Co

**PROJECT:** Minnkota FGD Pond – Cell 5 Phase 1A
Center, ND

## DENSITY TESTS OF COMPACTED FILL

| | | | | |
|---|---|---|---|---|
| **TEST NUMBER:** | RF-121 | RF-122 | RF-123 | RF-124 |
| **DATE TAKEN** | 7/22/22 | 7/22/22 | 7/22/22 | 7/22/22 |
| **ASTM: D2488-00 DESCRIPTION AND IDENTIFICATION OF SOILS (Visual-Manual Procedure):** | Lean Clay trace of gravel brown. (CL)-6 | Lean Clay trace of gravel brown. (CL)-6 | Lean Clay trace of gravel brown. (CL)-6 | Lean Clay trace of gravel brown. (CL)-6 |
| **LOCATION:** | Embankment fill, N 505132.7 E 1820020.6 | Embankment fill, N 505132.4 E 1819987.5 | Embankment fill, N 505134.1 E 1819942.2 | Embankment fill, N 505126.6 E 1819887.9 |
| **ELEVATION OF TEST:** | 2088.0' | 2088.0' | 2088.0' | 2089.0' |
| **DEPTH BELOW FINAL GRADE:** | 4.0' | 4.0' | 4.0' | 3.0' |
| **DEPTH BELOW EXISTING GRADE:** | 8" | 8" | 8" | 8" |

**FIELD DENSITY DETERMINATION:**

ASTM: D6938-17 Density of Soil-Aggregate in Place by Nuclear Density Methods (Shallow Depth), Direct Transmission

| | | | | |
|---|---|---|---|---|
| Dry Density (pcf) | 102.7 | 103.1 | 103.3 | 101.1 |
| Moisture Content (%) | 21.9 | 19.7 | 20.2 | 21.2 |
| Plus #4 Material (%) | 1 | 1 | 1 | 1 |
| Probe Depth (inches) | 12 | 12 | 12 | 12 |
| Operator | M. J. Tschosik | M. J. Tschosik | M. J. Tschosik | M. J. Tschosik |

**LABORATORY MOISTURE-DENSITY RELATION OF SOIL:**

Method ASTM:D698-12a, Method "A"

| | | | | |
|---|---|---|---|---|
| Maximum Dry Density (pcf) | 105.8 | 105.8 | 105.8 | 105.8 |
| Optimum Moisture (%) | 20.1 | 20.1 | 20.1 | 20.1 |

**COMPACTION TEST RESULTS:**

| | | | | |
|---|---|---|---|---|
| Compaction (%) | 97.1 | 97.4 | 97.6 | 95.6 |
| Specified Compaction (%) | 95 | 95 | 95 | 95 |
| Specified Moisture (%) | 15.9 – 24.1 | 15.9 – 24.1 | 15.9 – 24.1 | 15.9 – 24.1 |

**ATTENTION:** Density tests are valid at the location and elevation of the test only. No representation is made as to the adequacy of fill and compaction at locations and elevations other than those tested. The test locations and number of tests were selected by Baranko Brothers. Compaction and moisture content meet project specification in the above test areas.

GEOSERV, INC.

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**GEOSERV, INC.** *Testing - Exploration - Engineering*
*Construction Materials Testing, Geotechnical, Geosynthetics, Geoenvironmental, Drilling*

**TO:** Mr. Joe Kessel
Baranko Bros, Inc.
P.O. Box 0820
Dickinson, ND 58602-0820

**DATE:** July 25, 2022
**PROJECT NO:** GEO-062205
**COPIES TO:** Minnkota Power Coop
Barr Engineering Co

**PROJECT:** Minnkota FGD Pond – Cell 5 Phase 1A
Center, ND

## DENSITY TESTS OF COMPACTED FILL

| | | | | |
|---|---|---|---|---|
| **TEST NUMBER:** | RF-125 | RF-126 | RF-127 | RF-128 |
| **DATE TAKEN** | 7/25/22 | 7/25/22 | 7/25/22 | 7/25/22 |
| **ASTM: D2488-00 DESCRIPTION AND IDENTIFICATION OF SOILS (Visual-Manual Procedure):** | Lean Clay trace of gravel brown. (CL)-6 | Lean Clay trace of gravel brown. (CL)-6 | Lean Clay trace of gravel brown. (CL)-6 | Lean Clay trace of gravel brown. (CL)-6 |
| **LOCATION:** | Embankment fill, N 505144.5 E 1820187.1 | Embankment fill, N 505146.7 E 1820110.9 | Embankment fill, N 505148.6 E 1820050.5 | Embankment fill, N 505150.5 E 1819981.4 |
| **ELEVATION OF TEST:** | 2092.0' | 2092.0' | 2092.0' | 2092.0' |
| **DEPTH BELOW FINAL GRADE:** | - | - | - | - |
| **DEPTH BELOW EXISTING GRADE:** | 8" | 8" | 8" | 8" |

**FIELD DENSITY DETERMINATION:**

ASTM: D6938-17 Density of Soil-Aggregate in Place by Nuclear Density Methods (Shallow Depth), Direct Transmission

| | | | | |
|---|---|---|---|---|
| Dry Density (pcf) | 102.4 | 102.9 | 102.4 | 105.2 |
| Moisture Content (%) | 19.7 | 19.6 | 19.8 | 16.5 |
| Plus #4 Material (%) | 1 | 1 | 1 | 1 |
| Probe Depth (inches) | 12 | 12 | 12 | 12 |
| Operator | M. J. Tschosik | M. J. Tschosik | M. J. Tschosik | M. J. Tschosik |

**LABORATORY MOISTURE-DENSITY RELATION OF SOIL:**

| | | | | |
|---|---|---|---|---|
| Method | ASTM:D698-12a, Method "A" | | | |
| Maximum Dry Density (pcf) | 105.8 | 105.8 | 105.8 | 105.8 |
| Optimum Moisture (%) | 20.1 | 20.1 | 20.1 | 20.1 |

**COMPACTION TEST RESULTS:**

| | | | | |
|---|---|---|---|---|
| Compaction (%) | 96.8 | 97.3 | 96.8 | 99.4 |
| Specified Compaction (%) | 95 | 95 | 95 | 95 |
| Specified Moisture (%) | 15.9 – 24.1 | 15.9 – 24.1 | 15.9 – 24.1 | 15.9 – 24.1 |

**ATTENTION:** Density tests are valid at the location and elevation of the test only. No representation is made as to the adequacy of fill and compaction at locations and elevations other than those tested. The test locations and number of tests were selected by Baranko Brothers. Compaction and moisture content meet project specification in the above test areas.

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**GEOSERV, INC.** *Testing - Exploration - Engineering*
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**TO:** Mr. Joe Kessel
Baranko Bros, Inc.
P.O. Box 0820
Dickinson, ND 58602-0820

**DATE:** July 25, 2022
**PROJECT NO:** GEO-062205
**COPIES TO:** Minnkota Power Coop
Barr Engineering Co

**PROJECT:** Minnkota FGD Pond – Cell 5 Phase 1A
Center, ND

## DENSITY TESTS OF COMPACTED FILL

| | | |
|---|---|---|
| **TEST NUMBER:** | RF-129 | RF-130 |
| **DATE TAKEN** | 7/25/22 | 7/25/22 |
| **ASTM: D2488-00 DESCRIPTION AND IDENTIFICATION OF SOILS (Visual-Manual Procedure):** | Lean Clay<br>trace of gravel<br>brown.<br>(CL)-6 | Lean Clay<br>trace of gravel<br>brown.<br>(CL)-6 |
| **LOCATION:** | Embankment fill,<br>N 505150.6<br>E 1819900.7 | Embankment fill,<br>N 505151.9<br>E 1819801.2 |
| **ELEVATION OF TEST:** | 2092.0' | 2092.0' |
| **DEPTH BELOW FINAL GRADE:** | - | - |
| **DEPTH BELOW EXISTING GRADE:** | 8" | 8" |

**FIELD DENSITY DETERMINATION:**

ASTM: D6938-17 Density of Soil-Aggregate in Place by Nuclear Density Methods (Shallow Depth), Direct Transmission

| | | |
|---|---|---|
| Dry Density (pcf) | 103.1 | 101.6 |
| Moisture Content (%) | 21.3 | 18.8 |
| Plus #4 Material (%) | 1 | 1 |
| Probe Depth (inches) | 12 | 12 |
| Operator | M. J. Tschosik | M. J. Tschosik |

**LABORATORY MOISTURE-DENSITY RELATION OF SOIL:**

| | | |
|---|---|---|
| Method | ASTM:D698-12a, Method "A" | |
| Maximum Dry Density (pcf) | 105.8 | 105.8 |
| Optimum Moisture (%) | 20.1 | 20.1 |

**COMPACTION TEST RESULTS:**

| | | |
|---|---|---|
| Compaction (%) | 97.4 | 96.0 |
| Specified Compaction (%) | 95 | 95 |
| Specified Moisture (%) | 15.9 – 24.1 | 15.9 – 24.1 |

**ATTENTION:** Density tests are valid at the location and elevation of the test only. No representation is made as to the adequacy of fill and compaction at locations and elevations other than those tested. The test locations and number of tests were selected by Baranko Brothers. Compaction and moisture content meet project specification in the above test areas.

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**GEOSERV, INC.** *Testing - Exploration - Engineering*
*Construction Materials Testing, Geotechnical, Geosynthetics, Geoenvironmental, Drilling*

**TO:** Mr. Joe Kessel
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P.O. Box 0820
Dickinson, ND 58602-0820

**DATE:** July 26, 2022
**PROJECT NO:** GEO-062205
**COPIES TO:** Minnkota Power Coop
Barr Engineering Co

**PROJECT:** Minnkota FGD Pond – Cell 5 Phase 1A
Center, ND

## DENSITY TESTS OF COMPACTED FILL

| | | |
|---|---|---|
| **TEST NUMBER:** | RF-131 | RF-132 |
| **DATE TAKEN** | 7/26/22 | 7/26/22 |
| **ASTM: D2488-00 DESCRIPTION AND IDENTIFICATION OF SOILS (Visual-Manual Procedure):** | Lean Clay<br>trace of gravel<br>brown.<br>(CL)-6 | Lean Clay<br>trace of gravel<br>brown.<br>(CL)-6 |
| **LOCATION:** | Embankment fill,<br>N 505671.4<br>E 1819615.6 | Embankment fill,<br>N 505601.1<br>E 1819613.3 |
| **ELEVATION OF TEST:** | 2070.0' | 2065.0' |
| **DEPTH BELOW FINAL GRADE:** | 8' | 13' |
| **DEPTH BELOW EXISTING GRADE:** | 8" | 8" |

**FIELD DENSITY DETERMINATION:**

ASTM: D6938-17 Density of Soil-Aggregate in Place by Nuclear Density Methods (Shallow Depth), Direct Transmission

| | | |
|---|---|---|
| Dry Density (pcf) | 101.6 | 102.1 |
| Moisture Content (%) | 21.7 | 22.9 |
| Plus #4 Material (%) | 1 | 1 |
| Probe Depth (inches) | 12 | 12 |
| Operator | M. J. Tschosik | M. J. Tschosik |

**LABORATORY MOISTURE-DENSITY RELATION OF SOIL:**

| | | |
|---|---|---|
| Method | ASTM:D698-12a, Method "A" | |
| Maximum Dry Density (pcf) | 105.8 | 105.8 |
| Optimum Moisture (%) | 20.1 | 20.1 |

**COMPACTION TEST RESULTS:**

| | | |
|---|---|---|
| Compaction (%) | 96.0 | 96.5 |
| Specified Compaction (%) | 95 | 95 |
| Specified Moisture (%) | 15.9 – 24.1 | 15.9 – 24.1 |

**ATTENTION:** Density tests are valid at the location and elevation of the test only. No representation is made as to the adequacy of fill and compaction at locations and elevations other than those tested. The test locations and number of tests were selected by Baranko Brothers. Compaction and moisture content meet project specification in the above test areas.

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**GEOSERV, INC.** *Testing - Exploration - Engineering*
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**TO:** Mr. Joe Kessel
Baranko Bros, Inc.
P.O. Box 0820
Dickinson, ND 58602-0820

**DATE:** September 16, 2022
**PROJECT NO:** GEO-062205
**COPIES TO:** Minnkota Power Coop
Barr Engineering Co

**PROJECT:** Minnkota FGD Pond – Cell 5 Phase 1A
Center, ND

## DENSITY TESTS OF COMPACTED FILL

| | | | | |
|---|---|---|---|---|
| **TEST NUMBER:** | RF-133 | RF-134 | RF-134 | RF-136 |
| **DATE TAKEN** | 9/16/22 | 9/16/22 | 9/16/22 | 9/16/22 |
| **ASTM: D2488-00 DESCRIPTION AND IDENTIFICATION OF SOILS (Visual-Manual Procedure):** | Lean Clay trace of gravel brown. (CL)-6 | Lean Clay trace of gravel brown. (CL)-6 | Lean Clay trace of gravel brown. (CL)-6 | Lean Clay trace of gravel brown. (CL)-6 |
| **LOCATION:** | Embankment fill, N 505396.6 E 1819748.0 | Embankment fill, N 505394.9 E 1819701.3 | Embankment fill, N 505397.5 E 1819611.5 | Embankment fill, N 505436.2 E 1819592.1 |
| **ELEVATION OF TEST:** | 2060.0' | 2061.0' | 2059.0' | 2058.0' |
| **DEPTH BELOW FINAL GRADE:** | 24' | 37' | 19' | 15' |
| **DEPTH BELOW EXISTING GRADE:** | 8" | 8" | 8" | 8" |

**FIELD DENSITY DETERMINATION:**

ASTM: D6938-17 Density of Soil-Aggregate in Place by Nuclear Density Methods (Shallow Depth), Direct Transmission

| | | | | |
|---|---|---|---|---|
| Dry Density (pcf) | 101.9 | 102.8 | 103.6 | 102.2 |
| Moisture Content (%) | 23.2 | 22.6 | 23.2 | 20.2 |
| Plus #4 Material (%) | 1 | 1 | 1 | 1 |
| Probe Depth (inches) | 12 | 12 | 12 | 12 |
| Operator | M. J. Tschosik | M. J. Tschosik | M. J. Tschosik | M. J. Tschosik |

**LABORATORY MOISTURE-DENSITY RELATION OF SOIL:**

Method ASTM:D698-12a, Method "A"

| | | | | |
|---|---|---|---|---|
| Maximum Dry Density (pcf) | 105.8 | 105.8 | 105.8 | 105.8 |
| Optimum Moisture (%) | 20.1 | 20.1 | 20.1 | 20.1 |

**COMPACTION TEST RESULTS:**

| | | | | |
|---|---|---|---|---|
| Compaction (%) | 96.3 | 97.2 | 97.9 | 96.6 |
| Specified Compaction (%) | 95 | 95 | 95 | 95 |
| Specified Moisture (%) | 15.9 – 24.1 | 15.9 – 24.1 | 15.9 – 24.1 | 15.9 – 24.1 |

**ATTENTION:** Density tests are valid at the location and elevation of the test only. No representation is made as to the adequacy of fill and compaction at locations and elevations other than those tested. The test locations and number of tests were selected by Baranko Brothers. Compaction and moisture content meet project specification in the above test areas.

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**GEOSERV, INC.** *Testing - Exploration - Engineering*
*Construction Materials Testing, Geotechnical, Geosynthetics, Geoenvironmental, Drilling*

**TO:** Mr. Joe Kessel
Baranko Bros, Inc.
P.O. Box 0820
Dickinson, ND 58602-0820

**DATE:** September 16, 2022
**PROJECT NO:** GEO-062205
**COPIES TO:** Minnkota Power Coop
Barr Engineering Co

**PROJECT:** Minnkota FGD Pond – Cell 5 Phase 1A
Center, ND

## DENSITY TESTS OF COMPACTED FILL

| | | |
|---|---|---|
| **TEST NUMBER:** | RF-137 | RF-138 |
| **DATE TAKEN** | 9/16/22 | 9/16/22 |
| **ASTM: D2488-00 DESCRIPTION AND IDENTIFICATION OF SOILS (Visual-Manual Procedure):** | Lean Clay<br>trace of gravel<br>brown.<br>(CL)-6 | Lean Clay<br>trace of gravel<br>brown.<br>(CL)-6 |
| **LOCATION:** | Embankment fill,<br>N 505435.0<br>E 1819666.2 | Embankment fill,<br>N 505431.7<br>E 1819754.6 |
| **ELEVATION OF TEST:** | 2061.0' | 2060.0' |
| **DEPTH BELOW FINAL GRADE:** | 30' | 22' |
| **DEPTH BELOW EXISTING GRADE:** | 8" | 8" |

**FIELD DENSITY DETERMINATION:**

ASTM: D6938-17 Density of Soil-Aggregate in Place by Nuclear Density Methods (Shallow Depth), Direct Transmission

| | | |
|---|---|---|
| Dry Density (pcf) | 101.4 | 104.1 |
| Moisture Content (%) | 21.7 | 20.9 |
| Plus #4 Material (%) | 1 | 1 |
| Probe Depth (inches) | 12 | 12 |
| Operator | M. J. Tschosik | M. J. Tschosik |

**LABORATORY MOISTURE-DENSITY RELATION OF SOIL:**

| | | |
|---|---|---|
| Method | ASTM:D698-12a, Method "A" | |
| Maximum Dry Density (pcf) | 105.8 | 105.8 |
| Optimum Moisture (%) | 20.1 | 20.1 |

**COMPACTION TEST RESULTS:**

| | | |
|---|---|---|
| Compaction (%) | 95.8 | 98.4 |
| Specified Compaction (%) | 95 | 95 |
| Specified Moisture (%) | 15.9 – 24.1 | 15.9 – 24.1 |

**ATTENTION:** Density tests are valid at the location and elevation of the test only. No representation is made as to the adequacy of fill and compaction at locations and elevations other than those tested. The test locations and number of tests were selected by Baranko Brothers. Compaction and moisture content meet project specification in the above test areas.

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**GEOSERV, INC.** *Testing - Exploration - Engineering*
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**TO:** Mr. Joe Kessel
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P.O. Box 0820
Dickinson, ND 58602-0820

**DATE:** September 29, 2022
**PROJECT NO:** GEO-062205
**COPIES TO:** Minnkota Power Coop
Barr Engineering Co

**PROJECT:** Minnkota FGD Pond – Cell 5 Phase 1A
Center, ND

## DENSITY TESTS OF COMPACTED FILL

| **TEST NUMBER:** | RF-139 | RF-140 | RF-141 |
|---|---|---|---|
| **DATE TAKEN** | 9/29/22 | 9/29/22 | 9/29/22 |
| **ASTM: D2488-00 DESCRIPTION AND IDENTIFICATION OF SOILS (Visual-Manual Procedure):** | Fat Clay<br>brown.<br>(CH)-1 | Fat Clay<br>brown.<br>(CH)-1 | Lean Clay<br>trace of gravel<br>brown.<br>(CL)-6 |
| **LOCATION:** | Embankment fill,<br>N 505426.9<br>E 1819593.8 | Embankment fill,<br>N 505383.9<br>E 1819736.4 | Embankment fill,<br>N 505524.3<br>E 1819693.0 |
| **ELEVATION OF TEST:** | 2065.0' | 2065.0' | 2065.0' |
| **DEPTH BELOW FINAL GRADE:** | 26' | 22' | 34' |
| **DEPTH BELOW EXISTING GRADE:** | 8" | 8" | 8" |

**FIELD DENSITY DETERMINATION:**

ASTM: D6938-17 Density of Soil-Aggregate in Place by Nuclear Density Methods (Shallow Depth), Direct Transmission

| | | | |
|---|---|---|---|
| Dry Density (pcf) | 94.7 | 94.2 | 102.4 |
| Moisture Content (%) | 21.3 | 21.8 | 18.6 |
| Plus #4 Material (%) | None | None | 1 |
| Probe Depth (inches) | 12 | 12 | 12 |
| Operator | M. J. Tschosik | M. J. Tschosik | M. J. Tschosik |

**LABORATORY MOISTURE-DENSITY RELATION OF SOIL:**

| Method | ASTM:D698-12a, Method "A" | | |
|---|---|---|---|
| Maximum Dry Density (pcf) | 94.8 | 94.8 | 105.8 |
| Optimum Moisture (%) | 26.5 | 26.5 | 20.1 |

**COMPACTION TEST RESULTS:**

| | | | |
|---|---|---|---|
| Compaction (%) | 99.9 | 99.4 | 96.8 |
| Specified Compaction (%) | 95 | 95 | 95 |
| Specified Moisture (%) | 18.6 – 30.4 | 18.6 – 30.4 | 15.9 – 24.1 |

**ATTENTION:** Density tests are valid at the location and elevation of the test only. No representation is made as to the adequacy of fill and compaction at locations and elevations other than those tested. The test locations and number of tests were selected by Baranko Brothers. Compaction and moisture content meet project specification in the above test areas.

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**GEOSERV, INC.** *Testing - Exploration - Engineering*
*Construction Materials Testing, Geotechnical, Geosynthetics, Geoenvironmental, Drilling*

**TO:** Mr. Joe Kessel
Baranko Bros, Inc.
P.O. Box 0820
Dickinson, ND 58602-0820

**DATE:** October 7, 2022
**PROJECT NO:** GEO-062205
**COPIES TO:** Minnkota Power Coop
Barr Engineering Co

**PROJECT:** Minnkota FGD Pond – Cell 5 Phase 1A
Center, ND

## DENSITY TESTS OF COMPACTED FILL

| | | | | |
|---|---|---|---|---|
| **TEST NUMBER:** | RF-142 | RF-143 | RF-144 | RF-145 |
| **DATE TAKEN** | 10/7/22 | 10/7/22 | 10/7/22 | 10/7/22 |
| **ASTM: D2488-00 DESCRIPTION AND IDENTIFICATION OF SOILS (Visual-Manual Procedure):** | Fat Clay, gray, (CH)-7 | Fat Clay, gray, (CH)-7 | Fat Clay, gray, (CH)-7 | Fat Clay, gray, (CH)-7 |
| **LOCATION:** | Embankment fill, N 505509.3 E 1819709.2 | Embankment fill, N 505440.8 E 1819718.9 | Embankment fill, N 505468.0 E 1819684.7 | Embankment fill, N 505544.7 E 1819626.5 |
| **ELEVATION OF TEST:** | 2071.0' | 2072.0' | 2072.0' | 2071.0' |
| **DEPTH BELOW FINAL GRADE:** | 26' | 22' | 26' | 23' |
| **DEPTH BELOW EXISTING GRADE:** | 8" | 8" | 8" | 8" |

**FIELD DENSITY DETERMINATION:**

ASTM: D6938-17 Density of Soil-Aggregate in Place by Nuclear Density Methods (Shallow Depth), Direct Transmission

| | | | | |
|---|---|---|---|---|
| Dry Density (pcf) | 94.1 | 98.0 | 96.6 | 96.5 |
| Moisture Content (%) | 20.5 | 20.1 | 21.9 | 20.0 |
| Plus #4 Material (%) | None | None | None | None |
| Probe Depth (inches) | 12 | 12 | 12 | 12 |
| Operator | M. J. Tschosik | M. J. Tschosik | M. J. Tschosik | M. J. Tschosik |

**LABORATORY MOISTURE-DENSITY RELATION OF SOIL:**

| | | | | |
|---|---|---|---|---|
| Method | ASTM:D698-12a, Method "A" | | | |
| Maximum Dry Density (pcf) | 98.1 | 98.1 | 98.1 | 98.1 |
| Optimum Moisture (%) | 23.9 | 23.9 | 23.9 | 23.9 |

**COMPACTION TEST RESULTS:**

| | | | | |
|---|---|---|---|---|
| Compaction (%) | 95.9 | 99.9 | 98.5 | 98.4 |
| Specified Compaction (%) | 95 | 95 | 95 | 95 |
| Specified Moisture (%) | 20.0 – 28.0 | 20.0 – 28.0 | 20.0 – 28.0 | 20.0 – 28.0 |

**ATTENTION:** Density tests are valid at the location and elevation of the test only. No representation is made as to the adequacy of fill and compaction at locations and elevations other than those tested. The test locations and number of tests were selected by Baranko Brothers. Compaction and moisture content meet project specification in the above test areas.

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**GEOSERV, INC.** *Testing - Exploration - Engineering*
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**TO:** Mr. Joe Kessel
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P.O. Box 0820
Dickinson, ND 58602-0820

**DATE:** October 7, 2022
**PROJECT NO:** GEO-062205
**COPIES TO:** Minnkota Power Coop
Barr Engineering Co

**PROJECT:** Minnkota FGD Pond – Cell 5 Phase 1A
Center, ND

## DENSITY TESTS OF COMPACTED FILL

| | |
|---|---|
| **TEST NUMBER:** | RF-146 |
| **DATE TAKEN** | 10/7/22 |
| **ASTM: D2488-00 DESCRIPTION AND IDENTIFICATION OF SOILS (Visual-Manual Procedure):** | Fat Clay,<br>gray,<br>(CH)-7 |
| **LOCATION:** | Embankment fill,<br>N 505568.0<br>E 1819695.0 |
| **ELEVATION OF TEST:** | 2071.0' |
| **DEPTH BELOW FINAL GRADE:** | 23' |
| **DEPTH BELOW EXISTING GRADE:** | 8" |

**FIELD DENSITY DETERMINATION:**

ASTM: D6938-17 Density of Soil-Aggregate in Place by Nuclear Density Methods (Shallow Depth), Direct Transmission

| | |
|---|---|
| Dry Density (pcf) | 98.6 |
| Moisture Content (%) | 21.0 |
| Plus #4 Material (%) | None |
| Probe Depth (inches) | 12 |
| Operator | M. J. Tschosik |

**LABORATORY MOISTURE-DENSITY RELATION OF SOIL:**

| | |
|---|---|
| Method | ASTM:D698-12a, Method "A" |
| Maximum Dry Density (pcf) | 98.1 |
| Optimum Moisture (%) | 23.9 |

**COMPACTION TEST RESULTS:**

| | |
|---|---|
| Compaction (%) | 100.5 |
| Specified Compaction (%) | 95 |
| Specified Moisture (%) | 20.0 – 28.0 |

**ATTENTION:** Density tests are valid at the location and elevation of the test only. No representation is made as to the adequacy of fill and compaction at locations and elevations other than those tested. The test locations and number of tests were selected by Baranko Brothers. Compaction and moisture content meet project specification in the above test area.

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**GEOSERV, INC.** *Testing - Exploration - Engineering*
*Construction Materials Testing, Geotechnical, Geosynthetics, Geoenvironmental, Drilling*

**TO:** Mr. Joe Kessel
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P.O. Box 0820
Dickinson, ND 58602-0820

**DATE:** October 11, 2022
**PROJECT NO:** GEO-062205
**COPIES TO:** Minnkota Power Coop
Barr Engineering Co

**PROJECT:** Minnkota FGD Pond – Cell 5 Phase 1A
Center, ND

## DENSITY TESTS OF COMPACTED FILL

| | | | | |
|---|---|---|---|---|
| **TEST NUMBER:** | RF-147 | RF-148 | RF-149 | RF-150 |
| **DATE TAKEN** | 10/11/22 | 10/11/22 | 10/11/22 | 10/11/22 |
| **ASTM: D2488-00 DESCRIPTION AND IDENTIFICATION OF SOILS (Visual-Manual Procedure):** | Fat Clay, gray, (CH)-7 | Fat Clay, gray, (CH)-7 | Fat Clay, gray, (CH)-7 | Fat Clay, gray, (CH)-7 |
| **LOCATION:** | Embankment fill, N 505461.7 E 1819719.0 | Embankment fill, N 505503.7 E 1819719.0 | Embankment fill, N 505552.8 E 1819715.3 | Embankment fill, N 505615.0 E 1819714.9 |
| **ELEVATION OF TEST:** | 2075.0' | 2074.0' | 2075.0' | 2074.5' |
| **DEPTH BELOW FINAL GRADE:** | 18' | 18' | 20' | 21' |
| **DEPTH BELOW EXISTING GRADE:** | 8" | 8" | 8" | 8" |

**FIELD DENSITY DETERMINATION:**

ASTM: D6938-17 Density of Soil-Aggregate in Place by Nuclear Density Methods (Shallow Depth), Direct Transmission

| | | | | |
|---|---|---|---|---|
| Dry Density (pcf) | 99.3 | 98.2 | 99.5 | 97.4 |
| Moisture Content (%) | 21.0 | 20.2 | 20.3 | 20.7 |
| Plus #4 Material (%) | None | None | None | None |
| Probe Depth (inches) | 12 | 12 | 12 | 12 |
| Operator | M. J. Tschosik | M. J. Tschosik | M. J. Tschosik | M. J. Tschosik |

**LABORATORY MOISTURE-DENSITY RELATION OF SOIL:**

Method ASTM:D698-12a, Method "A"

| | | | | |
|---|---|---|---|---|
| Maximum Dry Density (pcf) | 98.1 | 98.1 | 98.1 | 98.1 |
| Optimum Moisture (%) | 23.9 | 23.9 | 23.9 | 23.9 |

**COMPACTION TEST RESULTS:**

| | | | | |
|---|---|---|---|---|
| Compaction (%) | 101.2 | 100.1 | 101.4 | 99.3 |
| Specified Compaction (%) | 95 | 95 | 95 | 95 |
| Specified Moisture (%) | 20.0 – 28.0 | 20.0 – 28.0 | 20.0 – 28.0 | 20.0 – 28.0 |

**ATTENTION:** Density tests are valid at the location and elevation of the test only. No representation is made as to the adequacy of fill and compaction at locations and elevations other than those tested. The test locations and number of tests were selected by Baranko Brothers. Compaction and moisture content meet project specification in the above test areas.

GEOSERV, INC.

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**GEOSERV, INC.** *Testing - Exploration - Engineering*
*Construction Materials Testing, Geotechnical, Geosynthetics, Geoenvironmental, Drilling*

**TO:** Mr. Joe Kessel
Baranko Bros, Inc.
P.O. Box 0820
Dickinson, ND 58602-0820

**DATE:** October 25, 2022
**PROJECT NO:** GEO-062205
**COPIES TO:** Minnkota Power Coop
Barr Engineering Co

**PROJECT:** Minnkota FGD Pond – Cell 5 Phase 1A
Center, ND

## DENSITY TESTS OF COMPACTED FILL

| **TEST NUMBER:** | RF-151 | RF-152 | RF-153 | RF-154 |
|---|---|---|---|---|
| **DATE TAKEN** | 10/25/22 | 10/25/22 | 10/25/22 | 10/25/22 |
| **ASTM: D2488-00 DESCRIPTION AND IDENTIFICATION OF SOILS (Visual-Manual Procedure):** | Lean Clay trace of gravel brown. (CL)-6 | Lean Clay trace of gravel brown. (CL)-6 | Lean Clay trace of gravel brown. (CL)-6 | Lean Clay trace of gravel brown. (CL)-6 |
| **LOCATION:** | Embankment fill, N 505732.9 E 1819696.7 | Embankment fill, N 505670.6 E 1819694.5 | Embankment fill, N 505598.3 E 1819687.3 | Embankment fill, N 505508.6 E 1819687.1 |
| **ELEVATION OF TEST:** | 2092.0' | 2093.0' | 2093.0' | 2093.0' |
| **DEPTH BELOW FINAL GRADE:** | 6' | 5' | 5' | 5' |
| **DEPTH BELOW EXISTING GRADE:** | 8" | 8" | 8" | 8" |

**FIELD DENSITY DETERMINATION:**

ASTM: D6938-17 Density of Soil-Aggregate in Place by Nuclear Density Methods (Shallow Depth), Direct Transmission

| | | | | |
|---|---|---|---|---|
| Dry Density (pcf) | 101.1 | 102.9 | 101.5 | 102.1 |
| Moisture Content (%) | 19.9 | 19.7 | 19.2 | 18.6 |
| Plus #4 Material (%) | 1 | 1 | 1 | 1 |
| Probe Depth (inches) | 12 | 12 | 12 | 12 |
| Operator | M. J. Tschosik | M. J. Tschosik | M. J. Tschosik | M. J. Tschosik |

**LABORATORY MOISTURE-DENSITY RELATION OF SOIL:**

Method ASTM:D698-12a, Method "A"

| | | | | |
|---|---|---|---|---|
| Maximum Dry Density (pcf) | 105.8 | 105.8 | 105.8 | 105.8 |
| Optimum Moisture (%) | 20.1 | 20.1 | 20.1 | 20.1 |

**COMPACTION TEST RESULTS:**

| | | | | |
|---|---|---|---|---|
| Compaction (%) | 95.6 | 97.3 | 95.9 | 96.5 |
| Specified Compaction (%) | 95 | 95 | 95 | 95 |
| Specified Moisture (%) | 15.9 – 24.1 | 15.9 – 24.1 | 15.9 – 24.1 | 15.9 – 24.1 |

**ATTENTION:** Density tests are valid at the location and elevation of the test only. No representation is made as to the adequacy of fill and compaction at locations and elevations other than those tested. The test locations and number of tests were selected by Baranko Brothers. Compaction and moisture content meet project specification in the above test areas.

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**GEOSERV, INC.** *Testing - Exploration - Engineering*
*Construction Materials Testing, Geotechnical, Geosynthetics, Geoenvironmental, Drilling*

**TO:** Mr. Joe Kessel
Baranko Bros, Inc.
P.O. Box 0820
Dickinson, ND 58602-0820

**DATE:** October 25, 2022
**PROJECT NO:** GEO-062205
**COPIES TO:** Minnkota Power Coop
Barr Engineering Co

**PROJECT:** Minnkota FGD Pond – Cell 5 Phase 1A
Center, ND

## DENSITY TESTS OF COMPACTED FILL

| | |
|---|---|
| **TEST NUMBER:** | RF-155 |
| **DATE TAKEN** | 10/25/22 |
| **ASTM: D2488-00 DESCRIPTION AND IDENTIFICATION OF SOILS (Visual-Manual Procedure):** | Lean Clay<br>trace of gravel<br>brown.<br>(CL)-6 |
| **LOCATION:** | Embankment fill,<br>N 505385.2<br>E 1819685.8 |
| **ELEVATION OF TEST:** | 2093.0' |
| **DEPTH BELOW FINAL GRADE:** | 5' |
| **DEPTH BELOW EXISTING GRADE:** | 8" |

**FIELD DENSITY DETERMINATION:**

ASTM: D6938-17 Density of Soil-Aggregate in Place by Nuclear Density Methods (Shallow Depth), Direct Transmission

| | |
|---|---|
| Dry Density (pcf) | 105.5 |
| Moisture Content (%) | 16.6 |
| Plus #4 Material (%) | 1 |
| Probe Depth (inches) | 12 |
| Operator | M. J. Tschosik |

**LABORATORY MOISTURE-DENSITY RELATION OF SOIL:**

Method ASTM:D698-12a, Method "A"

| | |
|---|---|
| Maximum Dry Density (pcf) | 105.8 |
| Optimum Moisture (%) | 20.1 |

**COMPACTION TEST RESULTS:**

| | |
|---|---|
| Compaction (%) | 99.7 |
| Specified Compaction (%) | 95 |
| Specified Moisture (%) | 15.9 – 24.1 |

**ATTENTION:** Density tests are valid at the location and elevation of the test only. No representation is made as to the adequacy of fill and compaction at locations and elevations other than those tested. The test locations and number of tests were selected by Baranko Brothers. Compaction and moisture content meet project specification in the above test area.

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**GEOSERV, INC.** *Testing - Exploration - Engineering*
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**TO:** Mr. Joe Kessel
Baranko Bros, Inc.
P.O. Box 0820
Dickinson, ND 58602-0820

**DATE:** October 27, 2022
**PROJECT NO:** GEO-062205
**COPIES TO:** Minnkota Power Coop
Barr Engineering Co

**PROJECT:** Minnkota FGD Pond – Cell 5 Phase 1A
Center, ND

## DENSITY TESTS OF COMPACTED FILL

| | | | | |
|---|---|---|---|---|
| **TEST NUMBER:** | RF-156 | RF-157 | RF-158 | RF-159 |
| **DATE TAKEN** | 10/27/22 | 10/27/22 | 10/27/22 | 10/27/22 |
| **ASTM: D2488-00 DESCRIPTION AND IDENTIFICATION OF SOILS (Visual-Manual Procedure):** | Fat Clay, gray, (CH)-7 | Fat Clay, gray, (CH)-7 | Fat Clay, gray, (CH)-7 | Fat Clay, gray, (CH)-7 |
| **LOCATION:** | Embankment fill, N 505889.2 E 1819693.6 | Embankment fill, N 505791.0 E 1819698.6 | Embankment fill, N 505692.5 E 1819698.0 | Embankment fill, N 505514.4 E 1819698.3 |
| **ELEVATION OF TEST:** | 2098.0' | 2098.0' | 2098.0' | 2098.0' |
| **DEPTH BELOW FINAL GRADE:** | 0' | 0' | 0' | 0' |
| **DEPTH BELOW EXISTING GRADE:** | 2" | 2" | 2" | 2" |

**FIELD DENSITY DETERMINATION:**

ASTM: D6938-17 Density of Soil-Aggregate in Place by Nuclear Density Methods (Shallow Depth), Direct Transmission

| | | | | |
|---|---|---|---|---|
| Dry Density (pcf) | 98.8 | 100.4 | 96.1 | 98.4 |
| Moisture Content (%) | 20.9 | 20.3 | 20.4 | 21.8 |
| Plus #4 Material (%) | None | None | None | None |
| Probe Depth (inches) | 12 | 12 | 12 | 12 |
| Operator | M. J. Tschosik | M. J. Tschosik | M. J. Tschosik | M. J. Tschosik |

**LABORATORY MOISTURE-DENSITY RELATION OF SOIL:**

| | | | | |
|---|---|---|---|---|
| Method | ASTM:D698-12a, Method "A" | | | |
| Maximum Dry Density (pcf) | 98.1 | 98.1 | 98.1 | 98.1 |
| Optimum Moisture (%) | 23.9 | 23.9 | 23.9 | 23.9 |

**COMPACTION TEST RESULTS:**

| | | | | |
|---|---|---|---|---|
| Compaction (%) | 100.7 | 102.3 | 98.0 | 100.3 |
| Specified Compaction (%) | 95 | 95 | 95 | 95 |
| Specified Moisture (%) | 20.0 – 28.0 | 20.0 – 28.0 | 20.0 – 28.0 | 20.0 – 28.0 |

**ATTENTION:** Density tests are valid at the location and elevation of the test only. No representation is made as to the adequacy of fill and compaction at locations and elevations other than those tested. The test locations and number of tests were selected by Baranko Brothers. Compaction and moisture content meet project specification in the above test areas.

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**GEOSERV, INC.** *Testing - Exploration - Engineering*
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**TO:** Mr. Joe Kessel
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P.O. Box 0820
Dickinson, ND 58602-0820

**DATE:** October 27, 2022
**PROJECT NO:** GEO-062205
**COPIES TO:** Minnkota Power Coop
Barr Engineering Co

**PROJECT:** Minnkota FGD Pond – Cell 5 Phase 1A
Center, ND

## DENSITY TESTS OF COMPACTED FILL

| | |
|---|---|
| **TEST NUMBER:** | RF-160 |
| **DATE TAKEN** | 10/27/22 |
| **ASTM: D2488-00 DESCRIPTION AND IDENTIFICATION OF SOILS (Visual-Manual Procedure):** | Fat Clay,<br>gray,<br>(CH)-7 |
| **LOCATION:** | Embankment fill,<br>N 505416.2<br>E 1819697.5 |
| **ELEVATION OF TEST:** | 2098.0' |
| **DEPTH BELOW FINAL GRADE:** | 0' |
| **DEPTH BELOW EXISTING GRADE:** | 2" |

**FIELD DENSITY DETERMINATION:**

ASTM: D6938-17 Density of Soil-Aggregate in Place by Nuclear Density Methods (Shallow Depth), Direct Transmission

| | |
|---|---|
| Dry Density (pcf) | 99.1 |
| Moisture Content (%) | 21.5 |
| Plus #4 Material (%) | None |
| Probe Depth (inches) | 12 |
| Operator | M. J. Tschosik |

**LABORATORY MOISTURE-DENSITY RELATION OF SOIL:**

| | |
|---|---|
| Method | ASTM:D698-12a, Method "A" |
| Maximum Dry Density (pcf) | 98.1 |
| Optimum Moisture (%) | 23.9 |

**COMPACTION TEST RESULTS:**

| | |
|---|---|
| Compaction (%) | 101.0 |
| Specified Compaction (%) | 95 |
| Specified Moisture (%) | 20.0 – 28.0 |

**ATTENTION:** Density tests are valid at the location and elevation of the test only. No representation is made as to the adequacy of fill and compaction at locations and elevations other than those tested. The test locations and number of tests were selected by Baranko Brothers. Compaction and moisture content meet project specification in the above test areas.

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**GEOSERV, INC.** *Testing - Exploration - Engineering*
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**TO:** Mr. Joe Kessel
Baranko Bros, Inc.
P.O. Box 0820
Dickinson, ND 58602-0820

**DATE:** June 9, 2023
**PROJECT NO:** GEO-052310
**COPIES TO:**

**PROJECT:** Minnkota FGD Pond – Cell 5 Phase 1B
Center, ND

## DENSITY TESTS OF COMPACTED FILL

| | | | | |
|---|---|---|---|---|
| **TEST NUMBER:** | RF-1 | RF-2 | RF-3 | RF-4 |
| **DATE TAKEN** | 6/9/23 | 6/9/23 | 6/9/23 | 6/9/23 |
| **ASTM: D2488-00 DESCRIPTION AND IDENTIFICATION OF SOILS (Visual-Manual Procedure):** | Fat Clay, gray, (CH)-1 | Fat Clay, gray, (CH)-1 | Fat Clay, gray, (CH)-1 | Fat Clay, gray, (CH)-1 |
| **LOCATION:** | Embankment fill, N 505961.5 E 1820936.4 | Embankment fill, N 505966.0 E 1821122.0 | Embankment fill, N 505251.2 E 1821567.6 | Embankment fill, N 505231.3 E 1821521.3 |
| **ELEVATION OF TEST:** | 2072.0' | 2072.0' | 2071.0' | 2071.0' |
| **DEPTH BELOW FINAL GRADE:** | | | | |
| **DEPTH BELOW EXISTING GRADE:** | 2" | 2" | 2" | 2" |

**FIELD DENSITY DETERMINATION:**

ASTM: D6938-17 Density of Soil-Aggregate in Place by Nuclear Density Methods (Shallow Depth), Direct Transmission

| | | | | |
|---|---|---|---|---|
| Dry Density (pcf) | 100.0 | 98.6 | 95.9 | 95.1 |
| Moisture Content (%) | 17.1 | 17.6 | 24.2 | 17.7 |
| Plus #4 Material (%) | None | None | None | None |
| Probe Depth (inches) | 12 | 12 | 12 | 12 |
| Operator | M. J. Tschosik | M. J. Tschosik | M. J. Tschosik | M. J. Tschosik |

**LABORATORY MOISTURE-DENSITY RELATION OF SOIL:**

Method ASTM:D698-12a, Method "A"

| | | | | |
|---|---|---|---|---|
| Maximum Dry Density (pcf) | 98.2 | 98.2 | 98.2 | 98.2 |
| Optimum Moisture (%) | 24.1 | 24.1 | 24.1 | 24.1 |

**COMPACTION TEST RESULTS:**

| | | | | |
|---|---|---|---|---|
| Compaction (%) | 101.8 | 100.4 | 97.7 | 96.8 |
| Specified Compaction (%) | 95 | 95 | 95 | 95 |
| Specified Moisture (%) | 16.9 – 27.4 | 16.9 – 27.4 | 16.9 – 27.4 | 16.9 – 27.4 |

**ATTENTION:** Density tests are valid at the location and elevation of the test only. No representation is made as to the adequacy of fill and compaction at locations and elevations other than those tested. The test locations and number of tests were selected by Baranko Brothers. Compaction and moisture content meet project specification in the above test areas.

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**GEOSERV, INC.** *Testing - Exploration - Engineering*
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**TO:** Mr. Joe Kessel
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P.O. Box 0820
Dickinson, ND 58602-0820

**DATE:** June 9, 2023
**PROJECT NO:** GEO-052310
**COPIES TO:**

**PROJECT:** Minnkota FGD Pond – Cell 5 Phase 1B
Center, ND

## DENSITY TESTS OF COMPACTED FILL

| | | | |
|---|---|---|---|
| **TEST NUMBER:** | RF-5 | RF-6 | RF-7 |
| **DATE TAKEN** | 6/9/23 | 6/9/23 | 6/9/23 |
| **ASTM: D2488-00 DESCRIPTION AND IDENTIFICATION OF SOILS (Visual-Manual Procedure):** | Fat Clay, gray, (CH)-1 | Fat Clay, gray, (CH)-1 | Fat Clay, gray, (CH)-1 |
| **LOCATION:** | Embankment fill, N 505292.5 E 1820391.3 | Embankment fill, N 505294.5 E 1820171.3 | Embankment fill, N 505294.8 E 1819944.0 |
| **ELEVATION OF TEST:** | 2048.0' | 2048.0' | 2050.0' |
| **DEPTH BELOW FINAL GRADE:** | | | |
| **DEPTH BELOW EXISTING GRADE:** | 2" | 2" | 2" |

**FIELD DENSITY DETERMINATION:**

ASTM: D6938-17 Density of Soil-Aggregate in Place by Nuclear Density Methods (Shallow Depth), Direct Transmission

| | | | |
|---|---|---|---|
| Dry Density (pcf) | 99.4 | 94.1 | 99.9 |
| Moisture Content (%) | 19.0 | 20.1 | 17.8 |
| Plus #4 Material (%) | None | None | None |
| Probe Depth (inches) | 12 | 12 | 12 |
| Operator | M. J. Tschosik | M. J. Tschosik | M. J. Tschosik |

**LABORATORY MOISTURE-DENSITY RELATION OF SOIL:**

| | | | |
|---|---|---|---|
| Method | ASTM:D698-12a, Method "A" | | |
| Maximum Dry Density (pcf) | 98.2 | 98.2 | 98.2 |
| Optimum Moisture (%) | 24.1 | 24.1 | 24.1 |

**COMPACTION TEST RESULTS:**

| | | | |
|---|---|---|---|
| Compaction (%) | 101.2 | 95.8 | 101.7 |
| Specified Compaction (%) | 95 | 95 | 95 |
| Specified Moisture (%) | 16.9 – 27.4 | 16.9 – 27.4 | 16.9 – 27.4 |

**ATTENTION:** Density tests are valid at the location and elevation of the test only. No representation is made as to the adequacy of fill and compaction at locations and elevations other than those tested. The test locations and number of tests were selected by Baranko Brothers. Compaction and moisture content meet project specification in the above test areas.

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**GEOSERV, INC.** *Testing - Exploration - Engineering*
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**TO:** Mr. Joe Kessel
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P.O. Box 0820
Dickinson, ND 58602-0820

**DATE:** June 12, 2023
**PROJECT NO:** GEO-052310
**COPIES TO:**

**PROJECT:** Minnkota FGD Pond – Cell 5 Phase 1B
Center, ND

## DENSITY TESTS OF COMPACTED FILL

| | | | | |
|---|---|---|---|---|
| **TEST NUMBER:** | RF-8 | RF-9 | RF-10 | RF-11 |
| **DATE TAKEN** | 6/12/23 | 6/12/23 | 6/12/23 | 6/12/23 |
| **ASTM: D2488-00 DESCRIPTION AND IDENTIFICATION OF SOILS (Visual-Manual Procedure):** | Fat Clay, gray, (CH)-1 | Fat Clay, gray, (CH)-1 | Fat Clay, gray, (CH)-1 | Fat Clay, gray, (CH)-1 |
| **LOCATION:** | Embankment fill, N 505277.4 E 1820597.0 | Embankment fill, N 505261.8 E 1819910.7 | Embankment fill, N 505366.1 E 1819818.5 | Embankment fill, N 505796.3 E 1819824.8 |
| **ELEVATION OF TEST:** | 2057.0' | 2062.0' | 2062.0' | 2060.0' |
| **DEPTH BELOW FINAL GRADE:** | | | | |
| **DEPTH BELOW EXISTING GRADE:** | 2" | 2" | 2" | 2" |

**FIELD DENSITY DETERMINATION:**

ASTM: D6938-17 Density of Soil-Aggregate in Place by Nuclear Density Methods (Shallow Depth), Direct Transmission

| | | | | |
|---|---|---|---|---|
| Dry Density (pcf) | 96.4 | 95.6 | 97.1 | 98.4 |
| Moisture Content (%) | 17.4 | 18.9 | 19.8 | 19.1 |
| Plus #4 Material (%) | None | None | None | None |
| Probe Depth (inches) | 12 | 12 | 12 | 12 |
| Operator | M. J. Tschosik | M. J. Tschosik | M. J. Tschosik | M. J. Tschosik |

**LABORATORY MOISTURE-DENSITY RELATION OF SOIL:**

Method ASTM:D698-12a, Method "A"

| | | | | |
|---|---|---|---|---|
| Maximum Dry Density (pcf) | 98.2 | 98.2 | 98.2 | 98.2 |
| Optimum Moisture (%) | 24.1 | 24.1 | 24.1 | 24.1 |

**COMPACTION TEST RESULTS:**

| | | | | |
|---|---|---|---|---|
| Compaction (%) | 98.2 | 97.4 | 96.7 | 100.2 |
| Specified Compaction (%) | 95 | 95 | 95 | 95 |
| Specified Moisture (%) | 16.9 – 27.4 | 16.9 – 27.4 | 16.9 – 27.4 | 16.9 – 27.4 |

**ATTENTION:** Density tests are valid at the location and elevation of the test only. No representation is made as to the adequacy of fill and compaction at locations and elevations other than those tested. The test locations and number of tests were selected by Baranko Brothers. Compaction and moisture content meet project specification in the above test areas.

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**GEOSERV, INC.** *Testing - Exploration - Engineering*
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**TO:** Mr. Joe Kessel
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P.O. Box 0820
Dickinson, ND 58602-0820

**DATE:** June 12, 2023
**PROJECT NO:** GEO-052310
**COPIES TO:**

**PROJECT:** Minnkota FGD Pond – Cell 5 Phase 1B
Center, ND

## DENSITY TESTS OF COMPACTED FILL

| | | |
|---|---|---|
| **TEST NUMBER:** | RF-12 | RF-13 |
| **DATE TAKEN** | 6/12/23 | 6/12/23 |
| **ASTM: D2488-00 DESCRIPTION AND IDENTIFICATION OF SOILS (Visual-Manual Procedure):** | Fat Clay, gray, (CH)-1 | Fat Clay, gray, (CH)-1 |
| **LOCATION:** | Embankment fill, N 505931.4 E 1819880.8 | Embankment fill, N 505222.2 E 1820412.0 |
| **ELEVATION OF TEST:** | 2061.0' | 2057.0' |
| **DEPTH BELOW FINAL GRADE:** | | |
| **DEPTH BELOW EXISTING GRADE:** | 2" | 2" |

**FIELD DENSITY DETERMINATION:**

ASTM: D6938-17 Density of Soil-Aggregate in Place by Nuclear Density Methods (Shallow Depth), Direct Transmission

| | | |
|---|---|---|
| Dry Density (pcf) | 96.6 | 98.9 |
| Moisture Content (%) | 18.9 | 17.2 |
| Plus #4 Material (%) | None | None |
| Probe Depth (inches) | 12 | 12 |
| Operator | M. J. Tschosik | M. J. Tschosik |

**LABORATORY MOISTURE-DENSITY RELATION OF SOIL:**

| | | |
|---|---|---|
| Method | ASTM:D698-12a, Method "A" | |
| Maximum Dry Density (pcf) | 98.2 | 98.2 |
| Optimum Moisture (%) | 24.1 | 24.1 |

**COMPACTION TEST RESULTS:**

| | | |
|---|---|---|
| Compaction (%) | 98.4 | 100.7 |
| Specified Compaction (%) | 95 | 95 |
| Specified Moisture (%) | 16.9 – 27.4 | 16.9 – 27.4 |

**ATTENTION:** Density tests are valid at the location and elevation of the test only. No representation is made as to the adequacy of fill and compaction at locations and elevations other than those tested. The test locations and number of tests were selected by Baranko Brothers. Compaction and moisture content meet project specification in the above test areas.

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**TO:** Mr. Joe Kessel
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Dickinson, ND 58602-0820

**DATE:** June 13, 2023
**PROJECT NO:** GEO-052310
**COPIES TO:**

**PROJECT:** Minnkota FGD Pond – Cell 5 Phase 1B
Center, ND

## DENSITY TESTS OF COMPACTED FILL

| | | | | |
|---|---|---|---|---|
| **TEST NUMBER:** | RF-14 | RF-15 | RF-16 | RF-17 |
| **DATE TAKEN** | 6/13/23 | 6/13/23 | 6/13/23 | 6/13/23 |
| **ASTM: D2488-00 DESCRIPTION AND IDENTIFICATION OF SOILS (Visual-Manual Procedure):** | Fat Clay, gray, (CH)-1 | Fat Clay, gray, (CH)-1 | Fat Clay, gray, (CH)-1 | Fat Clay, gray, (CH)-1 |
| **LOCATION:** | Embankment fill, N 505937.1 E 1819958.4 | Embankment fill, N 505934.1 E 1820374.0 | Embankment fill, N 505253.9 E 1820379.8 | Embankment fill, N 505256.0 E 1820201.1 |
| **ELEVATION OF TEST:** | 2064.0' | 2062.0' | 2065.0' | 2064.0' |
| **DEPTH BELOW FINAL GRADE:** | | | | |
| **DEPTH BELOW EXISTING GRADE:** | 2" | 2" | 2" | 2" |

**FIELD DENSITY DETERMINATION:**

ASTM: D6938-17 Density of Soil-Aggregate in Place by Nuclear Density Methods (Shallow Depth), Direct Transmission

| | | | | |
|---|---|---|---|---|
| Dry Density (pcf) | 93.7 | 98.9 | 98.1 | 97.4 |
| Moisture Content (%) | 17.5 | 19.5 | 17.4 | 17.0 |
| Plus #4 Material (%) | None | None | None | None |
| Probe Depth (inches) | 12 | 12 | 12 | 12 |
| Operator | M. J. Tschosik | M. J. Tschosik | M. J. Tschosik | M. J. Tschosik |

**LABORATORY MOISTURE-DENSITY RELATION OF SOIL:**

Method ASTM:D698-12a, Method "A"

| | | | | |
|---|---|---|---|---|
| Maximum Dry Density (pcf) | 98.2 | 98.2 | 98.2 | 98.2 |
| Optimum Moisture (%) | 24.1 | 24.1 | 24.1 | 24.1 |

**COMPACTION TEST RESULTS:**

| | | | | |
|---|---|---|---|---|
| Compaction (%) | 95.4 | 100.7 | 99.9 | 99.2 |
| Specified Compaction (%) | 95 | 95 | 95 | 95 |
| Specified Moisture (%) | 16.9 – 27.4 | 16.9 – 27.4 | 16.9 – 27.4 | 16.9 – 27.4 |

**ATTENTION:** Density tests are valid at the location and elevation of the test only. No representation is made as to the adequacy of fill and compaction at locations and elevations other than those tested. The test locations and number of tests were selected by Baranko Brothers. Compaction and moisture content meet project specification in the above test areas.

GEOSERV, INC.

3100 EAST BROADWAY AVENUE • BISMARCK, ND 58501 PHONE 701-223-6149
P.O. BOX 3159 • BISMARCK, ND 58502-3159 FAX 701-223-2372

**GEOSERV, INC.** *Testing - Exploration - Engineering*
*Construction Materials Testing, Geotechnical, Geosynthetics, Geoenvironmental, Drilling*

**TO:** Mr. Joe Kessel
Baranko Bros, Inc.
P.O. Box 0820
Dickinson, ND 58602-0820

**DATE:** June 13, 2023
**PROJECT NO:** GEO-052310
**COPIES TO:**

**PROJECT:** Minnkota FGD Pond – Cell 5 Phase 1B
Center, ND

## DENSITY TESTS OF COMPACTED FILL

| | | |
|---|---|---|
| **TEST NUMBER:** | RF-18 | RF-19 |
| **DATE TAKEN** | 6/13/23 | 6/13/23 |
| **ASTM: D2488-00 DESCRIPTION AND IDENTIFICATION OF SOILS (Visual-Manual Procedure):** | Fat Clay, gray, (CH)-1 | Fat Clay, gray, (CH)-1 |
| **LOCATION:** | Embankment fill, N 505356.7 E 1819804.9 | Embankment fill, N 505528.0 E 1819808.8 |
| **ELEVATION OF TEST:** | 2066.0' | 2065.0' |
| **DEPTH BELOW FINAL GRADE:** | | |
| **DEPTH BELOW EXISTING GRADE:** | 2" | 2" |

**FIELD DENSITY DETERMINATION:**

ASTM: D6938-17 Density of Soil-Aggregate in Place by Nuclear Density Methods (Shallow Depth), Direct Transmission

| | | |
|---|---|---|
| Dry Density (pcf) | 99.0 | 98.3 |
| Moisture Content (%) | 17.2 | 17.0 |
| Plus #4 Material (%) | None | None |
| Probe Depth (inches) | 12 | 12 |
| Operator | M. J. Tschosik | M. J. Tschosik |

**LABORATORY MOISTURE-DENSITY RELATION OF SOIL:**

| | | |
|---|---|---|
| Method | ASTM:D698-12a, Method "A" | |
| Maximum Dry Density (pcf) | 98.2 | 98.2 |
| Optimum Moisture (%) | 24.1 | 24.1 |

**COMPACTION TEST RESULTS:**

| | | |
|---|---|---|
| Compaction (%) | 100.8 | 100.1 |
| Specified Compaction (%) | 95 | 95 |
| Specified Moisture (%) | 16.9 – 27.4 | 16.9 – 27.4 |

**ATTENTION:** Density tests are valid at the location and elevation of the test only. No representation is made as to the adequacy of fill and compaction at locations and elevations other than those tested. The test locations and number of tests were selected by Baranko Brothers. Compaction and moisture content meet project specification in the above test areas.

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**TO:** Mr. Joe Kessel
Baranko Bros, Inc.
P.O. Box 0820
Dickinson, ND 58602-0820

**DATE:** June 15, 2023
**PROJECT NO:** GEO-052310
**COPIES TO:**

**PROJECT:** Minnkota FGD Pond – Cell 5 Phase 1B
Center, ND

## DENSITY TESTS OF COMPACTED FILL

| | | | | |
|---|---|---|---|---|
| **TEST NUMBER:** | RF-20 | RF-21 | RF-22 | RF-23 |
| **DATE TAKEN** | 6/15/23 | 6/15/23 | 6/15/23 | 6/15/23 |
| **ASTM: D2488-00 DESCRIPTION AND IDENTIFICATION OF SOILS (Visual-Manual Procedure):** | Fat Clay, gray, (CH)-1 | Fat Clay, gray, (CH)-1 | Fat Clay, gray, (CH)-1 | Fat Clay, gray, (CH)-1 |
| **LOCATION:** | Embankment fill, N 505233.2 E 18203478.8 | Embankment fill, N 505233.9 E 1820191.4 | Embankment fill, N 505318.0 E 1819787.7 | Embankment fill, N 505495.5 E 1819787.8 |
| **ELEVATION OF TEST:** | 2072.0' | 2072.0' | 2072.0' | 2072.0' |
| **DEPTH BELOW FINAL GRADE:** | | | | |
| **DEPTH BELOW EXISTING GRADE:** | 2" | 2" | 2" | 2" |

**FIELD DENSITY DETERMINATION:**

ASTM: D6938-17 Density of Soil-Aggregate in Place by Nuclear Density Methods (Shallow Depth), Direct Transmission

| | | | | |
|---|---|---|---|---|
| Dry Density (pcf) | 99.1 | 98.1 | 98.1 | 98.9 |
| Moisture Content (%) | 17.8 | 18.5 | 18.1 | 17.7 |
| Plus #4 Material (%) | None | None | None | None |
| Probe Depth (inches) | 12 | 12 | 12 | 12 |
| Operator | M. J. Tschosik | M. J. Tschosik | M. J. Tschosik | M. J. Tschosik |

**LABORATORY MOISTURE-DENSITY RELATION OF SOIL:**

Method ASTM:D698-12a, Method "A"

| | | | | |
|---|---|---|---|---|
| Maximum Dry Density (pcf) | 98.2 | 98.2 | 98.2 | 98.2 |
| Optimum Moisture (%) | 24.1 | 24.1 | 24.1 | 24.1 |

**COMPACTION TEST RESULTS:**

| | | | | |
|---|---|---|---|---|
| Compaction (%) | 100.9 | 99.9 | 99.9 | 100.7 |
| Specified Compaction (%) | 95 | 95 | 95 | 95 |
| Specified Moisture (%) | 16.9 – 27.4 | 16.9 – 27.4 | 16.9 – 27.4 | 16.9 – 27.4 |

**ATTENTION:** Density tests are valid at the location and elevation of the test only. No representation is made as to the adequacy of fill and compaction at locations and elevations other than those tested. The test locations and number of tests were selected by Baranko Brothers. Compaction and moisture content meet project specification in the above test areas.

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**GEOSERV, INC.** *Testing - Exploration - Engineering*
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**TO:** Mr. Joe Kessel
Baranko Bros, Inc.
P.O. Box 0820
Dickinson, ND 58602-0820

**DATE:** June 15, 2023
**PROJECT NO:** GEO-052310
**COPIES TO:**

**PROJECT:** Minnkota FGD Pond – Cell 5 Phase 1B
Center, ND

## DENSITY TESTS OF COMPACTED FILL

| | | |
|---|---|---|
| **TEST NUMBER:** | RF-24 | RF-25 |
| **DATE TAKEN** | 6/15/23 | 6/15/23 |
| **ASTM: D2488-00 DESCRIPTION AND IDENTIFICATION OF SOILS (Visual-Manual Procedure):** | Fat Clay, gray, (CH)-1 | Fat Clay, gray, (CH)-1 |
| **LOCATION:** | Embankment fill, N 505962.6 E 1819922.7 | Embankment fill, N 505962.4 E 1820174.2 |
| **ELEVATION OF TEST:** | 2072.0' | 2072.0' |
| **DEPTH BELOW FINAL GRADE:** | | |
| **DEPTH BELOW EXISTING GRADE:** | 2" | 2" |

**FIELD DENSITY DETERMINATION:**

ASTM: D6938-17 Density of Soil-Aggregate in Place by Nuclear Density Methods (Shallow Depth), Direct Transmission

| | | |
|---|---|---|
| Dry Density (pcf) | 95.4 | 96.6 |
| Moisture Content (%) | 18.5 | 18.5 |
| Plus #4 Material (%) | None | None |
| Probe Depth (inches) | 12 | 12 |
| Operator | M. J. Tschosik | M. J. Tschosik |

**LABORATORY MOISTURE-DENSITY RELATION OF SOIL:**

| | | |
|---|---|---|
| Method | ASTM:D698-12a, Method "A" | |
| Maximum Dry Density (pcf) | 98.2 | 98.2 |
| Optimum Moisture (%) | 24.1 | 24.1 |

**COMPACTION TEST RESULTS:**

| | | |
|---|---|---|
| Compaction (%) | 97.1 | 98.4 |
| Specified Compaction (%) | 95 | 95 |
| Specified Moisture (%) | 16.9 – 27.4 | 16.9 – 27.4 |

**ATTENTION:** Density tests are valid at the location and elevation of the test only. No representation is made as to the adequacy of fill and compaction at locations and elevations other than those tested. The test locations and number of tests were selected by Baranko Brothers. Compaction and moisture content meet project specification in the above test areas.

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**GEOSERV, INC.** *Testing - Exploration - Engineering*
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**TO:** Mr. Joe Kessel
Baranko Bros, Inc.
P.O. Box 0820
Dickinson, ND 58602-0820

**DATE:** July 20, 2023
**PROJECT NO:** GEO-052310
**COPIES TO:**

**PROJECT:** Minnkota FGD Pond – Cell 5 Phase 1B
Center, ND

## DENSITY TESTS OF COMPACTED FILL

| | | | |
|---|---|---|---|
| **TEST NUMBER:** | RF-26 | RF-27 | RF-28 |
| **DATE TAKEN** | 7/20/23 | 7/20/23 | 7/20/23 |
| **ASTM: D2488-00 DESCRIPTION AND IDENTIFICATION OF SOILS (Visual-Manual Procedure):** | Fat Clay, gray, (CH)-1 | Fat Clay, gray, (CH)-1 | Fat Clay, gray, (CH)-1 |
| **LOCATION:** | Embankment fill, N 505230.6 E 1820757.5 | Embankment fill, N 505226.7 E 1820693.8 | Embankment Fill, N 505235.5 E 1820591.2 |
| **ELEVATION OF TEST:** | 2071.0' | 2072.0' | 2071.0' |
| **DEPTH BELOW FINAL GRADE:** | | | |
| **DEPTH BELOW EXISTING GRADE:** | 2" | 2" | 2" |

**FIELD DENSITY DETERMINATION:**

ASTM: D6938-17 Density of Soil-Aggregate in Place by Nuclear Density Methods (Shallow Depth), Direct Transmission

| | | | |
|---|---|---|---|
| Dry Density (pcf) | 99.2 | 97.9 | 97.3 |
| Moisture Content (%) | 18.6 | 18.9 | 17.9 |
| Plus #4 Material (%) | None | None | None |
| Probe Depth (inches) | 12 | 12 | 12 |
| Operator | M. J. Tschosik | M. J. Tschosik | M.J. Tschosik |

**LABORATORY MOISTURE-DENSITY RELATION OF SOIL:**

| | | | |
|---|---|---|---|
| Method | ASTM:D698-12a, Method "A" | | |
| Maximum Dry Density (pcf) | 98.2 | 98.2 | 98.2 |
| Optimum Moisture (%) | 24.1 | 24.1 | 24.1 |

**COMPACTION TEST RESULTS:**

| | | | |
|---|---|---|---|
| Compaction (%) | 101.6 | 99.7 | 99.1 |
| Specified Compaction (%) | 95 | 95 | 95 |
| Specified Moisture (%) | 16.9 – 27.4 | 16.9 – 27.4 | 16.9 -- 27.4 |

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# Appendix D

## Select Clay

Select Clay Material Tests
Select Clay Proctors
Select Clay Field Test Results
Select Clay Field Test Results – Sand Cone
Select Clay Hydraulic Conductivity Test Results

# Select Clay Material Tests

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# Atterberg Limits

**ASTM D4318**

**Report Date:** 07/15/2022

1502 Grumman Lane
Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 459455 | **Alternate ID:** | P-01 |
| **Sample From:** | Not Given | **Sampled By:** | Client |
| **Location:** | Other | | |
| **Location Details:** | Select Clay Stockpile, Sample 1 | | |
| **Sample Date:** | 07/11/2022 | | |
| **Received Date:** | 07/12/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 07/15/2022 | **Tested By:** | Austin, Jon |

## Laboratory Data

| Description | Result | Specifications |
|---|---|---|
| **Liquid Limit:** | 53 | - |
| **Plastic Limit:** | 18 | |
| **Plastic Index:** | 35 | - |
| **Soil Classification:** | CH Fat Clay | |

## General

**Results:** The test is for informational purposes.

The results included in this report relate only to the items inspected or tested. Sample plan outlined in project specifications as applicable.Additionally, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without the prior written approval.

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# Atterberg Limits

**ASTM D4318**

**Report Date:** 07/15/2022

1502 Grumman Lane
Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 459456 | **Alternate ID:** | P-02 |
| **Sample From:** | Not Given | **Sampled By:** | Client |
| **Location:** | Other | | |
| **Location Details:** | Select Clay Stockpile, Sample 2 | | |
| **Sample Date:** | 07/11/2022 | | |
| **Received Date:** | 07/12/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 07/15/2022 | **Tested By:** | Austin, Jon |

## Laboratory Data

| Description | Result | Specifications |
|---|---|---|
| **Liquid Limit:** | 57 | - |
| **Plastic Limit:** | 19 | |
| **Plastic Index:** | 38 | - |
| **Soil Classification:** | CH Fat Clay | |

## General

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# Atterberg Limits

**ASTM D4318**

**Report Date:** 07/22/2022

1502 Grumman Lane
Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 460948 | **Alternate ID:** | P-03 |
| **Sample From:** | Stockpile | **Sampled By:** | Client |
| **Location Details:** | Select Clay Stockpile, Sample 3 | | |
| **Sample Date:** | 07/12/2022 | | |
| **Received Date:** | 07/12/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 07/22/2022 | **Tested By:** | Austin, Jon |

## Laboratory Data

| Description | Result | Specifications |
|---|---|---|
| **Liquid Limit:** | 53 | - |
| **Plastic Limit:** | 16 | |
| **Plastic Index:** | 37 | - |
| **Soil Classification:** | CH Fat Clay | |

## General

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# Atterberg Limits

**ASTM D4318**

**Report Date:** 07/22/2022

1502 Grumman Lane
Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 460949 | **Alternate ID:** | P-04 |
| **Sample From:** | Stockpile | **Sampled By:** | Client |
| **Location Details:** | Select Clay Stockpile, Sample 4 | | |
| **Sample Date:** | 07/12/2022 | | |
| **Received Date:** | 07/12/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 07/22/2022 | **Tested By:** | Austin, Jon |

## Laboratory Data

| Description | Result | Specifications |
|---|---|---|
| **Liquid Limit:** | 54 | - |
| **Plastic Limit:** | 16 | |
| **Plastic Index:** | 38 | - |
| **Soil Classification:** | CH Fat Clay | |

## General

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# Atterberg Limits

**ASTM D4318**

**Report Date:** 07/22/2022

1502 Grumman Lane
Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 460950 | **Alternate ID:** | P-05 |
| **Sample From:** | Stockpile | **Sampled By:** | Client |
| **Location Details:** | Select Clay Stockpile, Sample 5 | | |
| **Sample Date:** | 07/12/2022 | | |
| **Received Date:** | 07/12/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 07/22/2022 | **Tested By:** | Austin, Jon |

## Laboratory Data

| Description | Result | Specifications |
|---|---|---|
| **Liquid Limit:** | 66 | - |
| **Plastic Limit:** | 18 | |
| **Plastic Index:** | 48 | - |
| **Soil Classification:** | CH Fat Clay | |

## General

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Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 460951 | **Alternate ID:** | P-06 |
| **Sample From:** | Stockpile | **Sampled By:** | Client |
| **Location Details:** | Select Clay Stockpile, Sample 6 | | |
| **Sample Date:** | 07/12/2022 | | |
| **Received Date:** | 07/12/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 07/22/2022 | **Tested By:** | Austin, Jon |

## Laboratory Data

| Description | Result | Specifications |
|---|---|---|
| **Liquid Limit:** | 61 | - |
| **Plastic Limit:** | 18 | |
| **Plastic Index:** | 43 | - |
| **Soil Classification:** | CH Fat Clay | |

## General

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**ASTM D4318**

**Report Date:** 07/22/2022

1502 Grumman Lane
Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 460952 | **Alternate ID:** | P-07 |
| **Sample From:** | Stockpile | **Sampled By:** | Client |
| **Location Details:** | Select Clay Stockpile, Sample 7 | | |
| **Sample Date:** | 07/12/2022 | | |
| **Received Date:** | 07/12/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 07/22/2022 | **Tested By:** | Austin, Jon |

## Laboratory Data

| Description | Result | Specifications |
|---|---|---|
| **Liquid Limit:** | 67 | - |
| **Plastic Limit:** | 19 | |
| **Plastic Index:** | 48 | - |
| **Soil Classification:** | CH Fat Clay | |

## General

**Results:** The test is for informational purposes.

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**ASTM D4318**

**Report Date:** 07/22/2022

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Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 460953 | **Alternate ID:** | P-08 |
| **Sample From:** | Stockpile | **Sampled By:** | Client |
| **Location Details:** | Select Clay Stockpile, Sample 8 | | |
| **Sample Date:** | 07/14/2022 | | |
| **Received Date:** | 07/14/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 07/22/2022 | **Tested By:** | Austin, Jon |

## Laboratory Data

| Description | Result | Specifications |
|---|---|---|
| **Liquid Limit:** | 58 | - |
| **Plastic Limit:** | 17 | |
| **Plastic Index:** | 41 | - |
| **Soil Classification:** | CH Fat Clay | |

## General

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# Atterberg Limits

**ASTM D4318**

**Report Date:** 07/29/2022

1502 Grumman Lane
Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 460954 | **Alternate ID:** | P-09 |
| **Sample From:** | Stockpile | **Sampled By:** | Client |
| **Location Details:** | Select Clay Stockpile, Sample 9 | | |
| **Sample Date:** | 07/18/2022 | | |
| **Received Date:** | 07/18/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 07/29/2022 | **Tested By:** | Austin, Jon |

## Laboratory Data

| Description | Result | Specifications |
|---|---|---|
| **Liquid Limit:** | 57 | - |
| **Plastic Limit:** | 18 | |
| **Plastic Index:** | 39 | - |
| **Soil Classification:** | CH Fat Clay | |

## General

**Results:** The test is for informational purposes.

The results included in this report relate only to the items inspected or tested. Sample plan outlined in project specifications as applicable.Additionally, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without the prior written approval.

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**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 460956 | **Alternate ID:** | P-10 |
| **Sample From:** | Stockpile | **Sampled By:** | Client |
| **Location Details:** | Select Clay Stockpile, Sample 10 | | |
| **Sample Date:** | 07/18/2022 | | |
| **Received Date:** | 07/18/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 07/29/2022 | **Tested By:** | Austin, Jon |

## Laboratory Data

| Description | Result | Specifications |
|---|---|---|
| **Liquid Limit:** | 65 | - |
| **Plastic Limit:** | 20 | |
| **Plastic Index:** | 45 | - |
| **Soil Classification:** | CH Fat Clay | |

## General

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1502 Grumman Lane
Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 460957 | **Alternate ID:** | P-11 |
| **Sample From:** | Stockpile | **Sampled By:** | Client |
| **Location Details:** | Select Clay Stockpile, Sample 11 | | |
| **Sample Date:** | 07/18/2022 | | |
| **Received Date:** | 07/18/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 07/29/2022 | **Tested By:** | Austin, Jon |

## Laboratory Data

| Description | Result | Specifications |
|---|---|---|
| **Liquid Limit:** | 63 | - |
| **Plastic Limit:** | 19 | |
| **Plastic Index:** | 44 | - |
| **Soil Classification:** | CH Fat Clay | |

## General

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Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 460958 | **Alternate ID:** | P-12 |
| **Sample From:** | Stockpile | **Sampled By:** | Client |
| **Location Details:** | Select Clay Stockpile, Sample 12 | | |
| **Sample Date:** | 07/18/2022 | | |
| **Received Date:** | 07/18/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 07/29/2022 | **Tested By:** | Austin, Jon |

## Laboratory Data

| Description | Result | Specifications |
|---|---|---|
| **Liquid Limit:** | 60 | - |
| **Plastic Limit:** | 18 | |
| **Plastic Index:** | 42 | - |
| **Soil Classification:** | CH Fat Clay | |

## General

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# Atterberg Limits

**ASTM D4318**

**Report Date:** 05/24/2023

2908 Morrison Ave.
Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2303912
Minnkota Cell 5
Center, ND

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 517473 | **Alternate ID:** | P-20 |
| **Sample From:** | In Place | **Sampled By:** | Wenko, Steve |
| **Location Details:** | Zone 26, 2016' | | |
| **Sample Date:** | 05/02/2023 | | |
| **Received Date:** | 05/02/2023 | **Lab:** | 2908 Morrison Ave. Suite 3, Bismarck, ND |
| **Tested Date:** | 05/22/2023 | **Tested By:** | Austin, Jon |

## Laboratory Data

| Description | Result | Specifications |
|---|---|---|
| **Liquid Limit:** | 89 | - |
| **Plastic Limit:** | 27 | |
| **Plastic Index:** | 62 | - |
| **Soil Classification:** | CH Fat Clay | |

## General

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# Atterberg Limits

**ASTM D4318**

**Report Date:** 05/26/2023

2908 Morrison Ave.
Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2303912
Minnkota Cell 5
Center, ND

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 517470 | **Alternate ID:** | SC-01 |
| **Sample From:** | Stockpile | **Sampled By:** | Wenko, Steve |
| **Location Details:** | Zone 8 | | |
| **Sample Date:** | 05/02/2023 | | |
| **Received Date:** | 05/02/2023 | **Lab:** | 2908 Morrison Ave. Suite 3, Bismarck, ND |
| **Tested Date:** | 05/22/2023 | **Tested By:** | Austin, Jon |

## Laboratory Data

| Description | Result | Specifications |
|---|---|---|
| **Liquid Limit:** | 78 | - |
| **Plastic Limit:** | 17 | |
| **Plastic Index:** | 61 | - |
| **Soil Classification:** | CH Fat Clay | |

## General

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# Atterberg Limits

**ASTM D4318**

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2908 Morrison Ave.
Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2303912
Minnkota Cell 5
Center, ND

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 517472 | **Alternate ID:** | SC-02 |
| **Sample From:** | Stockpile | **Sampled By:** | Wenko, Steve |
| **Location Details:** | Zone 9 | | |
| **Sample Date:** | 05/02/2023 | | |
| **Received Date:** | 05/02/2023 | **Lab:** | 2908 Morrison Ave. Suite 3, Bismarck, ND |
| **Tested Date:** | 05/22/2023 | **Tested By:** | Austin, Jon |

## Laboratory Data

| Description | Result | Specifications |
|---|---|---|
| **Liquid Limit:** | 84 | - |
| **Plastic Limit:** | 18 | |
| **Plastic Index:** | 66 | - |
| **Soil Classification:** | CH Fat Clay | |

## General

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# Atterberg Limits

**ASTM D4318**

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Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2303912
Minnkota Cell 5
Center, ND

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 519369 | **Alternate ID:** | SC-3 |
| **Sample From:** | Stockpile | **Sampled By:** | Wenko, Steve |
| **Location Details:** | E side of SC Stockpile | | |
| **Sample Date:** | 05/10/2023 | | |
| **Received Date:** | 05/10/2023 | **Lab:** | 2908 Morrison Ave. Suite 3, Bismarck, ND |
| **Tested Date:** | 05/22/2023 | **Tested By:** | Austin, Jon |

## Laboratory Data

| Description | Result | Specifications |
|---|---|---|
| **Liquid Limit:** | 54 | - |
| **Plastic Limit:** | 15 | |
| **Plastic Index:** | 39 | - |
| **Soil Classification:** | CH Fat Clay | |

## General

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# Atterberg Limits

**ASTM D4318**

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Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2303912
Minnkota Cell 5
Center, ND

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 519367 | **Alternate ID:** | SC-4 |
| **Sample From:** | Stockpile | **Sampled By:** | Wenko, Steve |
| **Location Details:** | Middle of SC Stockpile | | |
| **Sample Date:** | 05/10/2023 | | |
| **Received Date:** | 05/10/2023 | **Lab:** | 2908 Morrison Ave. Suite 3, Bismarck, ND |
| **Tested Date:** | 05/22/2023 | **Tested By:** | Austin, Jon |

## Laboratory Data

| Description | Result | Specifications |
|---|---|---|
| **Liquid Limit:** | 71 | - |
| **Plastic Limit:** | 16 | |
| **Plastic Index:** | 55 | - |
| **Soil Classification:** | CH Fat Clay | |

## General

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Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2303912
Minnkota Cell 5
Center, ND

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 519368 | **Alternate ID:** | SC-5 |
| **Sample From:** | Stockpile | **Sampled By:** | Wenko, Steve |
| **Location Details:** | W side of SC Stockpile | | |
| **Sample Date:** | 05/10/2023 | | |
| **Received Date:** | 05/10/2023 | **Lab:** | 2908 Morrison Ave. Suite 3, Bismarck, ND |
| **Tested Date:** | 05/22/2023 | **Tested By:** | Austin, Jon |

## Laboratory Data

| Description | Result | Specifications |
|---|---|---|
| **Liquid Limit:** | 62 | - |
| **Plastic Limit:** | 15 | |
| **Plastic Index:** | 47 | - |
| **Soil Classification:** | CH Fat Clay | |

## General

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# Atterberg Limits

**ASTM D4318**

**Report Date:** 08/01/2022

1502 Grumman Lane
Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 464193 | **Alternate ID:** | SC-13 |
| **Sampling Method:** | Not Provided | **Sampled By:** | Client |
| **Location:** | In-place | | |
| **Location Details:** | Select Clay, SC-13 | | |
| **Specification:** | Project | | |
| **Sample Date:** | 07/20/2022 | **Material:** | Select Fill |
| **Received Date:** | 07/22/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 07/29/2022 | **Tested By:** | Austin, Jon |

## Laboratory Data

| Description | Result | Specifications |
|---|---|---|
| **Liquid Limit:** | 57 | - |
| **Plastic Limit:** | 17 | |
| **Plastic Index:** | 40 | - |
| **Soil Classification:** | CH Fat Clay | |

## General

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Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 464194 | **Alternate ID:** | SC-14 |
| **Sampling Method:** | Not Provided | **Sampled By:** | Client |
| **Location:** | In-place | | |
| **Location Details:** | Select Clay, SC-14 | | |
| **Specification:** | Project | | |
| **Sample Date:** | 07/20/2022 | **Material:** | Select Fill |
| **Received Date:** | 07/22/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 07/29/2022 | **Tested By:** | Austin, Jon |

## Laboratory Data

| Description | Result | Specifications |
|---|---|---|
| **Liquid Limit:** | 64 | - |
| **Plastic Limit:** | 20 | |
| **Plastic Index:** | 44 | - |
| **Soil Classification:** | CH Fat Clay | |

## General

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# Atterberg Limits

**ASTM D4318**

**Report Date:** 08/04/2022

1502 Grumman Lane
Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 464324 | **Alternate ID:** | SC-15 |
| **Sample From:** | Not Given | **Sampled By:** | Client |
| **Location Details:** | Select Clay Stockpile, Sample 15 | | |
| **Sample Date:** | 07/27/2022 | | |
| **Received Date:** | 07/28/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 08/03/2022 | **Tested By:** | Austin, Jon |

## Laboratory Data

| Description | Result | Specifications |
|---|---|---|
| **Liquid Limit:** | 53 | - |
| **Plastic Limit:** | 19 | |
| **Plastic Index:** | 34 | - |
| **Soil Classification:** | CH Fat Clay | |

## General

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Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 464326 | **Alternate ID:** | SC-16 |
| **Sample From:** | Not Given | **Sampled By:** | Client |
| **Location Details:** | Select Clay Stockpile, Sample 16 | | |
| **Sample Date:** | 07/27/2022 | | |
| **Received Date:** | 07/28/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 08/03/2022 | **Tested By:** | Austin, Jon |

## Laboratory Data

| Description | Result | Specifications |
|---|---|---|
| **Liquid Limit:** | 53 | - |
| **Plastic Limit:** | 19 | |
| **Plastic Index:** | 34 | - |
| **Soil Classification:** | CH Fat Clay | |

## General

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Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 464327 | **Alternate ID:** | SC-17 |
| **Sample From:** | Not Given | **Sampled By:** | Client |
| **Location Details:** | Select Clay Stockpile, Sample 17 | | |
| **Sample Date:** | 07/27/2022 | | |
| **Received Date:** | 07/28/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 08/03/2022 | **Tested By:** | Austin, Jon |

## Laboratory Data

| Description | Result | Specifications |
|---|---|---|
| **Liquid Limit:** | 54 | - |
| **Plastic Limit:** | 18 | |
| **Plastic Index:** | 36 | - |
| **Soil Classification:** | CH Fat Clay | |

## General

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Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 467164 | **Alternate ID:** | SC-18 |
| **Sampling Method:** | Stockpile ASTM D75/AASHTO T2 | **Sampled By:** | Client |
| **Location:** | Other | | |
| **Location Details:** | Select Clay Stockpile | | |
| **Specification:** | Project | | |
| **Sample Date:** | 08/04/2022 | **Material:** | Select Fill |
| **Received Date:** | 08/04/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 08/10/2022 | **Tested By:** | Austin, Jon |

## Laboratory Data

| Description | Result | Specifications |
|---|---|---|
| **Liquid Limit:** | 54 | - |
| **Plastic Limit:** | 18 | |
| **Plastic Index:** | 36 | - |
| **Soil Classification:** | CH Fat Clay | |

## General

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**Client:**

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5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 467166 | **Alternate ID:** | SC-19 |
| **Sampling Method:** | Stockpile ASTM D75/AASHTO T2 | **Sampled By:** | Client |
| **Location:** | Other | | |
| **Location Details:** | Select Clay Stockpile | | |
| **Specification:** | Project | | |
| **Sample Date:** | 08/04/2022 | **Material:** | Select Fill |
| **Received Date:** | 08/04/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 08/10/2022 | **Tested By:** | Austin, Jon |

## Laboratory Data

| Description | Result | Specifications |
|---|---|---|
| **Liquid Limit:** | 53 | - |
| **Plastic Limit:** | 17 | |
| **Plastic Index:** | 36 | - |
| **Soil Classification:** | CH Fat Clay | |

## General

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# Atterberg Limits

**ASTM D4318**

**Report Date:** 09/23/2022

1502 Grumman Lane
Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 479411 | **Alternate ID:** | SC-20 |
| **Sample From:** | Not Given | **Sampled By:** | Client |
| **Location Details:** | Select Clay Stockpile, Sample 20 | | |
| **Sample Date:** | 09/12/2022 | | |
| **Received Date:** | 09/12/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 09/23/2022 | **Tested By:** | Ficek, Kevin |

## Laboratory Data

| Description | Result | Specifications |
|---|---|---|
| **Liquid Limit:** | 54 | - |
| **Plastic Limit:** | 17 | |
| **Plastic Index:** | 37 | - |
| **Soil Classification:** | CH Fat Clay | |

## General

**Results:** The test is for informational purposes.

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# Atterberg Limits

**ASTM D4318**

**Report Date:** 09/23/2022

1502 Grumman Lane
Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 479413 | **Alternate ID:** | SC-21 |
| **Sample From:** | Not Given | **Sampled By:** | Client |
| **Location Details:** | Select Clay Stockpile, Sample 21 | | |
| **Sample Date:** | 09/12/2022 | | |
| **Received Date:** | 09/12/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 09/23/2022 | **Tested By:** | Ficek, Kevin |

## Laboratory Data

| Description | Result | Specifications |
|---|---|---|
| **Liquid Limit:** | 49 | - |
| **Plastic Limit:** | 16 | |
| **Plastic Index:** | 33 | - |
| **Soil Classification:** | CL Lean Clay | |

## General

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# Atterberg Limits

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**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 479414 | **Alternate ID:** | SC-22 |
| **Sample From:** | Not Given | **Sampled By:** | Client |
| **Location Details:** | Select Clay Stockpile, Sample 22 | | |
| **Sample Date:** | 09/12/2022 | | |
| **Received Date:** | 09/12/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 09/23/2022 | **Tested By:** | Ficek, Kevin |

## Laboratory Data

| Description | Result | Specifications |
|---|---|---|
| **Liquid Limit:** | 53 | - |
| **Plastic Limit:** | 17 | |
| **Plastic Index:** | 36 | - |
| **Natural Moisture Content (%):** | | |
| **Passing #200 Sieve (%):** | | |
| **Soil Classification:** | CH Fat Clay | |

## General

**Results:** The test is for informational purposes.

**Remarks:**

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**Client:**

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5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

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Cell 5 Phase 1A
Milton Young Station
Center, ND

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 479415 | **Alternate ID:** | SC-23 |
| **Sample From:** | Not Given | **Sampled By:** | Client |
| **Location Details:** | Select Clay Stockpile, Sample 23 | | |
| **Sample Date:** | 09/12/2022 | | |
| **Received Date:** | 09/12/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 09/23/2022 | **Tested By:** | Ficek, Kevin |

## Laboratory Data

| Description | Result | Specifications |
|---|---|---|
| **Liquid Limit:** | 72 | - |
| **Plastic Limit:** | 21 | |
| **Plastic Index:** | 51 | - |
| **Soil Classification:** | CH Fat Clay | |

## General

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**Client:**

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5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

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Cell 5 Phase 1A
Milton Young Station
Center, ND

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 479416 | **Alternate ID:** | SC-24 |
| **Sample From:** | Not Given | **Sampled By:** | Client |
| **Location Details:** | Select Clay Stockpile, Sample 24 | | |
| **Sample Date:** | 09/12/2022 | | |
| **Received Date:** | 09/12/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 09/23/2022 | **Tested By:** | Ficek, Kevin |

## Laboratory Data

| Description | Result | Specifications |
|---|---|---|
| **Liquid Limit:** | 57 | - |
| **Plastic Limit:** | 17 | |
| **Plastic Index:** | 40 | - |
| **Natural Moisture Content (%):** | | |
| **Passing #200 Sieve (%):** | | |
| **Soil Classification:** | CH Fat Clay | |

## General

**Results:** The test is for informational purposes.

**Remarks:**

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**Client:**

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5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 479417 | **Alternate ID:** | SC-25 |
| **Sample From:** | Not Given | **Sampled By:** | Client |
| **Location Details:** | Select Clay Stockpile, Sample 25 | | |
| **Sample Date:** | 09/14/2022 | | |
| **Received Date:** | 09/15/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 09/23/2022 | **Tested By:** | Ficek, Kevin |

## Laboratory Data

| Description | Result | Specifications |
|---|---|---|
| **Liquid Limit:** | 59 | - |
| **Plastic Limit:** | 17 | |
| **Plastic Index:** | 42 | - |
| **Soil Classification:** | CH Fat Clay | |

## General

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# Atterberg Limits

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**Client:**

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5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

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Cell 5 Phase 1A
Milton Young Station
Center, ND

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 479418 | **Alternate ID:** | SC-26 |
| **Sample From:** | Not Given | **Sampled By:** | Client |
| **Location Details:** | Select Clay Stockpile, Sample 26 | | |
| **Sample Date:** | 09/14/2022 | | |
| **Received Date:** | 09/15/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 09/23/2022 | **Tested By:** | Ficek, Kevin |

## Laboratory Data

| Description | Result | Specifications |
|---|---|---|
| **Liquid Limit:** | 59 | - |
| **Plastic Limit:** | 17 | |
| **Plastic Index:** | 42 | - |
| **Soil Classification:** | CH Fat Clay | |

## General

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Grand Forks, ND 58201

**Project:**

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Cell 5 Phase 1A
Milton Young Station
Center, ND

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 479420 | **Alternate ID:** | SC-27 |
| **Sample From:** | Not Given | **Sampled By:** | Client |
| **Location Details:** | Select Clay Stockpile, Sample 27 | | |
| **Sample Date:** | 09/14/2022 | | |
| **Received Date:** | 09/15/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 09/23/2022 | **Tested By:** | Ficek, Kevin |

## Laboratory Data

| Description | Result | Specifications |
|---|---|---|
| **Liquid Limit:** | 57 | - |
| **Plastic Limit:** | 17 | |
| **Plastic Index:** | 40 | - |
| **Soil Classification:** | CH Fat Clay | |

## General

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**Project:**

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Center, ND

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 479421 | **Alternate ID:** | SC-28 |
| **Sample From:** | Not Given | **Sampled By:** | Client |
| **Location Details:** | Select Clay Stockpile, Sample 28 | | |
| **Sample Date:** | 09/14/2022 | | |
| **Received Date:** | 09/15/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 09/23/2022 | **Tested By:** | Ficek, Kevin |

## Laboratory Data

| Description | Result | Specifications |
|---|---|---|
| **Liquid Limit:** | 63 | - |
| **Plastic Limit:** | 17 | |
| **Plastic Index:** | 46 | - |
| **Soil Classification:** | CH Fat Clay | |

## General

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Grand Forks, ND 58201

**Project:**

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Center, ND

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 482377 | **Alternate ID:** | SC-29 |
| **Sample From:** | In Place | **Sampled By:** | Client |
| **Location Details:** | Select Clay Stockpile, Sample 29 | | |
| **Sample Date:** | 09/21/2022 | | |
| **Received Date:** | 09/21/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 10/11/2022 | **Tested By:** | Ficek, Kevin |

## Laboratory Data

| Description | Result | Specifications |
|---|---|---|
| **Liquid Limit:** | 58 | - |
| **Plastic Limit:** | 15 | |
| **Plastic Index:** | 43 | - |
| **Soil Classification:** | CH Fat Clay | |

## General

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Bismarck, ND 58504
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**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 482381 | **Alternate ID:** | SC-30 |
| **Sample From:** | In Place | **Sampled By:** | Client |
| **Location Details:** | Select Clay Stockpile, Sample 30 | | |
| **Sample Date:** | 09/21/2022 | | |
| **Received Date:** | 09/21/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 10/11/2022 | **Tested By:** | Ficek, Kevin |

## Laboratory Data

| Description | Result | Specifications |
|---|---|---|
| **Liquid Limit:** | 51 | - |
| **Plastic Limit:** | 15 | |
| **Plastic Index:** | 36 | - |
| **Soil Classification:** | CH Fat Clay | |

## General

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# Atterberg Limits

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Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 482382 | **Alternate ID:** | SC-31 |
| **Sample From:** | In Place | **Sampled By:** | Client |
| **Location Details:** | Select Clay Stockpile, Sample 31 | | |
| **Sample Date:** | 09/21/2022 | | |
| **Received Date:** | 09/21/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 10/11/2022 | **Tested By:** | Ficek, Kevin |

## Laboratory Data

| Description | Result | Specifications |
|---|---|---|
| **Liquid Limit:** | 61 | - |
| **Plastic Limit:** | 16 | |
| **Plastic Index:** | 45 | - |
| **Soil Classification:** | CH Fat Clay | |

## General

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# Atterberg Limits

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**Client:**

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5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 482384 | **Alternate ID:** | SC-32 |
| **Sample From:** | In Place | **Sampled By:** | Client |
| **Location Details:** | Select Clay Stockpile, Sample 32 | | |
| **Sample Date:** | 09/21/2022 | | |
| **Received Date:** | 09/21/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 10/11/2022 | **Tested By:** | Ficek, Kevin |

## Laboratory Data

| Description | Result | Specifications |
|---|---|---|
| **Liquid Limit:** | 48 | - |
| **Plastic Limit:** | 14 | |
| **Plastic Index:** | 34 | - |
| **Soil Classification:** | CL Lean Clay | |

## General

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**Client:**

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5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 482385 | **Alternate ID:** | SC-33 |
| **Sample From:** | In Place | **Sampled By:** | Client |
| **Location Details:** | Select Clay Stockpile, Sample 33 | | |
| **Sample Date:** | 09/30/2022 | | |
| **Received Date:** | 09/30/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 10/11/2022 | **Tested By:** | Ficek, Kevin |

## Laboratory Data

| Description | Result | Specifications |
|---|---|---|
| **Liquid Limit:** | 59 | - |
| **Plastic Limit:** | 16 | |
| **Plastic Index:** | 43 | - |
| **Soil Classification:** | CH Fat Clay | |

## General

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**Client:**

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Grand Forks, ND 58201

**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 482387 | **Alternate ID:** | SC-34 |
| **Sample From:** | In Place | **Sampled By:** | Client |
| **Location Details:** | Select Clay Stockpile, Sample 34 | | |
| **Sample Date:** | 09/30/2022 | | |
| **Received Date:** | 09/30/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 10/11/2022 | **Tested By:** | Ficek, Kevin |

## Laboratory Data

| Description | Result | Specifications |
|---|---|---|
| **Liquid Limit:** | 55 | - |
| **Plastic Limit:** | 16 | |
| **Plastic Index:** | 39 | - |
| **Soil Classification:** | CH Fat Clay | |

## General

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**Client:**

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Grand Forks, ND 58201

**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 482388 | **Alternate ID:** | SC-35 |
| **Sample From:** | In Place | **Sampled By:** | Client |
| **Location Details:** | Select Clay Stockpile, Sample 35 | | |
| **Sample Date:** | 09/30/2022 | | |
| **Received Date:** | 09/30/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 10/11/2022 | **Tested By:** | Ficek, Kevin |

## Laboratory Data

| Description | Result | Specifications |
|---|---|---|
| **Liquid Limit:** | 56 | - |
| **Plastic Limit:** | 16 | |
| **Plastic Index:** | 40 | - |
| **Soil Classification:** | CH Fat Clay | |

## General

**Results:** The test is for informational purposes.

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**Client:**

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Grand Forks, ND 58201

**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 482389 | **Alternate ID:** | SC-36 |
| **Sample From:** | In Place | **Sampled By:** | Client |
| **Location Details:** | Select Clay Stockpile, Sample 36 | | |
| **Sample Date:** | 09/30/2022 | | |
| **Received Date:** | 09/30/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 10/11/2022 | **Tested By:** | Ficek, Kevin |

## Laboratory Data

| Description | Result | Specifications |
|---|---|---|
| **Liquid Limit:** | 59 | - |
| **Plastic Limit:** | 17 | |
| **Plastic Index:** | 42 | - |
| **Soil Classification:** | CH Fat Clay | |

## General

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**ASTM D4318**

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Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 483845 | **Alternate ID:** | SC-37 |
| **Sample From:** | Not Given | **Sampled By:** | Client |
| **Location Details:** | Select Clay Stockpile, Sample 37 | | |
| **Sample Date:** | 10/06/2022 | | |
| **Received Date:** | 10/06/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 10/07/2022 | **Tested By:** | Ficek, Kevin |

## Laboratory Data

| Description | Result | Specifications |
|---|---|---|
| **Liquid Limit:** | 53 | - |
| **Plastic Limit:** | 17 | |
| **Plastic Index:** | 36 | - |
| **Soil Classification:** | CH Fat Clay | |

## General

**Results:** The test is for informational purposes.

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# Atterberg Limits

**ASTM D4318**

**Report Date:** 10/17/2022

1502 Grumman Lane
Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 486656 | **Alternate ID:** | SC-38 |
| **Sampling Method:** | Not Provided | **Sampled By:** | Client |
| **Location:** | In-place | | |
| **Location Details:** | Cell 5 Borrow Area | | |
| **Specification:** | Project | | |
| **Sample Date:** | 10/12/2022 | **Material:** | Select Fill |
| **Received Date:** | 10/12/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 10/14/2022 | **Tested By:** | Austin, Jon |

## Laboratory Data

| Description | Result | Specifications |
|---|---|---|
| **Liquid Limit:** | 52 | - |
| **Plastic Limit:** | 18 | |
| **Plastic Index:** | 34 | - |
| **Soil Classification:** | CH Fat Clay | |

## General

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# Atterberg Limits

**ASTM D4318**

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1502 Grumman Lane
Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 488506 | **Alternate ID:** | SC-39 |
| **Sample From:** | In Place | **Sampled By:** | Client |
| **Location Details:** | Select Clay Stockpile, Sample 39 | | |
| **Sample Date:** | 10/19/2022 | | |
| **Received Date:** | 10/19/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 11/01/2022 | **Tested By:** | Ficek, Kevin |

## Laboratory Data

| Description | Result | Specifications |
|---|---|---|
| **Liquid Limit:** | 97 | - |
| **Plastic Limit:** | 17 | |
| **Plastic Index:** | 80 | - |
| **Soil Classification:** | CH Fat Clay | |

## General

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# Atterberg Limits

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**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 488507 | **Alternate ID:** | SC-40 |
| **Sample From:** | In Place | **Sampled By:** | Client |
| **Location Details:** | Select Clay Stockpile, Sample 40 | | |
| **Sample Date:** | 10/19/2022 | | |
| **Received Date:** | 10/19/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 11/01/2022 | **Tested By:** | Ficek, Kevin |

## Laboratory Data

| Description | Result | Specifications |
|---|---|---|
| **Liquid Limit:** | 115 | - |
| **Plastic Limit:** | 20 | |
| **Plastic Index:** | 95 | - |
| **Soil Classification:** | CH Fat Clay | |

## General

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**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 488508 | **Alternate ID:** | SC-41 |
| **Sample From:** | In Place | **Sampled By:** | Client |
| **Location Details:** | Select Clay Stockpile, Sample 41 | | |
| **Sample Date:** | 10/19/2022 | | |
| **Received Date:** | 10/19/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 11/01/2022 | **Tested By:** | Ficek, Kevin |

## Laboratory Data

| Description | Result | Specifications |
|---|---|---|
| **Liquid Limit:** | 107 | - |
| **Plastic Limit:** | 19 | |
| **Plastic Index:** | 88 | - |
| **Soil Classification:** | CH Fat Clay | |

## General

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**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 488509 | **Alternate ID:** | SC-42 |
| **Sample From:** | In Place | **Sampled By:** | Client |
| **Location Details:** | Select Clay Stockpile, Sample 42 | | |
| **Sample Date:** | 10/19/2022 | | |
| **Received Date:** | 10/19/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 11/01/2022 | **Tested By:** | Ficek, Kevin |

## Laboratory Data

| Description | Result | Specifications |
|---|---|---|
| **Liquid Limit:** | 98 | - |
| **Plastic Limit:** | 17 | |
| **Plastic Index:** | 81 | - |
| **Soil Classification:** | CH Fat Clay | |

## General

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**Client:**

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5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

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Cell 5 Phase 1A
Milton Young Station
Center, ND

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 488510 | **Alternate ID:** | SC-43 |
| **Sample From:** | In Place | **Sampled By:** | Client |
| **Location Details:** | Select Clay Stockpile, Sample 43 | | |
| **Sample Date:** | 10/19/2022 | | |
| **Received Date:** | 10/19/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 11/01/2022 | **Tested By:** | Ficek, Kevin |

## Laboratory Data

| Description | Result | Specifications |
|---|---|---|
| **Liquid Limit:** | 51 | - |
| **Plastic Limit:** | 16 | |
| **Plastic Index:** | 35 | - |
| **Soil Classification:** | CH Fat Clay | |

## General

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**Client:**

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Grand Forks, ND 58201

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## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 488511 | **Alternate ID:** | SC-44 |
| **Sample From:** | In Place | **Sampled By:** | Client |
| **Location Details:** | Select Clay Stockpile, Sample 44 | | |
| **Sample Date:** | 10/19/2022 | | |
| **Received Date:** | 10/19/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 11/01/2022 | **Tested By:** | Ficek, Kevin |

## Laboratory Data

| Description | Result | Specifications |
|---|---|---|
| **Liquid Limit:** | 105 | - |
| **Plastic Limit:** | 18 | |
| **Plastic Index:** | 87 | - |
| **Soil Classification:** | CH Fat Clay | |

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Grand Forks, ND 58201

**Project:**

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Center, ND

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 488512 | **Alternate ID:** | SC-45 |
| **Sample From:** | In Place | **Sampled By:** | Client |
| **Location Details:** | Select Clay Stockpile, Sample 45 | | |
| **Sample Date:** | 10/19/2022 | | |
| **Received Date:** | 10/19/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 11/01/2022 | **Tested By:** | Ficek, Kevin |

## Laboratory Data

| Description | Result | Specifications |
|---|---|---|
| **Liquid Limit:** | 69 | - |
| **Plastic Limit:** | 20 | |
| **Plastic Index:** | 49 | - |
| **Soil Classification:** | CH Fat Clay | |

## General

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**Project:**

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Center, ND

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 491930 | **Alternate ID:** | SC-46 |
| **Sample From:** | Stockpile | **Sampled By:** | Client |
| **Location Details:** | Select Clay Stockpile, Sample 46 | | |
| **Sample Date:** | 10/28/2022 | | |
| **Received Date:** | 10/28/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 11/23/2022 | **Tested By:** | Ficek, Kevin |

## Laboratory Data

| Description | Result | Specifications |
|---|---|---|
| **Liquid Limit:** | 66 | - |
| **Plastic Limit:** | 19 | |
| **Plastic Index:** | 47 | - |
| **Soil Classification:** | CH Fat Clay | |

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Phone: 701-255-7180

**Client:**

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5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 491931 | **Alternate ID:** | SC-47 |
| **Sample From:** | Stockpile | **Sampled By:** | Client |
| **Location Details:** | Select Clay Stockpile, Sample 47 | | |
| **Sample Date:** | 10/28/2022 | | |
| **Received Date:** | 10/28/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 11/23/2022 | **Tested By:** | Ficek, Kevin |

## Laboratory Data

| Description | Result | Specifications |
|---|---|---|
| **Liquid Limit:** | 69 | - |
| **Plastic Limit:** | 16 | |
| **Plastic Index:** | 53 | - |
| **Soil Classification:** | CH Fat Clay | |

## General

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# Atterberg Limits

**ASTM D4318**

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Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 491932 | **Alternate ID:** | SC-48 |
| **Sample From:** | Stockpile | **Sampled By:** | Client |
| **Location Details:** | Select Clay Stockpile, Sample 48 | | |
| **Sample Date:** | 10/28/2022 | | |
| **Received Date:** | 10/28/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 11/23/2022 | **Tested By:** | Ficek, Kevin |

## Laboratory Data

| Description | Result | Specifications |
|---|---|---|
| **Liquid Limit:** | 67 | - |
| **Plastic Limit:** | 16 | |
| **Plastic Index:** | 51 | - |
| **Soil Classification:** | CH Fat Clay | |

## General

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# Atterberg Limits

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1502 Grumman Lane
Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 491933 | **Alternate ID:** | SC-49 |
| **Sample From:** | Stockpile | **Sampled By:** | Client |
| **Location Details:** | Select Clay Stockpile, Sample 49 | | |
| **Sample Date:** | 10/28/2022 | | |
| **Received Date:** | 10/28/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 11/23/2022 | **Tested By:** | Ficek, Kevin |

## Laboratory Data

| Description | Result | Specifications |
|---|---|---|
| **Liquid Limit:** | 86 | - |
| **Plastic Limit:** | 16 | |
| **Plastic Index:** | 70 | - |
| **Soil Classification:** | CH Fat Clay | |

## General

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# Atterberg Limits

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Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 491934 | **Alternate ID:** | SC-50 |
| **Sample From:** | Stockpile | **Sampled By:** | Client |
| **Location Details:** | Select Clay Stockpile, Sample 50 | | |
| **Sample Date:** | 10/28/2022 | | |
| **Received Date:** | 10/28/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 11/23/2022 | **Tested By:** | Ficek, Kevin |

## Laboratory Data

| Description | Result | Specifications |
|---|---|---|
| **Liquid Limit:** | 65 | - |
| **Plastic Limit:** | 15 | |
| **Plastic Index:** | 50 | - |
| **Soil Classification:** | CH Fat Clay | |

## General

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5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 491935 | **Alternate ID:** | SC-51 |
| **Sample From:** | Stockpile | **Sampled By:** | Client |
| **Location Details:** | Select Clay Stockpile, Sample 51 | | |
| **Sample Date:** | 10/28/2022 | | |
| **Received Date:** | 10/28/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 11/23/2022 | **Tested By:** | Ficek, Kevin |

## Laboratory Data

| Description | Result | Specifications |
|---|---|---|
| **Liquid Limit:** | 54 | - |
| **Plastic Limit:** | 18 | |
| **Plastic Index:** | 36 | - |
| **Soil Classification:** | CH Fat Clay | |

## General

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Grand Forks, ND 58201

**Project:**

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Cell 5 Phase 1A
Milton Young Station
Center, ND

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 491936 | **Alternate ID:** | SC-52 |
| **Sample From:** | Stockpile | **Sampled By:** | Client |
| **Location Details:** | Select Clay Stockpile, Sample 52 | | |
| **Sample Date:** | 10/28/2022 | | |
| **Received Date:** | 10/28/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 11/23/2022 | **Tested By:** | Ficek, Kevin |

## Laboratory Data

| Description | Result | Specifications |
|---|---|---|
| **Liquid Limit:** | 54 | - |
| **Plastic Limit:** | 18 | |
| **Plastic Index:** | 36 | - |
| **Soil Classification:** | CH Fat Clay | |

## General

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5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 491937 | **Alternate ID:** | SC-53 |
| **Sample From:** | Stockpile | **Sampled By:** | Client |
| **Location Details:** | Select Clay Stockpile, Sample 53 | | |
| **Sample Date:** | 11/03/2022 | | |
| **Received Date:** | 11/03/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 11/23/2022 | **Tested By:** | Ficek, Kevin |

## Laboratory Data

| Description | Result | Specifications |
|---|---|---|
| **Liquid Limit:** | 55 | - |
| **Plastic Limit:** | 17 | |
| **Plastic Index:** | 38 | - |
| **Soil Classification:** | CH Fat Clay | |

## General

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**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 491938 | **Alternate ID:** | SC-54 |
| **Sample From:** | Stockpile | **Sampled By:** | Client |
| **Location Details:** | Select Clay Stockpile, Sample 54 | | |
| **Sample Date:** | 11/03/2022 | | |
| **Received Date:** | 11/03/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 11/23/2022 | **Tested By:** | Ficek, Kevin |

## Laboratory Data

| Description | Result | Specifications |
|---|---|---|
| **Liquid Limit:** | 79 | - |
| **Plastic Limit:** | 18 | |
| **Plastic Index:** | 61 | - |
| **Soil Classification:** | CH Fat Clay | |

## General

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**Report Date:** 11/23/2022

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 491939 | **Alternate ID:** | SC-55 |
| **Sample From:** | Stockpile | **Sampled By:** | Client |
| **Location Details:** | Select Clay Stockpile, Sample 55 | | |
| **Sample Date:** | 11/03/2022 | | |
| **Received Date:** | 11/03/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 11/23/2022 | **Tested By:** | Ficek, Kevin |

## Laboratory Data

| Description | Result | Specifications |
|---|---|---|
| **Liquid Limit:** | 76 | - |
| **Plastic Limit:** | 16 | |
| **Plastic Index:** | 60 | - |
| **Soil Classification:** | CH Fat Clay | |

## General

**Results:** The test is for informational purposes.

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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# Atterberg Limits

**ASTM D4318**

**Report Date:** 11/23/2022

1502 Grumman Lane
Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 491940 | **Alternate ID:** | SC-56 |
| **Sample From:** | Stockpile | **Sampled By:** | Client |
| **Location Details:** | Select Clay Stockpile, Sample 56 | | |
| **Sample Date:** | 11/03/2022 | | |
| **Received Date:** | 11/03/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 11/23/2022 | **Tested By:** | Ficek, Kevin |

## Laboratory Data

| Description | Result | Specifications |
|---|---|---|
| **Liquid Limit:** | 62 | - |
| **Plastic Limit:** | 18 | |
| **Plastic Index:** | 44 | - |
| **Soil Classification:** | CH Fat Clay | |

## General

**Results:** The test is for informational purposes.

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# Atterberg Limits

**ASTM D4318**

**Report Date:** 11/23/2022

1502 Grumman Lane
Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 491941 | **Alternate ID:** | SC-57 |
| **Sample From:** | Stockpile | **Sampled By:** | Client |
| **Location Details:** | Select Clay Stockpile, Sample 57 | | |
| **Sample Date:** | 11/03/2022 | | |
| **Received Date:** | 11/03/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 11/23/2022 | **Tested By:** | Ficek, Kevin |

## Laboratory Data

| Description | Result | Specifications |
|---|---|---|
| **Liquid Limit:** | 60 | - |
| **Plastic Limit:** | 17 | |
| **Plastic Index:** | 43 | - |
| **Soil Classification:** | CH Fat Clay | |

## General

**Results:** The test is for informational purposes.

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Phone: 701-255-7180

# Atterberg Limits

**ASTM D4318**

**Report Date:** 11/23/2022

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 491942 | **Alternate ID:** | SC-58 |
| **Sample From:** | Stockpile | **Sampled By:** | Client |
| **Location Details:** | Select Clay Stockpile, Sample 58 | | |
| **Sample Date:** | 11/03/2022 | | |
| **Received Date:** | 11/03/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 11/23/2022 | **Tested By:** | Ficek, Kevin |

## Laboratory Data

| Description | Result | Specifications |
|---|---|---|
| **Liquid Limit:** | 59 | - |
| **Plastic Limit:** | 17 | |
| **Plastic Index:** | 42 | - |
| **Soil Classification:** | CH Fat Clay | |

## General

**Results:** The test is for informational purposes.

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# Atterberg Limits

**ASTM D4318**

**Report Date:** 11/23/2022

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 491943 | **Alternate ID:** | SC-59 |
| **Sample From:** | Stockpile | **Sampled By:** | Client |
| **Location Details:** | Select Clay Stockpile, Sample 59 | | |
| **Sample Date:** | 11/03/2022 | | |
| **Received Date:** | 11/03/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 11/23/2022 | **Tested By:** | Ficek, Kevin |

## Laboratory Data

| Description | Result | Specifications |
|---|---|---|
| **Liquid Limit:** | 60 | - |
| **Plastic Limit:** | 19 | |
| **Plastic Index:** | 41 | - |
| **Soil Classification:** | CH Fat Clay | |

## General

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# Atterberg Limits

**ASTM D4318**

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Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 491944 | **Alternate ID:** | SC-60 |
| **Sample From:** | Stockpile | **Sampled By:** | Client |
| **Location Details:** | Select Clay Stockpile, Sample 60 | | |
| **Sample Date:** | 11/03/2022 | | |
| **Received Date:** | 11/03/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 11/23/2022 | **Tested By:** | Ficek, Kevin |

## Laboratory Data

| Description | Result | Specifications |
|---|---|---|
| **Liquid Limit:** | 60 | - |
| **Plastic Limit:** | 17 | |
| **Plastic Index:** | 43 | - |
| **Soil Classification:** | CH Fat Clay | |

## General

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# Atterberg Limits

**ASTM D4318**

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1502 Grumman Lane
Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 491945 | **Alternate ID:** | SC-61 |
| **Sample From:** | Stockpile | **Sampled By:** | Client |
| **Location Details:** | Select Clay Stockpile, Sample 61 | | |
| **Sample Date:** | 11/03/2022 | | |
| **Received Date:** | 11/03/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 11/23/2022 | **Tested By:** | Ficek, Kevin |

## Laboratory Data

| Description | Result | Specifications |
|---|---|---|
| **Liquid Limit:** | 71 | - |
| **Plastic Limit:** | 18 | |
| **Plastic Index:** | 53 | - |
| **Soil Classification:** | CH Fat Clay | |

## General

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# Atterberg Limits

**ASTM D4318**

**Report Date:** 11/23/2022

**Client:**

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5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 491946 | **Alternate ID:** | SC-62 |
| **Sample From:** | Stockpile | **Sampled By:** | Client |
| **Location Details:** | Select Clay Stockpile, Sample 62 | | |
| **Sample Date:** | 11/03/2022 | | |
| **Received Date:** | 11/03/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 11/23/2022 | **Tested By:** | Ficek, Kevin |

## Laboratory Data

| Description | Result | Specifications |
|---|---|---|
| **Liquid Limit:** | 80 | - |
| **Plastic Limit:** | 18 | |
| **Plastic Index:** | 62 | - |
| **Soil Classification:** | CH Fat Clay | |

## General

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# Atterberg Limits

**ASTM D4318**

**Report Date:** 06/26/2023

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Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2303912
Minnkota Cell 5
Center, ND

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 530302 | **Sampled By:** | Drill Crew |
| **Boring Number:** | SC-63 | | |
| **Sample Date:** | 06/26/2023 | | |
| **Received Date:** | 06/26/2023 | **Lab:** | 11001 Hampshire Ave S, Bloomington, MN |
| **Tested Date:** | 06/26/2023 | **Tested By:** | Streier, Jim |

## Laboratory Data

| Description | Result | Specifications |
|---|---|---|
| **Liquid Limit:** | 94 | - |
| **Plastic Limit:** | 19 | |
| **Plastic Index:** | 75 | - |
| **Soil Classification:** | CH Fat Clay | |

## General

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Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2303912
Minnkota Cell 5
Center, ND

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 530304 | **Sampled By:** | Drill Crew |
| **Boring Number:** | SC-64 | | |
| **Sample Date:** | 06/26/2023 | | |
| **Received Date:** | 06/26/2023 | **Lab:** | 11001 Hampshire Ave S, Bloomington, MN |
| **Tested Date:** | 06/26/2023 | **Tested By:** | Streier, Jim |

## Laboratory Data

| Description | Result | Specifications |
|---|---|---|
| **Liquid Limit:** | 111 | - |
| **Plastic Limit:** | 22 | |
| **Plastic Index:** | 89 | - |
| **Soil Classification:** | CH Fat Clay | |

## General

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**ASTM D4318**

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Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2303912
Minnkota Cell 5
Center, ND

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 530305 | **Sampled By:** | Drill Crew |
| **Boring Number:** | SC-65 | | |
| **Sample Date:** | 06/26/2023 | | |
| **Received Date:** | 06/26/2023 | **Lab:** | 11001 Hampshire Ave S, Bloomington, MN |
| **Tested Date:** | 06/26/2023 | **Tested By:** | Streier, Jim |

## Laboratory Data

| Description | Result | Specifications |
|---|---|---|
| **Liquid Limit:** | 47 | - |
| **Plastic Limit:** | 20 | |
| **Plastic Index:** | 27 | - |
| **Soil Classification:** | CL Lean Clay | |

## General

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# Atterberg Limits

**ASTM D4318**

**Report Date:** 06/26/2023

2908 Morrison Ave.
Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2303912
Minnkota Cell 5
Center, ND

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 528518 | **Alternate ID:** | SC-66 |
| | | **Sampled By:** | Vang, Yang |
| **Location Details:** | SC-66 | | |
| **Sample Date:** | 06/19/2023 | | |
| **Received Date:** | 06/19/2023 | **Lab:** | 11001 Hampshire Ave S, Bloomington, MN |
| **Tested Date:** | 06/26/2023 | **Tested By:** | Streier, Jim |

## Laboratory Data

| Description | Result | Specifications |
|---|---|---|
| **Liquid Limit:** | 96 | - |
| **Plastic Limit:** | 19 | |
| **Plastic Index:** | 77 | - |
| **Soil Classification:** | CH Fat Clay | |

## General

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# Atterberg Limits

**ASTM D4318**

**Report Date:** 06/30/2023

2908 Morrison Ave.
Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2303912
Minnkota Cell 5
Center, ND

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 523245 | **Alternate ID:** | SC-67 |
| **Sampling Method:** | Not Provided | **Sampled By:** | Client |
| **Location:** | In-place | | |
| **Location Details:** | Minnkota Cell 5 | | |
| **Specification:** | Project | | |
| **Sample Date:** | 06/21/2023 | **Material:** | Select Fill |
| **Received Date:** | 06/21/2023 | **Lab:** | 2908 Morrison Ave. Suite 3, Bismarck, ND |
| **Tested Date:** | 06/30/2023 | **Tested By:** | Austin, Jon |

## Laboratory Data

| Description | Result | Specifications |
|---|---|---|
| **Liquid Limit:** | 77 | - |
| **Plastic Limit:** | 15 | |
| **Plastic Index:** | 62 | - |
| **Soil Classification:** | CH Fat Clay | |

## General

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# Atterberg Limits

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Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2303912
Minnkota Cell 5
Center, ND

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 523247 | **Alternate ID:** | SC-68 |
| **Sampling Method:** | Not Provided | **Sampled By:** | Client |
| **Location:** | In-place | | |
| **Location Details:** | Minnkota Cell 5 | | |
| **Specification:** | Project | | |
| **Sample Date:** | 06/21/2023 | **Material:** | Select Fill |
| **Received Date:** | 06/21/2023 | **Lab:** | 2908 Morrison Ave. Suite 3, Bismarck, ND |
| **Tested Date:** | 06/30/2023 | **Tested By:** | Austin, Jon |

## Laboratory Data

| Description | Result | Specifications |
|---|---|---|
| **Liquid Limit:** | 90 | - |
| **Plastic Limit:** | 15 | |
| **Plastic Index:** | 75 | - |
| **Soil Classification:** | CH Fat Clay | |

## General

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2908 Morrison Ave.
Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2303912
Minnkota Cell 5
Center, ND

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 523248 | **Alternate ID:** | SC-69 |
| **Sampling Method:** | Not Provided | **Sampled By:** | Client |
| **Location:** | In-place | | |
| **Location Details:** | Minnkota Cell 5 | | |
| **Specification:** | Project | | |
| **Sample Date:** | 06/21/2023 | **Material:** | Select Fill |
| **Received Date:** | 06/21/2023 | **Lab:** | 2908 Morrison Ave. Suite 3, Bismarck, ND |
| **Tested Date:** | 06/29/2023 | **Tested By:** | Austin, Jon |

## Laboratory Data

| Description | Result | Specifications |
|---|---|---|
| **Liquid Limit:** | 65 | - |
| **Plastic Limit:** | 16 | |
| **Plastic Index:** | 49 | - |
| **Soil Classification:** | CH Fat Clay | |

## General

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Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2303912
Minnkota Cell 5
Center, ND

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 531969 | **Alternate ID:** | SC-70 |
| **Sampling Method:** | Not Provided | **Sampled By:** | Client |
| **Location:** | In-place | | |
| **Location Details:** | Minnkota Cell 5 | | |
| **Specification:** | Project | | |
| **Sample Date:** | 06/21/2023 | **Material:** | Select Fill |
| **Received Date:** | 06/21/2023 | **Lab:** | 2908 Morrison Ave. Suite 3, Bismarck, ND |
| **Tested Date:** | 06/29/2023 | **Tested By:** | Austin, Jon |

## Laboratory Data

| Description | Result | Specifications |
|---|---|---|
| **Liquid Limit:** | 69 | - |
| **Plastic Limit:** | 16 | |
| **Plastic Index:** | 53 | - |
| **Soil Classification:** | CH Fat Clay | |

## General

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# Atterberg Limits

**ASTM D4318**

**Report Date:** 07/28/2023

2908 Morrison Ave.
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Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2303912
Minnkota Cell 5
Center, ND

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 537186 | **Alternate ID:** | SC-71 |
| **Sample From:** | In Place | **Sampled By:** | Bruce, Dalton |
| **Location Details:** | East Wall | | |
| **Sample Date:** | 07/13/2023 | | |
| **Received Date:** | 07/14/2023 | **Lab:** | 2908 Morrison Ave. Suite 3, Bismarck, ND |
| **Tested Date:** | 07/27/2023 | **Tested By:** | Austin, Jon |

## Laboratory Data

| Description | Result | Specifications |
|---|---|---|
| **Liquid Limit:** | 114 | - |
| **Plastic Limit:** | 20 | |
| **Plastic Index:** | 94 | - |
| **Soil Classification:** | CH Fat Clay | |

## General

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# Atterberg Limits

**ASTM D4318**

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Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2303912
Minnkota Cell 5
Center, ND

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 537187 | **Alternate ID:** | SC-72 |
| **Sample From:** | In Place | **Sampled By:** | Bruce, Dalton |
| **Location Details:** | NE Corner, East Half | | |
| **Sample Date:** | 07/13/2023 | | |
| **Received Date:** | 07/14/2023 | **Lab:** | 2908 Morrison Ave. Suite 3, Bismarck, ND |
| **Tested Date:** | 07/27/2023 | **Tested By:** | Austin, Jon |

## Laboratory Data

| Description | Result | Specifications |
|---|---|---|
| **Liquid Limit:** | 72 | - |
| **Plastic Limit:** | 14 | |
| **Plastic Index:** | 58 | - |
| **Soil Classification:** | CH Fat Clay | |

## General

**Results:** The test is for informational purposes.

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BRAUN INTERTEC
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# Atterberg Limits

**ASTM D4318**

**Report Date:** 07/28/2023

2908 Morrison Ave.
Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2303912
Minnkota Cell 5
Center, ND

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 537188 | **Alternate ID:** | SC-73 |
| **Sample From:** | In Place | **Sampled By:** | Bruce, Dalton |
| **Location Details:** | East Wall, East Half | | |
| **Sample Date:** | 07/13/2023 | | |
| **Received Date:** | 07/14/2023 | **Lab:** | 2908 Morrison Ave. Suite 3, Bismarck, ND |
| **Tested Date:** | 07/27/2023 | **Tested By:** | Austin, Jon |

## Laboratory Data

| Description | Result | Specifications |
|---|---|---|
| **Liquid Limit:** | 74 | - |
| **Plastic Limit:** | 15 | |
| **Plastic Index:** | 59 | - |
| **Soil Classification:** | CH Fat Clay | |

## General

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# Atterberg Limits

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Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2303912
Minnkota Cell 5
Center, ND

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 537183 | **Alternate ID:** | P-22 (SC-74) |
| **Sample From:** | In Place | **Sampled By:** | Bruce, Dalton |
| **Location Details:** | N Wall Cell 5, E Half | | |
| **Sample Date:** | 07/14/2023 | | |
| **Received Date:** | 07/14/2023 | **Lab:** | 2908 Morrison Ave. Suite 3, Bismarck, ND |
| **Tested Date:** | 07/27/2023 | **Tested By:** | Austin, Jon |

## Laboratory Data

| Description | Result | Specifications |
|---|---|---|
| **Liquid Limit:** | 56 | - |
| **Plastic Limit:** | 16 | |
| **Plastic Index:** | 40 | - |
| **Soil Classification:** | CH Fat Clay | |

## General

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# Atterberg Limits

**ASTM D4318**

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2908 Morrison Ave.
Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2303912
Minnkota Cell 5
Center, ND

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 539924 | **Alternate ID:** | SC-75 |
| | | **Sampled By:** | Bruce, Dalton |
| **Location Details:** | Select Clay, In Place | | |
| **Sample Date:** | 07/14/2023 | | |
| **Received Date:** | 07/31/2023 | **Lab:** | 11001 Hampshire Ave S, Bloomington, MN |
| **Tested Date:** | 07/31/2023 | **Tested By:** | Streier, Jim |

## Laboratory Data

| Description | Result | Specifications |
|---|---|---|
| **Liquid Limit:** | 70 | - |
| **Plastic Limit:** | 20 | |
| **Plastic Index:** | 50 | - |
| **Soil Classification:** | CH Fat Clay | |

## General

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# Atterberg Limits

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2908 Morrison Ave.
Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2303912
Minnkota Cell 5
Center, ND

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 539927 | **Alternate ID:** | SC-76 |
| | | **Sampled By:** | Bruce, Dalton |
| **Location Details:** | Select Clay, In Place | | |
| **Sample Date:** | 07/14/2023 | | |
| **Received Date:** | 07/31/2023 | **Lab:** | 11001 Hampshire Ave S, Bloomington, MN |
| **Tested Date:** | 07/31/2023 | **Tested By:** | Streier, Jim |

## Laboratory Data

| Description | Result | Specifications |
|---|---|---|
| **Liquid Limit:** | 80 | - |
| **Plastic Limit:** | 19 | |
| **Plastic Index:** | 61 | - |
| **Soil Classification:** | CH Fat Clay | |

## General

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# Atterberg Limits

**ASTM D4318**

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Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2303912
Minnkota Cell 5
Center, ND

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 539928 | **Alternate ID:** | SC-77 |
| | | **Sampled By:** | Bruce, Dalton |
| **Location Details:** | Select Clay, In Place | | |
| **Sample Date:** | 07/14/2023 | | |
| **Received Date:** | 07/31/2023 | **Lab:** | 11001 Hampshire Ave S, Bloomington, MN |
| **Tested Date:** | 07/31/2023 | **Tested By:** | Streier, Jim |

## Laboratory Data

| Description | Result | Specifications |
|---|---|---|
| **Liquid Limit:** | 70 | - |
| **Plastic Limit:** | 20 | |
| **Plastic Index:** | 50 | - |
| **Soil Classification:** | CH Fat Clay | |

## General

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# Hydrometer And Sieve Analysis

**ASTM D422**

07/15/2022

1502 Grumman Lane
Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

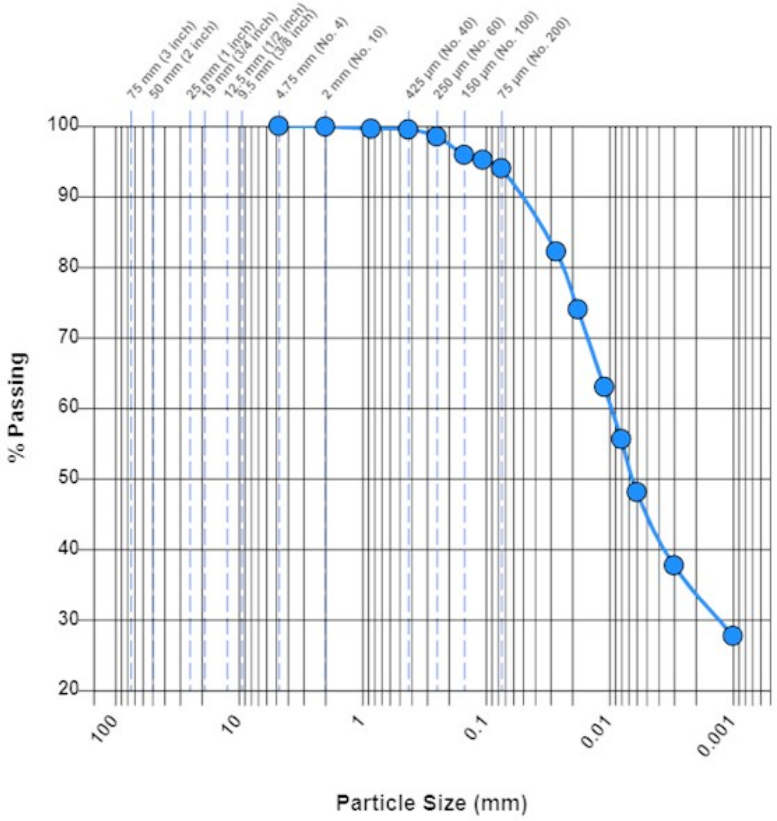
## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 459455 | **Alternate ID:** | P-01 |
| **Sample From:** | Not Given | **Sampled By:** | Client |
| **Location:** | Other | | |
| **Location Details:** | Select Clay Stockpile, Sample 1 | | |
| **Sample Date:** | 07/11/2022 | | |
| **Received Date:** | 07/12/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 07/15/2022 | **Tested By:** | Austin, Jon |

## Laboratory Data

### Sieve-Hydrometer Analysis

| Particle Size | % Passing | Specification |
|---|---|---|
| 4.75 mm (No. 4) | 100.0 | - |
| 2 mm (No. 10) | 99.9 | - |
| 850 µm (No. 20) | 99.6 | - |
| 425 µm (No. 40) | 99.5 | - |
| 250 µm (No. 60) | 98.5 | - |
| 150 µm (No. 100) | 95.9 | - |
| 106 µm (No. 140) | 95.2 | - |
| 75 µm (No. 200) | 94.0 | - |
| 26.6 (µm) | 82.2 | - |
| 17.6 (µm) | 74.0 | - |
| 10.7 (µm) | 63.0 | - |
| 7.9 (µm) | 55.6 | - |
| 5.7 (µm) | 48.1 | - |
| 2.9 (µm) | 37.7 | - |
| 1.3 (µm) | 27.7 | - |




**Soil Classification:** CH Fat Clay

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Gravel (%):** | 0.0 | **Sand (%):** | 6.0 | **Silt (%):** | 49.4 | **Clay (%):** | 44.6 |
| **$D_{60}$ (µm):** | 9.8 | **$D_{30}$ (µm):** | 1.5 | | | | |

## General

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# Hydrometer And Sieve Analysis

**ASTM D422**

07/15/2022

1502 Grumman Lane
Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

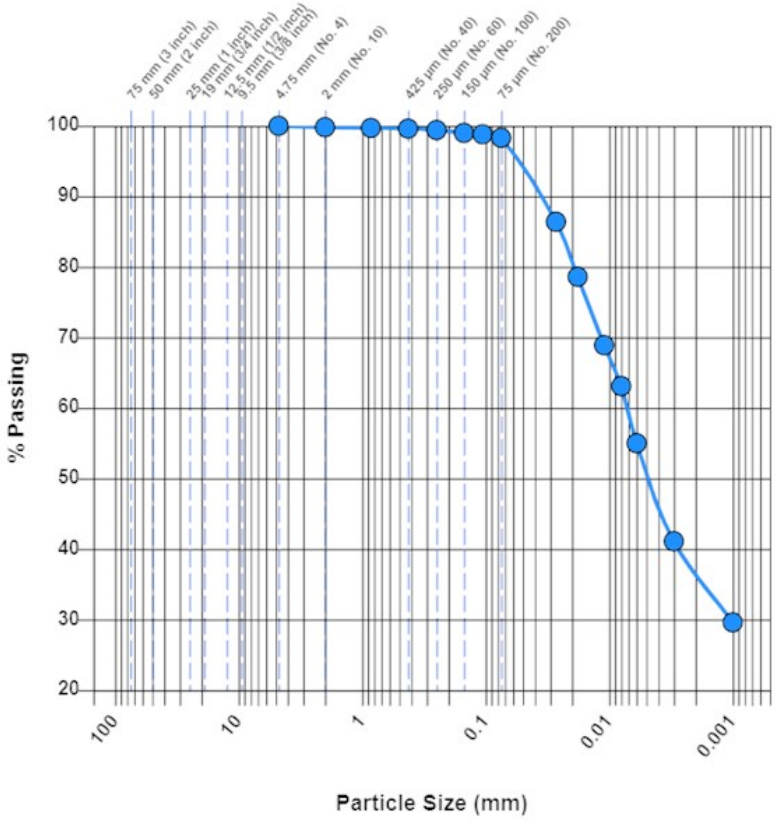
## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 459456 | **Alternate ID:** | P-02 |
| **Sample From:** | Not Given | **Sampled By:** | Client |
| **Location:** | Other | | |
| **Location Details:** | Select Clay Stockpile, Sample 2 | | |
| **Sample Date:** | 07/11/2022 | | |
| **Received Date:** | 07/12/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 07/15/2022 | **Tested By:** | Austin, Jon |

## Laboratory Data

### Sieve-Hydrometer Analysis

| Particle Size | % Passing | Specification |
|---|---|---|
| 4.75 mm (No. 4) | 100.0 | - |
| 2 mm (No. 10) | 99.8 | - |
| 850 µm (No. 20) | 99.7 | - |
| 425 µm (No. 40) | 99.6 | - |
| 250 µm (No. 60) | 99.4 | - |
| 150 µm (No. 100) | 99.0 | - |
| 106 µm (No. 140) | 98.8 | - |
| 75 µm (No. 200) | 98.3 | - |
| 26.8 (µm) | 86.4 | - |
| 17.7 (µm) | 78.6 | - |
| 10.7 (µm) | 68.9 | - |
| 7.7 (µm) | 63.1 | - |
| 5.7 (µm) | 55.0 | - |
| 2.9 (µm) | 41.1 | - |
| 1.3 (µm) | 29.6 | - |




**Soil Classification:** CH Fat Clay

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Gravel (%):** | 0.0 | **Sand (%):** | 1.7 | **Silt (%):** | 47.9 | **Clay (%):** | 50.4 |
| **$D_{60}$ (µm):** | 7.2 | **$D_{30}$ (µm):** | 1.1 | | | | |

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# Hydrometer And Sieve Analysis

**ASTM D422**

07/22/2022

1502 Grumman Lane
Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

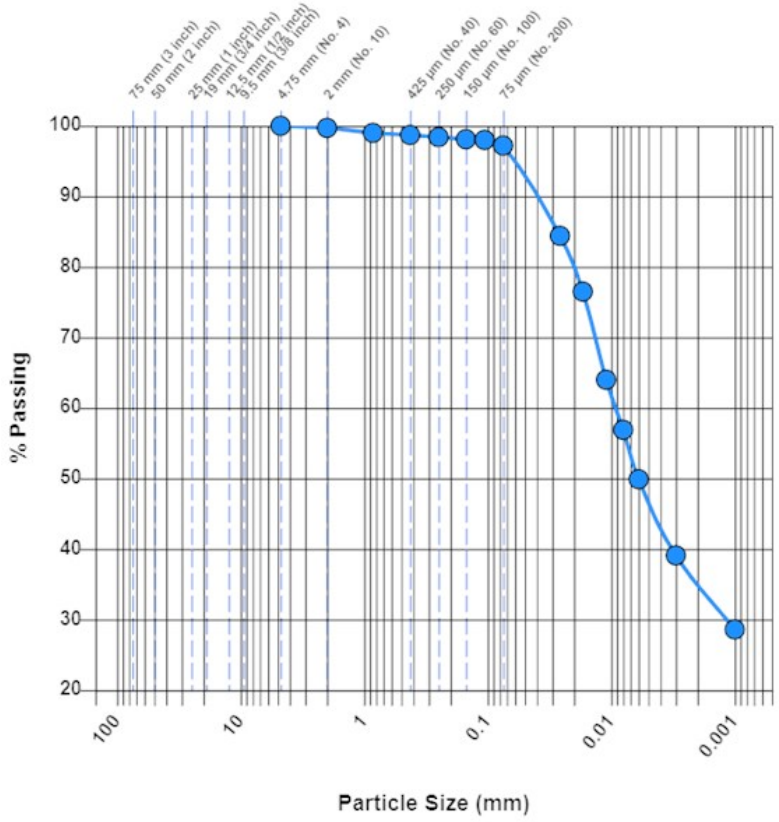
## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 460948 | **Alternate ID:** | P-03 |
| **Sample From:** | Stockpile | **Sampled By:** | Client |
| **Location Details:** | Select Clay Stockpile, Sample 3 | | |
| **Sample Date:** | 07/12/2022 | | |
| **Received Date:** | 07/12/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 07/22/2022 | **Tested By:** | Austin, Jon |

## Laboratory Data

### Sieve-Hydrometer Analysis

| Particle Size | % Passing | Specification |
|---|---|---|
| 4.75 mm (No. 4) | 100.0 | - |
| 2 mm (No. 10) | 99.7 | - |
| 850 µm (No. 20) | 99.0 | - |
| 425 µm (No. 40) | 98.7 | - |
| 250 µm (No. 60) | 98.4 | - |
| 150 µm (No. 100) | 98.1 | - |
| 106 µm (No. 140) | 98.0 | - |
| 75 µm (No. 200) | 97.2 | - |
| 25.7 (µm) | 84.4 | - |
| 17.0 (µm) | 76.5 | - |
| 10.6 (µm) | 64.0 | - |
| 7.7 (µm) | 56.9 | - |
| 5.6 (µm) | 49.9 | - |
| 2.9 (µm) | 39.1 | - |
| 1.3 (µm) | 28.6 | - |




**Soil Classification:** CH Fat Clay

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Gravel (%):** | 0.0 | **Sand (%):** | 2.8 | **Silt (%):** | 50.9 | **Clay (%):** | 46.3 |
| **$D_{60}$ (µm):** | 9.3 | **$D_{30}$ (µm):** | 1.3 | | | | |

## General

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# Hydrometer And Sieve Analysis

**ASTM D422**

07/22/2022

1502 Grumman Lane
Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

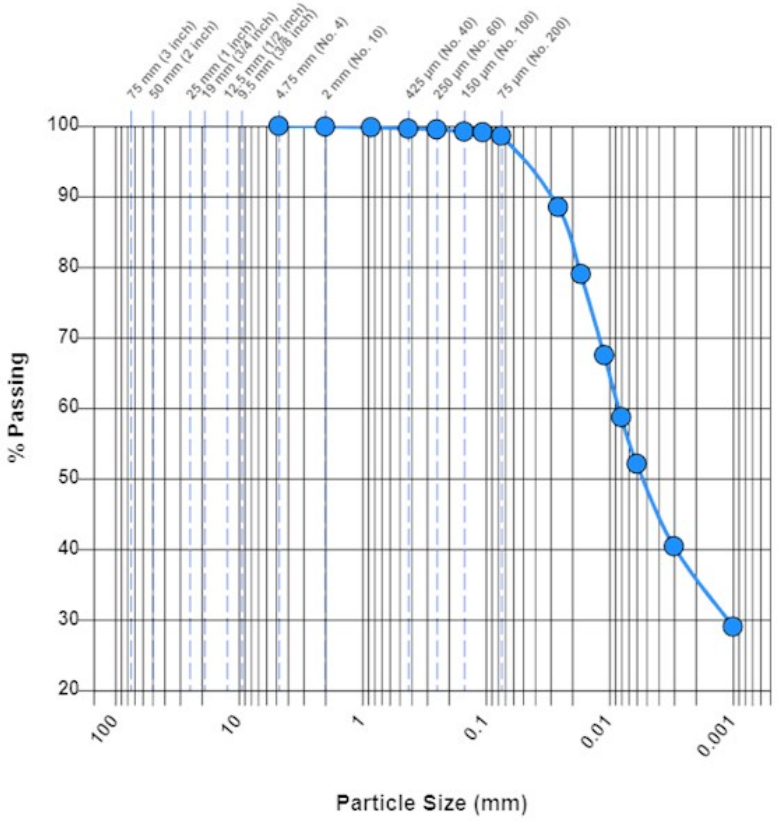
## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 460949 | **Alternate ID:** | P-04 |
| **Sample From:** | Stockpile | **Sampled By:** | Client |
| **Location Details:** | Select Clay Stockpile, Sample 4 | | |
| **Sample Date:** | 07/12/2022 | | |
| **Received Date:** | 07/12/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 07/22/2022 | **Tested By:** | Austin, Jon |

## Laboratory Data

### Sieve-Hydrometer Analysis

| Particle Size | % Passing | Specification |
|---|---|---|
| 4.75 mm (No. 4) | 100.0 | - |
| 2 mm (No. 10) | 99.9 | - |
| 850 µm (No. 20) | 99.8 | - |
| 425 µm (No. 40) | 99.6 | - |
| 250 µm (No. 60) | 99.5 | - |
| 150 µm (No. 100) | 99.2 | - |
| 106 µm (No. 140) | 99.1 | - |
| 75 µm (No. 200) | 98.6 | - |
| 26.0 (µm) | 88.5 | - |
| 17.3 (µm) | 79.0 | - |
| 10.6 (µm) | 67.5 | - |
| 7.8 (µm) | 58.7 | - |
| 5.7 (µm) | 52.1 | - |
| 2.9 (µm) | 40.4 | - |
| 1.3 (µm) | 29.0 | - |




**Soil Classification:** CH Fat Clay

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Gravel (%):** | 0.0 | **Sand (%):** | 1.4 | **Silt (%):** | 50.4 | **Clay (%):** | 48.2 |
| **$D_{60}$ (µm):** | 8.4 | **$D_{30}$ (µm):** | 1.2 | | | | |

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# Hydrometer And Sieve Analysis

**ASTM D422**

07/22/2022

1502 Grumman Lane
Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

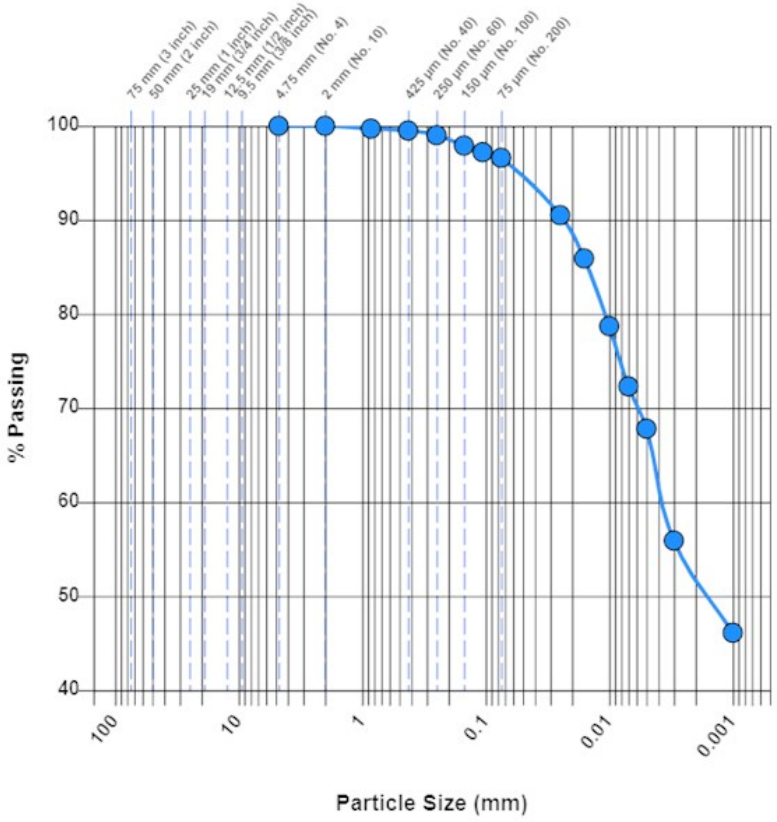
## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 460950 | **Alternate ID:** | P-05 |
| **Sample From:** | Stockpile | **Sampled By:** | Client |
| **Location Details:** | Select Clay Stockpile, Sample 5 | | |
| **Sample Date:** | 07/12/2022 | | |
| **Received Date:** | 07/12/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 07/22/2022 | **Tested By:** | Austin, Jon |

## Laboratory Data

### Sieve-Hydrometer Analysis

| Particle Size | % Passing | Specification |
|---|---|---|
| 4.75 mm (No. 4) | 100.0 | - |
| 2 mm (No. 10) | 100.0 | - |
| 850 µm (No. 20) | 99.7 | - |
| 425 µm (No. 40) | 99.5 | - |
| 250 µm (No. 60) | 99.0 | - |
| 150 µm (No. 100) | 97.9 | - |
| 106 µm (No. 140) | 97.2 | - |
| 75 µm (No. 200) | 96.6 | - |
| 24.9 (µm) | 90.5 | - |
| 16.2 (µm) | 85.9 | - |
| 9.8 (µm) | 78.7 | - |
| 7.2 (µm) | 72.3 | - |
| 5.2 (µm) | 67.8 | - |
| 2.7 (µm) | 55.9 | - |
| 1.2 (µm) | 46.1 | - |




**Soil Classification:** CH Fat Clay

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Gravel (%):** | 0.0 | **Sand (%):** | 3.4 | **Silt (%):** | 28.8 | **Clay (%):** | 67.8 |
| **$D_{60}$ (µm):** | 3.7 | | | | | | |

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# Hydrometer And Sieve Analysis

**ASTM D422**

07/22/2022

1502 Grumman Lane
Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

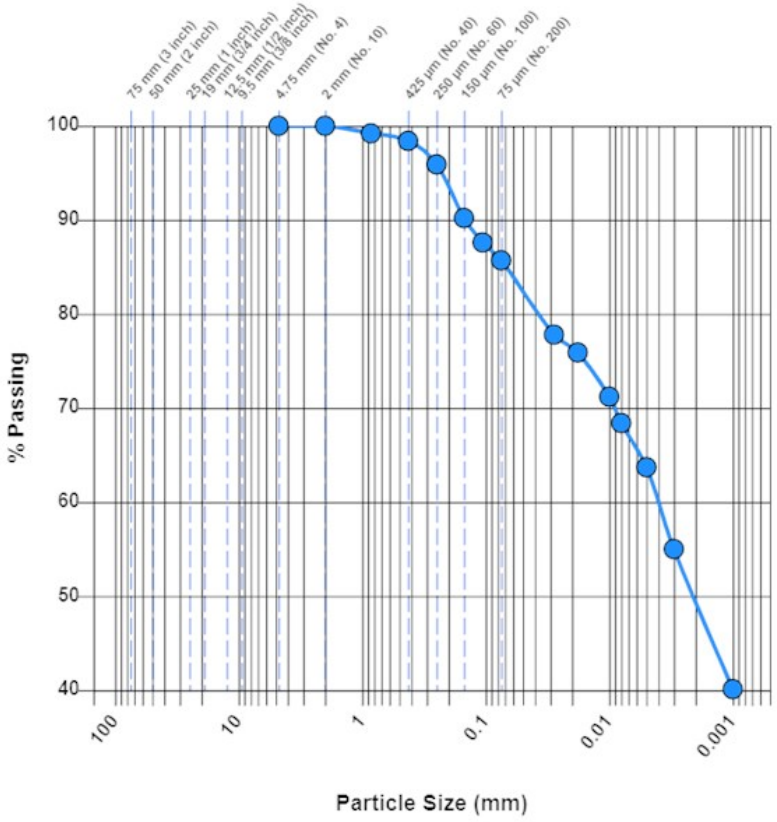
## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 460951 | **Alternate ID:** | P-06 |
| **Sample From:** | Stockpile | **Sampled By:** | Client |
| **Location Details:** | Select Clay Stockpile, Sample 6 | | |
| **Sample Date:** | 07/12/2022 | | |
| **Received Date:** | 07/12/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 07/22/2022 | **Tested By:** | Austin, Jon |

## Laboratory Data

### Sieve-Hydrometer Analysis

| Particle Size | % Passing | Specification |
|---|---|---|
| 4.75 mm (No. 4) | 100.0 | - |
| 2 mm (No. 10) | 100.0 | - |
| 850 µm (No. 20) | 99.2 | - |
| 425 µm (No. 40) | 98.4 | - |
| 250 µm (No. 60) | 95.9 | - |
| 150 µm (No. 100) | 90.2 | - |
| 106 µm (No. 140) | 87.6 | - |
| 75 µm (No. 200) | 85.7 | - |
| 27.6 (µm) | 77.8 | - |
| 17.6 (µm) | 75.9 | - |
| 10.4 (µm) | 71.2 | - |
| 7.5 (µm) | 68.4 | - |
| 5.4 (µm) | 63.7 | - |
| 2.8 (µm) | 55.0 | - |
| 1.2 (µm) | 40.1 | - |




**Soil Classification:** CH Fat clay with sand

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Gravel (%):** | 0.0 | **Sand (%):** | 14.3 | **Silt (%):** | 22.0 | **Clay (%):** | 63.7 |
| **$D_{60}$ (µm):** | 4.1 | | | | | | |

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# Hydrometer And Sieve Analysis

**ASTM D422**

07/22/2022

1502 Grumman Lane
Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

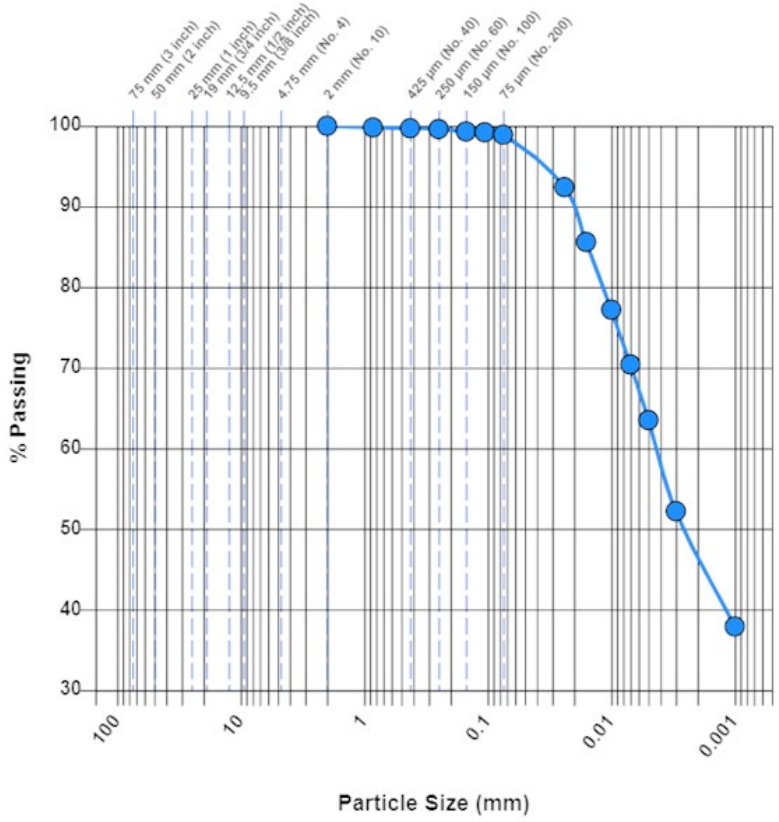
## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 460952 | **Alternate ID:** | P-07 |
| **Sample From:** | Stockpile | **Sampled By:** | Client |
| **Location Details:** | Select Clay Stockpile, Sample 7 | | |
| **Sample Date:** | 07/12/2022 | | |
| **Received Date:** | 07/12/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 07/22/2022 | **Tested By:** | Austin, Jon |

## Laboratory Data

### Sieve-Hydrometer Analysis

| Particle Size | % Passing | Specification |
|---|---|---|
| 2 mm (No. 10) | 100.0 | - |
| 850 µm (No. 20) | 99.8 | - |
| 425 µm (No. 40) | 99.7 | - |
| 250 µm (No. 60) | 99.6 | - |
| 150 µm (No. 100) | 99.3 | - |
| 106 µm (No. 140) | 99.2 | - |
| 75 µm (No. 200) | 98.9 | - |
| 23.8 (µm) | 92.4 | - |
| 15.8 (µm) | 85.6 | - |
| 9.7 (µm) | 77.2 | - |
| 7.1 (µm) | 70.4 | - |
| 5.2 (µm) | 63.5 | - |
| 2.7 (µm) | 52.2 | - |
| 1.2 (µm) | 37.9 | - |




**Soil Classification:** CH Fat Clay

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Gravel (%):** | 0 | **Sand (%):** | 1.1 | **Silt (%):** | 35.4 | **Clay (%):** | 63.5 |
| **$D_{60}$ (µm):** | 4.4 | | | | | | |

## General

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BRAUN INTERTEC
The Science You Build On.

# Hydrometer And Sieve Analysis

**ASTM D422**

07/22/2022

1502 Grumman Lane
Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

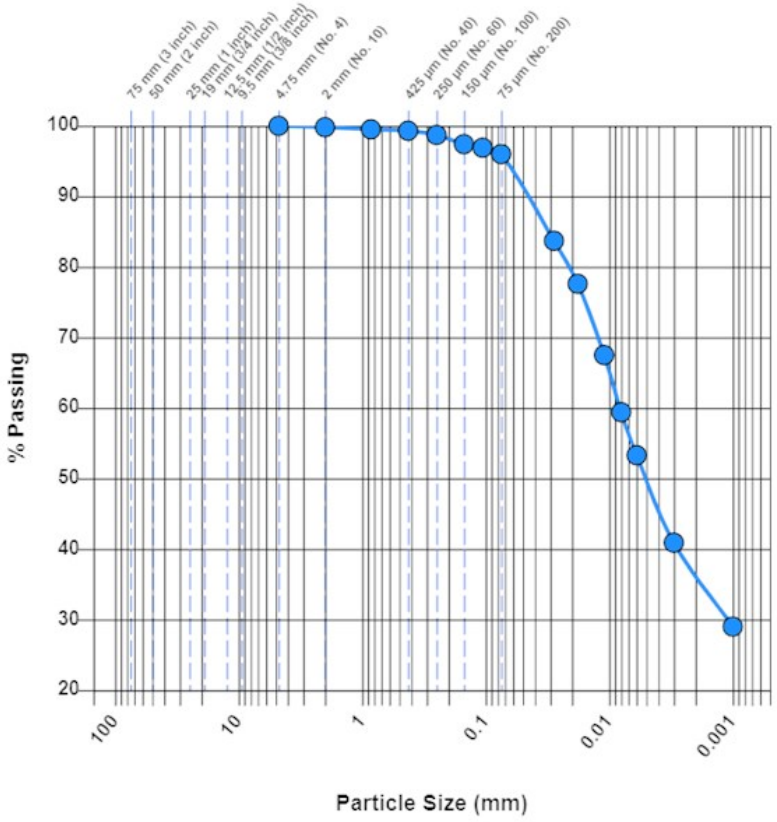
## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 460953 | **Alternate ID:** | P-08 |
| **Sample From:** | Stockpile | **Sampled By:** | Client |
| **Location Details:** | Select Clay Stockpile, Sample 8 | | |
| **Sample Date:** | 07/14/2022 | | |
| **Received Date:** | 07/14/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 07/22/2022 | **Tested By:** | Austin, Jon |

## Laboratory Data

### Sieve-Hydrometer Analysis

| Particle Size | % Passing | Specification |
|---|---|---|
| 4.75 mm (No. 4) | 100.0 | - |
| 2 mm (No. 10) | 99.8 | - |
| 850 µm (No. 20) | 99.5 | - |
| 425 µm (No. 40) | 99.3 | - |
| 250 µm (No. 60) | 98.7 | - |
| 150 µm (No. 100) | 97.4 | - |
| 106 µm (No. 140) | 96.9 | - |
| 75 µm (No. 200) | 96.0 | - |
| 27.6 (µm) | 83.7 | - |
| 18.0 (µm) | 77.6 | - |
| 10.8 (µm) | 67.5 | - |
| 7.9 (µm) | 59.4 | - |
| 5.7 (µm) | 53.3 | - |
| 2.9 (µm) | 40.9 | - |
| 1.3 (µm) | 29.0 | - |




**Soil Classification:** CH Fat Clay

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Gravel (%):** | 0.0 | **Sand (%):** | 4.0 | **Silt (%):** | 46.8 | **Clay (%):** | 49.2 |
| **$D_{60}$ (µm):** | 8.2 | **$D_{30}$ (µm):** | 1.2 | | | | |

## General

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# Hydrometer And Sieve Analysis

**ASTM D422**

07/29/2022

1502 Grumman Lane
Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

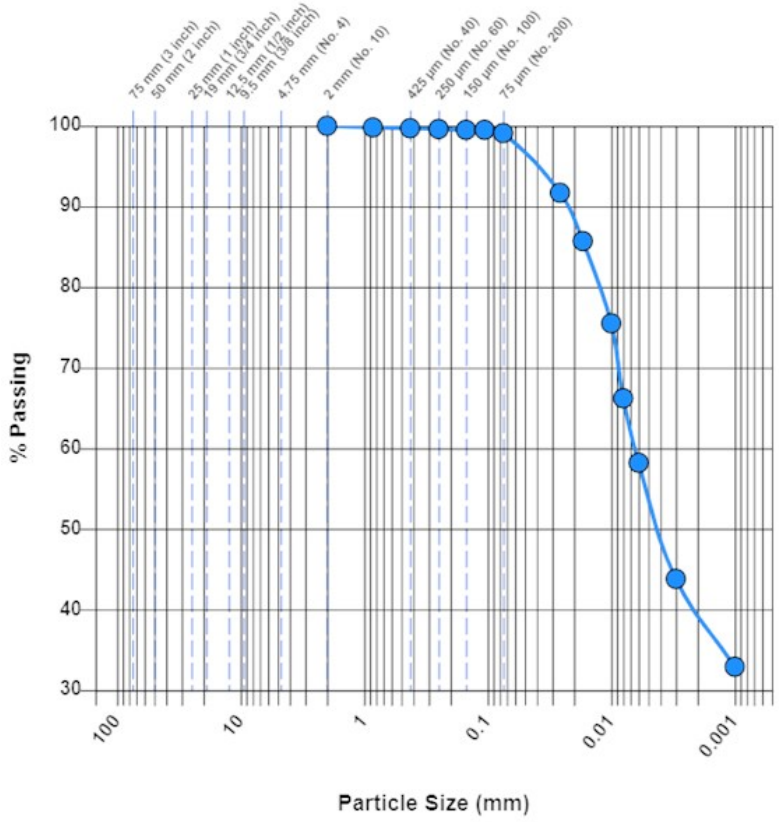
## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 460954 | **Alternate ID:** | P-09 |
| **Sample From:** | Stockpile | **Sampled By:** | Client |
| **Location Details:** | Select Clay Stockpile, Sample 9 | | |
| **Sample Date:** | 07/18/2022 | | |
| **Received Date:** | 07/18/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 07/29/2022 | **Tested By:** | Austin, Jon |

## Laboratory Data

### Sieve-Hydrometer Analysis

| Particle Size | % Passing | Specification |
|---|---|---|
| 2 mm (No. 10) | 100.0 | - |
| 850 µm (No. 20) | 99.8 | - |
| 425 µm (No. 40) | 99.7 | - |
| 250 µm (No. 60) | 99.6 | - |
| 150 µm (No. 100) | 99.5 | - |
| 106 µm (No. 140) | 99.5 | - |
| 75 µm (No. 200) | 99.1 | - |
| 26.3 (µm) | 91.7 | - |
| 17.2 (µm) | 85.7 | - |
| 10.4 (µm) | 75.5 | - |
| 7.7 (µm) | 66.2 | - |
| 5.6 (µm) | 58.2 | - |
| 2.9 (µm) | 43.8 | - |
| 1.3 (µm) | 32.9 | - |




**Soil Classification:** CH Fat Clay

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Gravel (%):** | 0 | **Sand (%):** | 0.9 | **Silt (%):** | 45.7 | **Clay (%):** | 53.4 |
| **$D_{60}$ (µm):** | 6.4 | | | | | | |

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# Hydrometer And Sieve Analysis

**ASTM D422**

07/29/2022

1502 Grumman Lane
Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

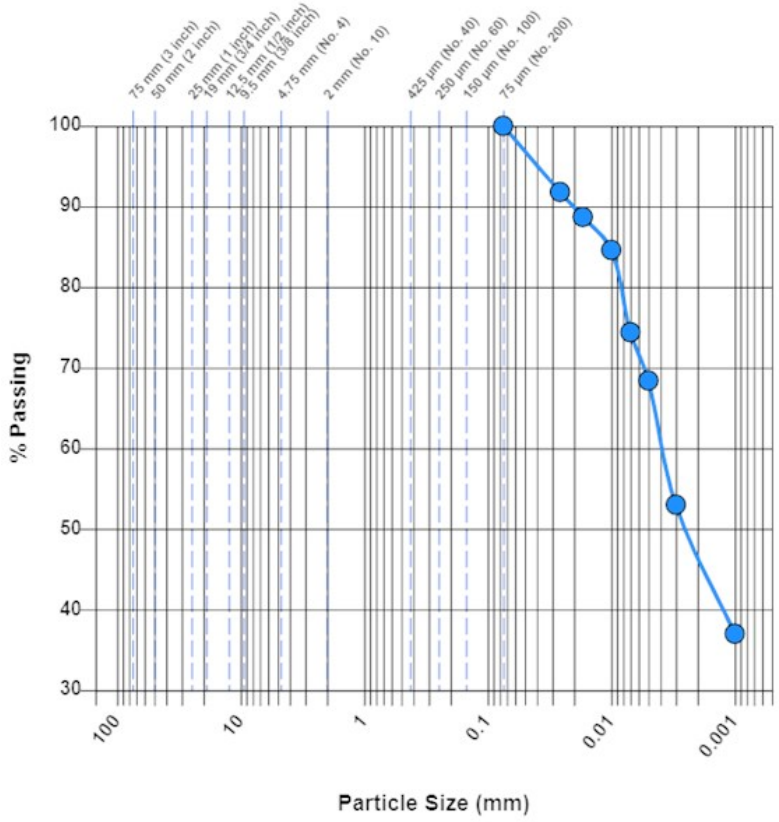
## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 460956 | **Alternate ID:** | P-10 |
| **Sample From:** | Stockpile | **Sampled By:** | Client |
| **Location Details:** | Select Clay Stockpile, Sample 10 | | |
| **Sample Date:** | 07/18/2022 | | |
| **Received Date:** | 07/18/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 07/29/2022 | **Tested By:** | Austin, Jon |

## Laboratory Data

### Sieve-Hydrometer Analysis

| Particle Size | % Passing | Specification |
|---|---|---|
| 75 µm (No. 200) | 100.0 | - |
| 26.4 (µm) | 91.8 | - |
| 17.0 (µm) | 88.7 | - |
| 10.0 (µm) | 84.6 | - |
| 7.4 (µm) | 74.4 | - |
| 5.4 (µm) | 68.4 | - |
| 2.8 (µm) | 53.0 | - |
| 1.2 (µm) | 37.0 | - |




**Soil Classification:** CH Fat Clay

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Gravel (%):** | 0 | **Sand (%):** | 0.0 | **Silt (%):** | 31.6 | **Clay (%):** | 68.4 |
| **$D_{60}$ (µm):** | 3.9 | | | | | | |

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# Hydrometer And Sieve Analysis

**ASTM D422**

07/29/2022

1502 Grumman Lane
Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

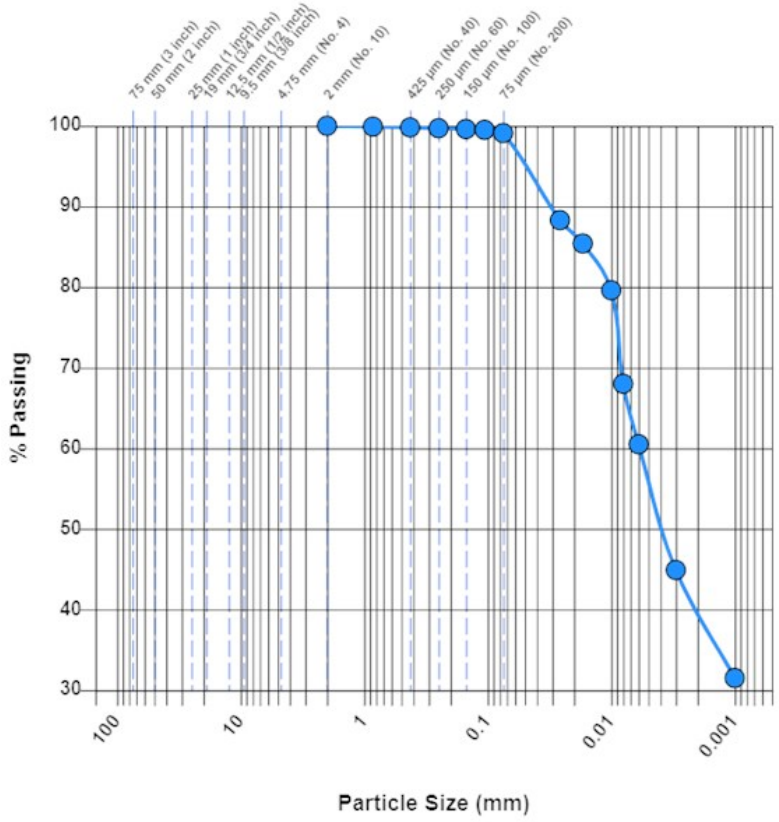
## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 460957 | **Alternate ID:** | P-11 |
| **Sample From:** | Stockpile | **Sampled By:** | Client |
| **Location Details:** | Select Clay Stockpile, Sample 11 | | |
| **Sample Date:** | 07/18/2022 | | |
| **Received Date:** | 07/18/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 07/29/2022 | **Tested By:** | Austin, Jon |

## Laboratory Data

### Sieve-Hydrometer Analysis

| Particle Size | % Passing | Specification |
|---|---|---|
| 2 mm (No. 10) | 100.0 | - |
| 850 µm (No. 20) | 99.9 | - |
| 425 µm (No. 40) | 99.8 | - |
| 250 µm (No. 60) | 99.7 | - |
| 150 µm (No. 100) | 99.6 | - |
| 106 µm (No. 140) | 99.5 | - |
| 75 µm (No. 200) | 99.1 | - |
| 26.4 (µm) | 88.3 | - |
| 17.0 (µm) | 85.4 | - |
| 10.1 (µm) | 79.6 | - |
| 7.6 (µm) | 68.0 | - |
| 5.5 (µm) | 60.5 | - |
| 2.9 (µm) | 44.9 | - |
| 1.3 (µm) | 31.5 | - |




**Soil Classification:** CH Fat Clay

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Gravel (%):** | 0 | **Sand (%):** | 0.9 | **Silt (%):** | 43.8 | **Clay (%):** | 55.3 |
| **$D_{60}$ (µm):** | 5.9 | | | | | | |

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# Hydrometer And Sieve Analysis

**ASTM D422**

07/29/2022

1502 Grumman Lane
Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

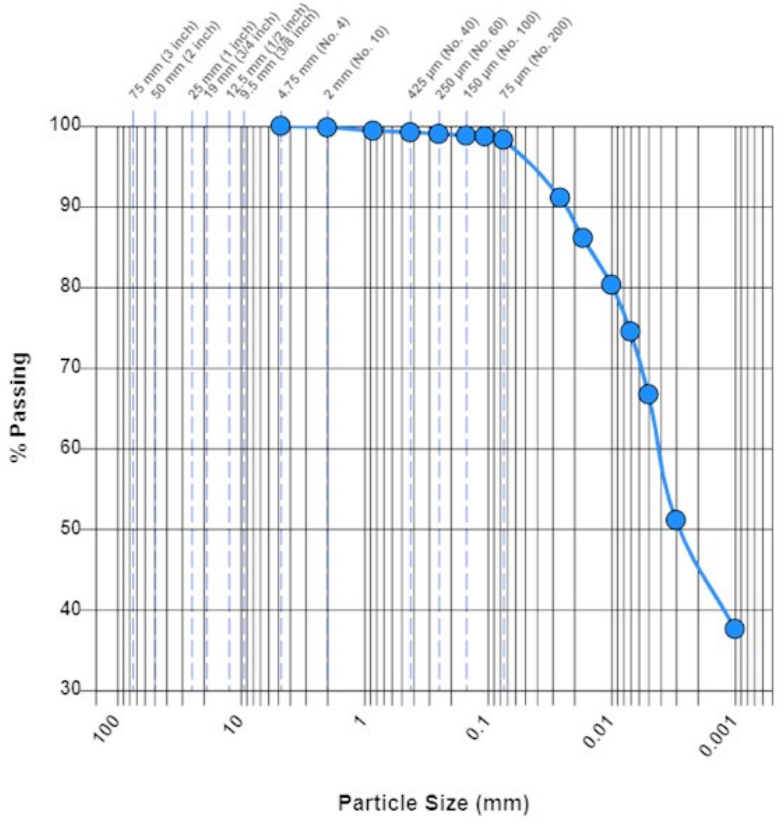
## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 460958 | **Alternate ID:** | P-12 |
| **Sample From:** | Stockpile | **Sampled By:** | Client |
| **Location Details:** | Select Clay Stockpile, Sample 12 | | |
| **Sample Date:** | 07/18/2022 | | |
| **Received Date:** | 07/18/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 07/29/2022 | **Tested By:** | Austin, Jon |

## Laboratory Data

### Sieve-Hydrometer Analysis

| Particle Size | % Passing | Specification |
|---|---|---|
| 4.75 mm (No. 4) | 100.0 | - |
| 2 mm (No. 10) | 99.8 | - |
| 850 µm (No. 20) | 99.4 | - |
| 425 µm (No. 40) | 99.2 | - |
| 250 µm (No. 60) | 99.0 | - |
| 150 µm (No. 100) | 98.8 | - |
| 106 µm (No. 140) | 98.7 | - |
| 75 µm (No. 200) | 98.3 | - |
| 26.1 (µm) | 91.1 | - |
| 17.0 (µm) | 86.1 | - |
| 10.1 (µm) | 80.3 | - |
| 7.3 (µm) | 74.5 | - |
| 5.4 (µm) | 66.7 | - |
| 2.8 (µm) | 51.1 | - |
| 1.2 (µm) | 37.6 | - |




**Soil Classification:** CH Fat Clay

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Gravel (%):** | 0.0 | **Sand (%):** | 1.7 | **Silt (%):** | 31.6 | **Clay (%):** | 66.7 |
| **$D_{60}$ (µm):** | 4.1 | | | | | | |

## General

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# Hydrometer And Sieve Analysis

**ASTM D422**

05/24/2023

2908 Morrison Ave.
Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2303912
Minnkota Cell 5
Center, ND

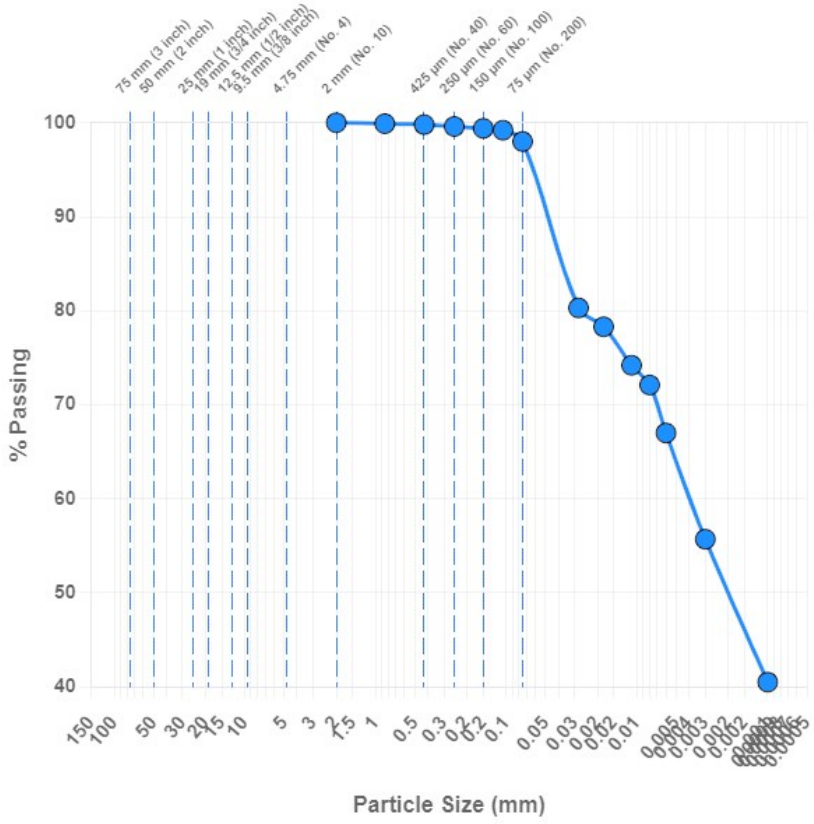
## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 517473 | **Alternate ID:** | P-20 |
| **Sample From:** | In Place | **Sampled By:** | Wenko, Steve |
| **Location Details:** | Zone 26, 2016' | | |
| **Sample Date:** | 05/02/2023 | | |
| **Received Date:** | 05/02/2023 | **Lab:** | 2908 Morrison Ave. Suite 3, Bismarck, ND |
| **Tested Date:** | 05/22/2023 | **Tested By:** | Austin, Jon |

## Laboratory Data

### Sieve-Hydrometer Analysis

| Particle Size | % Passing | Specification |
|---|---|---|
| 2 mm (No. 10) | 100.0 | - |
| 850 µm (No. 20) | 99.9 | - |
| 425 µm (No. 40) | 99.8 | - |
| 250 µm (No. 60) | 99.6 | - |
| 150 µm (No. 100) | 99.4 | - |
| 106 µm (No. 140) | 99.2 | - |
| 75 µm (No. 200) | 98.0 | - |
| 28.2 (µm) | 80.3 | - |
| 18.0 (µm) | 78.3 | - |
| 10.6 (µm) | 74.2 | - |
| 7.6 (µm) | 72.1 | - |
| 5.5 (µm) | 67.0 | - |
| 2.8 (µm) | 55.7 | - |
| 1.2 (µm) | 40.5 | - |




**Soil Classification:** CH Fat Clay

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Gravel (%):** | 0 | **Sand (%):** | 2.0 | **Silt (%):** | 34.8 | **Clay (%):** | 63.2 |
| **$D_{60}$ (µm):** | 4.1 | | | | | | |

## General

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# Hydrometer And Sieve Analysis

**ASTM D422**

05/26/2023

2908 Morrison Ave.
Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2303912
Minnkota Cell 5
Center, ND

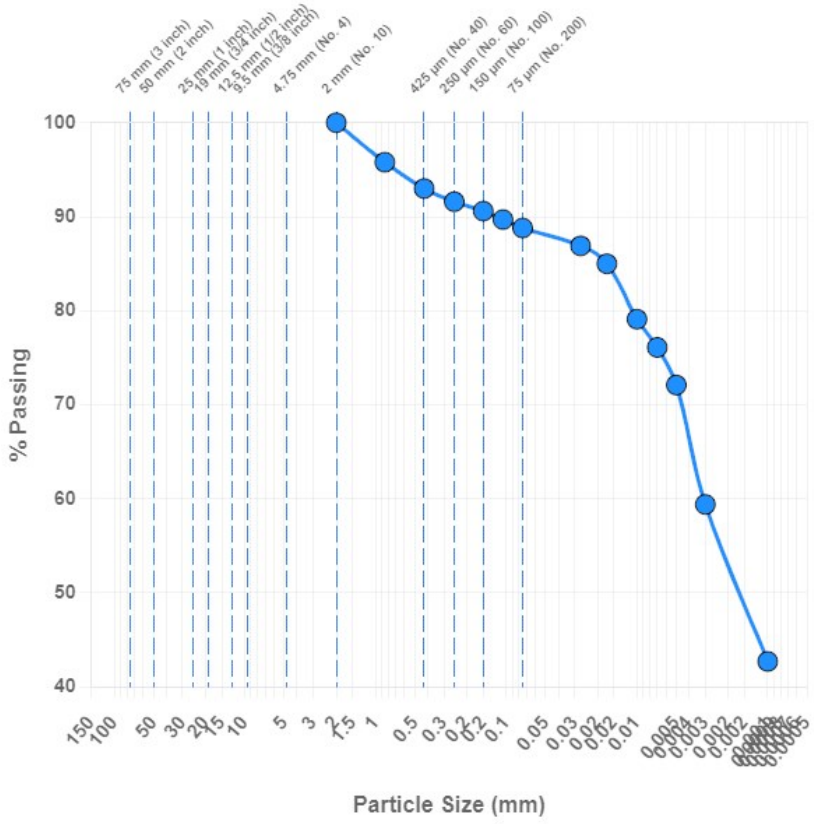
## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 517470 | **Alternate ID:** | SC-01 |
| **Sample From:** | Stockpile | **Sampled By:** | Wenko, Steve |
| **Location Details:** | Zone 8 | | |
| **Sample Date:** | 05/02/2023 | | |
| **Received Date:** | 05/02/2023 | **Lab:** | 2908 Morrison Ave. Suite 3, Bismarck, ND |
| **Tested Date:** | 05/22/2023 | **Tested By:** | Austin, Jon |

## Laboratory Data

### Sieve-Hydrometer Analysis

| Particle Size | % Passing | Specification |
|---|---|---|
| 2 mm (No. 10) | 100.0 | - |
| 850 µm (No. 20) | 95.8 | - |
| 425 µm (No. 40) | 93.0 | - |
| 250 µm (No. 60) | 91.6 | - |
| 150 µm (No. 100) | 90.6 | - |
| 106 µm (No. 140) | 89.7 | - |
| 75 µm (No. 200) | 88.8 | - |
| 26.8 (µm) | 86.9 | - |
| 17.2 (µm) | 85.0 | - |
| 10.2 (µm) | 79.1 | - |
| 7.3 (µm) | 76.1 | - |
| 5.3 (µm) | 72.1 | - |
| 2.7 (µm) | 59.4 | - |
| 1.2 (µm) | 42.7 | - |




**Soil Classification:** CH Fat Clay

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Gravel (%):** | 0 | **Sand (%):** | 11.2 | **Silt (%):** | 16.7 | **Clay (%):** | 72.1 |
| **$D_{60}$ (µm):** | 3.1 | | | | | | |

## General

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# Hydrometer And Sieve Analysis

**ASTM D422**

05/26/2023

2908 Morrison Ave.
Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2303912
Minnkota Cell 5
Center, ND

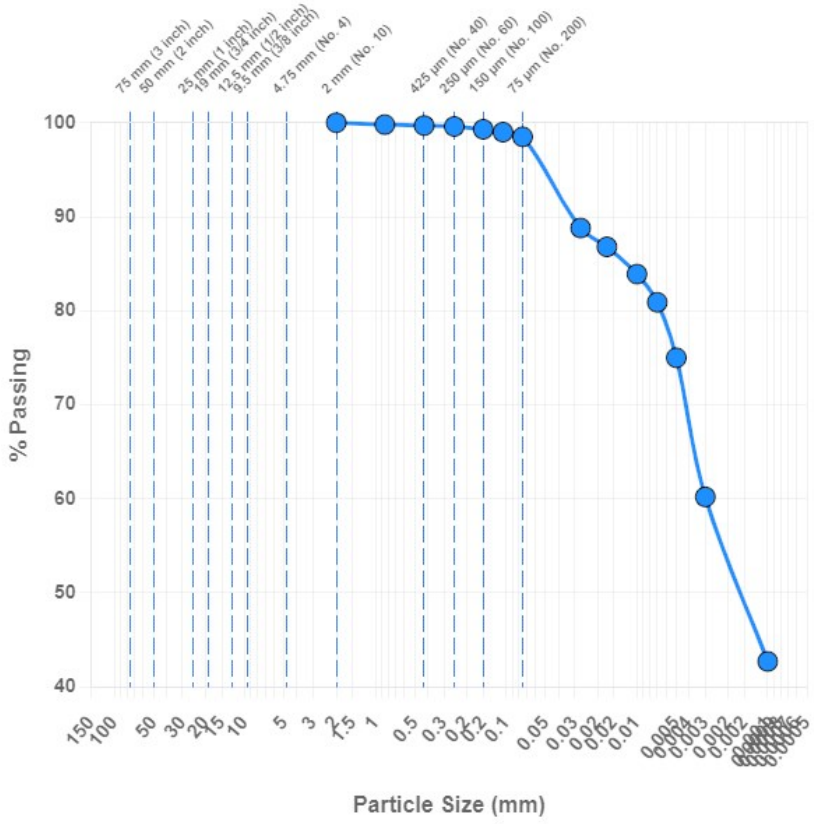
## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 517472 | **Alternate ID:** | SC-02 |
| **Sample From:** | Stockpile | **Sampled By:** | Wenko, Steve |
| **Location Details:** | Zone 9 | | |
| **Sample Date:** | 05/02/2023 | | |
| **Received Date:** | 05/02/2023 | **Lab:** | 2908 Morrison Ave. Suite 3, Bismarck, ND |
| **Tested Date:** | 05/22/2023 | **Tested By:** | Austin, Jon |

## Laboratory Data

### Sieve-Hydrometer Analysis

| Particle Size | % Passing | Specification |
|---|---|---|
| 2 mm (No. 10) | 100.0 | - |
| 850 µm (No. 20) | 99.8 | - |
| 425 µm (No. 40) | 99.7 | - |
| 250 µm (No. 60) | 99.6 | - |
| 150 µm (No. 100) | 99.3 | - |
| 106 µm (No. 140) | 99.0 | - |
| 75 µm (No. 200) | 98.5 | - |
| 26.6 (µm) | 88.8 | - |
| 17.0 (µm) | 86.8 | - |
| 10.0 (µm) | 83.9 | - |
| 7.1 (µm) | 80.9 | - |
| 5.2 (µm) | 75.0 | - |
| 2.7 (µm) | 60.2 | - |
| 1.2 (µm) | 42.7 | - |




**Soil Classification:** CH Fat Clay

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Gravel (%):** | 0 | **Sand (%):** | 1.5 | **Silt (%):** | 23.5 | **Clay (%):** | 75.0 |
| **$D_{60}$ (µm):** | 3.0 | | | | | | |

## General

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# Hydrometer And Sieve Analysis

**ASTM D422**

05/26/2023

2908 Morrison Ave.
Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2303912
Minnkota Cell 5
Center, ND

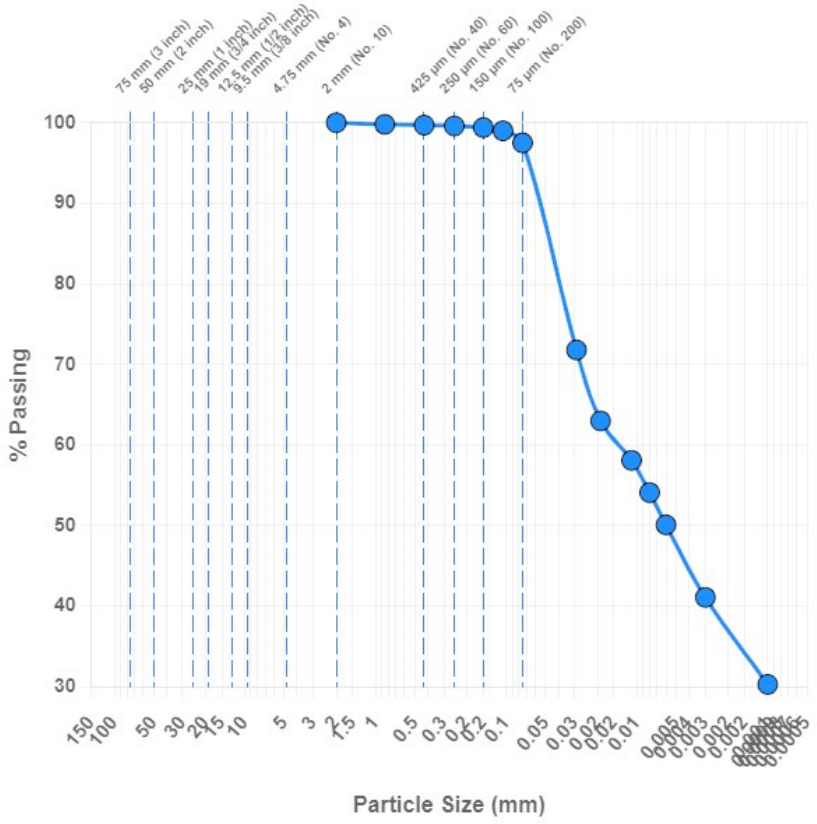
## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 519369 | **Alternate ID:** | SC-3 |
| **Sample From:** | Stockpile | **Sampled By:** | Wenko, Steve |
| **Location Details:** | E side of SC Stockpile | | |
| **Sample Date:** | 05/10/2023 | | |
| **Received Date:** | 05/10/2023 | **Lab:** | 2908 Morrison Ave. Suite 3, Bismarck, ND |
| **Tested Date:** | 05/24/2023 | **Tested By:** | Austin, Jon |

## Laboratory Data

### Sieve-Hydrometer Analysis

| Particle Size | % Passing | Specification |
|---|---|---|
| 2 mm (No. 10) | 100.0 | - |
| 850 µm (No. 20) | 99.8 | - |
| 425 µm (No. 40) | 99.7 | - |
| 250 µm (No. 60) | 99.6 | - |
| 150 µm (No. 100) | 99.4 | - |
| 106 µm (No. 140) | 99.0 | - |
| 75 µm (No. 200) | 97.5 | - |
| 28.9 (µm) | 71.8 | - |
| 19.0 (µm) | 63.0 | - |
| 11.2 (µm) | 58.1 | - |
| 8.0 (µm) | 54.1 | - |
| 5.8 (µm) | 50.1 | - |
| 2.9 (µm) | 41.1 | - |
| 1.3 (µm) | 30.3 | - |




**Soil Classification:** CH Fat Clay

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Gravel (%):** | 0 | **Sand (%):** | 2.5 | **Silt (%):** | 50.4 | **Clay (%):** | 47.1 |
| **$D_{60}$ (µm):** | 14.1 | | | | | | |

## General

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

# Hydrometer And Sieve Analysis

**ASTM D422**

05/26/2023

2908 Morrison Ave.
Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2303912
Minnkota Cell 5
Center, ND

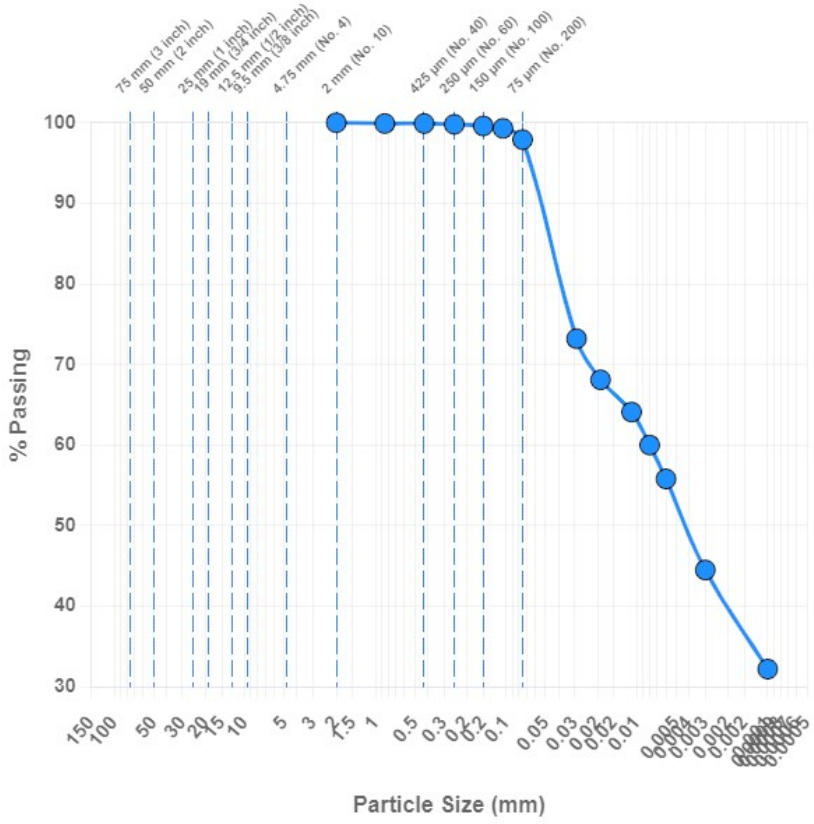
## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 519367 | **Alternate ID:** | SC-4 |
| **Sample From:** | Stockpile | **Sampled By:** | Wenko, Steve |
| **Location Details:** | Middle of SC Stockpile | | |
| **Sample Date:** | 05/10/2023 | | |
| **Received Date:** | 05/10/2023 | **Lab:** | 2908 Morrison Ave. Suite 3, Bismarck, ND |
| **Tested Date:** | 05/22/2023 | **Tested By:** | Austin, Jon |

## Laboratory Data

### Sieve-Hydrometer Analysis

| Particle Size | % Passing | Specification |
|---|---|---|
| 2 mm (No. 10) | 100.0 | - |
| 850 µm (No. 20) | 99.9 | - |
| 425 µm (No. 40) | 99.9 | - |
| 250 µm (No. 60) | 99.8 | - |
| 150 µm (No. 100) | 99.6 | - |
| 106 µm (No. 140) | 99.3 | - |
| 75 µm (No. 200) | 97.9 | - |
| 28.9 (µm) | 73.2 | - |
| 18.7 (µm) | 68.1 | - |
| 11.0 (µm) | 64.1 | - |
| 7.9 (µm) | 60.0 | - |
| 5.7 (µm) | 55.8 | - |
| 2.9 (µm) | 44.5 | - |
| 1.3 (µm) | 32.2 | - |




**Soil Classification:** CH Fat Clay

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Gravel (%):** | 0 | **Sand (%):** | 2.1 | **Silt (%):** | 45.9 | **Clay (%):** | 52.0 |
| **$D_{60}$ (µm):** | 8.0 | | | | | | |

## General

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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# Hydrometer And Sieve Analysis

**ASTM D422**

05/26/2023

2908 Morrison Ave.
Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2303912
Minnkota Cell 5
Center, ND

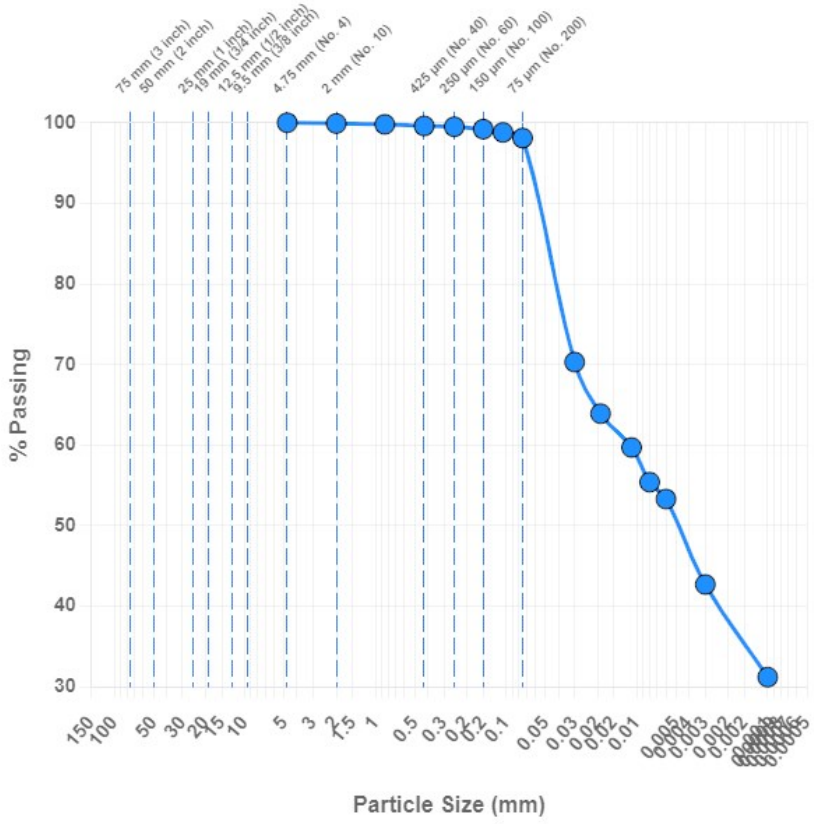
## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 519368 | **Alternate ID:** | SC-5 |
| **Sample From:** | Stockpile | **Sampled By:** | Wenko, Steve |
| **Location Details:** | W side of SC Stockpile | | |
| **Sample Date:** | 05/10/2023 | | |
| **Received Date:** | 05/10/2023 | **Lab:** | 2908 Morrison Ave. Suite 3, Bismarck, ND |
| **Tested Date:** | 05/22/2023 | **Tested By:** | Austin, Jon |

## Laboratory Data

### Sieve-Hydrometer Analysis

| Particle Size | % Passing | Specification |
|---|---|---|
| 4.75 mm (No. 4) | 100.0 | - |
| 2 mm (No. 10) | 99.9 | - |
| 850 µm (No. 20) | 99.8 | - |
| 425 µm (No. 40) | 99.6 | - |
| 250 µm (No. 60) | 99.5 | - |
| 150 µm (No. 100) | 99.2 | - |
| 106 µm (No. 140) | 98.8 | - |
| 75 µm (No. 200) | 98.1 | - |
| 29.8 (µm) | 70.3 | - |
| 19.3 (µm) | 63.9 | - |
| 11.3 (µm) | 59.7 | - |
| 8.1 (µm) | 55.4 | - |
| 5.8 (µm) | 53.3 | - |
| 2.9 (µm) | 42.7 | - |
| 1.3 (µm) | 31.2 | - |




**Soil Classification:** CH Fat Clay

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Gravel (%):** | 0.0 | **Sand (%):** | 1.9 | **Silt (%):** | 48.3 | **Clay (%):** | 49.8 |
| **$D_{60}$ (µm):** | 11.6 | | | | | | |

## General

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# Hydrometer And Sieve Analysis

**ASTM D422**

08/01/2022

1502 Grumman Lane
Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

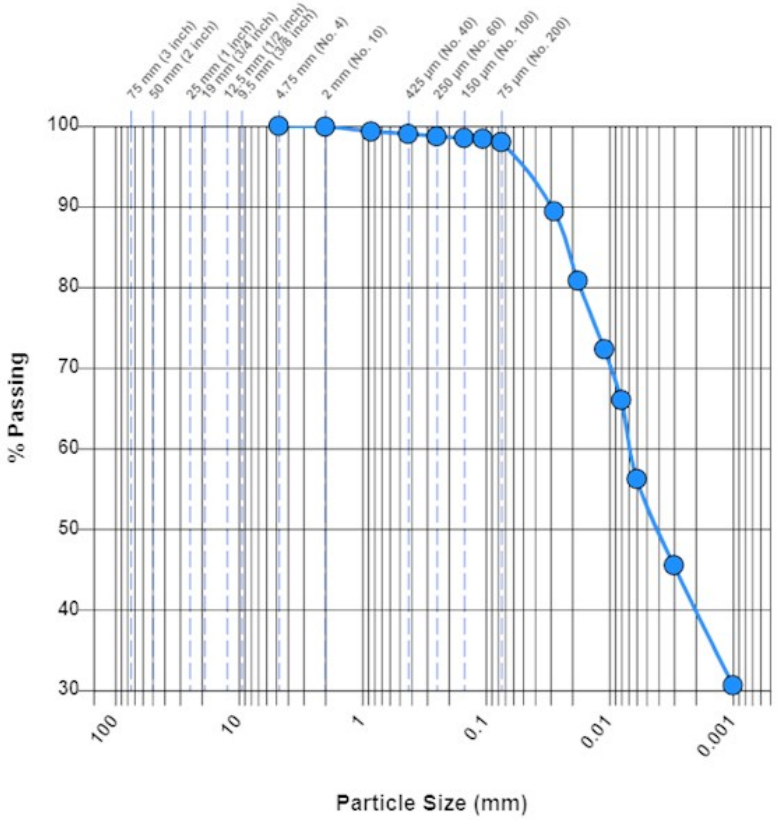
## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 464193 | **Alternate ID:** | SC-13 |
| **Sampling Method:** | Not Provided | **Sampled By:** | Client |
| **Location:** | In-place | | |
| **Location Details:** | Select Clay, SC-13 | | |
| **Specification:** | Project | | |
| **Sample Date:** | 07/20/2022 | **Material:** | Select Fill |
| **Received Date:** | 07/22/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 07/28/2022 | **Tested By:** | Austin, Jon |

## Laboratory Data

### Sieve-Hydrometer Analysis

| Particle Size | % Passing | Specification |
|---|---|---|
| 4.75 mm (No. 4) | 100.0 | - |
| 2 mm (No. 10) | 99.9 | - |
| 850 µm (No. 20) | 99.3 | - |
| 425 µm (No. 40) | 99.0 | - |
| 250 µm (No. 60) | 98.7 | - |
| 150 µm (No. 100) | 98.5 | - |
| 106 µm (No. 140) | 98.4 | - |
| 75 µm (No. 200) | 98.0 | - |
| 27.5 (µm) | 89.4 | - |
| 18.1 (µm) | 80.8 | - |
| 10.8 (µm) | 72.3 | - |
| 7.8 (µm) | 66.0 | - |
| 5.8 (µm) | 56.2 | - |
| 2.9 (µm) | 45.5 | - |
| 1.3 (µm) | 30.6 | - |




**Soil Classification:** CH Fat Clay

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Gravel (%):** | 0.0 | **Sand (%):** | 2.0 | **Silt (%):** | 45.4 | **Clay (%):** | 52.6 |
| **$D_{60}$ (µm):** | 6.8 | | | | | | |

## General

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# Hydrometer And Sieve Analysis

**ASTM D422**

08/01/2022

1502 Grumman Lane
Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

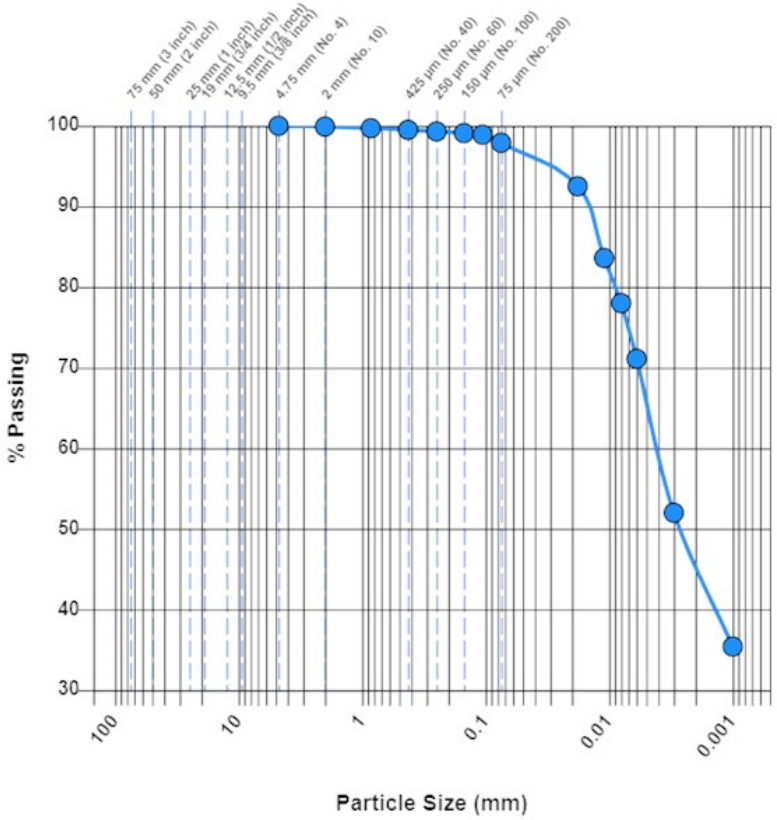
## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 464194 | **Alternate ID:** | SC-14 |
| **Sampling Method:** | Not Provided | **Sampled By:** | Client |
| **Location:** | In-place | | |
| **Location Details:** | Select Clay, SC-14 | | |
| **Specification:** | Project | | |
| **Sample Date:** | 07/20/2022 | **Material:** | Select Fill |
| **Received Date:** | 07/22/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 07/28/2022 | **Tested By:** | Austin, Jon |

## Laboratory Data

### Sieve-Hydrometer Analysis

| Particle Size | % Passing | Specification |
|---|---|---|
| 4.75 mm (No. 4) | 100.0 | - |
| 2 mm (No. 10) | 99.9 | - |
| 850 µm (No. 20) | 99.7 | - |
| 425 µm (No. 40) | 99.5 | - |
| 250 µm (No. 60) | 99.3 | - |
| 150 µm (No. 100) | 99.1 | - |
| 106 µm (No. 140) | 98.9 | - |
| 75 µm (No. 200) | 97.9 | - |
| 17.5 (µm) | 92.5 | - |
| 10.5 (µm) | 83.6 | - |
| 7.6 (µm) | 78.0 | - |
| 5.5 (µm) | 71.1 | - |
| 2.9 (µm) | 52.0 | - |
| 1.3 (µm) | 35.4 | - |




**Soil Classification:** CH Fat Clay

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Gravel (%):** | 0.0 | **Sand (%):** | 2.1 | **Silt (%):** | 33.2 | **Clay (%):** | 64.7 |
| **$D_{60}$ (µm):** | 4.3 | | | | | | |

## General

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# Hydrometer And Sieve Analysis

**ASTM D422**

08/04/2022

1502 Grumman Lane
Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

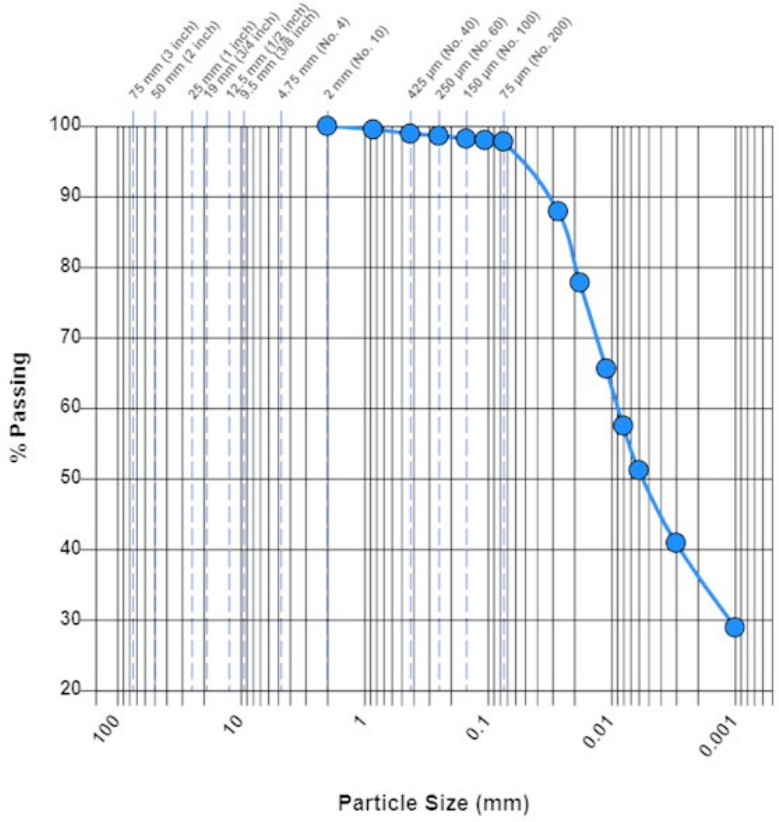
## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 464324 | **Alternate ID:** | SC-15 |
| **Sample From:** | Not Given | **Sampled By:** | Client |
| **Location Details:** | Select Clay Stockpile, Sample 15 | | |
| **Sample Date:** | 07/27/2022 | | |
| **Received Date:** | 07/28/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 08/03/2022 | **Tested By:** | Austin, Jon |

## Laboratory Data

### Sieve-Hydrometer Analysis

| Particle Size | % Passing | Specification |
|---|---|---|
| 2 mm (No. 10) | 100.0 | - |
| 850 µm (No. 20) | 99.5 | - |
| 425 µm (No. 40) | 98.9 | - |
| 250 µm (No. 60) | 98.6 | - |
| 150 µm (No. 100) | 98.2 | - |
| 106 µm (No. 140) | 98.0 | - |
| 75 µm (No. 200) | 97.8 | - |
| 26.9 (µm) | 87.9 | - |
| 17.9 (µm) | 77.8 | - |
| 10.9 (µm) | 65.6 | - |
| 8.0 (µm) | 57.5 | - |
| 5.8 (µm) | 51.2 | - |
| 2.9 (µm) | 40.9 | - |
| 1.3 (µm) | 28.9 | - |




**Soil Classification:** CH Fat Clay

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Gravel (%):** | 0 | **Sand (%):** | 2.2 | **Silt (%):** | 50.0 | **Clay (%):** | 47.8 |
| **$D_{60}$ (µm):** | 8.9 | **$D_{30}$ (µm):** | 1.2 | | | | |

## General

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# Hydrometer And Sieve Analysis

**ASTM D422**

08/04/2022

1502 Grumman Lane
Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

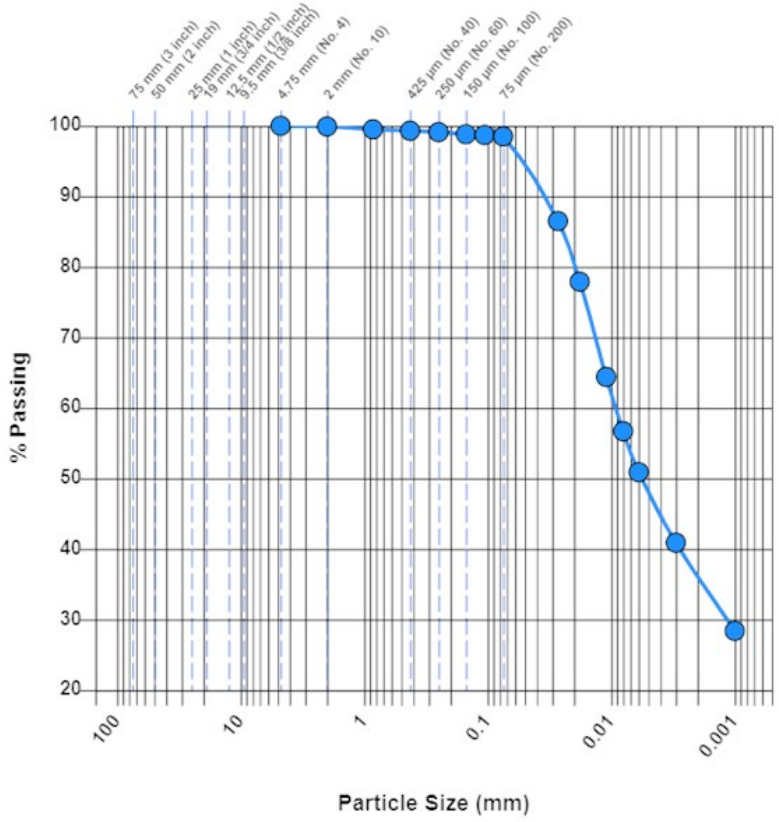
## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 464326 | **Alternate ID:** | SC-16 |
| **Sample From:** | Not Given | **Sampled By:** | Client |
| **Location Details:** | Select Clay Stockpile, Sample 16 | | |
| **Sample Date:** | 07/27/2022 | | |
| **Received Date:** | 07/28/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 08/03/2022 | **Tested By:** | Austin, Jon |

## Laboratory Data

### Sieve-Hydrometer Analysis

| Particle Size | % Passing | Specification |
|---|---|---|
| 4.75 mm (No. 4) | 100.0 | - |
| 2 mm (No. 10) | 99.9 | - |
| 850 µm (No. 20) | 99.5 | - |
| 425 µm (No. 40) | 99.3 | - |
| 250 µm (No. 60) | 99.1 | - |
| 150 µm (No. 100) | 98.8 | - |
| 106 µm (No. 140) | 98.7 | - |
| 75 µm (No. 200) | 98.5 | - |
| 26.5 (µm) | 86.5 | - |
| 17.5 (µm) | 77.9 | - |
| 10.8 (µm) | 64.4 | - |
| 7.9 (µm) | 56.7 | - |
| 5.7 (µm) | 50.9 | - |
| 2.9 (µm) | 40.9 | - |
| 1.3 (µm) | 28.4 | - |




**Soil Classification:** CH Fat Clay

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Gravel (%):** | 0.0 | **Sand (%):** | 1.5 | **Silt (%):** | 50.9 | **Clay (%):** | 47.6 |
| **$D_{60}$ (µm):** | 9.3 | **$D_{30}$ (µm):** | 1.3 | | | | |

## General

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# Hydrometer And Sieve Analysis

**ASTM D422**

08/04/2022

1502 Grumman Lane
Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

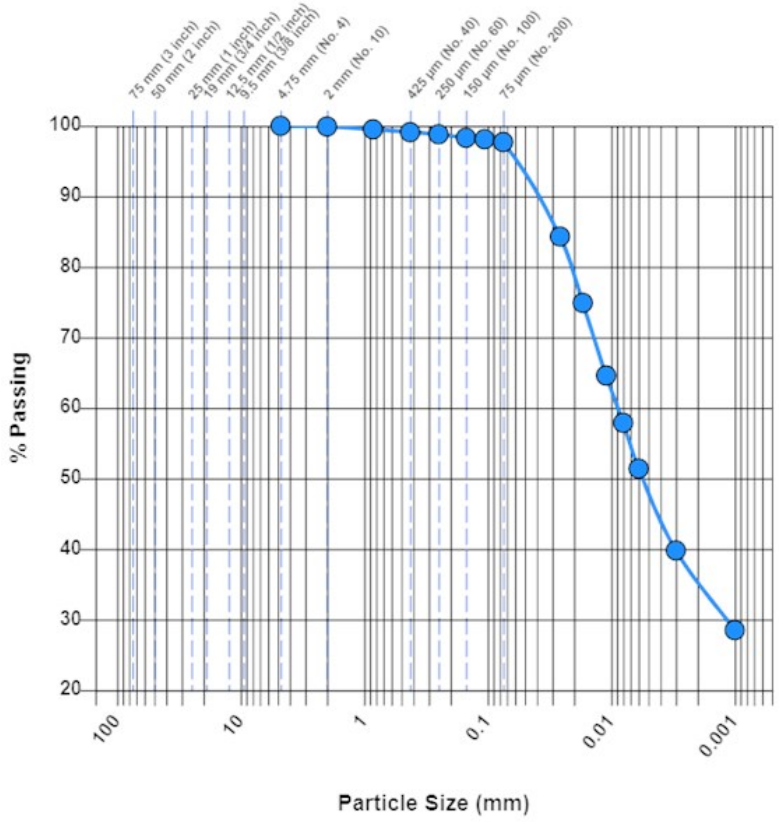
## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 464327 | **Alternate ID:** | SC-17 |
| **Sample From:** | Not Given | **Sampled By:** | Client |
| **Location Details:** | Select Clay Stockpile, Sample 17 | | |
| **Sample Date:** | 07/27/2022 | | |
| **Received Date:** | 07/28/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 08/03/2022 | **Tested By:** | Austin, Jon |

## Laboratory Data

### Sieve-Hydrometer Analysis

| Particle Size | % Passing | Specification |
|---|---|---|
| 4.75 mm (No. 4) | 100.0 | - |
| 2 mm (No. 10) | 99.9 | - |
| 850 µm (No. 20) | 99.5 | - |
| 425 µm (No. 40) | 99.1 | - |
| 250 µm (No. 60) | 98.8 | - |
| 150 µm (No. 100) | 98.3 | - |
| 106 µm (No. 140) | 98.1 | - |
| 75 µm (No. 200) | 97.7 | - |
| 25.9 (µm) | 84.3 | - |
| 17.2 (µm) | 74.9 | - |
| 10.5 (µm) | 64.6 | - |
| 7.6 (µm) | 57.9 | - |
| 5.5 (µm) | 51.4 | - |
| 2.9 (µm) | 39.8 | - |
| 1.2 (µm) | 28.5 | - |




**Soil Classification:** CH Fat Clay

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Gravel (%):** | 0.0 | **Sand (%):** | 2.3 | **Silt (%):** | 50.2 | **Clay (%):** | 47.5 |
| **$D_{60}$ (µm):** | 8.9 | **$D_{30}$ (µm):** | 1.3 | | | | |

## General

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# Hydrometer And Sieve Analysis

**ASTM D422**

08/10/2022

1502 Grumman Lane
Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

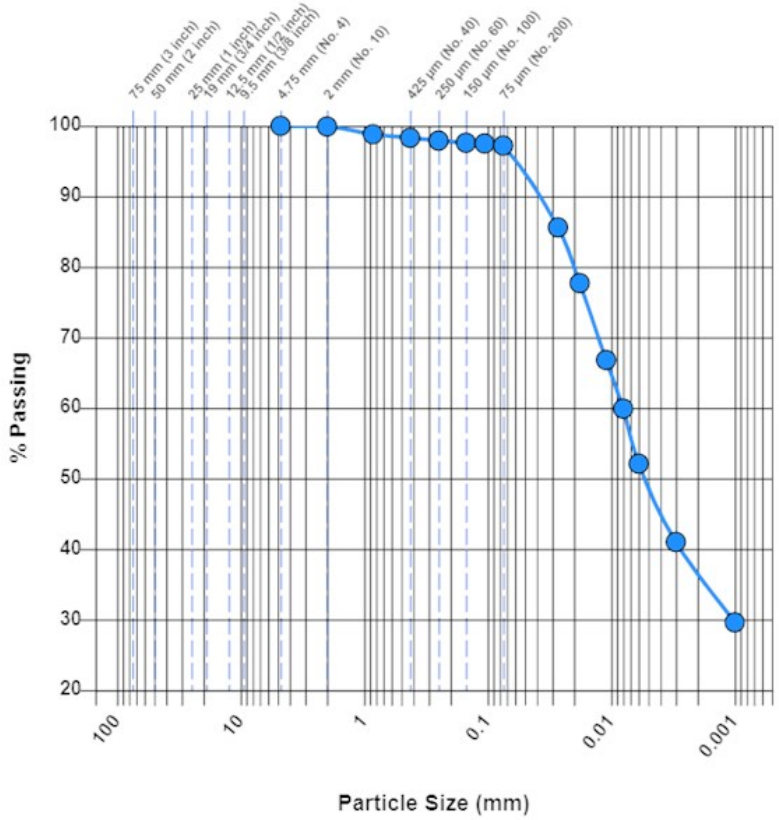
## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 467164 | **Alternate ID:** | SC-18 |
| **Sampling Method:** | Stockpile ASTM D75/AASHTO T2 | **Sampled By:** | Client |
| **Location:** | Other | | |
| **Location Details:** | Select Clay Stockpile | | |
| **Specification:** | Project | | |
| **Sample Date:** | 08/04/2022 | **Material:** | Select Fill |
| **Received Date:** | 08/04/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 08/10/2022 | **Tested By:** | Austin, Jon |

## Laboratory Data

### Sieve-Hydrometer Analysis

| Particle Size | % Passing | Specification |
|---|---|---|
| 4.75 mm (No. 4) | 100.0 | - |
| 2 mm (No. 10) | 99.9 | - |
| 850 µm (No. 20) | 98.8 | - |
| 425 µm (No. 40) | 98.3 | - |
| 250 µm (No. 60) | 97.9 | - |
| 150 µm (No. 100) | 97.6 | - |
| 106 µm (No. 140) | 97.5 | - |
| 75 µm (No. 200) | 97.2 | - |
| 26.9 (µm) | 85.6 | - |
| 17.7 (µm) | 77.7 | - |
| 10.8 (µm) | 66.8 | - |
| 7.8 (µm) | 59.9 | - |
| 5.7 (µm) | 52.1 | - |
| 2.9 (µm) | 41.0 | - |
| 1.2 (µm) | 29.6 | - |




**Soil Classification:** CH Fat Clay

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Gravel (%):** | 0.0 | **Sand (%):** | 2.8 | **Silt (%):** | 48.8 | **Clay (%):** | 48.4 |
| **$D_{60}$ (µm):** | 8.0 | **$D_{30}$ (µm):** | 1.1 | | | | |

## General

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# Hydrometer And Sieve Analysis

**ASTM D422**

08/10/2022

1502 Grumman Lane
Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

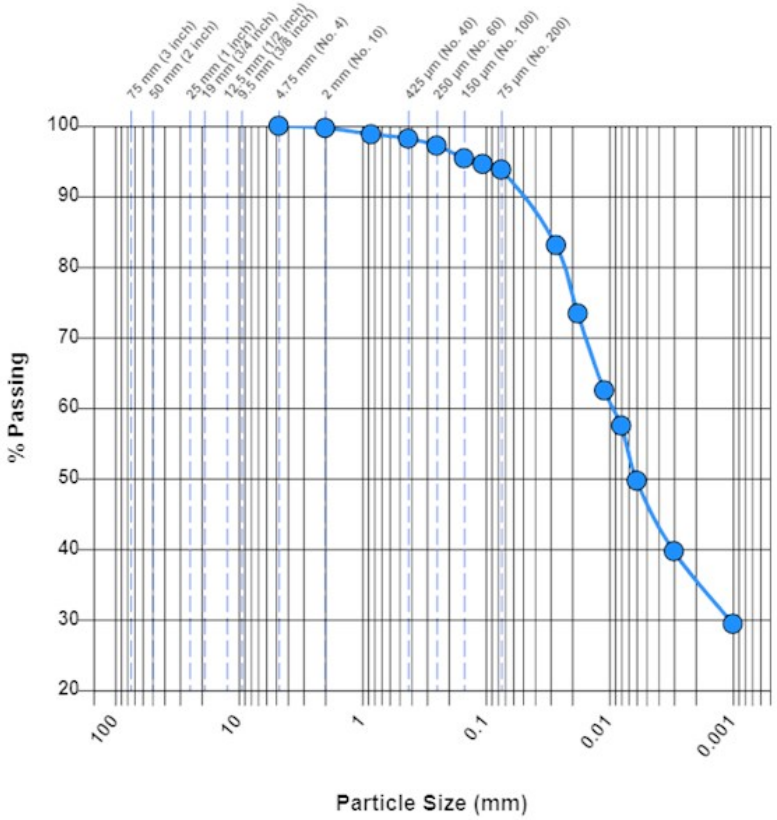
## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 467166 | **Alternate ID:** | SC-19 |
| **Sampling Method:** | Stockpile ASTM D75/AASHTO T2 | **Sampled By:** | Client |
| **Location:** | Other | | |
| **Location Details:** | Select Clay Stockpile | | |
| **Specification:** | Project | | |
| **Sample Date:** | 08/04/2022 | **Material:** | Select Fill |
| **Received Date:** | 08/04/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 08/10/2022 | **Tested By:** | Austin, Jon |

## Laboratory Data

### Sieve-Hydrometer Analysis

| Particle Size | % Passing | Specification |
|---|---|---|
| 4.75 mm (No. 4) | 100.0 | - |
| 2 mm (No. 10) | 99.7 | - |
| 850 µm (No. 20) | 98.8 | - |
| 425 µm (No. 40) | 98.2 | - |
| 250 µm (No. 60) | 97.2 | - |
| 150 µm (No. 100) | 95.4 | - |
| 106 µm (No. 140) | 94.6 | - |
| 75 µm (No. 200) | 93.8 | - |
| 27.1 (µm) | 83.1 | - |
| 18.0 (µm) | 73.4 | - |
| 10.9 (µm) | 62.5 | - |
| 7.9 (µm) | 57.5 | - |
| 5.8 (µm) | 49.7 | - |
| 2.9 (µm) | 39.7 | - |
| 1.2 (µm) | 29.4 | - |




**Soil Classification:** CH Fat Clay

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Gravel (%):** | 0.0 | **Sand (%):** | 6.2 | **Silt (%):** | 47.4 | **Clay (%):** | 46.4 |
| **$D_{60}$ (µm):** | 9.5 | **$D_{30}$ (µm):** | 1.1 | | | | |

## General

The results included in this report relate only to the items inspected or tested. Sample plan outlined in project specifications as applicable. Additionally, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without the prior written approval.

BRAUN INTERTEC
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# Hydrometer And Sieve Analysis

**ASTM D422**

09/23/2022

1502 Grumman Lane
Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

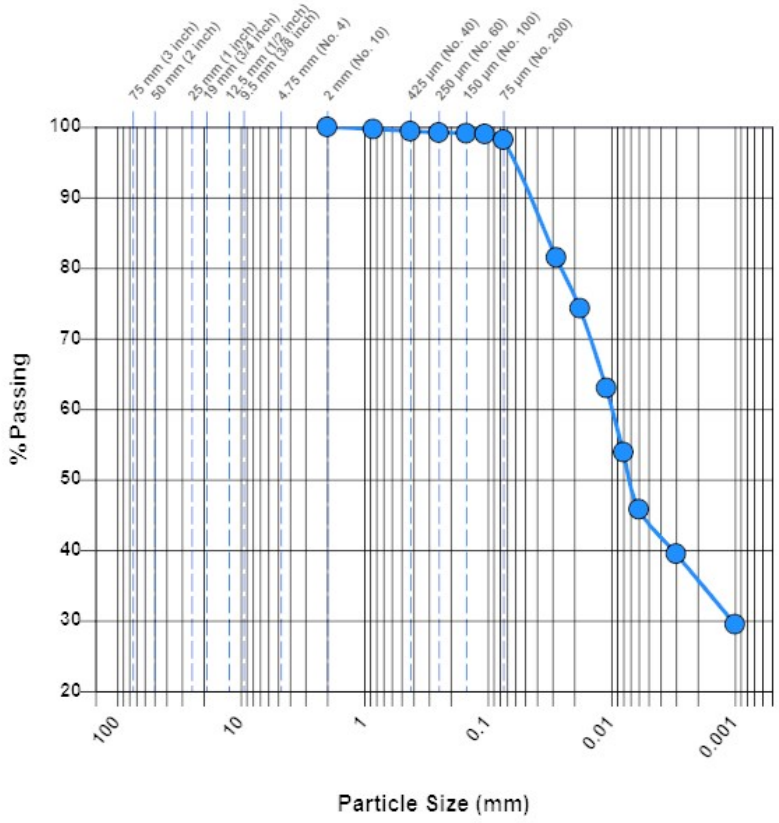
## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 479411 | **Alternate ID:** | SC-20 |
| **Sample From:** | Not Given | **Sampled By:** | Client |
| **Location Details:** | Select Clay Stockpile, Sample 20 | | |
| **Sample Date:** | 09/12/2022 | | |
| **Received Date:** | 09/12/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 09/23/2022 | **Tested By:** | Ficek, Kevin |

## Laboratory Data

### Sieve-Hydrometer Analysis

| Particle Size | % Passing | Specification |
|---|---|---|
| 2 mm (No. 10) | 100.0 | - |
| 850 µm (No. 20) | 99.7 | - |
| 425 µm (No. 40) | 99.4 | - |
| 250 µm (No. 60) | 99.2 | - |
| 150 µm (No. 100) | 99.1 | - |
| 106 µm (No. 140) | 99.0 | - |
| 75 µm (No. 200) | 98.2 | - |
| 27.9 (µm) | 81.5 | - |
| 18.2 (µm) | 74.3 | - |
| 11.0 (µm) | 63.0 | - |
| 8.1 (µm) | 53.9 | - |
| 5.9 (µm) | 45.8 | - |
| 3.0 (µm) | 39.5 | - |
| 1.3 (µm) | 29.5 | - |




**Soil Classification:** CH Fat Clay

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Gravel (%):** | 0 | **Sand (%):** | 1.8 | **Silt (%):** | 54.5 | **Clay (%):** | 43.7 |
| **$D_{60}$ (µm):** | 10.0 | **$D_{30}$ (µm):** | 1.1 | | | | |

## General

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# Hydrometer And Sieve Analysis

**ASTM D422**

09/23/2022

1502 Grumman Lane
Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

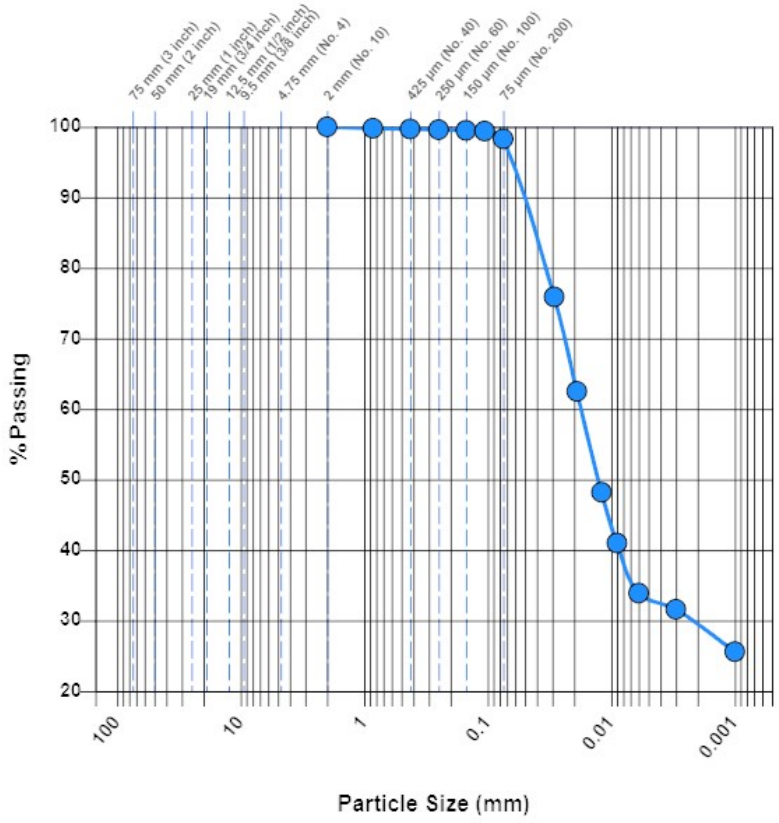
## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 479413 | **Alternate ID:** | SC-21 |
| **Sample From:** | Not Given | **Sampled By:** | Client |
| **Location Details:** | Select Clay Stockpile, Sample 21 | | |
| **Sample Date:** | 09/12/2022 | | |
| **Received Date:** | 09/12/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 09/23/2022 | **Tested By:** | Ficek, Kevin |

## Laboratory Data

### Sieve-Hydrometer Analysis

| Particle Size | % Passing | Specification |
|---|---|---|
| 2 mm (No. 10) | 100.0 | - |
| 850 µm (No. 20) | 99.8 | - |
| 425 µm (No. 40) | 99.7 | - |
| 250 µm (No. 60) | 99.6 | - |
| 150 µm (No. 100) | 99.5 | - |
| 106 µm (No. 140) | 99.4 | - |
| 75 µm (No. 200) | 98.3 | - |
| 28.7 (µm) | 75.9 | - |
| 19.2 (µm) | 62.5 | - |
| 11.7 (µm) | 48.2 | - |
| 8.5 (µm) | 41.0 | - |
| 6.1 (µm) | 33.9 | - |
| 3.0 (µm) | 31.6 | - |
| 1.3 (µm) | 25.6 | - |




**Soil Classification:** CL Lean clay

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Gravel (%):** | 0 | **Sand (%):** | 1.7 | **Silt (%):** | 65.2 | **Clay (%):** | 33.1 |
| **$D_{60}$ (µm):** | 17.8 | **$D_{30}$ (µm):** | 2.5 | | | | |

## General

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# Hydrometer And Sieve Analysis

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09/23/2022

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Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

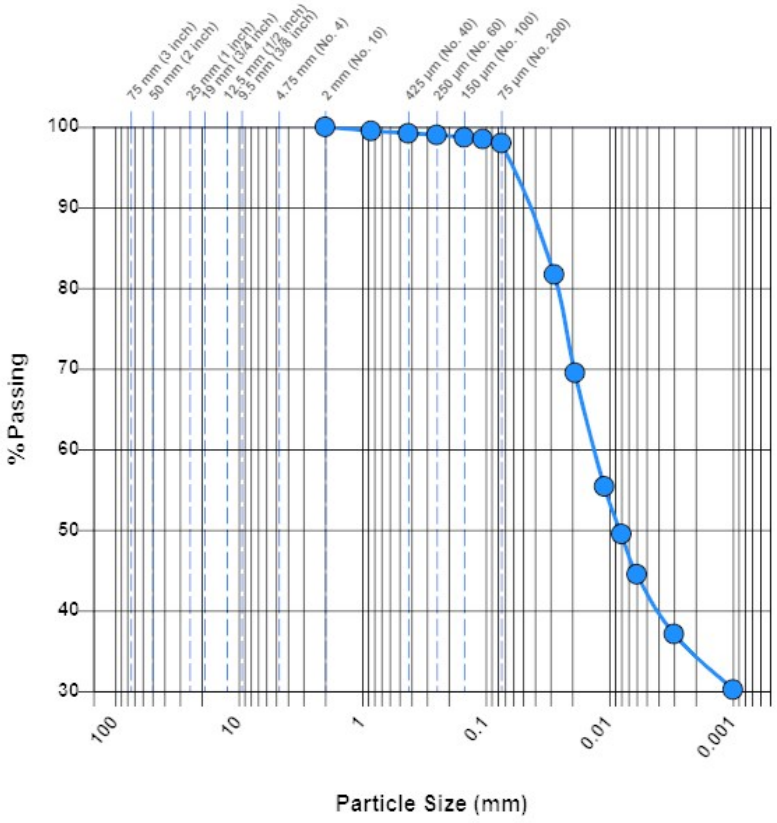
## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 479414 | **Alternate ID:** | SC-22 |
| **Sample From:** | Not Given | **Sampled By:** | Client |
| **Location Details:** | Select Clay Stockpile, Sample 22 | | |
| **Sample Date:** | 09/12/2022 | | |
| **Received Date:** | 09/12/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 09/23/2022 | **Tested By:** | Ficek, Kevin |

## Laboratory Data

### Sieve-Hydrometer Analysis

| Particle Size | % Passing | Specification |
|---|---|---|
| 2 mm (No. 10) | 100.0 | - |
| 850 µm (No. 20) | 99.5 | - |
| 425 µm (No. 40) | 99.2 | - |
| 250 µm (No. 60) | 99.0 | - |
| 150 µm (No. 100) | 98.7 | - |
| 106 µm (No. 140) | 98.5 | - |
| 75 µm (No. 200) | 98.0 | - |
| 27.7 (µm) | 81.7 | - |
| 18.5 (µm) | 69.5 | - |
| 11.3 (µm) | 55.4 | - |
| 8.2 (µm) | 49.5 | - |
| 5.9 (µm) | 44.5 | - |
| 3.0 (µm) | 37.1 | - |
| 1.3 (µm) | 30.2 | - |




**Soil Classification:** CH Fat Clay

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Gravel (%):** | 0 | **Sand (%):** | 2.0 | **Silt (%):** | 56.0 | **Clay (%):** | 42.0 |

**$D_{60}$ (µm):** 13.6

## General

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Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

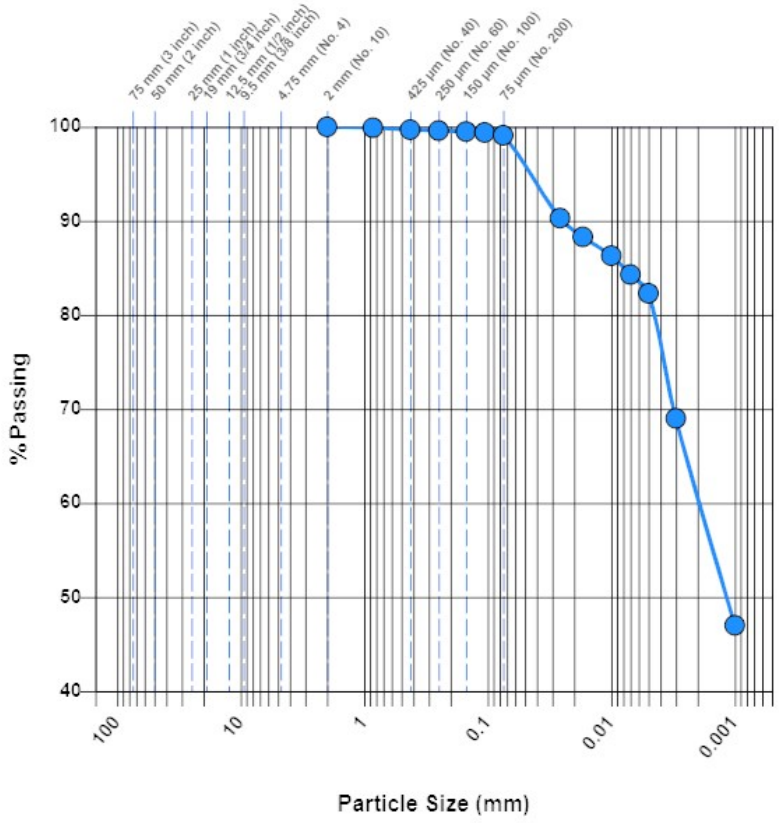
## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 479415 | **Alternate ID:** | SC-23 |
| **Sample From:** | Not Given | **Sampled By:** | Client |
| **Location Details:** | Select Clay Stockpile, Sample 23 | | |
| **Sample Date:** | 09/12/2022 | | |
| **Received Date:** | 09/12/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 09/23/2022 | **Tested By:** | Ficek, Kevin |

## Laboratory Data

### Sieve-Hydrometer Analysis

| Particle Size | % Passing | Specification |
|---|---|---|
| 2 mm (No. 10) | 100.0 | - |
| 850 µm (No. 20) | 99.9 | - |
| 425 µm (No. 40) | 99.7 | - |
| 250 µm (No. 60) | 99.6 | - |
| 150 µm (No. 100) | 99.5 | - |
| 106 µm (No. 140) | 99.4 | - |
| 75 µm (No. 200) | 99.1 | - |
| 26.4 (µm) | 90.3 | - |
| 16.9 (µm) | 88.3 | - |
| 9.9 (µm) | 86.3 | - |
| 7.0 (µm) | 84.3 | - |
| 5.0 (µm) | 82.3 | - |
| 2.6 (µm) | 69.0 | - |
| 1.2 (µm) | 47.0 | - |




**Soil Classification:** CH Fat Clay

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Gravel (%):** | 0 | **Sand (%):** | 0.9 | **Silt (%):** | 16.8 | **Clay (%):** | 82.3 |
| **$D_{60}$ (µm):** | 2.2 | | | | | | |

## General

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Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

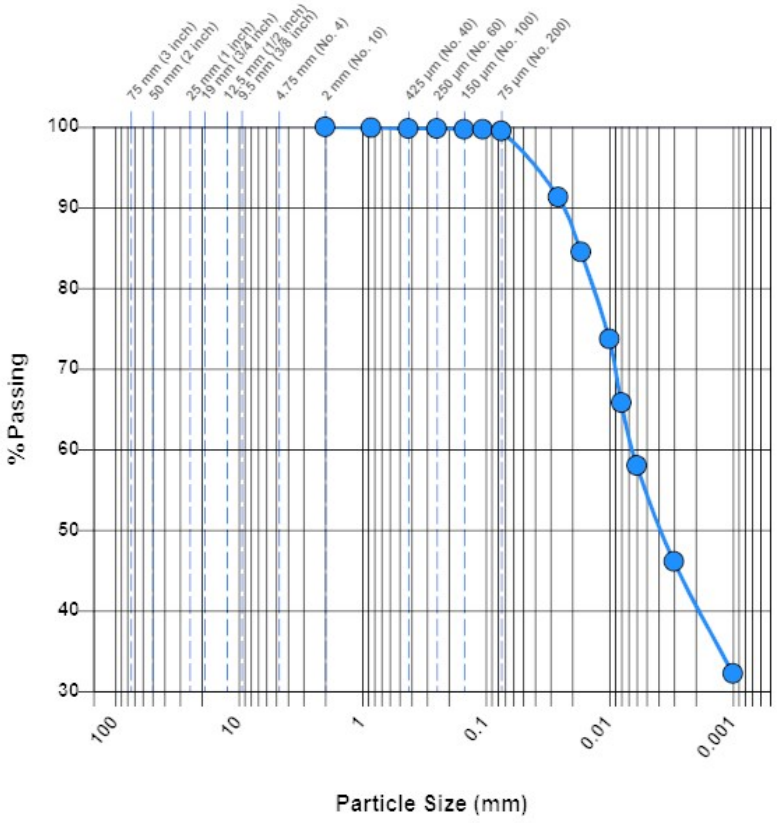
## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 479416 | **Alternate ID:** | SC-24 |
| **Sample From:** | Not Given | **Sampled By:** | Client |
| **Location Details:** | Select Clay Stockpile, Sample 24 | | |
| **Sample Date:** | 09/12/2022 | | |
| **Received Date:** | 09/12/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 09/23/2022 | **Tested By:** | Ficek, Kevin |

## Laboratory Data

### Sieve-Hydrometer Analysis

| Particle Size | % Passing | Specification |
|---|---|---|
| 2 mm (No. 10) | 100.0 | - |
| 850 µm (No. 20) | 99.9 | - |
| 425 µm (No. 40) | 99.8 | - |
| 250 µm (No. 60) | 99.8 | - |
| 150 µm (No. 100) | 99.7 | - |
| 106 µm (No. 140) | 99.7 | - |
| 75 µm (No. 200) | 99.5 | - |
| 26.0 (µm) | 91.3 | - |
| 17.1 (µm) | 84.5 | - |
| 10.4 (µm) | 73.7 | - |
| 7.6 (µm) | 65.8 | - |
| 5.6 (µm) | 58.0 | - |
| 2.9 (µm) | 46.1 | - |
| 1.3 (µm) | 32.2 | - |




**Soil Classification:** CH Fat Clay

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Gravel (%):** | 0 | **Sand (%):** | 0.5 | **Silt (%):** | 45.5 | **Clay (%):** | 54.0 |
| **$D_{60}$ (µm):** | 6.5 | | | | | | |

## General

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# Hydrometer And Sieve Analysis

**ASTM D422**

09/23/2022

1502 Grumman Lane
Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

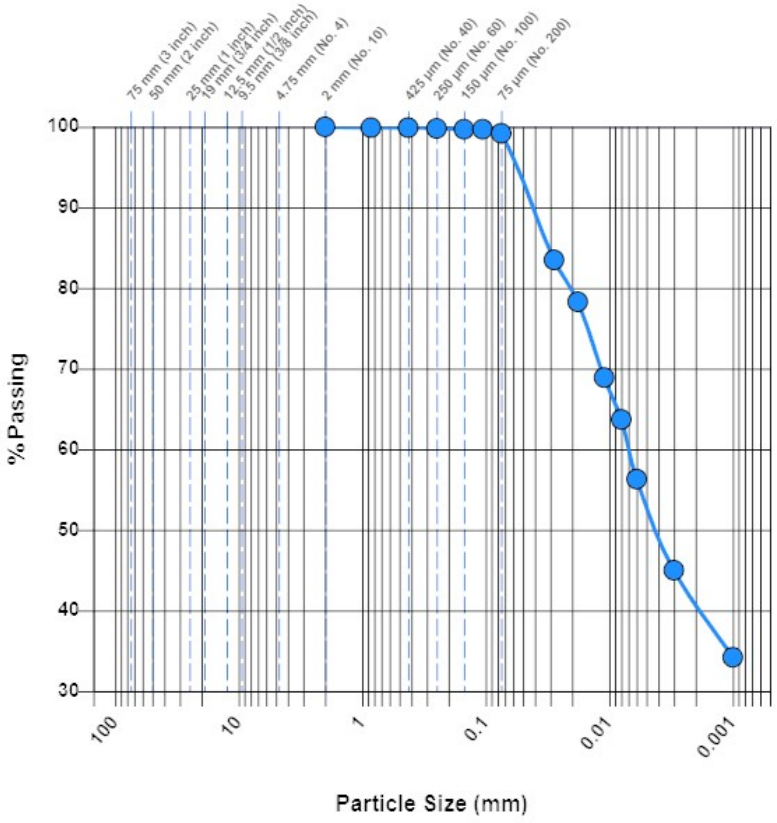
## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 479417 | **Alternate ID:** | SC-25 |
| **Sample From:** | Not Given | **Sampled By:** | Client |
| **Location Details:** | Select Clay Stockpile, Sample 25 | | |
| **Sample Date:** | 09/14/2022 | | |
| **Received Date:** | 09/15/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 09/23/2022 | **Tested By:** | Ficek, Kevin |

## Laboratory Data

### Sieve-Hydrometer Analysis

| Particle Size | % Passing | Specification |
|---|---|---|
| 2 mm (No. 10) | 100.0 | - |
| 850 µm (No. 20) | 99.9 | - |
| 425 µm (No. 40) | 99.9 | - |
| 250 µm (No. 60) | 99.8 | - |
| 150 µm (No. 100) | 99.7 | - |
| 106 µm (No. 140) | 99.7 | - |
| 75 µm (No. 200) | 99.2 | - |
| 27.9 (µm) | 83.5 | - |
| 18.1 (µm) | 78.3 | - |
| 10.9 (µm) | 68.9 | - |
| 7.8 (µm) | 63.7 | - |
| 5.7 (µm) | 56.3 | - |
| 2.9 (µm) | 45.0 | - |
| 1.3 (µm) | 34.2 | - |




**Soil Classification:** CH Fat Clay

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Gravel (%):** | 0 | **Sand (%):** | 0.8 | **Silt (%):** | 46.7 | **Clay (%):** | 52.5 |
| **$D_{60}$ (µm):** | 7.0 | | | | | | |

## General

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09/23/2022

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Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

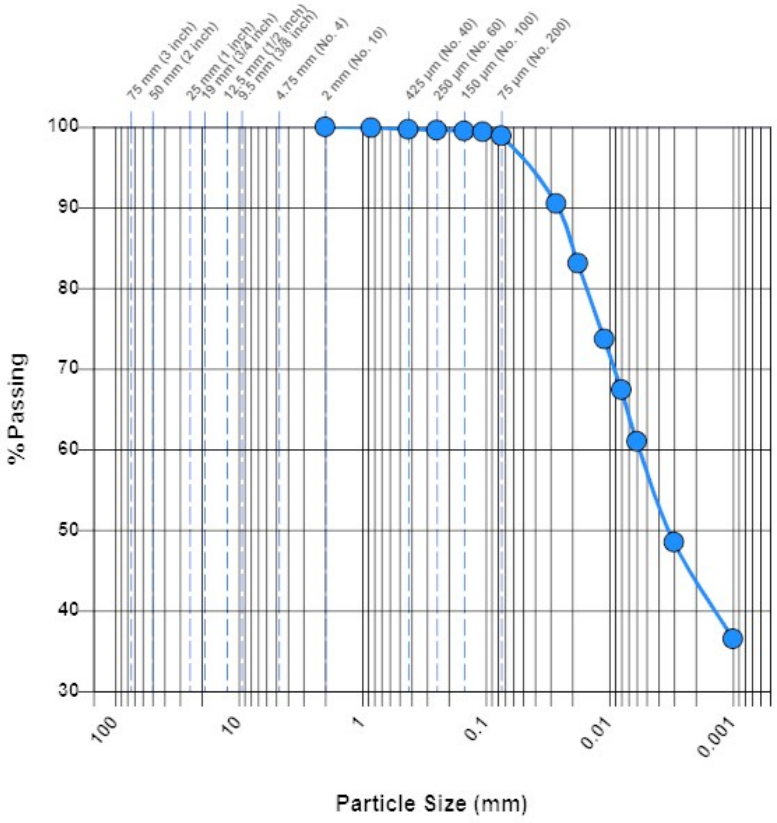
## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 479418 | **Alternate ID:** | SC-26 |
| **Sample From:** | Not Given | **Sampled By:** | Client |
| **Location Details:** | Select Clay Stockpile, Sample 26 | | |
| **Sample Date:** | 09/14/2022 | | |
| **Received Date:** | 09/15/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 09/23/2022 | **Tested By:** | Ficek, Kevin |

## Laboratory Data

### Sieve-Hydrometer Analysis

| Particle Size | % Passing | Specification |
|---|---|---|
| 2 mm (No. 10) | 100.0 | - |
| 850 µm (No. 20) | 99.9 | - |
| 425 µm (No. 40) | 99.7 | - |
| 250 µm (No. 60) | 99.6 | - |
| 150 µm (No. 100) | 99.5 | - |
| 106 µm (No. 140) | 99.4 | - |
| 75 µm (No. 200) | 98.9 | - |
| 27.1 (µm) | 90.5 | - |
| 17.7 (µm) | 83.1 | - |
| 10.7 (µm) | 73.7 | - |
| 7.7 (µm) | 67.4 | - |
| 5.6 (µm) | 61.0 | - |
| 2.9 (µm) | 48.5 | - |
| 1.3 (µm) | 36.5 | - |




**Soil Classification:** CH Fat Clay

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Gravel (%):** | 0 | **Sand (%):** | 1.1 | **Silt (%):** | 42.1 | **Clay (%):** | 56.8 |

**$D_{60}$ (µm):** 5.8

## General

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Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

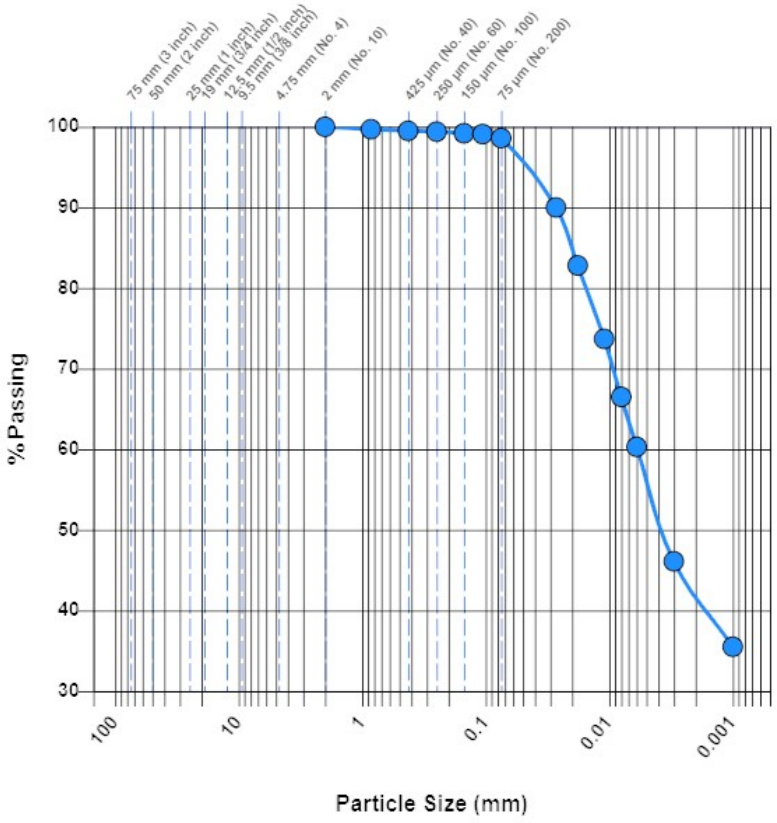
## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 479420 | **Alternate ID:** | SC-27 |
| **Sample From:** | Not Given | **Sampled By:** | Client |
| **Location Details:** | Select Clay Stockpile, Sample 27 | | |
| **Sample Date:** | 09/14/2022 | | |
| **Received Date:** | 09/15/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 09/23/2022 | **Tested By:** | Ficek, Kevin |

## Laboratory Data

### Sieve-Hydrometer Analysis

| Particle Size | % Passing | Specification |
|---|---|---|
| 2 mm (No. 10) | 100.0 | - |
| 850 µm (No. 20) | 99.7 | - |
| 425 µm (No. 40) | 99.5 | - |
| 250 µm (No. 60) | 99.4 | - |
| 150 µm (No. 100) | 99.2 | - |
| 106 µm (No. 140) | 99.1 | - |
| 75 µm (No. 200) | 98.6 | - |
| 26.8 (µm) | 90.0 | - |
| 17.6 (µm) | 82.8 | - |
| 10.6 (µm) | 73.7 | - |
| 7.7 (µm) | 66.5 | - |
| 5.6 (µm) | 60.3 | - |
| 2.9 (µm) | 46.1 | - |
| 1.3 (µm) | 35.5 | - |




**Soil Classification:** CH Fat Clay

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Gravel (%):** | 0 | **Sand (%):** | 1.4 | **Silt (%):** | 43.0 | **Clay (%):** | 55.6 |

**$D_{60}$ (µm):** 5.9

## General

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**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

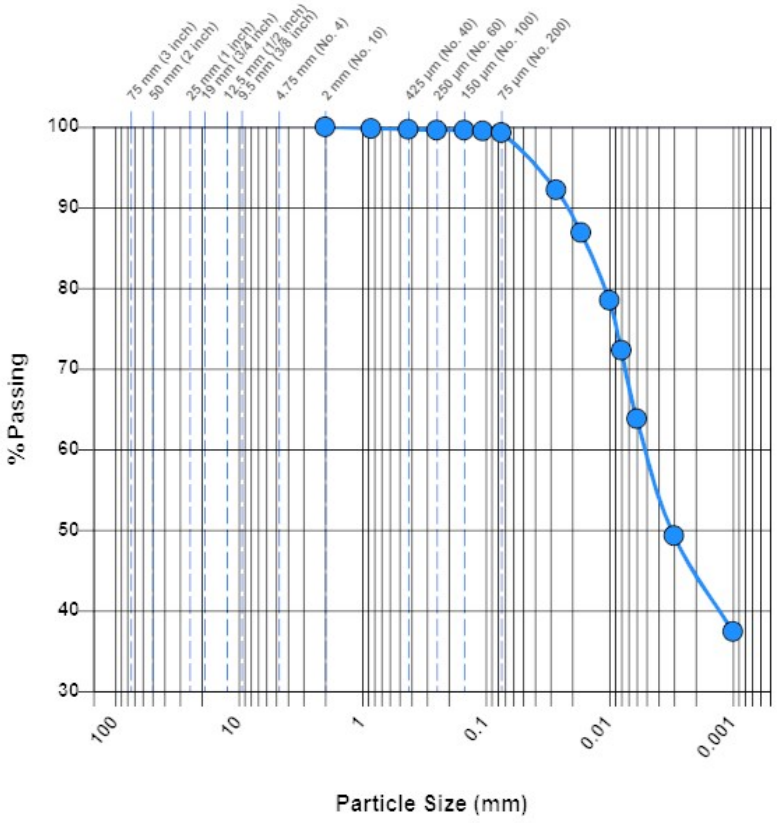
## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 479421 | **Alternate ID:** | SC-28 |
| **Sample From:** | Not Given | **Sampled By:** | Client |
| **Location Details:** | Select Clay Stockpile, Sample 28 | | |
| **Sample Date:** | 09/14/2022 | | |
| **Received Date:** | 09/15/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 09/23/2022 | **Tested By:** | Ficek, Kevin |

## Laboratory Data

### Sieve-Hydrometer Analysis

| Particle Size | % Passing | Specification |
|---|---|---|
| 2 mm (No. 10) | 100.0 | - |
| 850 µm (No. 20) | 99.8 | - |
| 425 µm (No. 40) | 99.7 | - |
| 250 µm (No. 60) | 99.6 | - |
| 150 µm (No. 100) | 99.6 | - |
| 106 µm (No. 140) | 99.5 | - |
| 75 µm (No. 200) | 99.3 | - |
| 26.8 (µm) | 92.2 | - |
| 17.4 (µm) | 86.9 | - |
| 10.4 (µm) | 78.5 | - |
| 7.6 (µm) | 72.3 | - |
| 5.5 (µm) | 63.8 | - |
| 2.9 (µm) | 49.3 | - |
| 1.2 (µm) | 37.4 | - |




**Soil Classification:** CH Fat Clay

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Gravel (%):** | 0 | **Sand (%):** | 0.7 | **Silt (%):** | 40.3 | **Clay (%):** | 59.0 |
| **$D_{60}$ (µm):** | 5.2 | | | | | | |

## General

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BRAUN INTERTEC
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# Hydrometer And Sieve Analysis

**ASTM D422**

10/11/2022

1502 Grumman Lane
Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

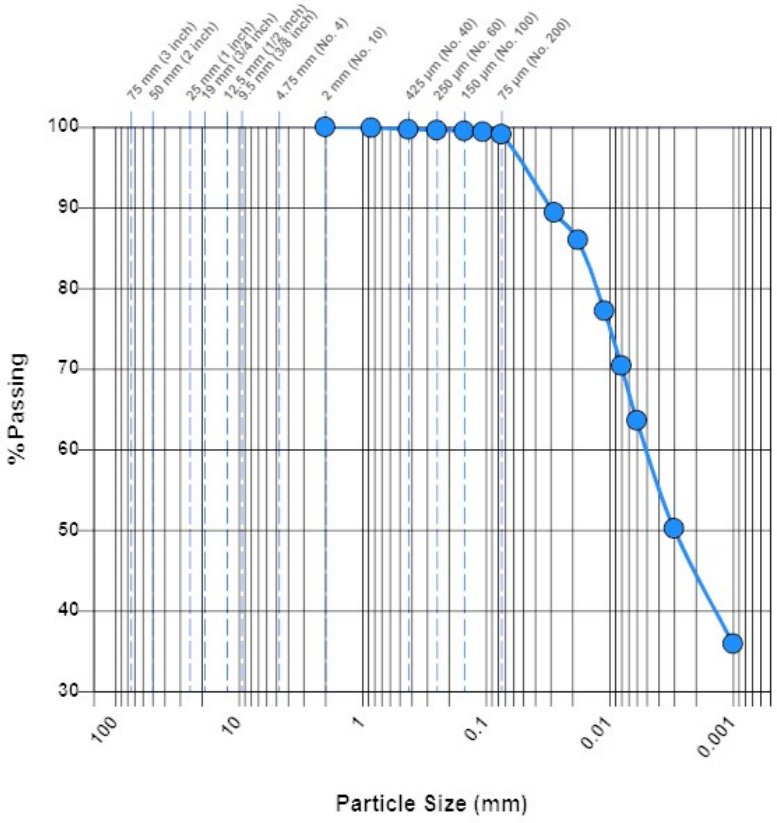
## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 482377 | **Alternate ID:** | SC-29 |
| **Sample From:** | In Place | **Sampled By:** | Client |
| **Location Details:** | Select Clay Stockpile, Sample 29 | | |
| **Sample Date:** | 09/21/2022 | | |
| **Received Date:** | 09/21/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 10/11/2022 | **Tested By:** | Ficek, Kevin |

## Laboratory Data

### Sieve-Hydrometer Analysis

| Particle Size | % Passing | Specification |
|---|---|---|
| 2 mm (No. 10) | 100.0 | - |
| 850 µm (No. 20) | 99.9 | - |
| 425 µm (No. 40) | 99.7 | - |
| 250 µm (No. 60) | 99.6 | - |
| 150 µm (No. 100) | 99.5 | - |
| 106 µm (No. 140) | 99.4 | - |
| 75 µm (No. 200) | 99.1 | - |
| 27.8 (µm) | 89.4 | - |
| 17.8 (µm) | 86.0 | - |
| 10.6 (µm) | 77.2 | - |
| 7.7 (µm) | 70.4 | - |
| 5.6 (µm) | 63.6 | - |
| 2.9 (µm) | 50.2 | - |
| 1.3 (µm) | 35.9 | - |




**Soil Classification:** CH Fat Clay

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Gravel (%):** | 0 | **Sand (%):** | 0.9 | **Silt (%):** | 40.0 | **Clay (%):** | 59.1 |

**$D_{60}$ (µm):** 5.2

## General

**Results:** The test is for informational purposes.

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10/11/2022

1502 Grumman Lane
Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

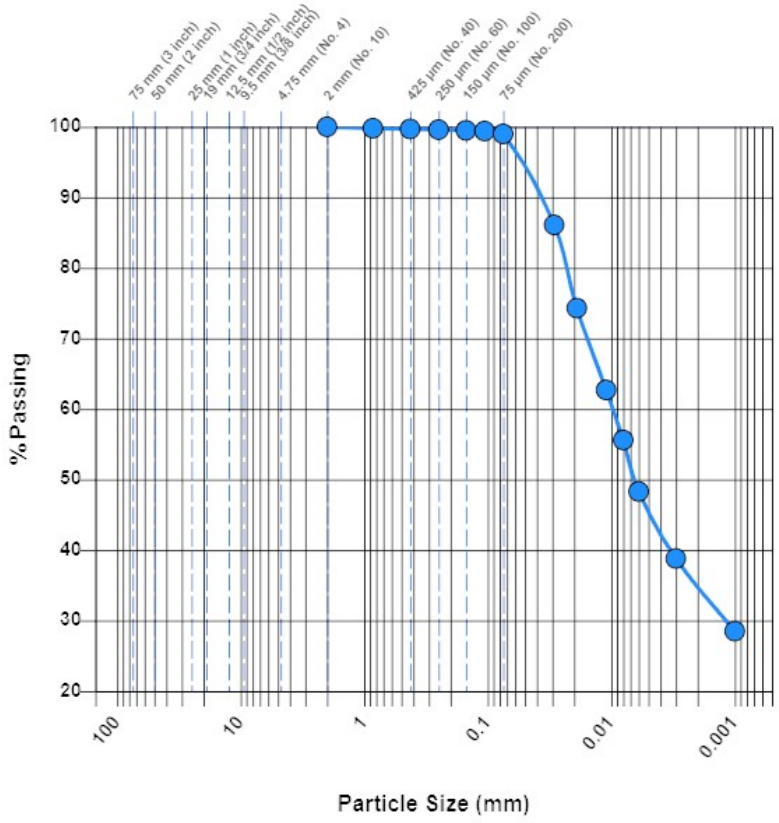
## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 482381 | **Alternate ID:** | SC-30 |
| **Sample From:** | In Place | **Sampled By:** | Client |
| **Location Details:** | Select Clay Stockpile, Sample 30 | | |
| **Sample Date:** | 09/21/2022 | | |
| **Received Date:** | 09/21/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 10/11/2022 | **Tested By:** | Ficek, Kevin |

## Laboratory Data

### Sieve-Hydrometer Analysis

| Particle Size | % Passing | Specification |
|---|---|---|
| 2 mm (No. 10) | 100.0 | - |
| 850 µm (No. 20) | 99.8 | - |
| 425 µm (No. 40) | 99.7 | - |
| 250 µm (No. 60) | 99.6 | - |
| 150 µm (No. 100) | 99.5 | - |
| 106 µm (No. 140) | 99.4 | - |
| 75 µm (No. 200) | 99.0 | - |
| 28.7 (µm) | 86.1 | - |
| 18.9 (µm) | 74.3 | - |
| 11.3 (µm) | 62.7 | - |
| 8.2 (µm) | 55.6 | - |
| 6.0 (µm) | 48.3 | - |
| 3.0 (µm) | 38.8 | - |
| 1.3 (µm) | 28.5 | - |




**Soil Classification:** CH Fat Clay

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Gravel (%):** | 0 | **Sand (%):** | 1.0 | **Silt (%):** | 53.9 | **Clay (%):** | 45.1 |
| **$D_{60}$ (µm):** | 9.9 | **$D_{30}$ (µm):** | 1.3 | | | | |

## General

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# Hydrometer And Sieve Analysis

**ASTM D422**

10/11/2022

1502 Grumman Lane
Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

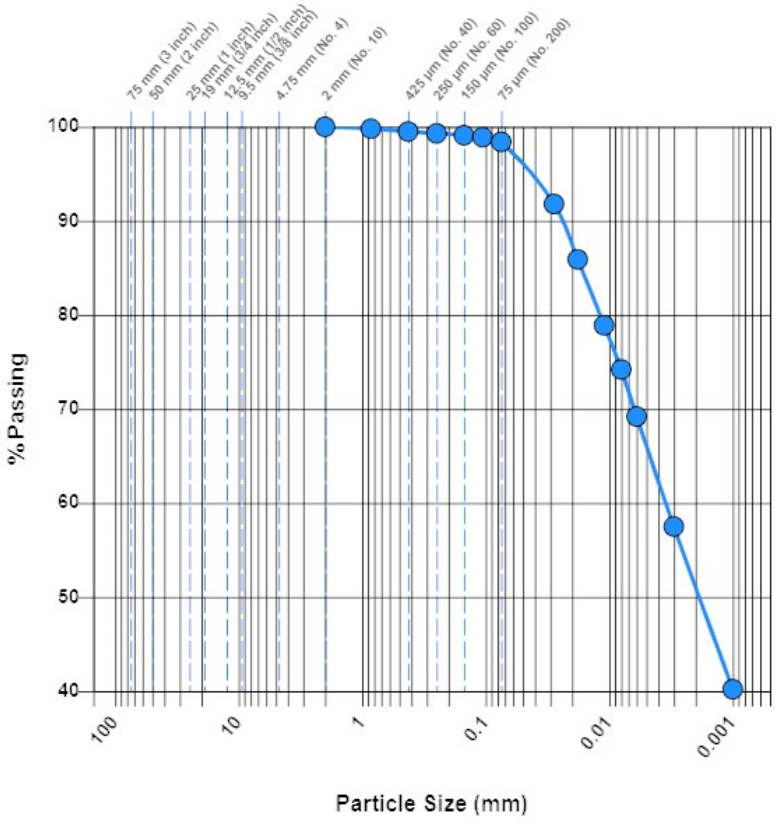
## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 482382 | **Alternate ID:** | SC-31 |
| **Sample From:** | In Place | **Sampled By:** | Client |
| **Location Details:** | Select Clay Stockpile, Sample 31 | | |
| **Sample Date:** | 09/21/2022 | | |
| **Received Date:** | 09/21/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 10/11/2022 | **Tested By:** | Ficek, Kevin |

## Laboratory Data

### Sieve-Hydrometer Analysis

| Particle Size | % Passing | Specification |
|---|---|---|
| 2 mm (No. 10) | 100.0 | - |
| 850 µm (No. 20) | 99.8 | - |
| 425 µm (No. 40) | 99.5 | - |
| 250 µm (No. 60) | 99.3 | - |
| 150 µm (No. 100) | 99.1 | - |
| 106 µm (No. 140) | 98.9 | - |
| 75 µm (No. 200) | 98.4 | - |
| 28.0 (µm) | 91.8 | - |
| 18.1 (µm) | 85.9 | - |
| 10.8 (µm) | 78.9 | - |
| 7.7 (µm) | 74.2 | - |
| 5.6 (µm) | 69.2 | - |
| 2.8 (µm) | 57.5 | - |
| 1.3 (µm) | 40.2 | - |




**Soil Classification:** CH Fat Clay

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Gravel (%):** | 0 | **Sand (%):** | 1.6 | **Silt (%):** | 33.1 | **Clay (%):** | 65.3 |
| **$D_{60}$ (µm):** | 3.6 | | | | | | |

## General

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# Hydrometer And Sieve Analysis

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10/11/2022

1502 Grumman Lane
Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

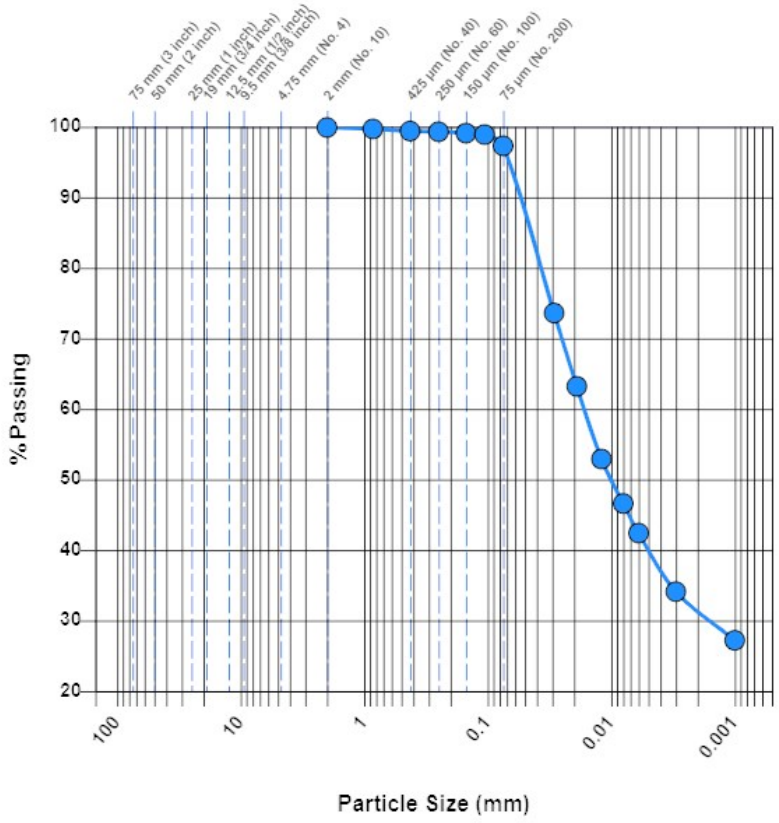
## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 482384 | **Alternate ID:** | SC-32 |
| **Sample From:** | In Place | **Sampled By:** | Client |
| **Location Details:** | Select Clay Stockpile, Sample 32 | | |
| **Sample Date:** | 09/21/2022 | | |
| **Received Date:** | 09/21/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 10/11/2022 | **Tested By:** | Ficek, Kevin |

## Laboratory Data

### Sieve-Hydrometer Analysis

| Particle Size | % Passing | Specification |
|---|---|---|
| 2 mm (No. 10) | 99.9 | - |
| 850 µm (No. 20) | 99.7 | - |
| 425 µm (No. 40) | 99.4 | - |
| 250 µm (No. 60) | 99.3 | - |
| 150 µm (No. 100) | 99.1 | - |
| 106 µm (No. 140) | 98.9 | - |
| 75 µm (No. 200) | 97.3 | - |
| 29.0 (µm) | 73.6 | - |
| 19.1 (µm) | 63.2 | - |
| 11.5 (µm) | 52.9 | - |
| 8.3 (µm) | 46.6 | - |
| 6.0 (µm) | 42.4 | - |
| 3.0 (µm) | 34.1 | - |
| 1.3 (µm) | 27.2 | - |




**Soil Classification:** CL Lean clay

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Gravel (%):** | 0 | **Sand (%):** | 2.7 | **Silt (%):** | 57.7 | **Clay (%):** | 39.6 |
| **$D_{60}$ (µm):** | 16.8 | **$D_{30}$ (µm):** | 1.8 | | | | |

## General

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# Hydrometer And Sieve Analysis

**ASTM D422**

10/11/2022

1502 Grumman Lane
Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

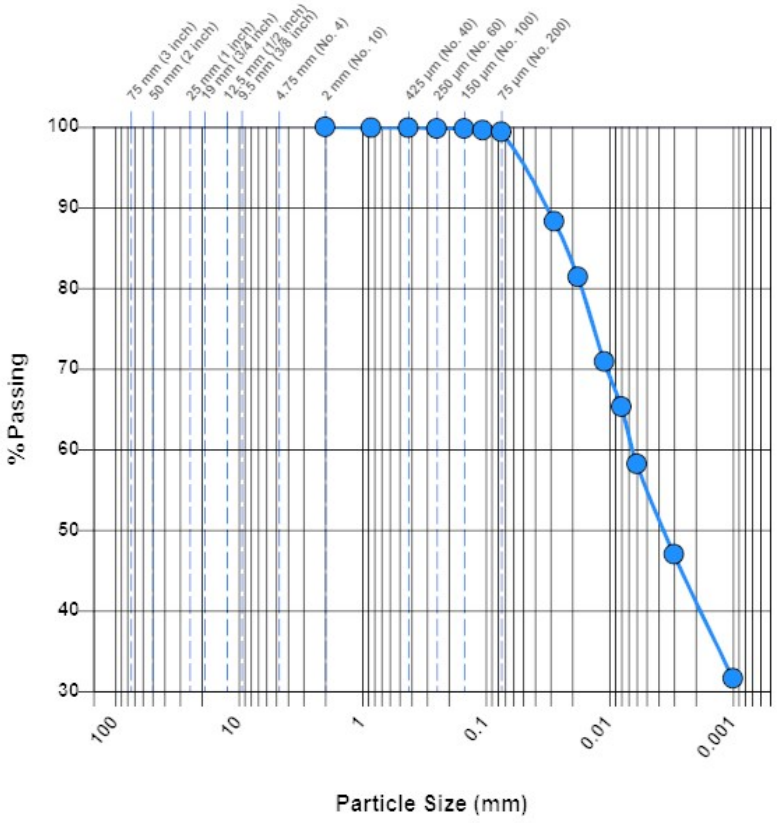
## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 482385 | **Alternate ID:** | SC-33 |
| **Sample From:** | In Place | **Sampled By:** | Client |
| **Location Details:** | Select Clay Stockpile, Sample 33 | | |
| **Sample Date:** | 09/30/2022 | | |
| **Received Date:** | 09/30/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 10/11/2022 | **Tested By:** | Ficek, Kevin |

## Laboratory Data

### Sieve-Hydrometer Analysis

| Particle Size | % Passing | Specification |
|---|---|---|
| 2 mm (No. 10) | 100.0 | - |
| 850 µm (No. 20) | 99.9 | - |
| 425 µm (No. 40) | 99.9 | - |
| 250 µm (No. 60) | 99.8 | - |
| 150 µm (No. 100) | 99.8 | - |
| 106 µm (No. 140) | 99.6 | - |
| 75 µm (No. 200) | 99.4 | - |
| 28.3 (µm) | 88.3 | - |
| 18.4 (µm) | 81.4 | - |
| 11.1 (µm) | 70.9 | - |
| 8.0 (µm) | 65.3 | - |
| 5.8 (µm) | 58.2 | - |
| 2.9 (µm) | 47.0 | - |
| 1.3 (µm) | 31.6 | - |




**Soil Classification:** CH Fat Clay

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Gravel (%):** | 0 | **Sand (%):** | 0.6 | **Silt (%):** | 44.9 | **Clay (%):** | 54.5 |

**$D_{60}$ (µm):** 6.5

## General

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# Hydrometer And Sieve Analysis

**ASTM D422**

10/11/2022

1502 Grumman Lane
Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

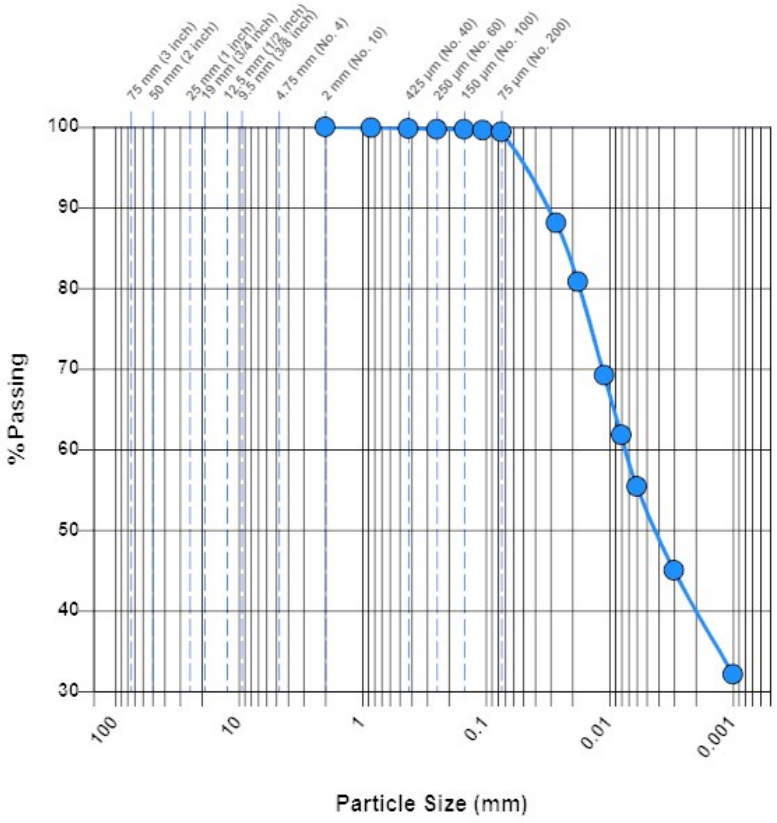
## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 482387 | **Alternate ID:** | SC-34 |
| **Sample From:** | In Place | **Sampled By:** | Client |
| **Location Details:** | Select Clay Stockpile, Sample 34 | | |
| **Sample Date:** | 09/30/2022 | | |
| **Received Date:** | 09/30/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 10/11/2022 | **Tested By:** | Ficek, Kevin |

## Laboratory Data

### Sieve-Hydrometer Analysis

| Particle Size | % Passing | Specification |
|---|---|---|
| 2 mm (No. 10) | 100.0 | - |
| 850 µm (No. 20) | 99.9 | - |
| 425 µm (No. 40) | 99.8 | - |
| 250 µm (No. 60) | 99.7 | - |
| 150 µm (No. 100) | 99.7 | - |
| 106 µm (No. 140) | 99.6 | - |
| 75 µm (No. 200) | 99.4 | - |
| 27.4 (µm) | 88.1 | - |
| 17.9 (µm) | 80.8 | - |
| 10.9 (µm) | 69.2 | - |
| 7.9 (µm) | 61.8 | - |
| 5.7 (µm) | 55.4 | - |
| 2.9 (µm) | 45.0 | - |
| 1.3 (µm) | 32.1 | - |




**Soil Classification:** CH Fat Clay

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Gravel (%):** | 0 | **Sand (%):** | 0.6 | **Silt (%):** | 47.5 | **Clay (%):** | 51.9 |

**$D_{60}$ (µm):** 7.4

## General

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10/11/2022

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Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

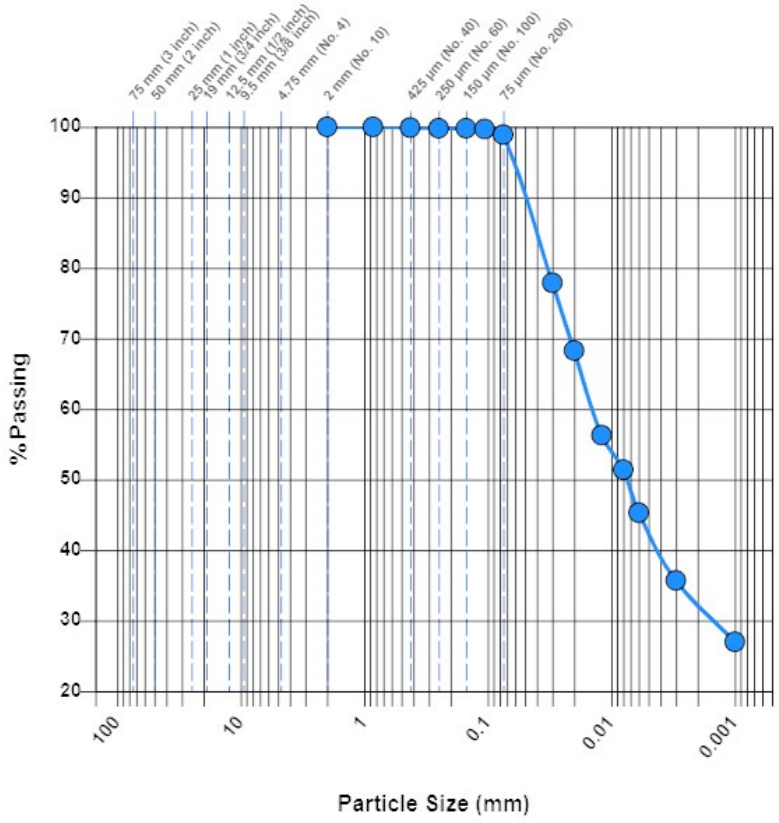
## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 482388 | **Alternate ID:** | SC-35 |
| **Sample From:** | In Place | **Sampled By:** | Client |
| **Location Details:** | Select Clay Stockpile, Sample 35 | | |
| **Sample Date:** | 09/30/2022 | | |
| **Received Date:** | 09/30/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 10/11/2022 | **Tested By:** | Ficek, Kevin |

## Laboratory Data

### Sieve-Hydrometer Analysis

| Particle Size | % Passing | Specification |
|---|---|---|
| 2 mm (No. 10) | 100.0 | - |
| 850 µm (No. 20) | 100.0 | - |
| 425 µm (No. 40) | 99.9 | - |
| 250 µm (No. 60) | 99.8 | - |
| 150 µm (No. 100) | 99.8 | - |
| 106 µm (No. 140) | 99.7 | - |
| 75 µm (No. 200) | 98.9 | - |
| 29.9 (µm) | 77.9 | - |
| 19.5 (µm) | 68.3 | - |
| 11.7 (µm) | 56.3 | - |
| 8.4 (µm) | 51.4 | - |
| 6.1 (µm) | 45.3 | - |
| 3.0 (µm) | 35.7 | - |
| 1.3 (µm) | 27.0 | - |




**Soil Classification:** CH Fat Clay

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Gravel (%):** | 0 | **Sand (%):** | 1.1 | **Silt (%):** | 56.8 | **Clay (%):** | 42.1 |
| **$D_{60}$ (µm):** | 14.5 | **$D_{30}$ (µm):** | 1.7 | | | | |

## General

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**ASTM D422**

10/11/2022

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Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

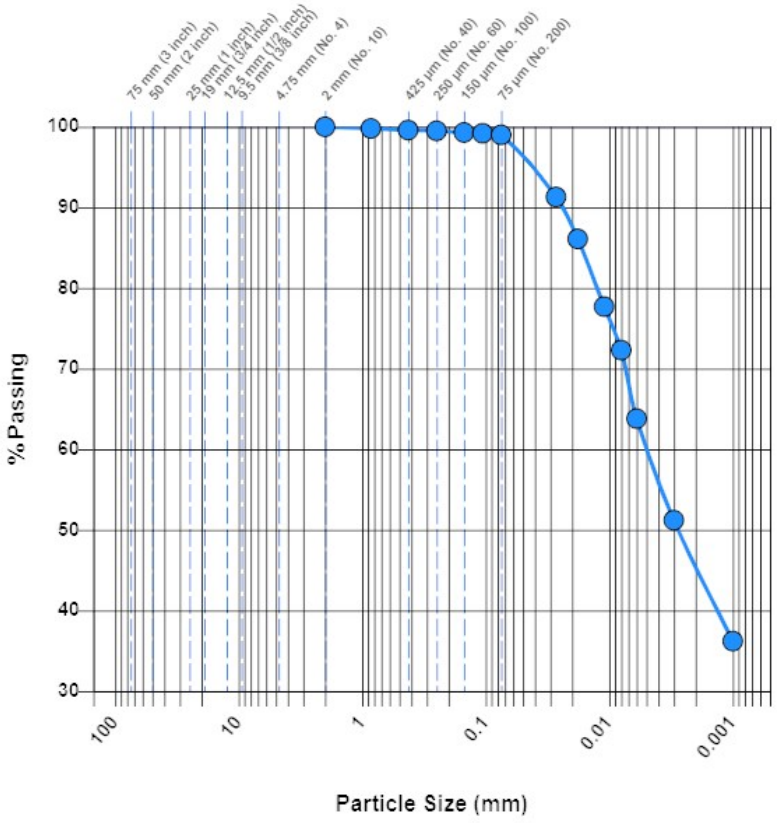
## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 482389 | **Alternate ID:** | SC-36 |
| **Sample From:** | In Place | **Sampled By:** | Client |
| **Location Details:** | Select Clay Stockpile, Sample 36 | | |
| **Sample Date:** | 09/30/2022 | | |
| **Received Date:** | 09/30/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 10/11/2022 | **Tested By:** | Ficek, Kevin |

## Laboratory Data

### Sieve-Hydrometer Analysis

| Particle Size | % Passing | Specification |
|---|---|---|
| 2 mm (No. 10) | 100.0 | - |
| 850 µm (No. 20) | 99.8 | - |
| 425 µm (No. 40) | 99.6 | - |
| 250 µm (No. 60) | 99.5 | - |
| 150 µm (No. 100) | 99.3 | - |
| 106 µm (No. 140) | 99.2 | - |
| 75 µm (No. 200) | 99.0 | - |
| 27.0 (µm) | 91.3 | - |
| 17.5 (µm) | 86.1 | - |
| 10.5 (µm) | 77.7 | - |
| 7.6 (µm) | 72.3 | - |
| 5.6 (µm) | 63.8 | - |
| 2.9 (µm) | 51.2 | - |
| 1.3 (µm) | 36.2 | - |




**Soil Classification:** CH Fat Clay

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Gravel (%):** | 0 | **Sand (%):** | 1.0 | **Silt (%):** | 39.4 | **Clay (%):** | 59.6 |
| **$D_{60}$ (µm):** | 5.1 | | | | | | |

## General

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10/10/2022

1502 Grumman Lane
Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

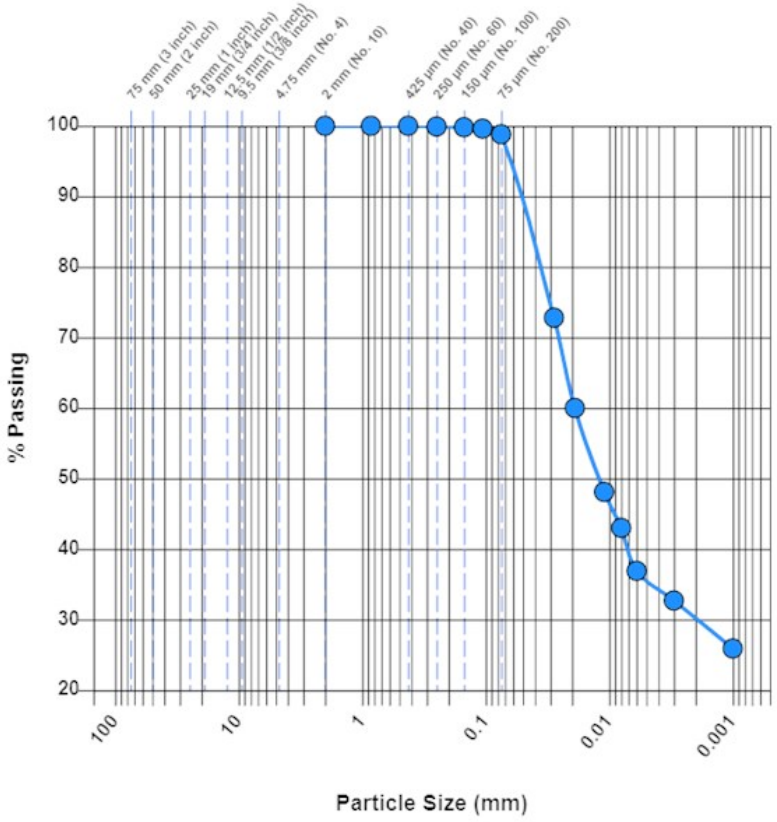
## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 483845 | **Alternate ID:** | SC-37 |
| **Sample From:** | Not Given | **Sampled By:** | Client |
| **Location Details:** | Select Clay Stockpile, Sample 37 | | |
| **Sample Date:** | 10/06/2022 | | |
| **Received Date:** | 10/06/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 10/10/2022 | **Tested By:** | Austin, Jon |

## Laboratory Data

### Sieve-Hydrometer Analysis

| Particle Size | % Passing | Specification |
|---|---|---|
| 2 mm (No. 10) | 100.0 | - |
| 850 µm (No. 20) | 100.0 | - |
| 425 µm (No. 40) | 100.0 | - |
| 250 µm (No. 60) | 99.9 | - |
| 150 µm (No. 100) | 99.8 | - |
| 106 µm (No. 140) | 99.6 | - |
| 75 µm (No. 200) | 98.8 | - |
| 27.5 (µm) | 72.8 | - |
| 18.7 (µm) | 60.0 | - |
| 11.4 (µm) | 48.1 | - |
| 8.3 (µm) | 43.0 | - |
| 6.0 (µm) | 36.9 | - |
| 3.0 (µm) | 32.7 | - |
| 1.3 (µm) | 25.9 | - |




**Soil Classification:** CH Fat Clay

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Gravel (%):** | 0 | **Sand (%):** | 1.2 | **Silt (%):** | 63.3 | **Clay (%):** | 35.5 |
| **$D_{60}$ (µm):** | 19.0 | **$D_{30}$ (µm):** | 2.2 | | | | |

## General

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

# Hydrometer And Sieve Analysis

**ASTM D422**

10/17/2022

1502 Grumman Lane
Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

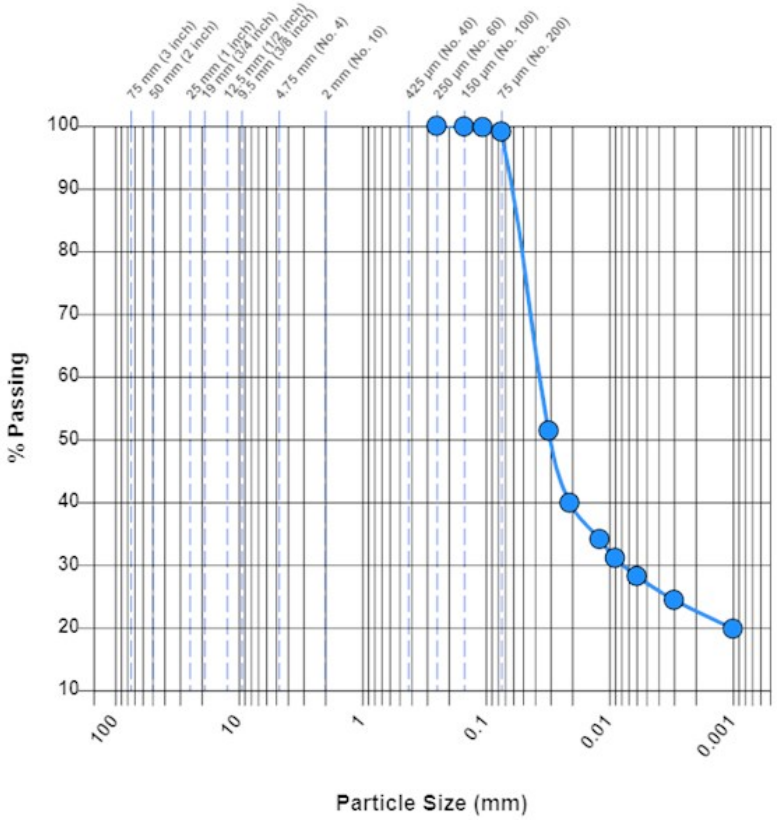
## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 486656 | **Alternate ID:** | SC-38 |
| **Sampling Method:** | Not Provided | **Sampled By:** | Client |
| **Location:** | In-place | | |
| **Location Details:** | Cell 5 Borrow Area | | |
| **Specification:** | Project | | |
| **Sample Date:** | 10/12/2022 | **Material:** | Select Fill |
| **Received Date:** | 10/12/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 10/17/2022 | **Tested By:** | Austin, Jon |

## Laboratory Data

### Sieve-Hydrometer Analysis

| Particle Size | % Passing | Specification |
|---|---|---|
| 250 µm (No. 60) | 100.0 | - |
| 150 µm (No. 100) | 99.9 | - |
| 106 µm (No. 140) | 99.8 | - |
| 75 µm (No. 200) | 99.1 | - |
| 31.1 (µm) | 51.4 | - |
| 20.5 (µm) | 39.9 | - |
| 12.1 (µm) | 34.1 | - |
| 8.7 (µm) | 31.1 | - |
| 6.2 (µm) | 28.2 | - |
| 3.1 (µm) | 24.4 | - |
| 1.3 (µm) | 19.8 | - |




**Soil Classification:** CH Fat Clay

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Gravel (%):** | 0 | **Sand (%):** | 0.9 | **Silt (%):** | 72.2 | **Clay (%):** | 26.9 |
| **$D_{60}$ (µm):** | 38.9 | **$D_{30}$ (µm):** | 7.9 | | | | |

## General

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# Hydrometer And Sieve Analysis

**ASTM D422**

11/01/2022

1502 Grumman Lane
Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

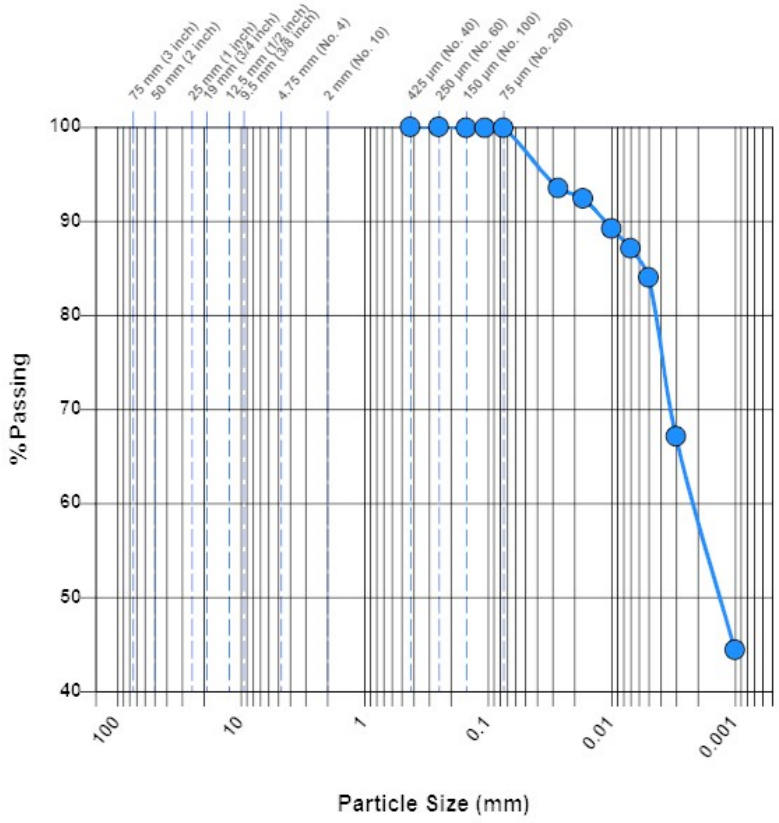
## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 488506 | **Alternate ID:** | SC-39 |
| **Sample From:** | In Place | **Sampled By:** | Client |
| **Location Details:** | Select Clay Stockpile, Sample 39 | | |
| **Sample Date:** | 10/19/2022 | | |
| **Received Date:** | 10/19/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 11/01/2022 | **Tested By:** | Ficek, Kevin |

## Laboratory Data

### Sieve-Hydrometer Analysis

| Particle Size | % Passing | Specification |
|---|---|---|
| 425 µm (No. 40) | 100.0 | - |
| 250 µm (No. 60) | 100.0 | - |
| 150 µm (No. 100) | 99.9 | - |
| 106 µm (No. 140) | 99.9 | - |
| 75 µm (No. 200) | 99.9 | - |
| 26.9 (µm) | 93.5 | - |
| 17.1 (µm) | 92.4 | - |
| 10.0 (µm) | 89.2 | - |
| 7.2 (µm) | 87.1 | - |
| 5.1 (µm) | 84.0 | - |
| 2.7 (µm) | 67.1 | - |
| 1.2 (µm) | 44.4 | - |




**Soil Classification:** CH Fat Clay

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Gravel (%):** | 0 | **Sand (%):** | 0.1 | **Silt (%):** | 15.9 | **Clay (%):** | 84.0 |

**$D_{60}$ (µm):** 2.4

## General

**Results:** The test is for informational purposes.

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# Hydrometer And Sieve Analysis

**ASTM D422**

11/01/2022

1502 Grumman Lane
Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

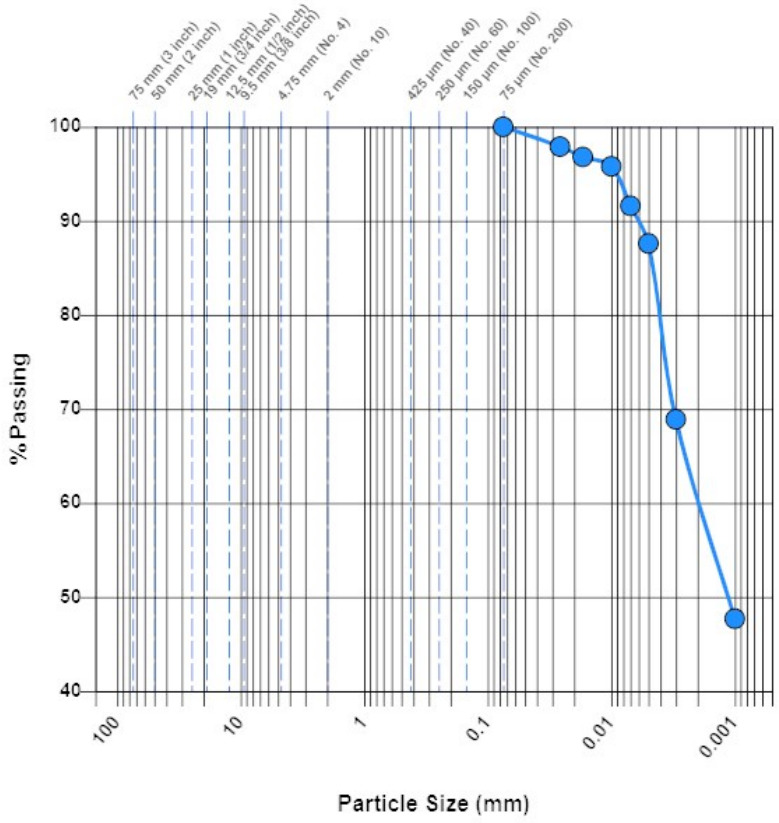
## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 488507 | **Alternate ID:** | SC-40 |
| **Sample From:** | In Place | **Sampled By:** | Client |
| **Location Details:** | Select Clay Stockpile, Sample 40 | | |
| **Sample Date:** | 10/19/2022 | | |
| **Received Date:** | 10/19/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 11/01/2022 | **Tested By:** | Ficek, Kevin |

## Laboratory Data

### Sieve-Hydrometer Analysis

| Particle Size | % Passing | Specification |
|---|---|---|
| 75 µm (No. 200) | 100.0 | - |
| 26.0 (µm) | 97.9 | - |
| 16.6 (µm) | 96.8 | - |
| 9.6 (µm) | 95.8 | - |
| 6.9 (µm) | 91.6 | - |
| 5.0 (µm) | 87.6 | - |
| 2.7 (µm) | 68.9 | - |
| 1.2 (µm) | 47.7 | - |




**Soil Classification:** CH Fat Clay

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Gravel (%):** | 0 | **Sand (%):** | 0.0 | **Silt (%):** | 12.4 | **Clay (%):** | 87.6 |

**$D_{60}$ (µm):** 2.2

## General

**Results:** The test is for informational purposes.

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# Hydrometer And Sieve Analysis

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1502 Grumman Lane
Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

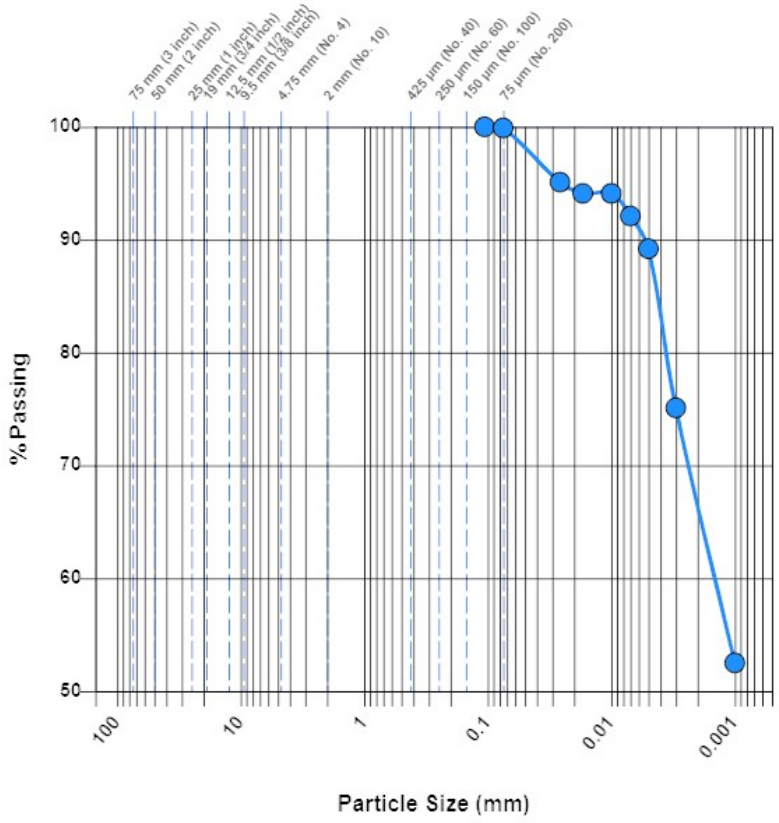
## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 488508 | **Alternate ID:** | SC-41 |
| **Sample From:** | In Place | **Sampled By:** | Client |
| **Location Details:** | Select Clay Stockpile, Sample 41 | | |
| **Sample Date:** | 10/19/2022 | | |
| **Received Date:** | 10/19/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 11/01/2022 | **Tested By:** | Ficek, Kevin |

## Laboratory Data

### Sieve-Hydrometer Analysis

| Particle Size | % Passing | Specification |
|---|---|---|
| 106 µm (No. 140) | 100.0 | - |
| 75 µm (No. 200) | 99.9 | - |
| 26.0 (µm) | 95.1 | - |
| 16.6 (µm) | 94.1 | - |
| 9.6 (µm) | 94.1 | - |
| 6.8 (µm) | 92.1 | - |
| 4.9 (µm) | 89.2 | - |
| 2.6 (µm) | 75.1 | - |
| 1.2 (µm) | 52.5 | - |




**Soil Classification:** CH Fat Clay

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Gravel (%):** | 0 | **Sand (%):** | 0.1 | **Silt (%):** | 10.7 | **Clay (%):** | 89.2 |
| **$D_{60}$ (µm):** | 1.7 | | | | | | |

## General

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Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

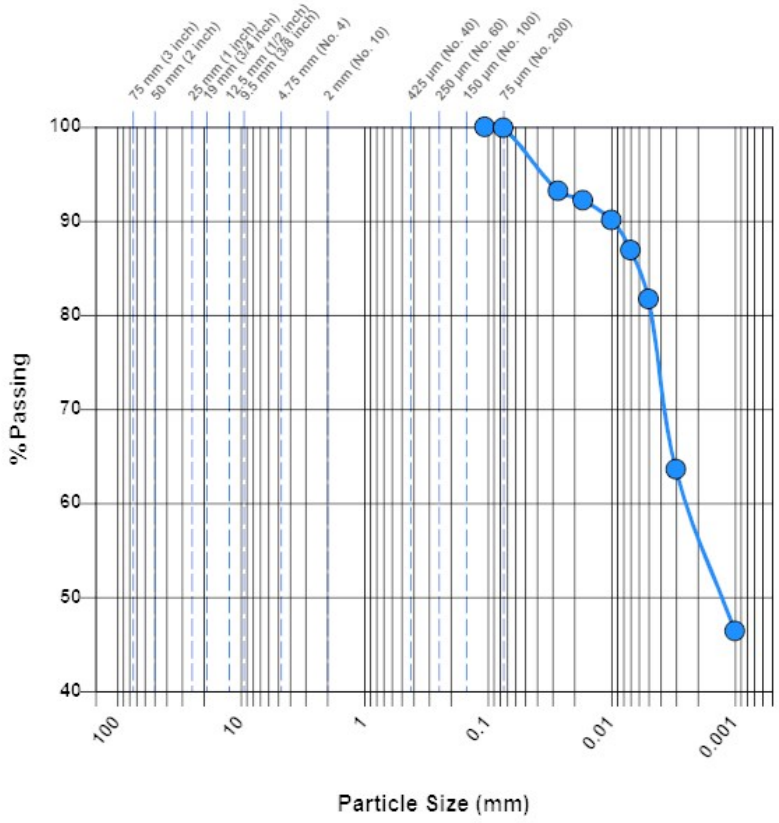
## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 488509 | **Alternate ID:** | SC-42 |
| **Sample From:** | In Place | **Sampled By:** | Client |
| **Location Details:** | Select Clay Stockpile, Sample 42 | | |
| **Sample Date:** | 10/19/2022 | | |
| **Received Date:** | 10/19/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 11/01/2022 | **Tested By:** | Ficek, Kevin |

## Laboratory Data

### Sieve-Hydrometer Analysis

| Particle Size | % Passing | Specification |
|---|---|---|
| 106 µm (No. 140) | 100.0 | - |
| 75 µm (No. 200) | 99.9 | - |
| 26.9 (µm) | 93.2 | - |
| 17.1 (µm) | 92.2 | - |
| 10.0 (µm) | 90.1 | - |
| 7.2 (µm) | 86.9 | - |
| 5.2 (µm) | 81.7 | - |
| 2.7 (µm) | 63.6 | - |
| 1.2 (µm) | 46.4 | - |




**Soil Classification:** CH Fat Clay

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Gravel (%):** | 0 | **Sand (%):** | 0.1 | **Silt (%):** | 18.2 | **Clay (%):** | 81.7 |

**$D_{60}$ (µm):** 2.6

## General

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# Hydrometer And Sieve Analysis

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11/01/2022

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Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

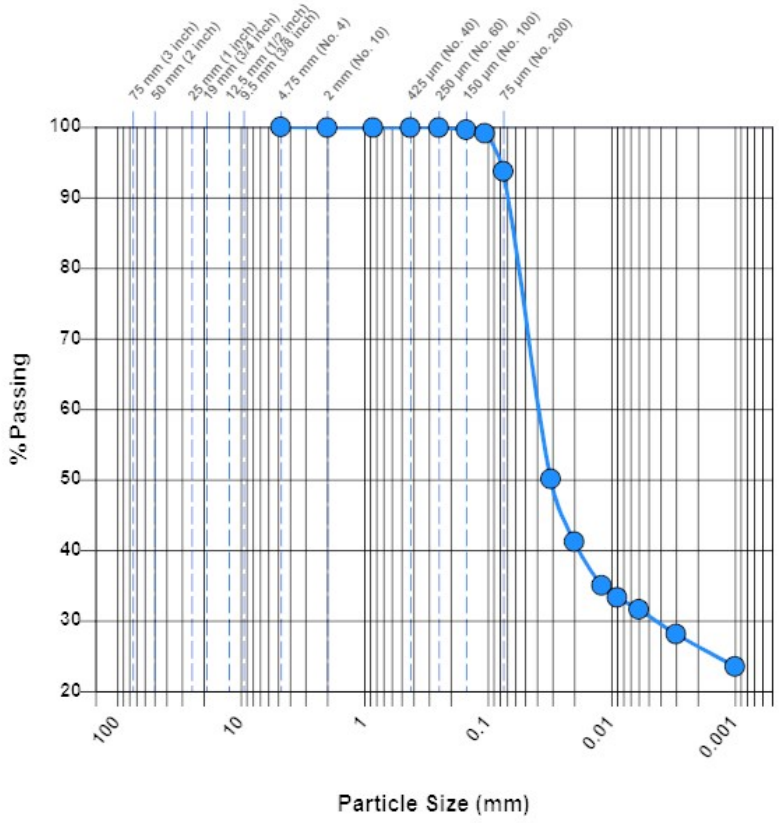
## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 488510 | **Alternate ID:** | SC-43 |
| **Sample From:** | In Place | **Sampled By:** | Client |
| **Location Details:** | Select Clay Stockpile, Sample 43 | | |
| **Sample Date:** | 10/19/2022 | | |
| **Received Date:** | 10/19/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 11/01/2022 | **Tested By:** | Ficek, Kevin |

## Laboratory Data

### Sieve-Hydrometer Analysis

| Particle Size | % Passing | Specification |
|---|---|---|
| 4.75 mm (No. 4) | 100.0 | - |
| 2 mm (No. 10) | 99.9 | - |
| 850 µm (No. 20) | 99.9 | - |
| 425 µm (No. 40) | 99.9 | - |
| 250 µm (No. 60) | 99.9 | - |
| 150 µm (No. 100) | 99.6 | - |
| 106 µm (No. 140) | 99.1 | - |
| 75 µm (No. 200) | 93.7 | - |
| 30.9 (µm) | 50.1 | - |
| 20.3 (µm) | 41.2 | - |
| 12.0 (µm) | 35.0 | - |
| 8.6 (µm) | 33.3 | - |
| 6.1 (µm) | 31.6 | - |
| 3.0 (µm) | 28.1 | - |
| 1.3 (µm) | 23.5 | - |




**Soil Classification:** CH Fat Clay

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Gravel (%):** | 0.0 | **Sand (%):** | 6.3 | **Silt (%):** | 63.3 | **Clay (%):** | 30.4 |
| **$D_{60}$ (µm):** | 41.0 | **$D_{30}$ (µm):** | 4.6 | | | | |

## General

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11/01/2022

1502 Grumman Lane
Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

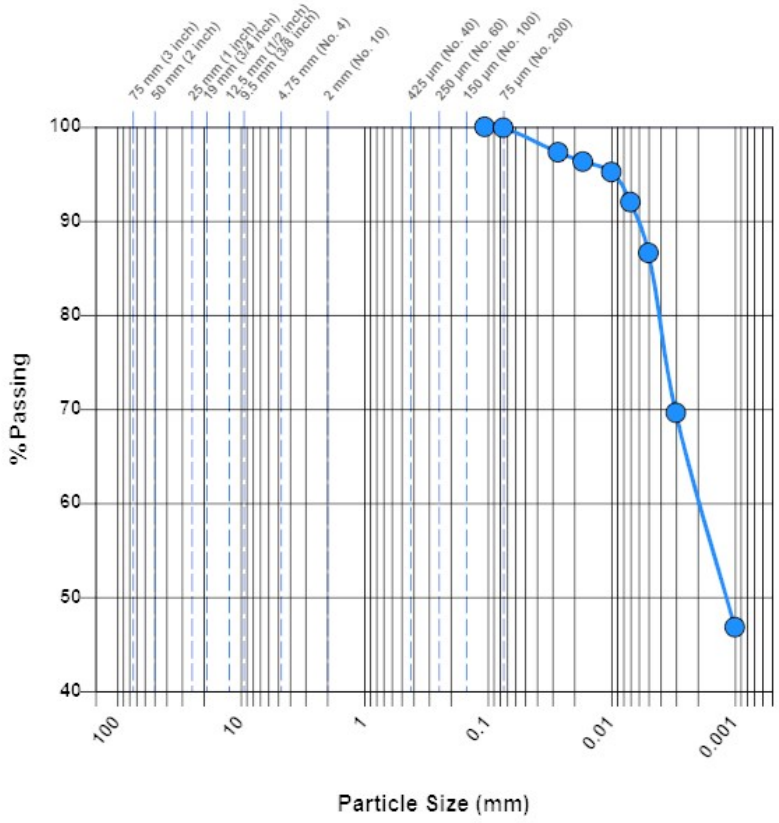
## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 488511 | **Alternate ID:** | SC-44 |
| **Sample From:** | In Place | **Sampled By:** | Client |
| **Location Details:** | Select Clay Stockpile, Sample 44 | | |
| **Sample Date:** | 10/19/2022 | | |
| **Received Date:** | 10/19/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 11/01/2022 | **Tested By:** | Ficek, Kevin |

## Laboratory Data

### Sieve-Hydrometer Analysis

| Particle Size | % Passing | Specification |
|---|---|---|
| 106 µm (No. 140) | 100.0 | - |
| 75 µm (No. 200) | 99.9 | - |
| 26.5 (µm) | 97.3 | - |
| 16.8 (µm) | 96.3 | - |
| 9.8 (µm) | 95.2 | - |
| 7.0 (µm) | 92.0 | - |
| 5.1 (µm) | 86.6 | - |
| 2.7 (µm) | 69.6 | - |
| 1.2 (µm) | 46.8 | - |




**Soil Classification:** CH Fat Clay

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Gravel (%):** | 0 | **Sand (%):** | 0.1 | **Silt (%):** | 13.3 | **Clay (%):** | 86.6 |
| **$D_{60}$ (µm):** | 2.2 | | | | | | |

## General

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1502 Grumman Lane
Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

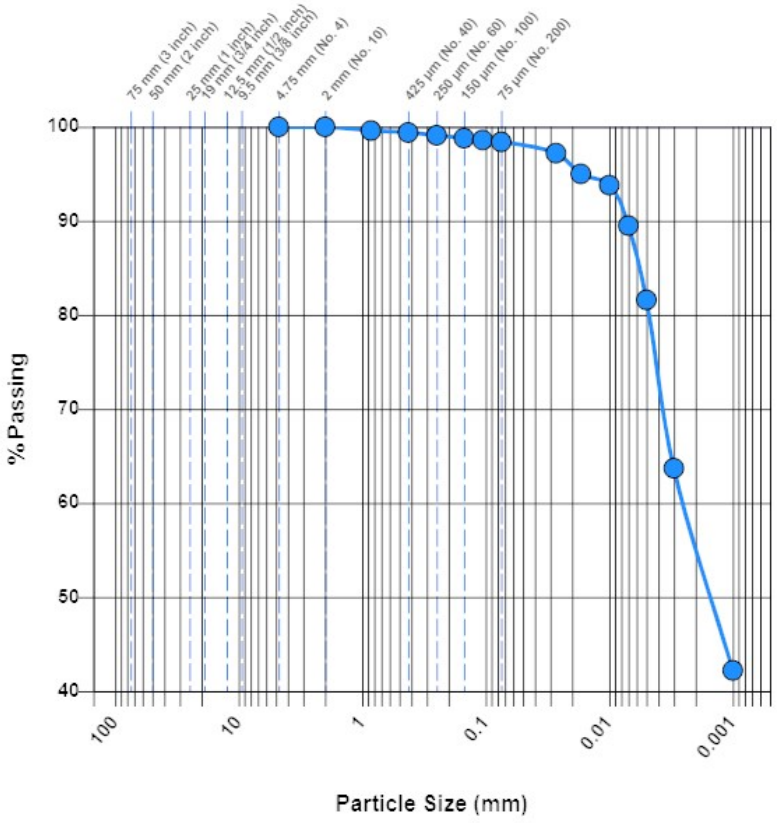
## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 488512 | **Alternate ID:** | SC-45 |
| **Sample From:** | In Place | **Sampled By:** | Client |
| **Location Details:** | Select Clay Stockpile, Sample 45 | | |
| **Sample Date:** | 10/19/2022 | | |
| **Received Date:** | 10/19/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 11/01/2022 | **Tested By:** | Ficek, Kevin |

## Laboratory Data

### Sieve-Hydrometer Analysis

| Particle Size | % Passing | Specification |
|---|---|---|
| 4.75 mm (No. 4) | 100.0 | - |
| 2 mm (No. 10) | 100.0 | - |
| 850 µm (No. 20) | 99.6 | - |
| 425 µm (No. 40) | 99.4 | - |
| 250 µm (No. 60) | 99.1 | - |
| 150 µm (No. 100) | 98.8 | - |
| 106 µm (No. 140) | 98.6 | - |
| 75 µm (No. 200) | 98.4 | - |
| 27.0 (µm) | 97.2 | - |
| 17.3 (µm) | 95.0 | - |
| 10.0 (µm) | 93.8 | - |
| 7.2 (µm) | 89.5 | - |
| 5.3 (µm) | 81.6 | - |
| 2.8 (µm) | 63.7 | - |
| 1.2 (µm) | 42.2 | - |




**Soil Classification:** CH Fat Clay

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Gravel (%):** | 0.0 | **Sand (%):** | 1.6 | **Silt (%):** | 16.8 | **Clay (%):** | 81.6 |
| **$D_{60}$ (µm):** | 2.7 | | | | | | |

## General

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# Hydrometer And Sieve Analysis

**ASTM D422**

11/23/2022

1502 Grumman Lane
Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

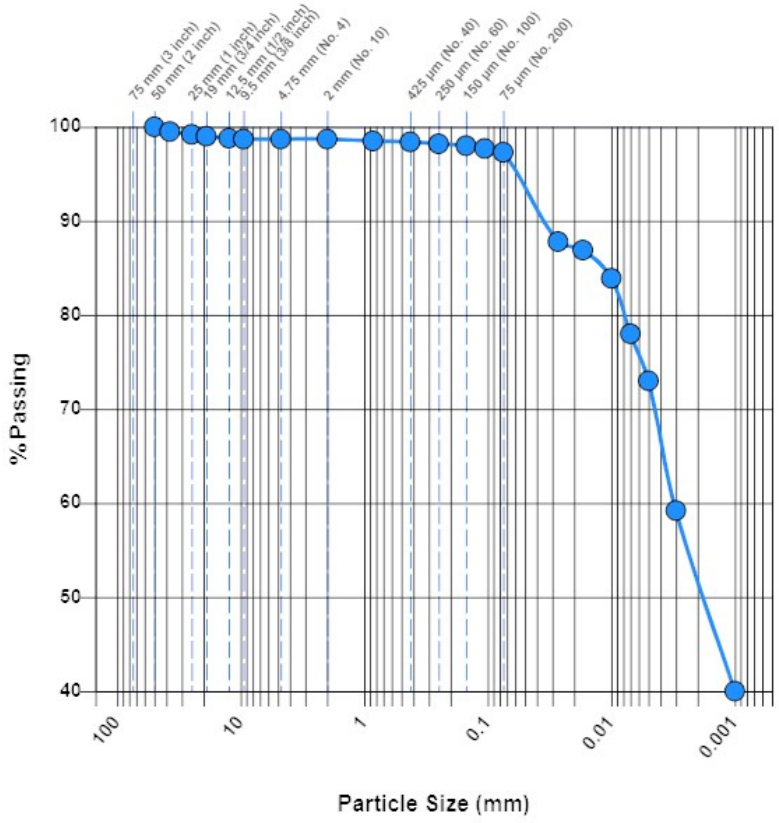
## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 491930 | **Alternate ID:** | SC-46 |
| **Sample From:** | Stockpile | **Sampled By:** | Client |
| **Location Details:** | Select Clay Stockpile, Sample 46 | | |
| **Sample Date:** | 10/28/2022 | | |
| **Received Date:** | 10/28/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 11/23/2022 | **Tested By:** | Ficek, Kevin |

## Laboratory Data

### Sieve-Hydrometer Analysis

| Particle Size | % Passing | Specification |
|---|---|---|
| 50 mm (2 inch) | 100.0 | - |
| 37.5 mm (1.5 inch) | 99.5 | - |
| 25 mm (1 inch) | 99.2 | - |
| 19 mm (3/4 inch) | 99.0 | - |
| 12.5 mm (1/2 inch) | 98.8 | - |
| 9.5 mm (3/8 inch) | 98.7 | - |
| 4.75 mm (No. 4) | 98.7 | - |
| 2 mm (No. 10) | 98.7 | - |
| 850 µm (No. 20) | 98.5 | - |
| 425 µm (No. 40) | 98.4 | - |
| 250 µm (No. 60) | 98.2 | - |
| 150 µm (No. 100) | 98.0 | - |
| 106 µm (No. 140) | 97.7 | - |
| 75 µm (No. 200) | 97.3 | - |
| 26.8 (µm) | 87.8 | - |
| 17.0 (µm) | 86.9 | - |
| 10.0 (µm) | 83.9 | - |
| 7.3 (µm) | 78.0 | - |
| 5.3 (µm) | 73.0 | - |
| 2.7 (µm) | 59.2 | - |
| 1.2 (µm) | 40.0 | - |




**Soil Classification:** CH Fat Clay

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Gravel (%):** | 1.3 | **Sand (%):** | 1.4 | **Silt (%):** | 24.3 | **Clay (%):** | 73.0 |
| **$D_{60}$ (µm):** | 3.1 | | | | | | |

## General

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Bismarck, ND 58504
Phone: 701-255-7180

# Hydrometer And Sieve Analysis

**ASTM D422**

11/23/2022

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

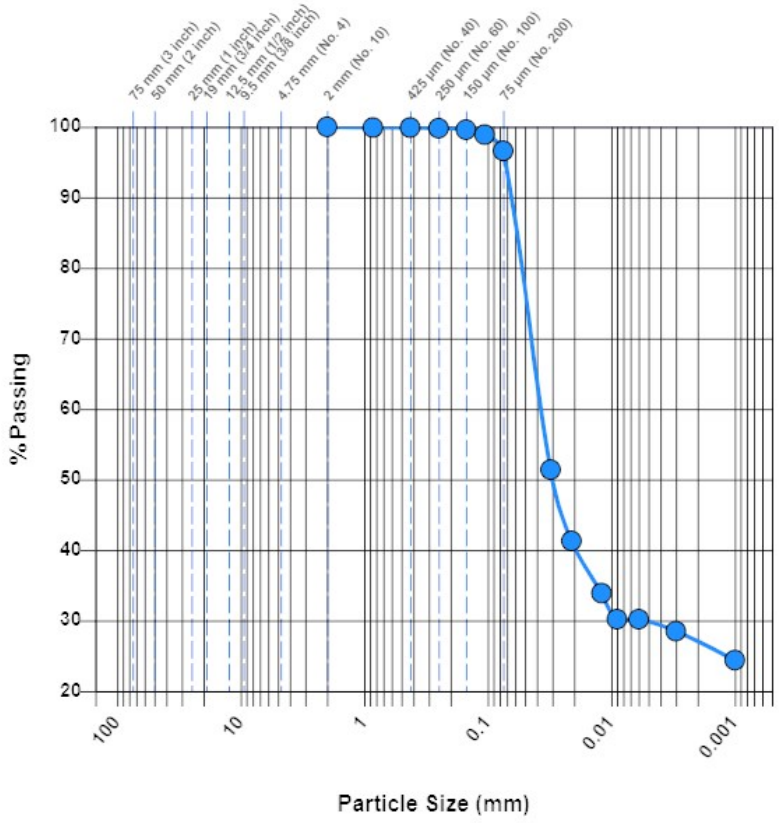
## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 491931 | **Alternate ID:** | SC-47 |
| **Sample From:** | Stockpile | **Sampled By:** | Client |
| **Location Details:** | Select Clay Stockpile, Sample 47 | | |
| **Sample Date:** | 10/28/2022 | | |
| **Received Date:** | 10/28/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 11/23/2022 | **Tested By:** | Ficek, Kevin |

## Laboratory Data

### Sieve-Hydrometer Analysis

| Particle Size | % Passing | Specification |
|---|---|---|
| 2 mm (No. 10) | 100.0 | - |
| 850 µm (No. 20) | 99.9 | - |
| 425 µm (No. 40) | 99.9 | - |
| 250 µm (No. 60) | 99.8 | - |
| 150 µm (No. 100) | 99.6 | - |
| 106 µm (No. 140) | 98.9 | - |
| 75 µm (No. 200) | 96.6 | - |
| 31.1 (µm) | 51.4 | - |
| 20.5 (µm) | 41.3 | - |
| 12.2 (µm) | 33.9 | - |
| 8.7 (µm) | 30.2 | - |
| 6.2 (µm) | 30.2 | - |
| 3.0 (µm) | 28.5 | - |
| 1.3 (µm) | 24.4 | - |




**Soil Classification:** CH Fat Clay

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Gravel (%):** | 0 | **Sand (%):** | 3.4 | **Silt (%):** | 67.0 | **Clay (%):** | 29.6 |
| **$D_{60}$ (µm):** | 39.4 | **$D_{30}$ (µm):** | 5.6 | | | | |

## General

**Results:** The test is for informational purposes.

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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Phone: 701-255-7180

# Hydrometer And Sieve Analysis

**ASTM D422**

11/23/2022

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

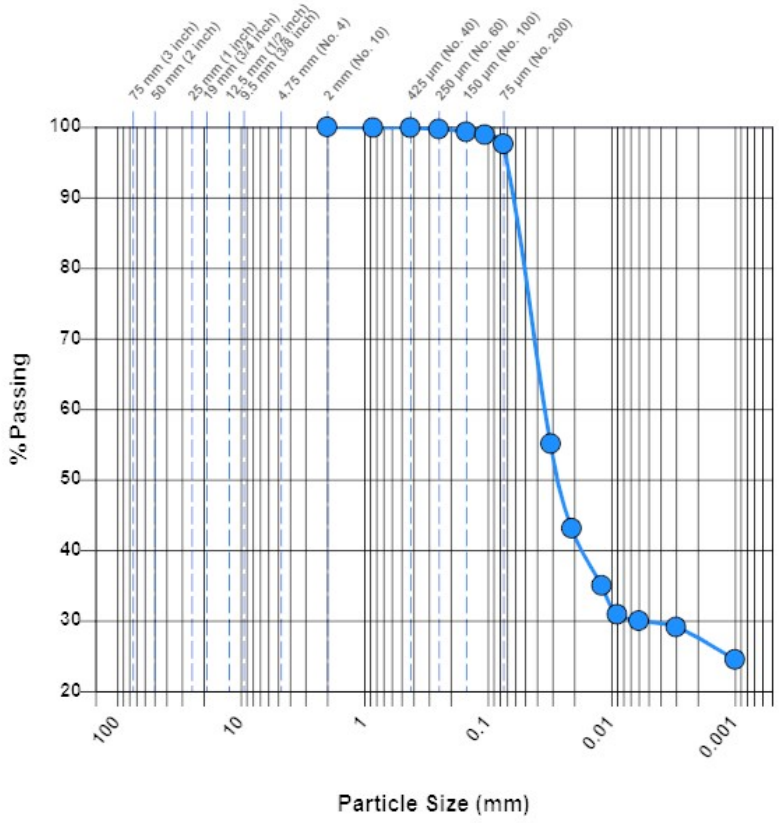
## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 491932 | **Alternate ID:** | SC-48 |
| **Sample From:** | Stockpile | **Sampled By:** | Client |
| **Location Details:** | Select Clay Stockpile, Sample 48 | | |
| **Sample Date:** | 10/28/2022 | | |
| **Received Date:** | 10/28/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 11/23/2022 | **Tested By:** | Ficek, Kevin |

## Laboratory Data

### Sieve-Hydrometer Analysis

| Particle Size | % Passing | Specification |
|---|---|---|
| 2 mm (No. 10) | 100.0 | - |
| 850 µm (No. 20) | 99.9 | - |
| 425 µm (No. 40) | 99.9 | - |
| 250 µm (No. 60) | 99.7 | - |
| 150 µm (No. 100) | 99.3 | - |
| 106 µm (No. 140) | 98.9 | - |
| 75 µm (No. 200) | 97.6 | - |
| 31.1 (µm) | 55.1 | - |
| 20.6 (µm) | 43.1 | - |
| 12.2 (µm) | 35.0 | - |
| 8.8 (µm) | 30.9 | - |
| 6.2 (µm) | 30.0 | - |
| 3.0 (µm) | 29.1 | - |
| 1.3 (µm) | 24.5 | - |




**Soil Classification:** CH Fat Clay

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Gravel (%):** | 0 | **Sand (%):** | 2.4 | **Silt (%):** | 67.9 | **Clay (%):** | 29.7 |
| **$D_{60}$ (µm):** | 36.1 | **$D_{30}$ (µm):** | 6.0 | | | | |

## General

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Phone: 701-255-7180

# Hydrometer And Sieve Analysis

**ASTM D422**

11/23/2022

| **Client:** | **Project:** |
|---|---|
| Minnkota Power Cooperative, Inc.<br>5301 32nd Ave S<br>Grand Forks, ND 58201 | B2205914<br>Cell 5 Phase 1A<br>Milton Young Station<br>Center, ND |

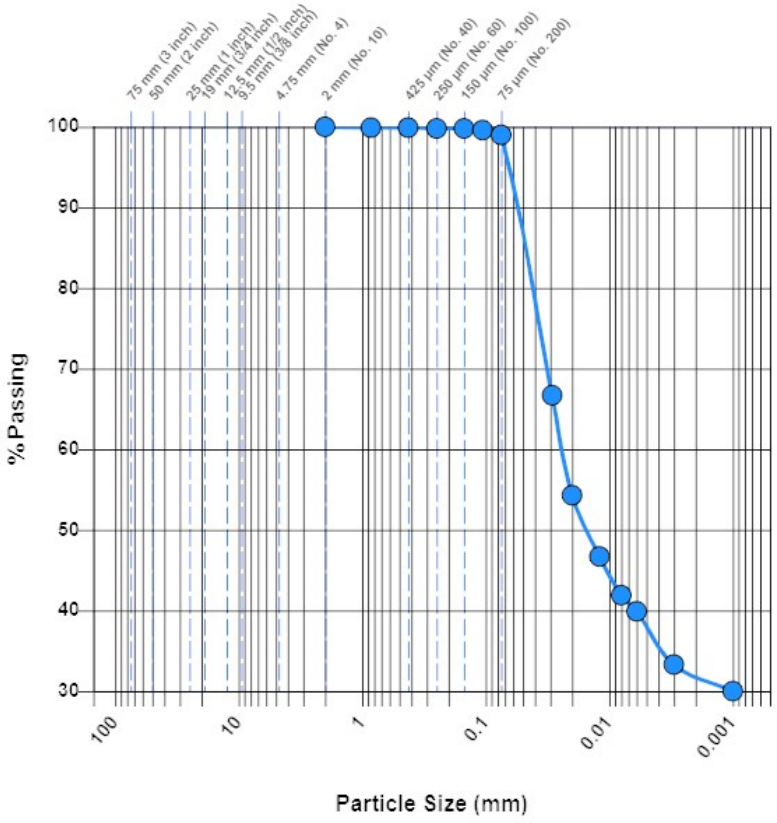
## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 491933 | **Alternate ID:** | SC-49 |
| **Sample From:** | Stockpile | **Sampled By:** | Client |
| **Location Details:** | Select Clay Stockpile, Sample 49 | | |
| **Sample Date:** | 10/28/2022 | | |
| **Received Date:** | 10/28/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 11/23/2022 | **Tested By:** | Ficek, Kevin |

## Laboratory Data

### Sieve-Hydrometer Analysis

| Particle Size | % Passing | Specification |
|---|---|---|
| 2 mm (No. 10) | 100.0 | - |
| 850 µm (No. 20) | 99.9 | - |
| 425 µm (No. 40) | 99.9 | - |
| 250 µm (No. 60) | 99.8 | - |
| 150 µm (No. 100) | 99.8 | - |
| 106 µm (No. 140) | 99.6 | - |
| 75 µm (No. 200) | 99.0 | - |
| 29.3 (µm) | 66.7 | - |
| 19.5 (µm) | 54.3 | - |
| 11.6 (µm) | 46.7 | - |
| 8.4 (µm) | 41.9 | - |
| 6.0 (µm) | 39.9 | - |
| 3.0 (µm) | 33.3 | - |
| 1.3 (µm) | 30.0 | - |




**Soil Classification:** CH Fat Clay

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Gravel (%):** | 0 | **Sand (%):** | 1.0 | **Silt (%):** | 61.3 | **Clay (%):** | 37.7 |
| **$D_{60}$ (µm):** | 24.1 | **$D_{30}$ (µm):** | 1.0 | | | | |

## General

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# Hydrometer And Sieve Analysis

**ASTM D422**

11/23/2022

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

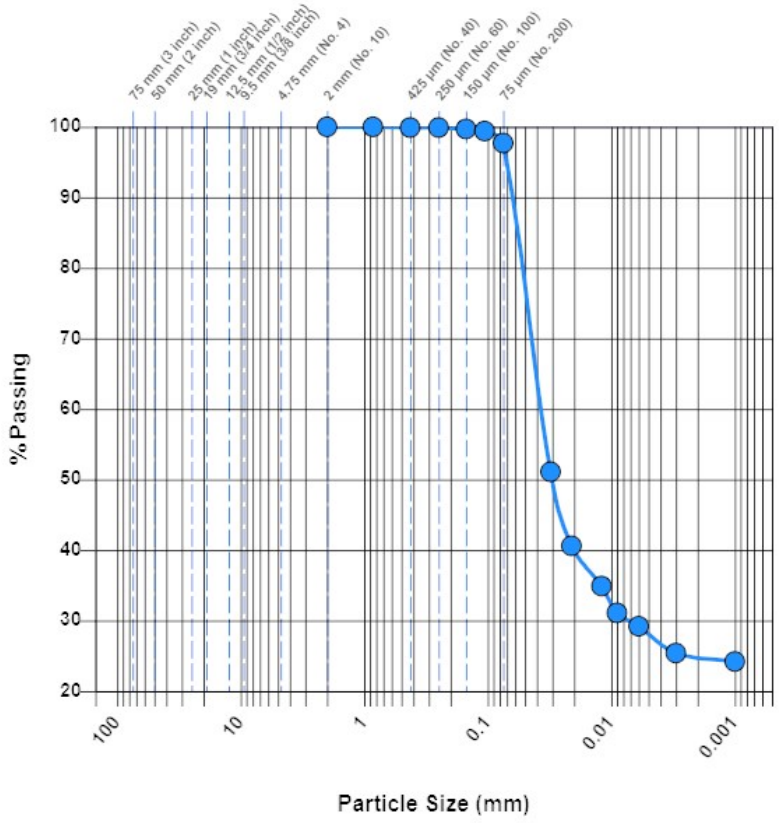
## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 491934 | **Alternate ID:** | SC-50 |
| **Sample From:** | Stockpile | **Sampled By:** | Client |
| **Location Details:** | Select Clay Stockpile, Sample 50 | | |
| **Sample Date:** | 10/28/2022 | | |
| **Received Date:** | 10/28/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 11/23/2022 | **Tested By:** | Ficek, Kevin |

## Laboratory Data

### Sieve-Hydrometer Analysis

| Particle Size | % Passing | Specification |
|---|---|---|
| 2 mm (No. 10) | 100.0 | - |
| 850 µm (No. 20) | 100.0 | - |
| 425 µm (No. 40) | 99.9 | - |
| 250 µm (No. 60) | 99.9 | - |
| 150 µm (No. 100) | 99.7 | - |
| 106 µm (No. 140) | 99.4 | - |
| 75 µm (No. 200) | 97.7 | - |
| 31.3 (µm) | 51.1 | - |
| 20.6 (µm) | 40.6 | - |
| 12.2 (µm) | 34.9 | - |
| 8.7 (µm) | 31.1 | - |
| 6.2 (µm) | 29.2 | - |
| 3.1 (µm) | 25.4 | - |
| 1.3 (µm) | 24.2 | - |




**Soil Classification:** CH Fat Clay

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Gravel (%):** | 0 | **Sand (%):** | 2.3 | **Silt (%):** | 69.8 | **Clay (%):** | 27.9 |
| **$D_{60}$ (µm):** | 39.4 | **$D_{30}$ (µm):** | 7.3 | | | | |

## General

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# Hydrometer And Sieve Analysis

**ASTM D422**

11/23/2022

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

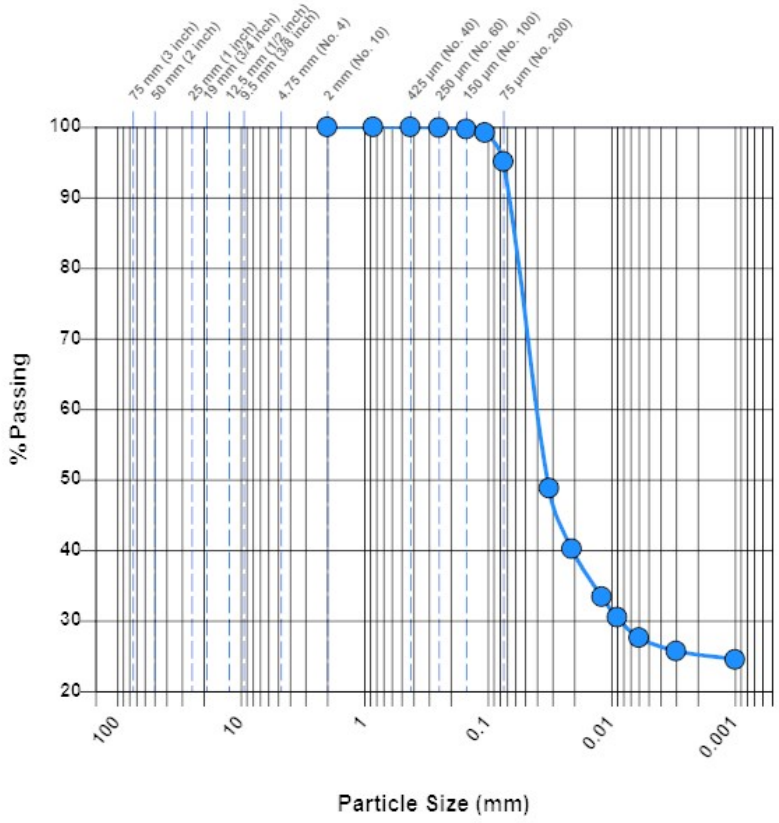
## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 491935 | **Alternate ID:** | SC-51 |
| **Sample From:** | Stockpile | **Sampled By:** | Client |
| **Location Details:** | Select Clay Stockpile, Sample 51 | | |
| **Sample Date:** | 10/28/2022 | | |
| **Received Date:** | 10/28/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 11/23/2022 | **Tested By:** | Ficek, Kevin |

## Laboratory Data

### Sieve-Hydrometer Analysis

| Particle Size | % Passing | Specification |
|---|---|---|
| 2 mm (No. 10) | 100.0 | - |
| 850 µm (No. 20) | 100.0 | - |
| 425 µm (No. 40) | 100.0 | - |
| 250 µm (No. 60) | 99.9 | - |
| 150 µm (No. 100) | 99.7 | - |
| 106 µm (No. 140) | 99.2 | - |
| 75 µm (No. 200) | 95.1 | - |
| 31.7 (µm) | 48.8 | - |
| 20.7 (µm) | 40.2 | - |
| 12.2 (µm) | 33.4 | - |
| 8.7 (µm) | 30.5 | - |
| 6.2 (µm) | 27.6 | - |
| 3.1 (µm) | 25.7 | - |
| 1.3 (µm) | 24.5 | - |




**Soil Classification:** CH Fat Clay

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Gravel (%):** | 0 | **Sand (%):** | 4.9 | **Silt (%):** | 68.1 | **Clay (%):** | 27.0 |
| **$D_{60}$ (µm):** | 42.4 | **$D_{30}$ (µm):** | 8.5 | | | | |

## General

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# Hydrometer And Sieve Analysis

**ASTM D422**

11/23/2022

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

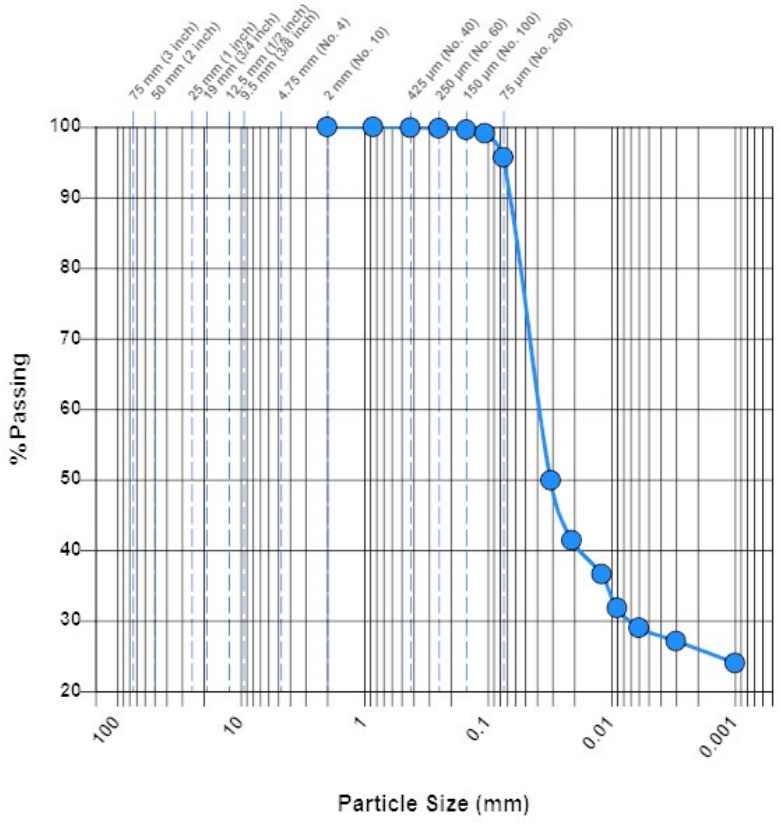
## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 491936 | **Alternate ID:** | SC-52 |
| **Sample From:** | Stockpile | **Sampled By:** | Client |
| **Location Details:** | Select Clay Stockpile, Sample 52 | | |
| **Sample Date:** | 10/28/2022 | | |
| **Received Date:** | 10/28/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 11/23/2022 | **Tested By:** | Ficek, Kevin |

## Laboratory Data

### Sieve-Hydrometer Analysis

| Particle Size | % Passing | Specification |
|---|---|---|
| 2 mm (No. 10) | 100.0 | - |
| 850 µm (No. 20) | 100.0 | - |
| 425 µm (No. 40) | 99.9 | - |
| 250 µm (No. 60) | 99.8 | - |
| 150 µm (No. 100) | 99.6 | - |
| 106 µm (No. 140) | 99.1 | - |
| 75 µm (No. 200) | 95.7 | - |
| 31.4 (µm) | 49.9 | - |
| 20.5 (µm) | 41.4 | - |
| 12.1 (µm) | 36.6 | - |
| 8.7 (µm) | 31.8 | - |
| 6.2 (µm) | 29.0 | - |
| 3.1 (µm) | 27.1 | - |
| 1.3 (µm) | 24.0 | - |




**Soil Classification:** CH Fat Clay

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Gravel (%):** | 0 | **Sand (%):** | 4.3 | **Silt (%):** | 67.3 | **Clay (%):** | 28.4 |
| **$D_{60}$ (µm):** | 40.7 | **$D_{30}$ (µm):** | 7.1 | | | | |

## General

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# Hydrometer And Sieve Analysis

**ASTM D422**

11/23/2022

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

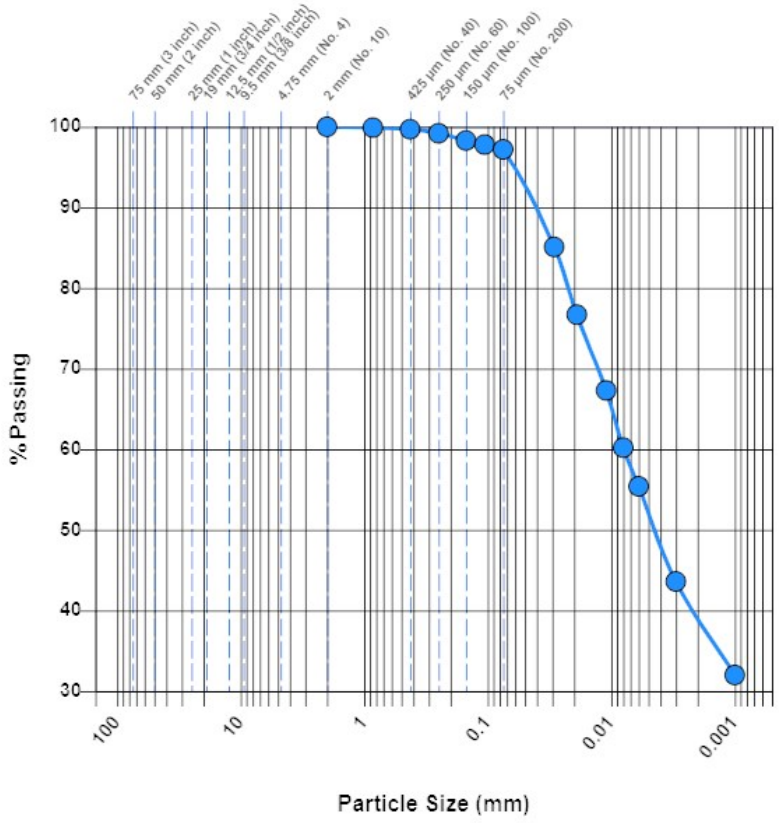
## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 491937 | **Alternate ID:** | SC-53 |
| **Sample From:** | Stockpile | **Sampled By:** | Client |
| **Location Details:** | Select Clay Stockpile, Sample 53 | | |
| **Sample Date:** | 11/03/2022 | | |
| **Received Date:** | 11/03/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 11/23/2022 | **Tested By:** | Ficek, Kevin |

## Laboratory Data

### Sieve-Hydrometer Analysis

| Particle Size | % Passing | Specification |
|---|---|---|
| 2 mm (No. 10) | 100.0 | - |
| 850 µm (No. 20) | 99.9 | - |
| 425 µm (No. 40) | 99.7 | - |
| 250 µm (No. 60) | 99.2 | - |
| 150 µm (No. 100) | 98.3 | - |
| 106 µm (No. 140) | 97.8 | - |
| 75 µm (No. 200) | 97.2 | - |
| 28.9 (µm) | 85.1 | - |
| 18.9 (µm) | 76.7 | - |
| 11.3 (µm) | 67.3 | - |
| 8.1 (µm) | 60.2 | - |
| 5.8 (µm) | 55.4 | - |
| 3.0 (µm) | 43.6 | - |
| 1.3 (µm) | 32.0 | - |




**Soil Classification:** CH Fat Clay

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Gravel (%):** | 0 | **Sand (%):** | 2.8 | **Silt (%):** | 45.7 | **Clay (%):** | 51.5 |

**$D_{60}$ (µm):** 7.9

## General

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# Hydrometer And Sieve Analysis

**ASTM D422**

11/23/2022

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Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

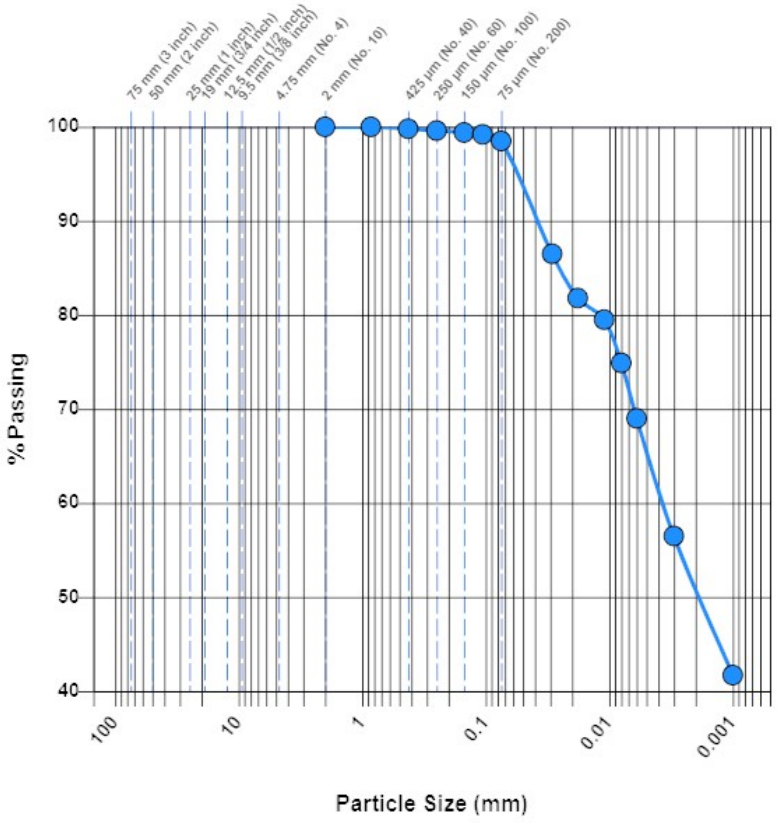
## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 491938 | **Alternate ID:** | SC-54 |
| **Sample From:** | Stockpile | **Sampled By:** | Client |
| **Location Details:** | Select Clay Stockpile, Sample 54 | | |
| **Sample Date:** | 11/03/2022 | | |
| **Received Date:** | 11/03/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 11/23/2022 | **Tested By:** | Ficek, Kevin |

## Laboratory Data

### Sieve-Hydrometer Analysis

| Particle Size | % Passing | Specification |
|---|---|---|
| 2 mm (No. 10) | 100.0 | - |
| 850 µm (No. 20) | 100.0 | - |
| 425 µm (No. 40) | 99.8 | - |
| 250 µm (No. 60) | 99.6 | - |
| 150 µm (No. 100) | 99.4 | - |
| 106 µm (No. 140) | 99.2 | - |
| 75 µm (No. 200) | 98.5 | - |
| 28.6 (µm) | 86.5 | - |
| 18.4 (µm) | 81.8 | - |
| 10.7 (µm) | 79.5 | - |
| 7.7 (µm) | 74.9 | - |
| 5.6 (µm) | 69.0 | - |
| 2.8 (µm) | 56.5 | - |
| 1.2 (µm) | 41.7 | - |




**Soil Classification:** CH Fat Clay

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Gravel (%):** | 0 | **Sand (%):** | 1.5 | **Silt (%):** | 33.7 | **Clay (%):** | 64.8 |
| **$D_{60}$ (µm):** | 3.8 | | | | | | |

## General

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# Hydrometer And Sieve Analysis

**ASTM D422**

11/23/2022

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Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

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5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

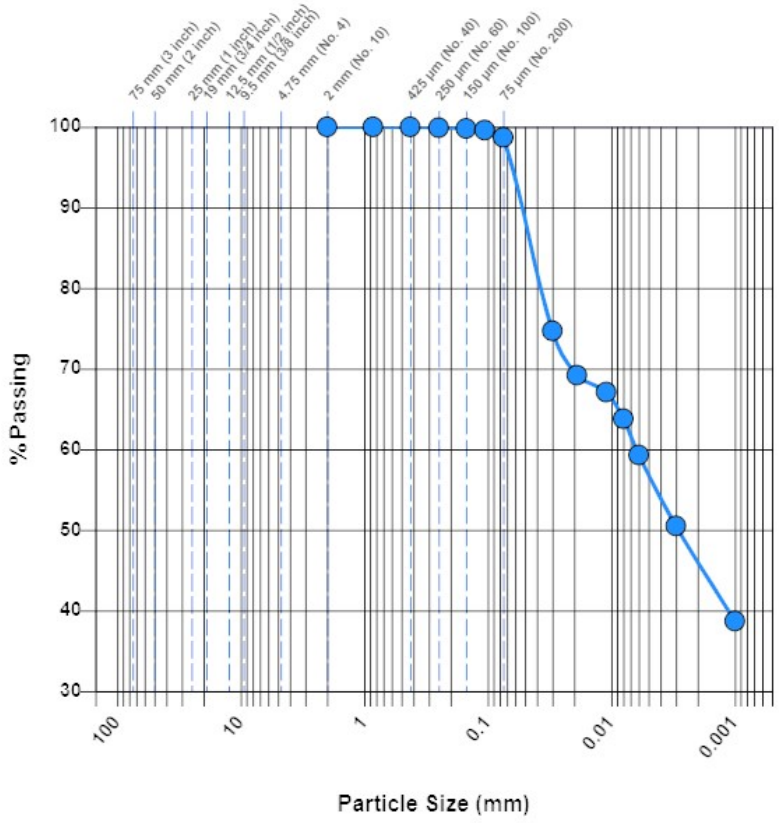
## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 491939 | **Alternate ID:** | SC-55 |
| **Sample From:** | Stockpile | **Sampled By:** | Client |
| **Location Details:** | Select Clay Stockpile, Sample 55 | | |
| **Sample Date:** | 11/03/2022 | | |
| **Received Date:** | 11/03/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 11/23/2022 | **Tested By:** | Ficek, Kevin |

## Laboratory Data

### Sieve-Hydrometer Analysis

| Particle Size | % Passing | Specification |
|---|---|---|
| 2 mm (No. 10) | 100.0 | - |
| 850 µm (No. 20) | 100.0 | - |
| 425 µm (No. 40) | 100.0 | - |
| 250 µm (No. 60) | 99.9 | - |
| 150 µm (No. 100) | 99.8 | - |
| 106 µm (No. 140) | 99.6 | - |
| 75 µm (No. 200) | 98.7 | - |
| 29.5 (µm) | 74.7 | - |
| 19.1 (µm) | 69.2 | - |
| 11.1 (µm) | 67.1 | - |
| 7.9 (µm) | 63.8 | - |
| 5.7 (µm) | 59.3 | - |
| 2.9 (µm) | 50.5 | - |
| 1.2 (µm) | 38.7 | - |




**Soil Classification:** CH Fat Clay

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Gravel (%):** | 0 | **Sand (%):** | 1.3 | **Silt (%):** | 42.3 | **Clay (%):** | 56.4 |
| **$D_{60}$ (µm):** | 6.3 | | | | | | |

## General

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# Hydrometer And Sieve Analysis

**ASTM D422**

11/23/2022

1502 Grumman Lane
Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

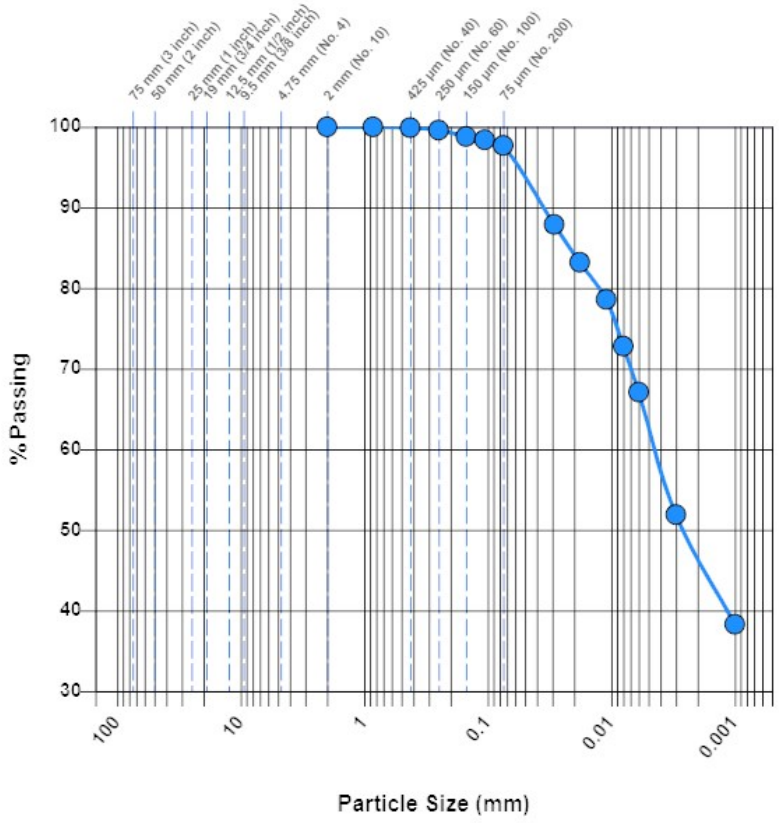
## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 491940 | **Alternate ID:** | SC-56 |
| **Sample From:** | Stockpile | **Sampled By:** | Client |
| **Location Details:** | Select Clay Stockpile, Sample 56 | | |
| **Sample Date:** | 11/03/2022 | | |
| **Received Date:** | 11/03/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 11/23/2022 | **Tested By:** | Ficek, Kevin |

## Laboratory Data

### Sieve-Hydrometer Analysis

| Particle Size | % Passing | Specification |
|---|---|---|
| 2 mm (No. 10) | 100.0 | - |
| 850 µm (No. 20) | 100.0 | - |
| 425 µm (No. 40) | 99.9 | - |
| 250 µm (No. 60) | 99.6 | - |
| 150 µm (No. 100) | 98.8 | - |
| 106 µm (No. 140) | 98.4 | - |
| 75 µm (No. 200) | 97.7 | - |
| 28.5 (µm) | 87.9 | - |
| 18.3 (µm) | 83.2 | - |
| 10.8 (µm) | 78.6 | - |
| 7.8 (µm) | 72.8 | - |
| 5.6 (µm) | 67.1 | - |
| 2.9 (µm) | 51.9 | - |
| 1.2 (µm) | 38.3 | - |




**Soil Classification:** CH Fat Clay

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Gravel (%):** | 0 | **Sand (%):** | 2.3 | **Silt (%):** | 35.7 | **Clay (%):** | 62.0 |

**$D_{60}$ (µm):** 4.6

## General

**Results:** The test is for informational purposes.

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1502 Grumman Lane
Bismarck, ND 58504
Phone: 701-255-7180

# Hydrometer And Sieve Analysis

**ASTM D422**

11/23/2022

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

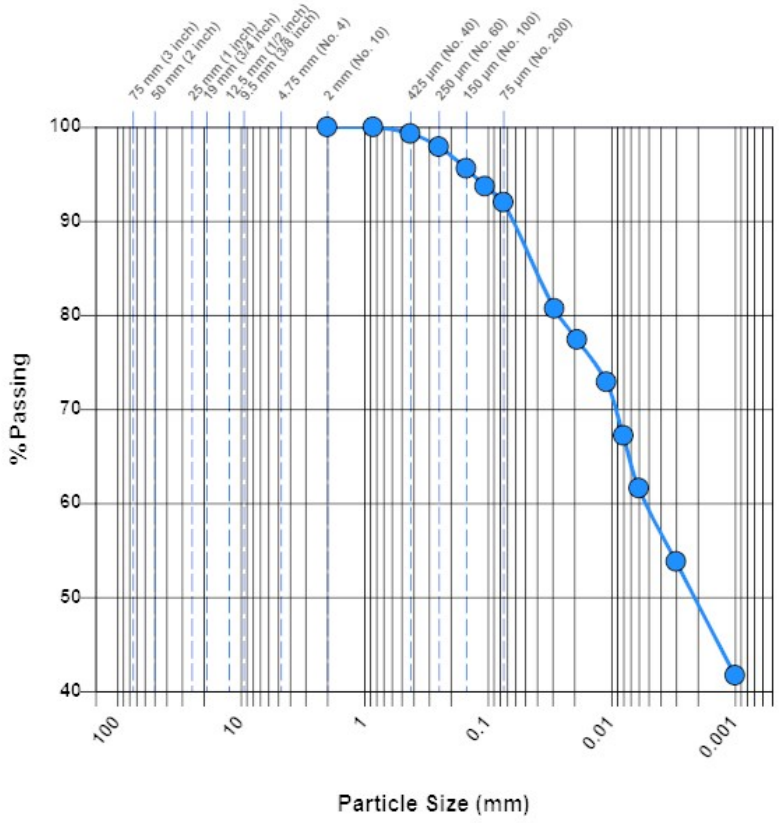
## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 491941 | **Alternate ID:** | SC-57 |
| **Sample From:** | Stockpile | **Sampled By:** | Client |
| **Location Details:** | Select Clay Stockpile, Sample 57 | | |
| **Sample Date:** | 11/03/2022 | | |
| **Received Date:** | 11/03/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 11/23/2022 | **Tested By:** | Ficek, Kevin |

## Laboratory Data

### Sieve-Hydrometer Analysis

| Particle Size | % Passing | Specification |
|---|---|---|
| 2 mm (No. 10) | 100.0 | - |
| 850 µm (No. 20) | 100.0 | - |
| 425 µm (No. 40) | 99.3 | - |
| 250 µm (No. 60) | 97.9 | - |
| 150 µm (No. 100) | 95.6 | - |
| 106 µm (No. 140) | 93.7 | - |
| 75 µm (No. 200) | 92.0 | - |
| 29.0 (µm) | 80.7 | - |
| 18.6 (µm) | 77.4 | - |
| 10.9 (µm) | 72.9 | - |
| 7.9 (µm) | 67.2 | - |
| 5.7 (µm) | 61.6 | - |
| 2.9 (µm) | 53.8 | - |
| 1.2 (µm) | 41.7 | - |




**Soil Classification:** CH Fat Clay

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Gravel (%):** | 0 | **Sand (%):** | 8.0 | **Silt (%):** | 33.0 | **Clay (%):** | 59.0 |

**$D_{60}$ (µm):** 5.4

## General

**Results:** The test is for informational purposes.

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# Hydrometer And Sieve Analysis

**ASTM D422**

11/23/2022

1502 Grumman Lane
Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

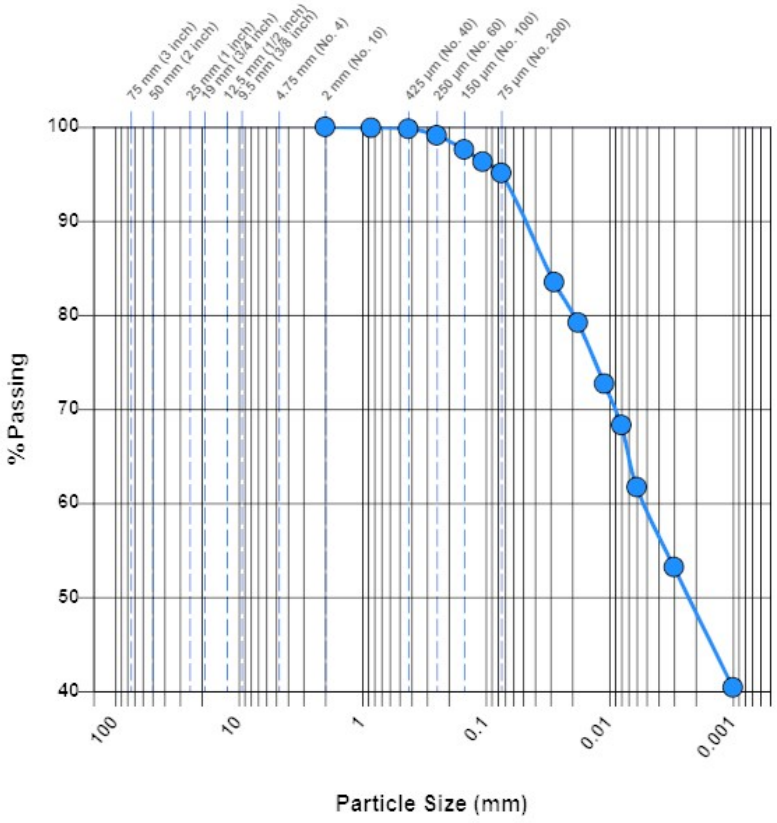
## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 491942 | **Alternate ID:** | SC-58 |
| **Sample From:** | Stockpile | **Sampled By:** | Client |
| **Location Details:** | Select Clay Stockpile, Sample 58 | | |
| **Sample Date:** | 11/03/2022 | | |
| **Received Date:** | 11/03/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 11/23/2022 | **Tested By:** | Ficek, Kevin |

## Laboratory Data

### Sieve-Hydrometer Analysis

| Particle Size | % Passing | Specification |
|---|---|---|
| 2 mm (No. 10) | 100.0 | - |
| 850 µm (No. 20) | 99.9 | - |
| 425 µm (No. 40) | 99.8 | - |
| 250 µm (No. 60) | 99.1 | - |
| 150 µm (No. 100) | 97.6 | - |
| 106 µm (No. 140) | 96.3 | - |
| 75 µm (No. 200) | 95.1 | - |
| 28.4 (µm) | 83.5 | - |
| 18.3 (µm) | 79.2 | - |
| 10.8 (µm) | 72.7 | - |
| 7.8 (µm) | 68.3 | - |
| 5.6 (µm) | 61.7 | - |
| 2.8 (µm) | 53.2 | - |
| 1.2 (µm) | 40.4 | - |




**Soil Classification:** CH Fat Clay

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Gravel (%):** | 0 | **Sand (%):** | 4.9 | **Silt (%):** | 36.2 | **Clay (%):** | 58.9 |
| **$D_{60}$ (µm):** | 5.4 | | | | | | |

## General

**Results:** The test is for informational purposes.

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# Hydrometer And Sieve Analysis

**ASTM D422**

11/23/2022

1502 Grumman Lane
Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

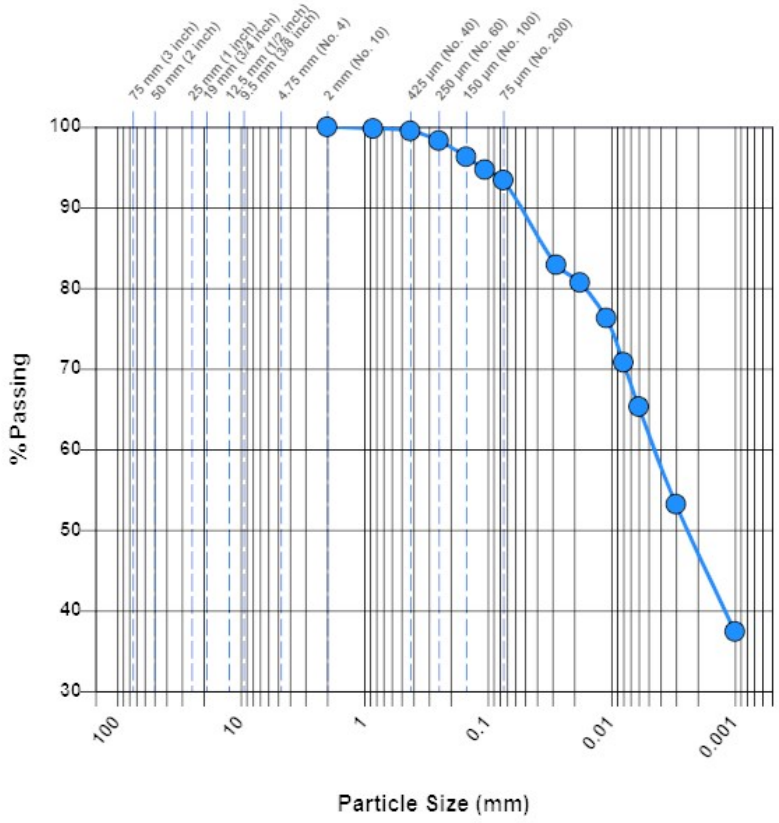
## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 491943 | **Alternate ID:** | SC-59 |
| **Sample From:** | Stockpile | **Sampled By:** | Client |
| **Location Details:** | Select Clay Stockpile, Sample 59 | | |
| **Sample Date:** | 11/03/2022 | | |
| **Received Date:** | 11/03/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 11/23/2022 | **Tested By:** | Ficek, Kevin |

## Laboratory Data

### Sieve-Hydrometer Analysis

| Particle Size | % Passing | Specification |
|---|---|---|
| 2 mm (No. 10) | 100.0 | - |
| 850 µm (No. 20) | 99.8 | - |
| 425 µm (No. 40) | 99.5 | - |
| 250 µm (No. 60) | 98.3 | - |
| 150 µm (No. 100) | 96.3 | - |
| 106 µm (No. 140) | 94.7 | - |
| 75 µm (No. 200) | 93.4 | - |
| 28.3 (µm) | 82.9 | - |
| 18.1 (µm) | 80.7 | - |
| 10.6 (µm) | 76.3 | - |
| 7.7 (µm) | 70.8 | - |
| 5.5 (µm) | 65.3 | - |
| 2.8 (µm) | 53.2 | - |
| 1.2 (µm) | 37.4 | - |




**Soil Classification:** CH Fat Clay

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Gravel (%):** | 0 | **Sand (%):** | 6.6 | **Silt (%):** | 32.1 | **Clay (%):** | 61.3 |
| **$D_{60}$ (µm):** | 4.7 | | | | | | |

## General

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Bismarck, ND 58504
Phone: 701-255-7180

# Hydrometer And Sieve Analysis

**ASTM D422**

11/23/2022

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

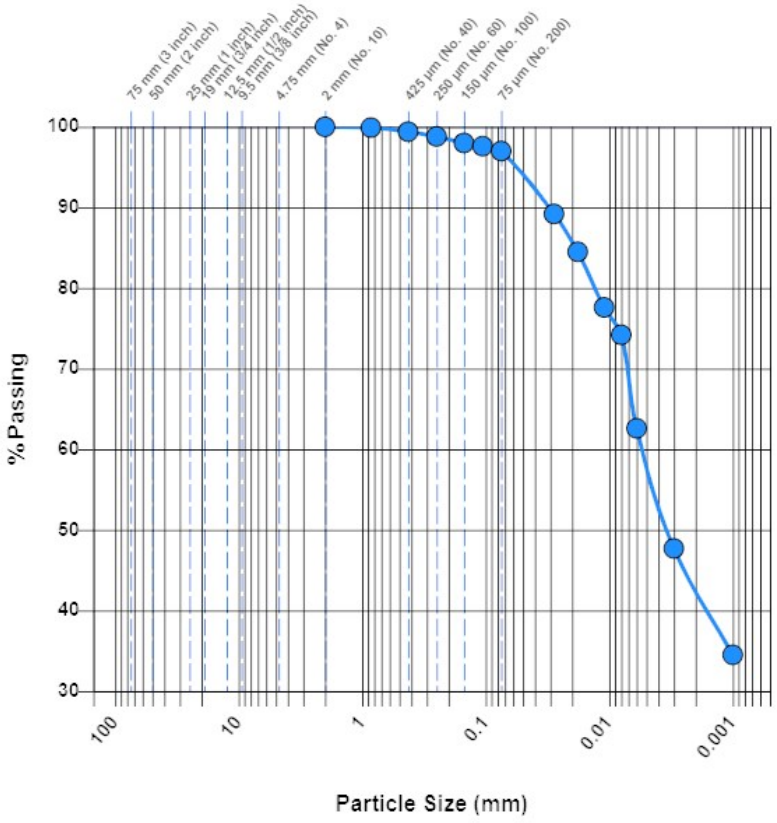
## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 491944 | **Alternate ID:** | SC-60 |
| **Sample From:** | Stockpile | **Sampled By:** | Client |
| **Location Details:** | Select Clay Stockpile, Sample 60 | | |
| **Sample Date:** | 11/03/2022 | | |
| **Received Date:** | 11/03/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 11/23/2022 | **Tested By:** | Ficek, Kevin |

## Laboratory Data

### Sieve-Hydrometer Analysis

| Particle Size | % Passing | Specification |
|---|---|---|
| 2 mm (No. 10) | 100.0 | - |
| 850 µm (No. 20) | 99.9 | - |
| 425 µm (No. 40) | 99.4 | - |
| 250 µm (No. 60) | 98.8 | - |
| 150 µm (No. 100) | 98.0 | - |
| 106 µm (No. 140) | 97.6 | - |
| 75 µm (No. 200) | 97.0 | - |
| 28.1 (µm) | 89.2 | - |
| 18.1 (µm) | 84.5 | - |
| 10.7 (µm) | 77.6 | - |
| 7.7 (µm) | 74.2 | - |
| 5.6 (µm) | 62.6 | - |
| 2.9 (µm) | 47.7 | - |
| 1.3 (µm) | 34.5 | - |




**Soil Classification:** CH Fat Clay

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Gravel (%):** | 0 | **Sand (%):** | 3.0 | **Silt (%):** | 39.4 | **Clay (%):** | 57.6 |

**$D_{60}$ (µm):** 5.5

## General

**Results:** The test is for informational purposes.

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# Hydrometer And Sieve Analysis

**ASTM D422**

11/23/2022

1502 Grumman Lane
Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

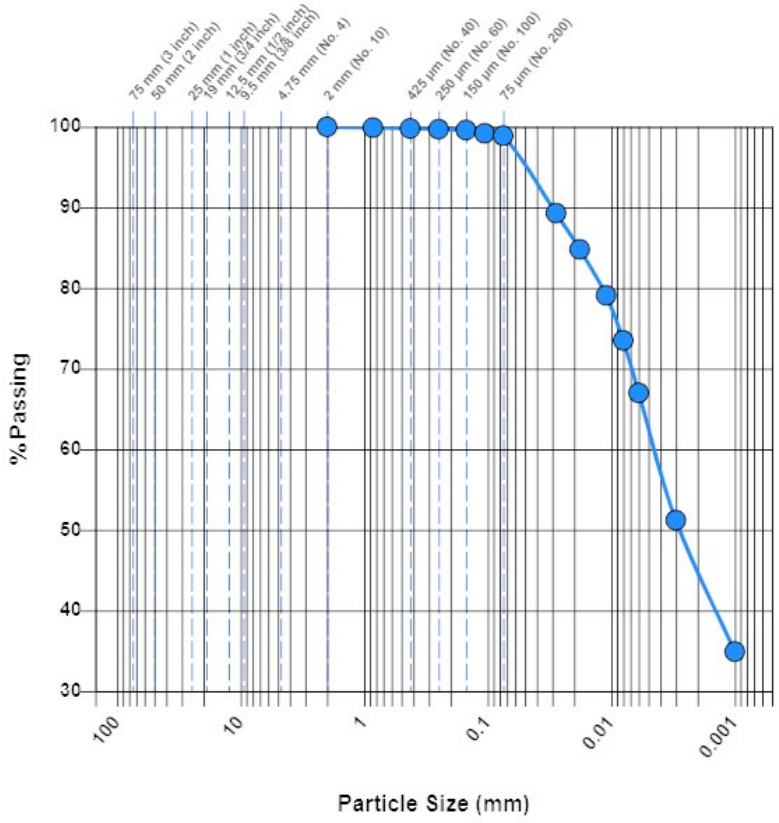
## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 491945 | **Alternate ID:** | SC-61 |
| **Sample From:** | Stockpile | **Sampled By:** | Client |
| **Location Details:** | Select Clay Stockpile, Sample 61 | | |
| **Sample Date:** | 11/03/2022 | | |
| **Received Date:** | 11/03/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 11/23/2022 | **Tested By:** | Ficek, Kevin |

## Laboratory Data

### Sieve-Hydrometer Analysis

| Particle Size | % Passing | Specification |
|---|---|---|
| 2 mm (No. 10) | 100.0 | - |
| 850 µm (No. 20) | 99.9 | - |
| 425 µm (No. 40) | 99.8 | - |
| 250 µm (No. 60) | 99.7 | - |
| 150 µm (No. 100) | 99.6 | - |
| 106 µm (No. 140) | 99.2 | - |
| 75 µm (No. 200) | 98.9 | - |
| 27.9 (µm) | 89.3 | - |
| 18.0 (µm) | 84.8 | - |
| 10.6 (µm) | 79.1 | - |
| 7.7 (µm) | 73.5 | - |
| 5.5 (µm) | 67.0 | - |
| 2.9 (µm) | 51.2 | - |
| 1.3 (µm) | 34.9 | - |




**Soil Classification:** CH Fat Clay

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Gravel (%):** | 0 | **Sand (%):** | 1.1 | **Silt (%):** | 37.2 | **Clay (%):** | 61.7 |
| **$D_{60}$ (µm):** | 4.7 | | | | | | |

## General

**Results:** The test is for informational purposes.

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1502 Grumman Lane
Bismarck, ND 58504
Phone: 701-255-7180

# Hydrometer And Sieve Analysis

**ASTM D422**

11/23/2022

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

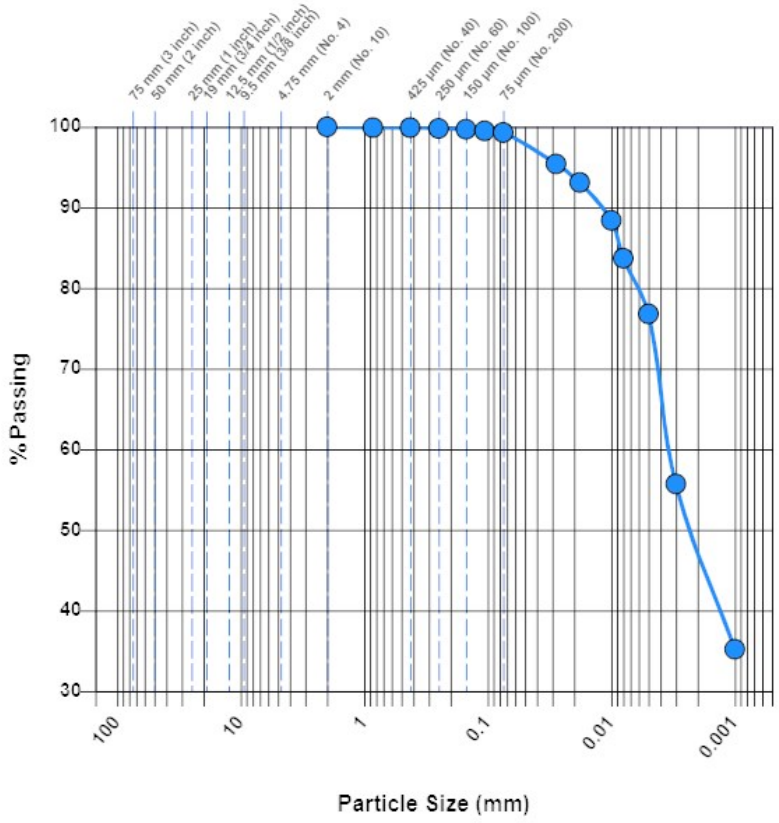
## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 491946 | **Alternate ID:** | SC-62 |
| **Sample From:** | Stockpile | **Sampled By:** | Client |
| **Location Details:** | Select Clay Stockpile, Sample 62 | | |
| **Sample Date:** | 11/03/2022 | | |
| **Received Date:** | 11/03/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 11/23/2022 | **Tested By:** | Ficek, Kevin |

## Laboratory Data

### Sieve-Hydrometer Analysis

| Particle Size | % Passing | Specification |
|---|---|---|
| 2 mm (No. 10) | 100.0 | - |
| 850 µm (No. 20) | 99.9 | - |
| 425 µm (No. 40) | 99.9 | - |
| 250 µm (No. 60) | 99.8 | - |
| 150 µm (No. 100) | 99.7 | - |
| 106 µm (No. 140) | 99.5 | - |
| 75 µm (No. 200) | 99.3 | - |
| 27.6 (µm) | 95.4 | - |
| 17.6 (µm) | 93.1 | - |
| 10.4 (µm) | 88.4 | - |
| 7.5 (µm) | 83.7 | - |
| 5.4 (µm) | 76.8 | - |
| 2.8 (µm) | 55.7 | - |
| 1.3 (µm) | 35.2 | - |




**Soil Classification:** CH Fat Clay

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Gravel (%):** | 0 | **Sand (%):** | 0.7 | **Silt (%):** | 22.5 | **Clay (%):** | 76.8 |
| **$D_{60}$ (µm):** | 3.4 | | | | | | |

## General

**Results:** The test is for informational purposes.

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# Hydrometer And Sieve Analysis

**ASTM D422**

06/26/2023

2908 Morrison Ave.
Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2303912
Minnkota Cell 5
Center, ND

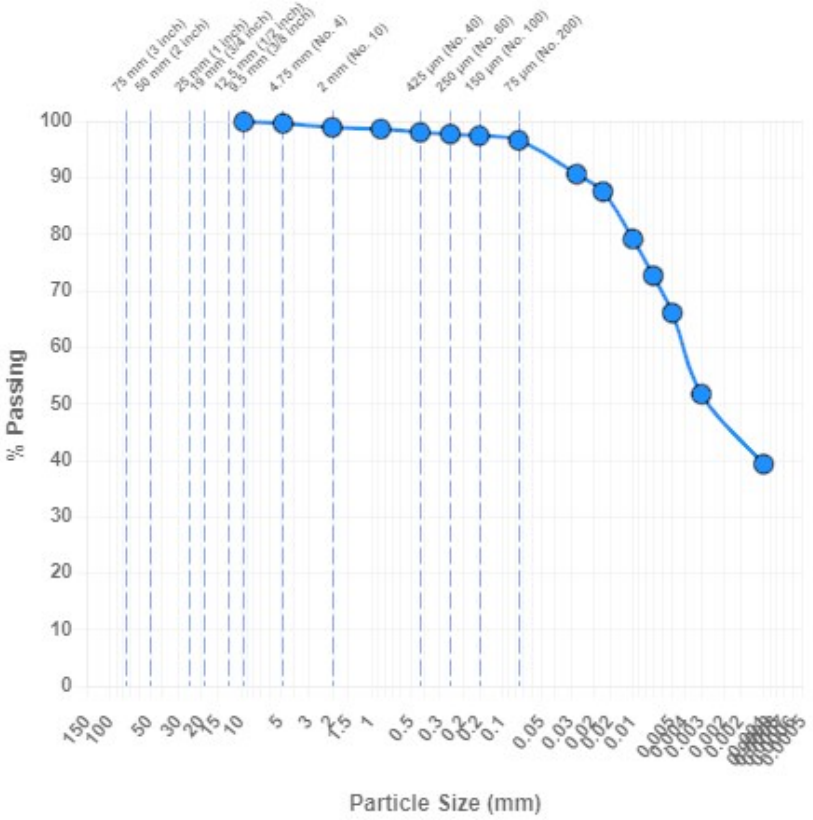
## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 530302 | **Sampled By:** | Drill Crew |
| **Boring Number:** | SC-63 | | |
| **Sample Date:** | 06/26/2023 | | |
| **Received Date:** | 06/26/2023 | **Lab:** | 11001 Hampshire Ave S, Bloomington, MN |
| **Tested Date:** | 06/26/2023 | **Tested By:** | Streier, Jim |

## Laboratory Data

### Sieve-Hydrometer Analysis

| Particle Size | % Passing | Specification |
|---|---|---|
| 9.5 mm (3/8 inch) | 100.0 | - |
| 4.75 mm (No. 4) | 99.7 | - |
| 2 mm (No. 10) | 99.0 | - |
| 850 µm (No. 20) | 98.7 | - |
| 425 µm (No. 40) | 98.1 | - |
| 250 µm (No. 60) | 97.8 | - |
| 150 µm (No. 100) | 97.5 | - |
| 75 µm (No. 200) | 96.7 | - |
| 26.8 (µm) | 90.7 | - |
| 17.1 (µm) | 87.6 | - |
| 10.2 (µm) | 79.2 | - |
| 7.4 (µm) | 72.7 | - |
| 5.4 (µm) | 66.1 | - |
| 2.8 (µm) | 51.7 | - |
| 1.3 (µm) | 39.3 | - |




**Soil Classification:** CH Fat Clay

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Gravel (%):** | 0.3 | **Sand (%):** | 3.0 | **Silt (%):** | 30.6 | **Clay (%):** | 66.1 |
| **$D_{60}$ (µm):** | 4.2 | | | | | | |

## General

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

# Hydrometer And Sieve Analysis

**ASTM D422**

06/26/2023

2908 Morrison Ave.
Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2303912
Minnkota Cell 5
Center, ND

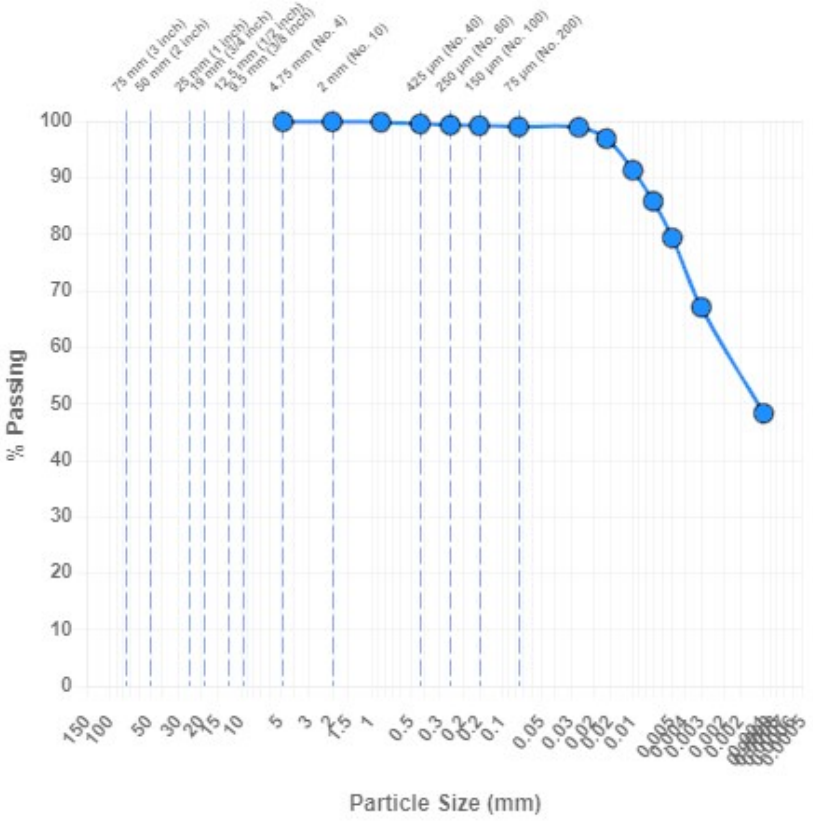
## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 530304 | **Sampled By:** | Drill Crew |
| **Boring Number:** | SC-64 | | |
| **Sample Date:** | 06/26/2023 | | |
| **Received Date:** | 06/26/2023 | **Lab:** | 11001 Hampshire Ave S, Bloomington, MN |
| **Tested Date:** | 06/26/2023 | **Tested By:** | Streier, Jim |

## Laboratory Data

### Sieve-Hydrometer Analysis

| Particle Size | % Passing | Specification |
|---|---|---|
| 4.75 mm (No. 4) | 100.0 | - |
| 2 mm (No. 10) | 100.0 | - |
| 850 µm (No. 20) | 99.9 | - |
| 425 µm (No. 40) | 99.6 | - |
| 250 µm (No. 60) | 99.4 | - |
| 150 µm (No. 100) | 99.3 | - |
| 75 µm (No. 200) | 99.1 | - |
| 25.6 (µm) | 99.0 | - |
| 16.3 (µm) | 97.0 | - |
| 9.7 (µm) | 91.4 | - |
| 7.0 (µm) | 85.9 | - |
| 5.1 (µm) | 79.4 | - |
| 2.6 (µm) | 67.1 | - |
| 1.2 (µm) | 48.3 | - |




**Soil Classification:** CH Fat Clay

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Gravel (%):** | 0.0 | **Sand (%):** | 0.9 | **Silt (%):** | 19.7 | **Clay (%):** | 79.4 |
| **$D_{60}$ (µm):** | 2.2 | | | | | | |

## General

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# Hydrometer And Sieve Analysis

**ASTM D422**

06/26/2023

2908 Morrison Ave.
Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2303912
Minnkota Cell 5
Center, ND

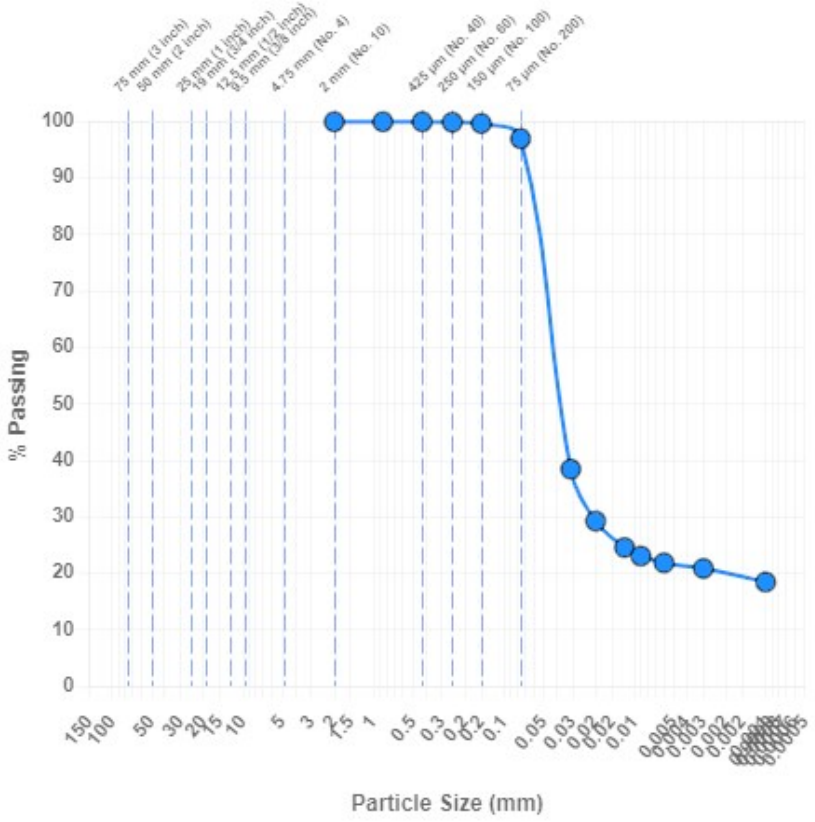
## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 530305 | **Sampled By:** | Drill Crew |
| **Boring Number:** | SC-65 | | |
| **Sample Date:** | 06/26/2023 | | |
| **Received Date:** | 06/26/2023 | **Lab:** | 11001 Hampshire Ave S, Bloomington, MN |
| **Tested Date:** | 06/26/2023 | **Tested By:** | Streier, Jim |

## Laboratory Data

### Sieve-Hydrometer Analysis

| Particle Size | % Passing | Specification |
|---|---|---|
| 2 mm (No. 10) | 100.0 | - |
| 850 µm (No. 20) | 100.0 | - |
| 425 µm (No. 40) | 100.0 | - |
| 250 µm (No. 60) | 99.9 | - |
| 150 µm (No. 100) | 99.7 | - |
| 75 µm (No. 200) | 97.0 | - |
| 30.6 (µm) | 38.4 | - |
| 20.2 (µm) | 29.2 | - |
| 11.9 (µm) | 24.5 | - |
| 8.5 (µm) | 23.0 | - |
| 6.0 (µm) | 21.8 | - |
| 2.9 (µm) | 20.8 | - |
| 1.3 (µm) | 18.4 | - |




**Soil Classification:** CL Lean clay

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Gravel (%):** | 0 | **Sand (%):** | 3.0 | **Silt (%):** | 75.5 | **Clay (%):** | 21.5 |
| **$D_{60}$ (µm):** | 47.2 | **$D_{30}$ (µm):** | 21.0 | | | | |

## General

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BRAUN INTERTEC
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# Hydrometer And Sieve Analysis

**ASTM D422**

06/26/2023

2908 Morrison Ave.
Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2303912
Minnkota Cell 5
Center, ND

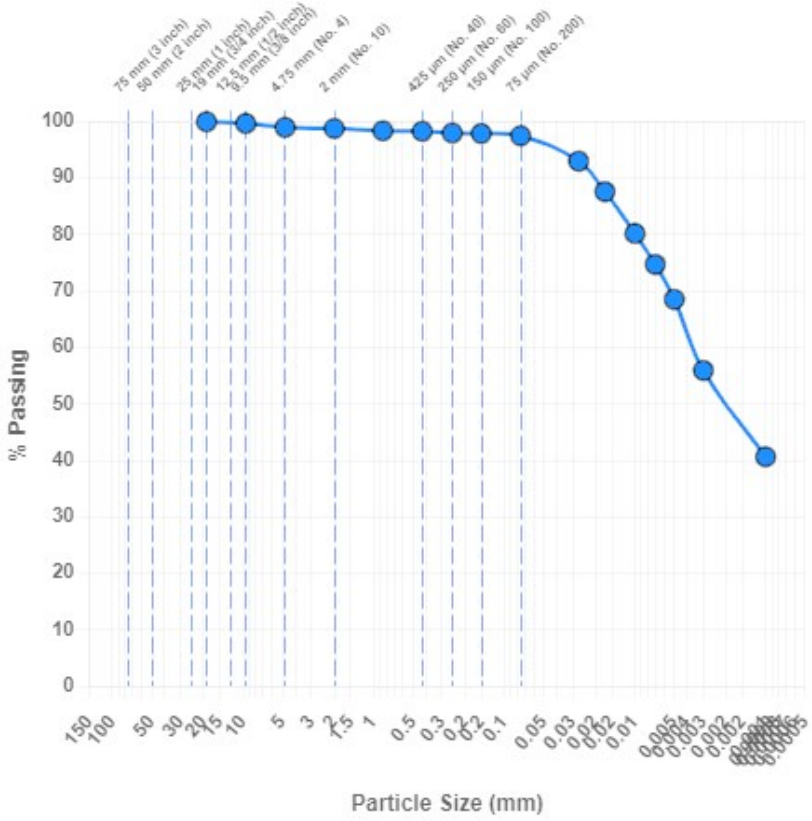
## Sample Information

**Sample Number:** 528518
**Alternate ID:** SC-66
**Sampled By:** Vang, Yang
**Location Details:** SC-66
**Sample Date:** 06/19/2023
**Received Date:** 06/19/2023
**Lab:** 11001 Hampshire Ave S, Bloomington, MN
**Tested Date:** 06/26/2023
**Tested By:** Streier, Jim

## Laboratory Data

### Sieve-Hydrometer Analysis

| Particle Size | % Passing | Specification |
|---|---|---|
| 19 mm (3/4 inch) | 100.0 | - |
| 9.5 mm (3/8 inch) | 99.7 | - |
| 4.75 mm (No. 4) | 99.0 | - |
| 2 mm (No. 10) | 98.8 | - |
| 850 µm (No. 20) | 98.4 | - |
| 425 µm (No. 40) | 98.3 | - |
| 250 µm (No. 60) | 98.0 | - |
| 150 µm (No. 100) | 97.9 | - |
| 75 µm (No. 200) | 97.5 | - |
| 26.7 (µm) | 93.0 | - |
| 17.2 (µm) | 87.6 | - |
| 10.3 (µm) | 80.2 | - |
| 7.4 (µm) | 74.7 | - |
| 5.3 (µm) | 68.5 | - |
| 2.7 (µm) | 55.9 | - |
| 1.2 (µm) | 40.6 | - |




**Soil Classification:** CH Fat Clay

**Gravel (%):** 1.0 **Sand (%):** 1.5 **Silt (%):** 29.0 **Clay (%):** 68.5

**$D_{60}$ (µm):** 3.7

## General

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# Hydrometer And Sieve Analysis

**ASTM D422**

06/30/2023

2908 Morrison Ave.
Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2303912
Minnkota Cell 5
Center, ND

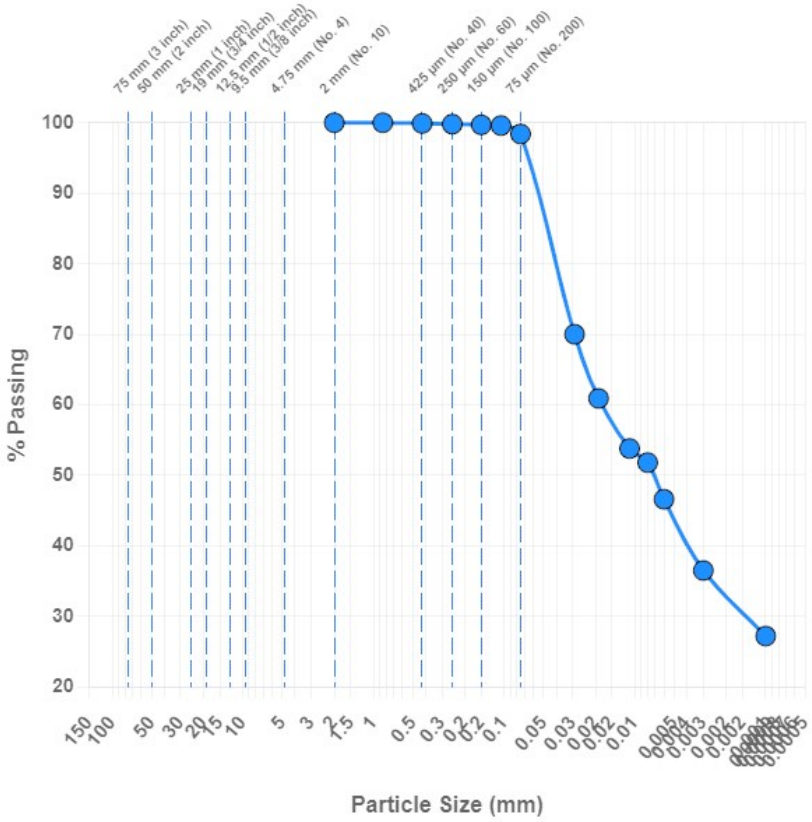
## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 523245 | **Alternate ID:** | SC-67 |
| **Sampling Method:** | Not Provided | **Sampled By:** | Client |
| **Location:** | In-place | | |
| **Location Details:** | Minnkota Cell 5 | | |
| **Specification:** | Project | | |
| **Sample Date:** | 06/21/2023 | **Material:** | Select Fill |
| **Received Date:** | 06/21/2023 | **Lab:** | 2908 Morrison Ave. Suite 3, Bismarck, ND |
| **Tested Date:** | 06/30/2023 | **Tested By:** | Austin, Jon |

## Laboratory Data

### Sieve-Hydrometer Analysis

| Particle Size | % Passing | Specification |
|---|---|---|
| 2 mm (No. 10) | 100.0 | - |
| 850 µm (No. 20) | 100.0 | - |
| 425 µm (No. 40) | 99.9 | - |
| 250 µm (No. 60) | 99.8 | - |
| 150 µm (No. 100) | 99.7 | - |
| 106 µm (No. 140) | 99.6 | - |
| 75 µm (No. 200) | 98.4 | - |
| 29.2 (µm) | 70.0 | - |
| 19.2 (µm) | 60.9 | - |
| 11.4 (µm) | 53.8 | - |
| 8.1 (µm) | 51.8 | - |
| 5.8 (µm) | 46.6 | - |
| 3.0 (µm) | 36.5 | - |
| 1.3 (µm) | 27.2 | - |




**Soil Classification:** CH Fat Clay

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Gravel (%):** | 0 | **Sand (%):** | 1.6 | **Silt (%):** | 55.2 | **Clay (%):** | 43.2 |
| **$D_{60}$ (µm):** | 18.0 | **$D_{30}$ (µm):** | 1.6 | | | | |

## General

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# Hydrometer And Sieve Analysis

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06/30/2023

2908 Morrison Ave.
Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2303912
Minnkota Cell 5
Center, ND

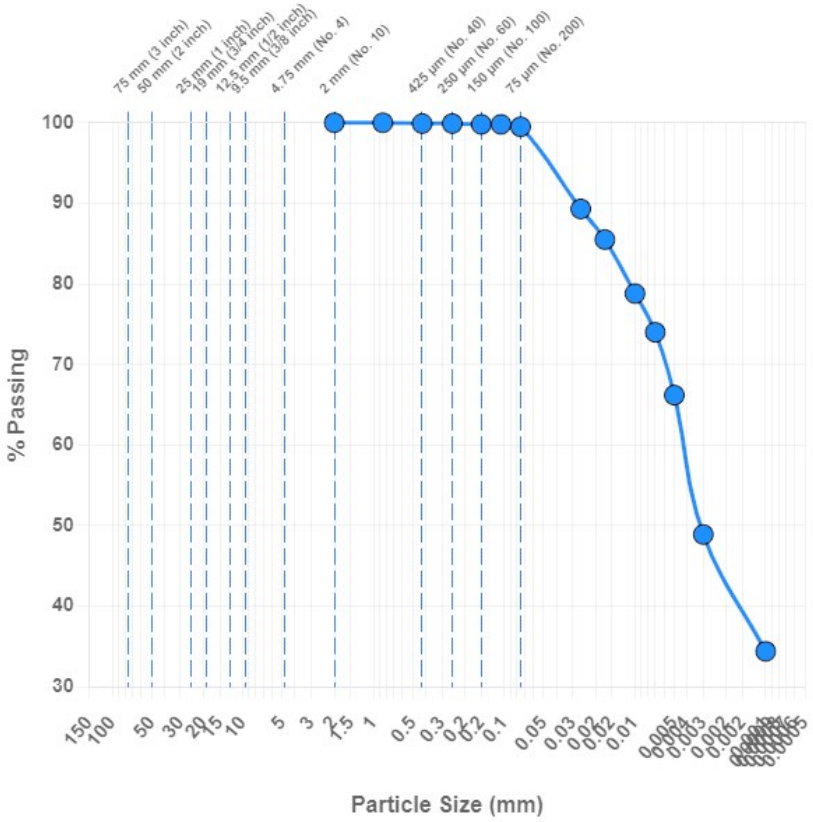
## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 523247 | **Alternate ID:** | SC-68 |
| **Sampling Method:** | Not Provided | **Sampled By:** | Client |
| **Location:** | In-place | | |
| **Location Details:** | Minnkota Cell 5 | | |
| **Specification:** | Project | | |
| **Sample Date:** | 06/21/2023 | **Material:** | Select Fill |
| **Received Date:** | 06/21/2023 | **Lab:** | 2908 Morrison Ave. Suite 3, Bismarck, ND |
| **Tested Date:** | 06/30/2023 | **Tested By:** | Austin, Jon |

## Laboratory Data

### Sieve-Hydrometer Analysis

| Particle Size | % Passing | Specification |
|---|---|---|
| 2 mm (No. 10) | 100.0 | - |
| 850 µm (No. 20) | 100.0 | - |
| 425 µm (No. 40) | 99.9 | - |
| 250 µm (No. 60) | 99.9 | - |
| 150 µm (No. 100) | 99.8 | - |
| 106 µm (No. 140) | 99.8 | - |
| 75 µm (No. 200) | 99.5 | - |
| 25.9 (µm) | 89.3 | - |
| 16.7 (µm) | 85.5 | - |
| 10.0 (µm) | 78.8 | - |
| 7.2 (µm) | 74.0 | - |
| 5.3 (µm) | 66.2 | - |
| 2.8 (µm) | 48.9 | - |
| 1.2 (µm) | 34.4 | - |




**Soil Classification:** CH Fat Clay

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Gravel (%):** | 0 | **Sand (%):** | 0.5 | **Silt (%):** | 33.3 | **Clay (%):** | 66.2 |
| **$D_{60}$ (µm):** | 4.3 | | | | | | |

## General

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# Hydrometer And Sieve Analysis

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Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2303912
Minnkota Cell 5
Center, ND

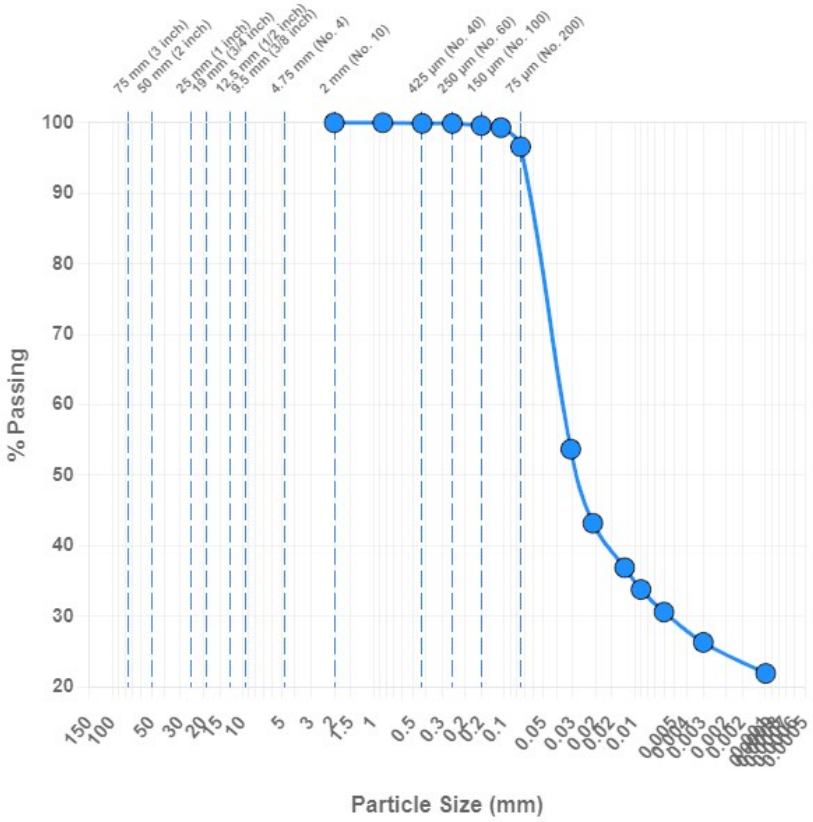
## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 523248 | **Alternate ID:** | SC-69 |
| **Sampling Method:** | Not Provided | **Sampled By:** | Client |
| **Location:** | In-place | | |
| **Location Details:** | Minnkota Cell 5 | | |
| **Specification:** | Project | | |
| **Sample Date:** | 06/21/2023 | **Material:** | Select Fill |
| **Received Date:** | 06/21/2023 | **Lab:** | 2908 Morrison Ave. Suite 3, Bismarck, ND |
| **Tested Date:** | 06/30/2023 | **Tested By:** | Austin, Jon |

## Laboratory Data

### Sieve-Hydrometer Analysis

| Particle Size | % Passing | Specification |
|---|---|---|
| 2 mm (No. 10) | 100.0 | - |
| 850 µm (No. 20) | 100.0 | - |
| 425 µm (No. 40) | 99.9 | - |
| 250 µm (No. 60) | 99.9 | - |
| 150 µm (No. 100) | 99.6 | - |
| 106 µm (No. 140) | 99.3 | - |
| 75 µm (No. 200) | 96.6 | - |
| 31.3 (µm) | 53.7 | - |
| 20.5 (µm) | 43.2 | - |
| 12.1 (µm) | 36.9 | - |
| 8.6 (µm) | 33.8 | - |
| 6.2 (µm) | 30.6 | - |
| 3.1 (µm) | 26.3 | - |
| 1.3 (µm) | 21.9 | - |




**Soil Classification:** CH Fat Clay

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Gravel (%):** | 0 | **Sand (%):** | 3.4 | **Silt (%):** | 67.4 | **Clay (%):** | 29.2 |
| **$D_{60}$ (µm):** | 37.5 | **$D_{30}$ (µm):** | 5.6 | | | | |

## General

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# Hydrometer And Sieve Analysis

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06/30/2023

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Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2303912
Minnkota Cell 5
Center, ND

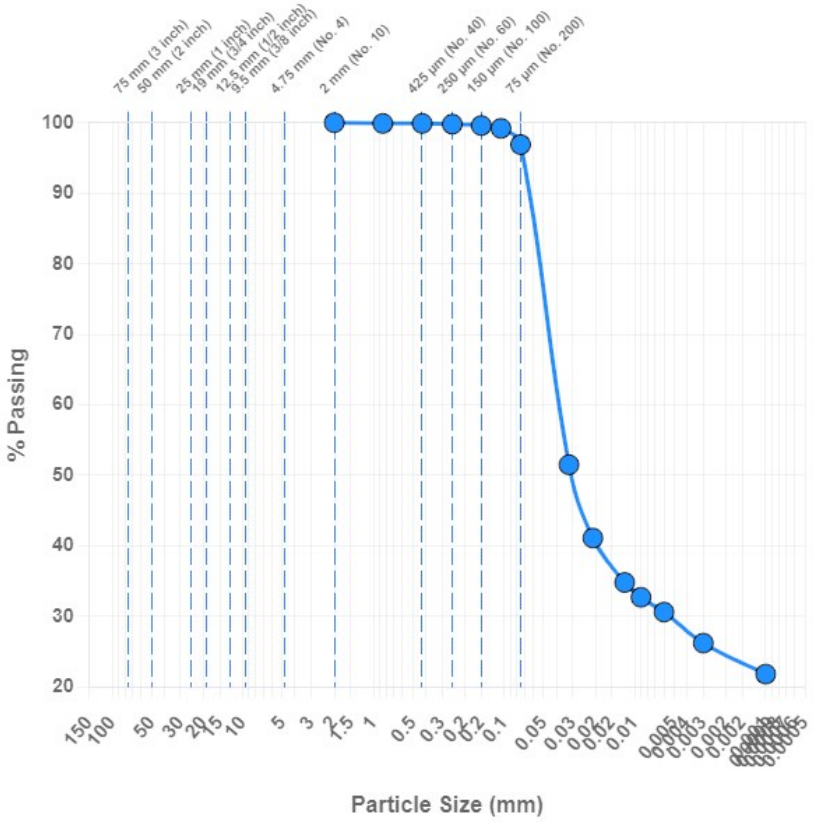
## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 531969 | **Alternate ID:** | SC-70 |
| **Sampling Method:** | Not Provided | **Sampled By:** | Client |
| **Location:** | In-place | | |
| **Location Details:** | Minnkota Cell 5 | | |
| **Specification:** | Project | | |
| **Sample Date:** | 06/21/2023 | **Material:** | Select Fill |
| **Received Date:** | 06/21/2023 | **Lab:** | 2908 Morrison Ave. Suite 3, Bismarck, ND |
| **Tested Date:** | 06/30/2023 | **Tested By:** | Austin, Jon |

## Laboratory Data

### Sieve-Hydrometer Analysis

| Particle Size | % Passing | Specification |
|---|---|---|
| 2 mm (No. 10) | 100.0 | - |
| 850 µm (No. 20) | 99.9 | - |
| 425 µm (No. 40) | 99.9 | - |
| 250 µm (No. 60) | 99.8 | - |
| 150 µm (No. 100) | 99.6 | - |
| 106 µm (No. 140) | 99.2 | - |
| 75 µm (No. 200) | 96.9 | - |
| 31.5 (µm) | 51.5 | - |
| 20.7 (µm) | 41.1 | - |
| 12.2 (µm) | 34.8 | - |
| 8.7 (µm) | 32.7 | - |
| 6.2 (µm) | 30.6 | - |
| 3.1 (µm) | 26.2 | - |
| 1.3 (µm) | 21.8 | - |




**Soil Classification:** CH Fat Clay

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Gravel (%):** | 0 | **Sand (%):** | 3.1 | **Silt (%):** | 67.8 | **Clay (%):** | 29.1 |
| **$D_{60}$ (µm):** | 40.1 | **$D_{30}$ (µm):** | 5.6 | | | | |

## General

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# Hydrometer And Sieve Analysis

**ASTM D422**

07/28/2023

2908 Morrison Ave.
Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2303912
Minnkota Cell 5
Center, ND

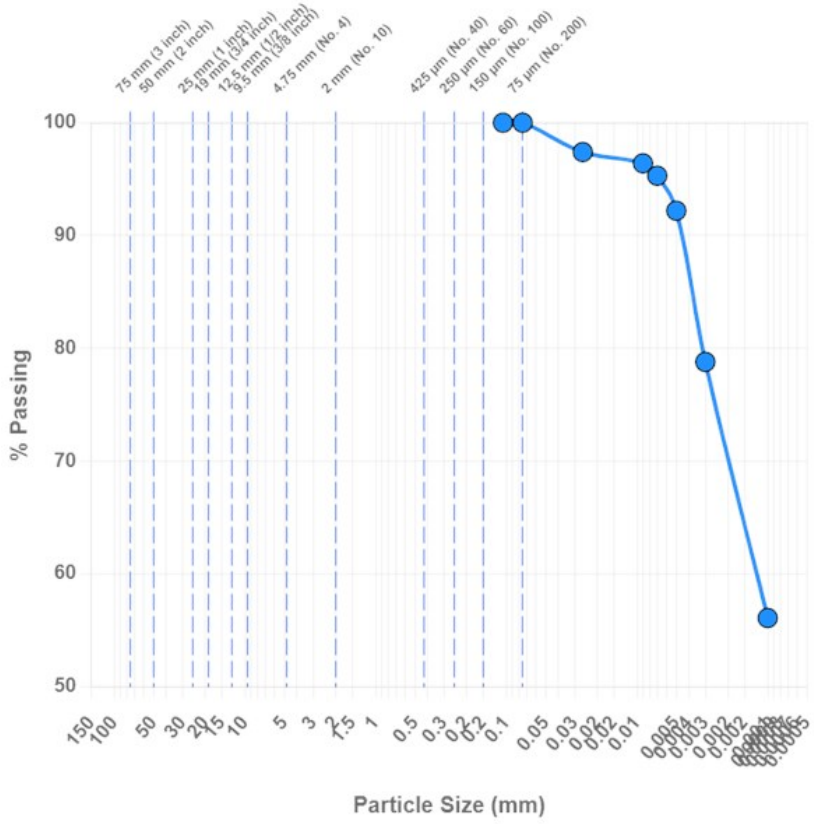
## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 537186 | **Alternate ID:** | SC-71 |
| **Sample From:** | In Place | **Sampled By:** | Bruce, Dalton |
| **Location Details:** | East Wall | | |
| **Sample Date:** | 07/13/2023 | | |
| **Received Date:** | 07/14/2023 | **Lab:** | 2908 Morrison Ave. Suite 3, Bismarck, ND |
| **Tested Date:** | 07/27/2023 | **Tested By:** | Austin, Jon |

## Laboratory Data

### Sieve-Hydrometer Analysis

| Particle Size | % Passing | Specification |
|---|---|---|
| 106 µm (No. 140) | 100.0 | - |
| 75 µm (No. 200) | 100.0 | - |
| 25.6 (µm) | 97.4 | - |
| 9.4 (µm) | 96.4 | - |
| 6.7 (µm) | 95.3 | - |
| 4.8 (µm) | 92.2 | - |
| 2.5 (µm) | 78.8 | - |
| 1.2 (µm) | 56.1 | - |




**Soil Classification:** CH Fat Clay

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Gravel (%):** | 0 | **Sand (%):** | 0.0 | **Silt (%):** | 7.8 | **Clay (%):** | 92.2 |
| **$D_{60}$ (µm):** | 1.3 | | | | | | |

## General

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# Hydrometer And Sieve Analysis

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Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2303912
Minnkota Cell 5
Center, ND

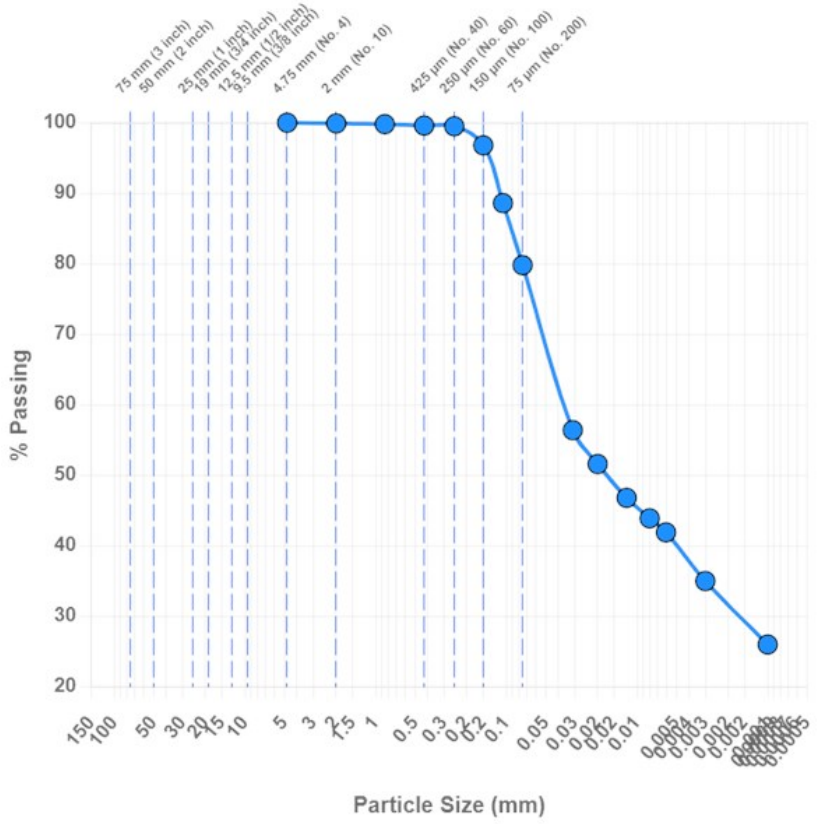
## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 537187 | **Alternate ID:** | SC-72 |
| **Sample From:** | In Place | **Sampled By:** | Bruce, Dalton |
| **Location Details:** | NE Corner, East Half | | |
| **Sample Date:** | 07/13/2023 | | |
| **Received Date:** | 07/14/2023 | **Lab:** | 2908 Morrison Ave. Suite 3, Bismarck, ND |
| **Tested Date:** | 07/27/2023 | **Tested By:** | Austin, Jon |

## Laboratory Data

### Sieve-Hydrometer Analysis

| Particle Size | % Passing | Specification |
|---|---|---|
| 4.75 mm (No. 4) | 100.0 | - |
| 2 mm (No. 10) | 99.9 | - |
| 850 µm (No. 20) | 99.8 | - |
| 425 µm (No. 40) | 99.6 | - |
| 250 µm (No. 60) | 99.5 | - |
| 150 µm (No. 100) | 96.8 | - |
| 106 µm (No. 140) | 88.6 | - |
| 75 µm (No. 200) | 79.8 | - |
| 30.5 (µm) | 56.4 | - |
| 19.6 (µm) | 51.6 | - |
| 11.6 (µm) | 46.8 | - |
| 8.3 (µm) | 43.9 | - |
| 5.9 (µm) | 41.9 | - |
| 3.0 (µm) | 35.0 | - |
| 1.3 (µm) | 26.0 | - |




**Soil Classification:** CH Fat clay with sand

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Gravel (%):** | 0.0 | **Sand (%):** | 20.2 | **Silt (%):** | 40.2 | **Clay (%):** | 39.6 |
| **$D_{60}$ (µm):** | 37.8 | **$D_{30}$ (µm):** | 1.9 | | | | |

## General

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# Hydrometer And Sieve Analysis

**ASTM D422**

07/28/2023

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Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2303912
Minnkota Cell 5
Center, ND

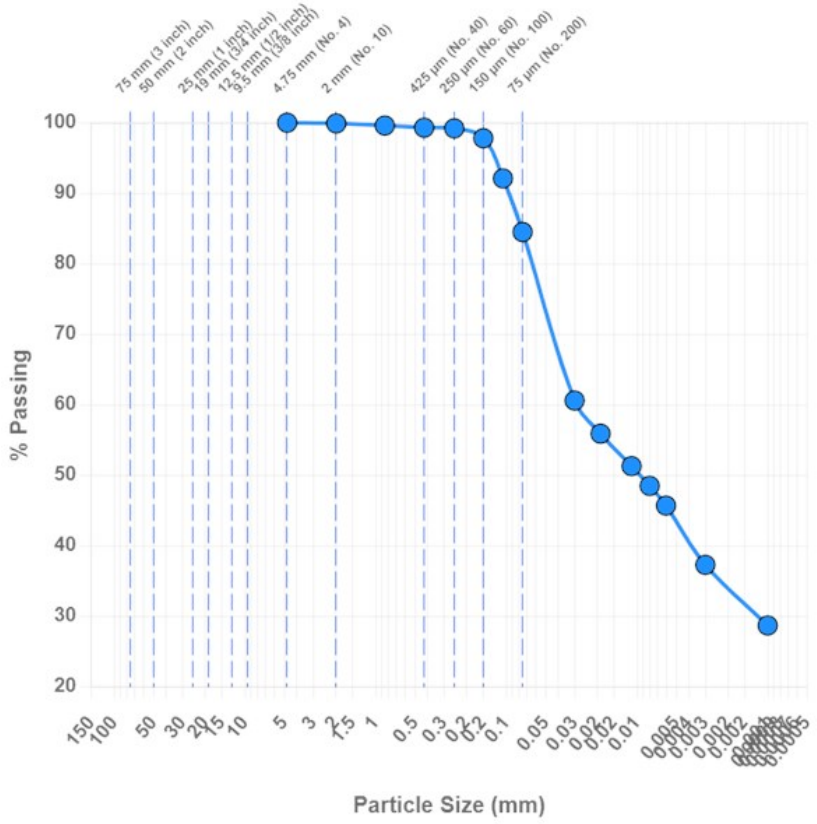
## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 537188 | **Alternate ID:** | SC-73 |
| **Sample From:** | In Place | **Sampled By:** | Bruce, Dalton |
| **Location Details:** | East Wall, East Half | | |
| **Sample Date:** | 07/13/2023 | | |
| **Received Date:** | 07/14/2023 | **Lab:** | 2908 Morrison Ave. Suite 3, Bismarck, ND |
| **Tested Date:** | 07/27/2023 | **Tested By:** | Austin, Jon |

## Laboratory Data

### Sieve-Hydrometer Analysis

| Particle Size | % Passing | Specification |
|---|---|---|
| 4.75 mm (No. 4) | 100.0 | - |
| 2 mm (No. 10) | 99.9 | - |
| 850 µm (No. 20) | 99.6 | - |
| 425 µm (No. 40) | 99.3 | - |
| 250 µm (No. 60) | 99.2 | - |
| 150 µm (No. 100) | 97.8 | - |
| 106 µm (No. 140) | 92.1 | - |
| 75 µm (No. 200) | 84.5 | - |
| 29.6 (µm) | 60.6 | - |
| 19.1 (µm) | 55.9 | - |
| 11.3 (µm) | 51.3 | - |
| 8.0 (µm) | 48.5 | - |
| 5.8 (µm) | 45.7 | - |
| 2.9 (µm) | 37.3 | - |
| 1.3 (µm) | 28.7 | - |




**Soil Classification:** CH Fat clay with sand

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Gravel (%):** | 0.0 | **Sand (%):** | 15.5 | **Silt (%):** | 41.6 | **Clay (%):** | 42.9 |
| **$D_{60}$ (µm):** | 28.6 | **$D_{30}$ (µm):** | 1.3 | | | | |

## General

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**Client:**

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5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2303912
Minnkota Cell 5
Center, ND

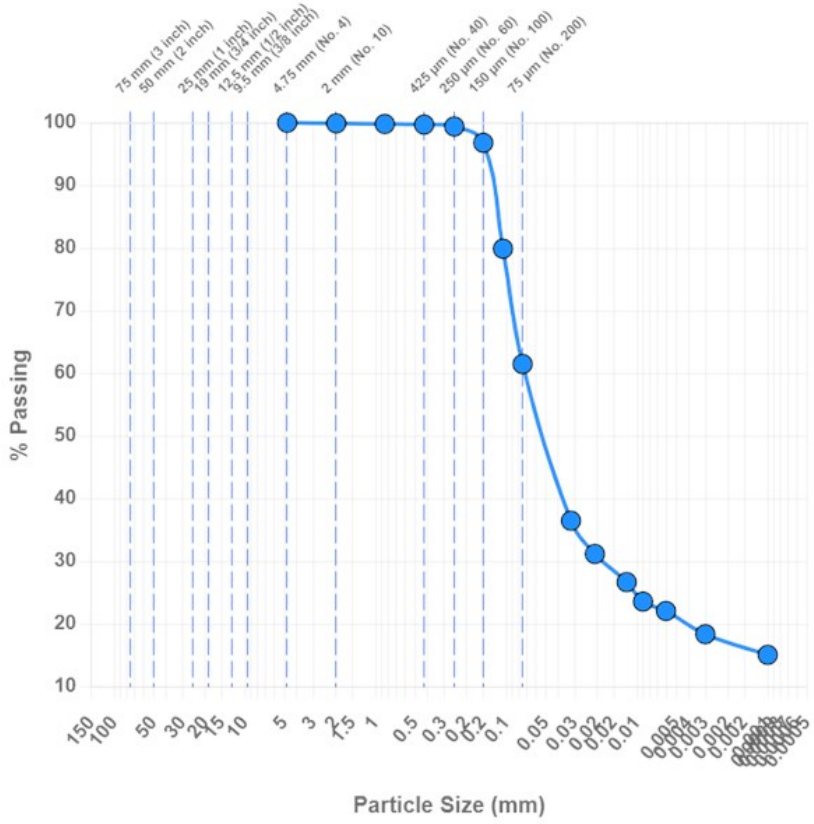
## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 537183 | **Alternate ID:** | P-22 (SC-74) |
| **Sample From:** | In Place | **Sampled By:** | Bruce, Dalton |
| **Location Details:** | N Wall Cell 5, E Half | | |
| **Sample Date:** | 07/14/2023 | | |
| **Received Date:** | 07/14/2023 | **Lab:** | 2908 Morrison Ave. Suite 3, Bismarck, ND |
| **Tested Date:** | 07/27/2023 | **Tested By:** | Austin, Jon |

## Laboratory Data

### Sieve-Hydrometer Analysis

| Particle Size | % Passing | Specification |
|---|---|---|
| 4.75 mm (No. 4) | 100.0 | - |
| 2 mm (No. 10) | 99.9 | - |
| 850 µm (No. 20) | 99.8 | - |
| 425 µm (No. 40) | 99.7 | - |
| 250 µm (No. 60) | 99.4 | - |
| 150 µm (No. 100) | 96.8 | - |
| 106 µm (No. 140) | 79.9 | - |
| 75 µm (No. 200) | 61.5 | - |
| 31.6 (µm) | 36.5 | - |
| 20.5 (µm) | 31.2 | - |
| 12.1 (µm) | 26.7 | - |
| 8.7 (µm) | 23.6 | - |
| 6.2 (µm) | 22.1 | - |
| 3.1 (µm) | 18.4 | - |
| 1.3 (µm) | 15.1 | - |




**Soil Classification:** CH Sandy fat clay

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Gravel (%):** | 0.0 | **Sand (%):** | 38.5 | **Silt (%):** | 40.6 | **Clay (%):** | 20.9 |
| **$D_{60}$ (µm):** | 72.4 | **$D_{30}$ (µm):** | 18.6 | | | | |

## General

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

BRAUN INTERTEC
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# Hydrometer And Sieve Analysis

**ASTM D422**

07/31/2023

2908 Morrison Ave.
Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2303912
Minnkota Cell 5
Center, ND

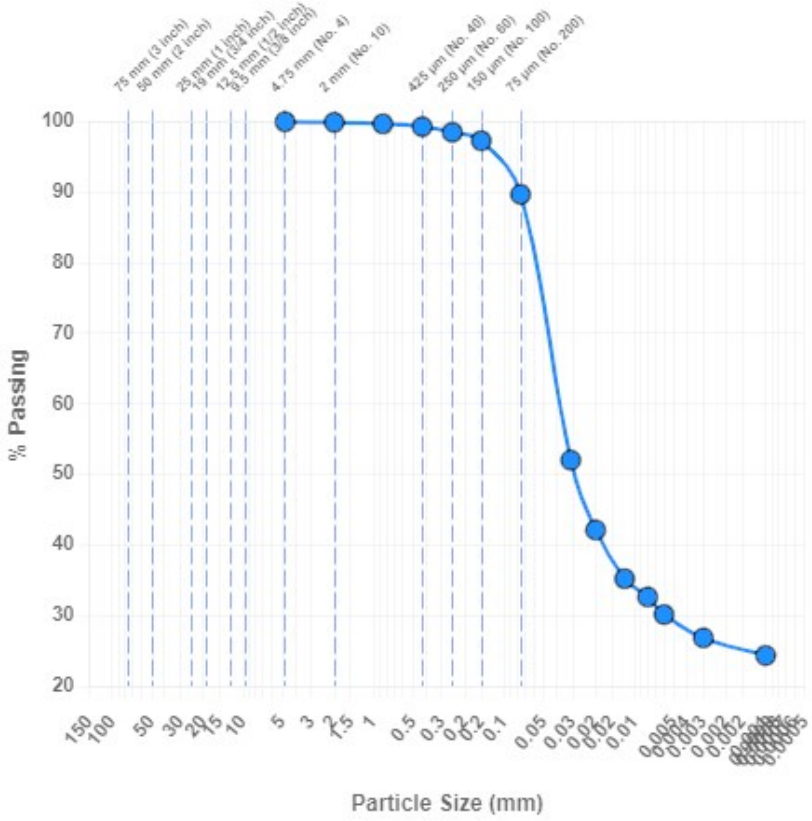
## Sample Information

**Sample Number:** 539924
**Alternate ID:** SC-75
**Sampled By:** Bruce, Dalton
**Location Details:** Select Clay, In Place
**Sample Date:** 07/14/2023
**Received Date:** 07/31/2023
**Lab:** 11001 Hampshire Ave S, Bloomington, MN
**Tested Date:** 07/31/2023
**Tested By:** Streier, Jim

## Laboratory Data

### Sieve-Hydrometer Analysis

| Particle Size | % Passing | Specification |
|---|---|---|
| 4.75 mm (No. 4) | 100.0 | - |
| 2 mm (No. 10) | 99.9 | - |
| 850 µm (No. 20) | 99.7 | - |
| 425 µm (No. 40) | 99.3 | - |
| 250 µm (No. 60) | 98.5 | - |
| 150 µm (No. 100) | 97.3 | - |
| 75 µm (No. 200) | 89.7 | - |
| 30.5 (µm) | 52.0 | - |
| 20.0 (µm) | 42.1 | - |
| 11.8 (µm) | 35.2 | - |
| 8.4 (µm) | 32.6 | - |
| 6.0 (µm) | 30.1 | - |
| 3.0 (µm) | 26.8 | - |
| 1.3 (µm) | 24.3 | - |




**Soil Classification:** CH Fat Clay

**Gravel (%):** 0.0 **Sand (%):** 10.3 **Silt (%):** 60.7 **Clay (%):** 29.0

**$D_{60}$ (µm):** 40.3 **$D_{30}$ (µm):** 5.9

## General

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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# Hydrometer And Sieve Analysis

**ASTM D422**

07/31/2023

2908 Morrison Ave.
Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2303912
Minnkota Cell 5
Center, ND

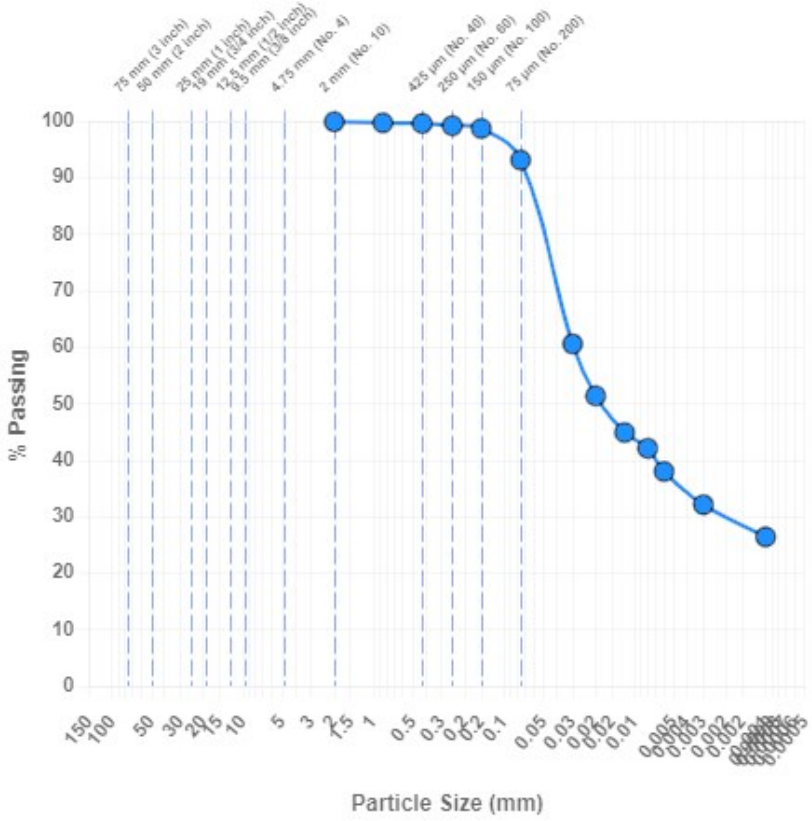
## Sample Information

**Sample Number:** 539927
**Alternate ID:** SC-76
**Sampled By:** Bruce, Dalton
**Location Details:** Select Clay, In Place
**Sample Date:** 07/14/2023
**Received Date:** 07/31/2023
**Lab:** 11001 Hampshire Ave S, Bloomington, MN
**Tested Date:** 07/31/2023
**Tested By:** Streier, Jim

## Laboratory Data

### Sieve-Hydrometer Analysis

| Particle Size | % Passing | Specification |
|---|---|---|
| 2 mm (No. 10) | 100.0 | - |
| 850 µm (No. 20) | 99.8 | - |
| 425 µm (No. 40) | 99.7 | - |
| 250 µm (No. 60) | 99.3 | - |
| 150 µm (No. 100) | 98.8 | - |
| 75 µm (No. 200) | 93.2 | - |
| 29.9 (µm) | 60.6 | - |
| 19.5 (µm) | 51.4 | - |
| 11.5 (µm) | 44.9 | - |
| 8.2 (µm) | 42.1 | - |
| 5.9 (µm) | 38.0 | - |
| 2.9 (µm) | 32.1 | - |
| 1.3 (µm) | 26.4 | - |




**Soil Classification:** CH Fat Clay

**Gravel (%):** 0 **Sand (%):** 6.8 **Silt (%):** 57.2 **Clay (%):** 36.0

**$D_{60}$ (µm):** 29.3 **$D_{30}$ (µm):** 2.3

## General

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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# Hydrometer And Sieve Analysis

**ASTM D422**

07/31/2023

2908 Morrison Ave.
Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
Center, ND

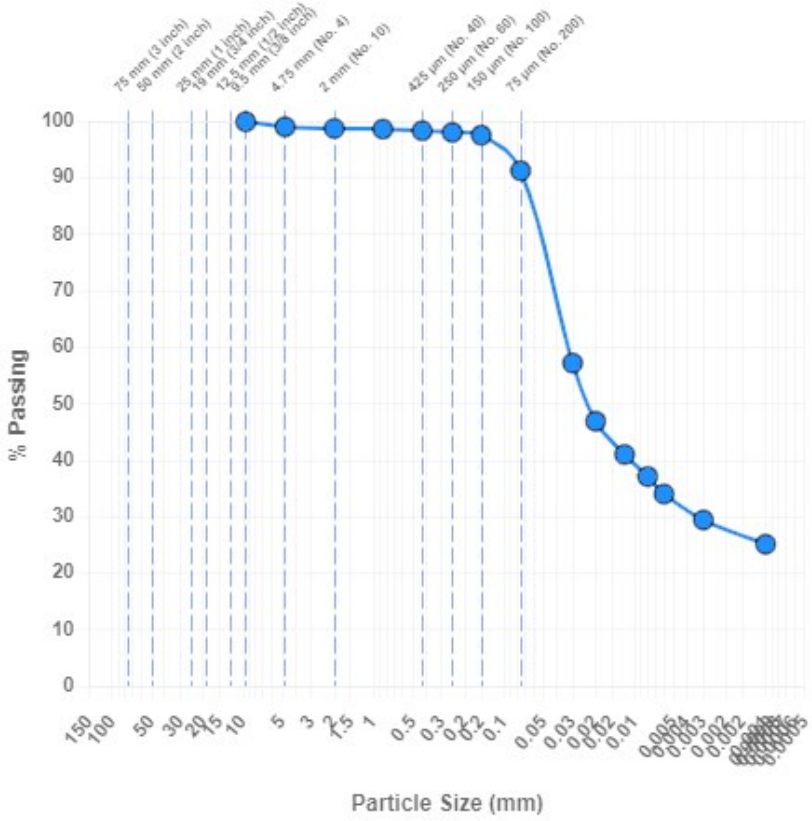
## Sample Information

**Sample Number:** 539928
**Alternate ID:** SC-77
**Sampled By:** Bruce, Dalton
**Location Details:** Select Clay, In Place
**Sample Date:** 07/14/2023
**Received Date:** 07/31/2023
**Lab:** 11001 Hampshire Ave S, Bloomington, MN
**Tested Date:** 07/31/2023
**Tested By:** Streier, Jim

## Laboratory Data

### Sieve-Hydrometer Analysis

| Particle Size | % Passing | Specification |
|---|---|---|
| 9.5 mm (3/8 inch) | 100.0 | - |
| 4.75 mm (No. 4) | 99.1 | - |
| 2 mm (No. 10) | 98.8 | - |
| 850 µm (No. 20) | 98.7 | - |
| 425 µm (No. 40) | 98.4 | - |
| 250 µm (No. 60) | 98.1 | - |
| 150 µm (No. 100) | 97.6 | - |
| 75 µm (No. 200) | 91.3 | - |
| 30.3 (µm) | 57.2 | - |
| 19.8 (µm) | 46.9 | - |
| 11.7 (µm) | 41.0 | - |
| 8.4 (µm) | 37.1 | - |
| 6.0 (µm) | 34.0 | - |
| 3.0 (µm) | 29.4 | - |
| 1.3 (µm) | 25.1 | - |




**Soil Classification:** CH Fat Clay

**Gravel (%):** 0.9 **Sand (%):** 7.8 **Silt (%):** 58.8 **Clay (%):** 32.5

**$D_{60}$ (µm):** 33.7 **$D_{30}$ (µm):** 3.4

## General

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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# Hydraulic Conductivity

**ASTM D5084**

1502 Grumman Lane
Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 459455 | **Alternate ID:** | P-01 |
| **Sample From:** | Not Given | **Sampled By:** | Client |
| **Sample Location :** | Select Clay Stockpile, Sample 1 | | |
| **Sample Date:** | 07/11/2022 | | |
| **Received Date:** | 07/27/2022 | **Lab:** | 11001 Hampshire Ave S, Bloomington, MN |
| **Tested Date:** | 07/27/2022 | **Tested By:** | Streier, Jim |

## Laboratory Data

| | | | | |
|---|---|---|---|---|
| **Type Of Specimen:** | Remolded | **Back Pressure (psi):** | 80.00 | |
| **Permeant Liquid:** | Water | **Specific Gravity:** | 2.80 | ( Assumed ) |
| **Saturation B Coefficient:** | 1.00 | **Effective Pressure (psi):** | 9.00 | |

**Method:** Method C Falling Head Rising Tailwater

| Elapsed Time (sec) | Average Test Temp. (°C) | Influent Reading Initial (cm) | Influent Reading Final (cm) | Effluent Reading Initial (cm) | Effluent Reading Final (cm) | Average Head Loss (cm) | Hydraulic Gradient | Hydraulic Conductivity @ 20 °C (cm/sec) |
|---|---|---|---|---|---|---|---|---|
| 9420 | 22.0 | 19.30 | 19.00 | 14.70 | 15.00 | 285.7 | 40.45 | 6.7E-08 |
| 57360 | 22.0 | 21.70 | 19.80 | 12.40 | 14.30 | 288.8 | 40.89 | 6.9E-08 |
| 13320 | 22.0 | 19.80 | 19.30 | 14.30 | 14.80 | 286.4 | 40.55 | 7.9E-08 |
| 6960 | 22.0 | 22.00 | 21.70 | 12.10 | 12.40 | 291.0 | 41.20 | 9.0E-08 |

**Average Of Last Four Hydraulic Conductivity (cm/sec):** 7.6E-08

| | Initial | Final |
|---|---|---|
| **Saturation (%)** | 75.8 | 99.8 |
| **Moisture Content (%):** | 21.6 | 28.1 |
| **Dry Density Of Specimen (pcf):** | 97.2 | 97.7 |

**Soil Classification:** CH Fat clay

## General

**Remarks:** Control parameters meet the testing requirements.

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# Hydraulic Conductivity

**ASTM D5084**

1502 Grumman Lane
Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

## Sample Information

**Sample Number:** 467327
**Alternate ID:** SC-16
**Sampled By:** Client
**Sample Location :** Select Clay stockpile, SC-16
**Sample Date:** 07/27/2022
**Received Date:** 08/10/2022
**Lab:** 11001 Hampshire Ave S, Bloomington, MN
**Tested Date:** 08/10/2022
**Tested By:** Streier, Jim

## Laboratory Data

**Type Of Specimen:** Intact
**Back Pressure (psi):** 81.00
**Permeant Liquid:** Water
**Specific Gravity:** 2.70 ( Assumed )
**Saturation B Coefficient:** 1.00
**Effective Pressure (psi):** 8.00
**Method:** Method C Falling Head Rising Tailwater

| Elapsed Time (sec) | Average Test Temp. (°C) | Influent Reading Initial (cm) | Influent Reading Final (cm) | Effluent Reading Initial (cm) | Effluent Reading Final (cm) | Average Head Loss (cm) | Hydraulic Gradient | Hydraulic Conductivity @ 20 °C (cm/sec) |
|---|---|---|---|---|---|---|---|---|
| 9420 | 22.0 | 11.50 | 10.00 | 11.40 | 12.90 | 209.6 | 36.98 | 9.4E-08 |
| 2340 | 22.0 | 13.20 | 12.80 | 9.70 | 10.10 | 214.1 | 37.78 | 9.8E-08 |
| 2460 | 22.0 | 12.80 | 12.40 | 10.10 | 10.50 | 213.3 | 37.64 | 9.4E-08 |
| 5760 | 22.0 | 12.40 | 11.50 | 10.50 | 11.40 | 212.0 | 37.41 | 9.1E-08 |

**Average Of Last Four Hydraulic Conductivity (cm/sec):** 9.4E-08

| | Initial | Final |
|---|---|---|
| **Saturation (%)** | 78.1 | 99.5 |
| **Moisture Content (%):** | 23.4 | 29.7 |
| **Dry Density Of Specimen (pcf):** | 93.2 | 93.4 |

**Soil Classification:** CL Lean clay

## General

**Remarks:** Control parameters meet the testing requirements.

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# Hydraulic Conductivity

**ASTM D5084**

1502 Grumman Lane
Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

## Sample Information

**Sample Number:** 479421
**Alternate ID:** SC-28
**Sample From:** Not Given
**Sampled By:** Client
**Sample Location :** Select Clay Stockpile, Sample 28
**Sample Date:** 09/14/2022
**Received Date:** 09/15/2022
**Lab:** 1502 Grumman Lane, Bismarck, ND
**Tested Date:** 10/05/2022
**Tested By:** Seokaran, Kanhai

## Laboratory Data

**Type Of Specimen:** Remolded
**Back Pressure (psi):** 81.00
**Permeant Liquid:** Water
**Specific Gravity:** 2.65 ( Assumed )
**Saturation B Coefficient:** 1.00
**Effective Pressure (psi):** 8.00
**Method:** Method C Falling Head Rising Tailwater

| Elapsed Time (sec) | Average Test Temp. (°C) | Influent Reading Initial (cm) | Influent Reading Final (cm) | Effluent Reading Initial (cm) | Effluent Reading Final (cm) | Average Head Loss (cm) | Hydraulic Gradient | Hydraulic Conductivity @ 20 °C (cm/sec) |
|---|---|---|---|---|---|---|---|---|
| 86340 | 22.0 | 15.80 | 15.60 | 11.70 | 11.90 | 214.9 | 30.32 | 6.5E-09 |
| 152160 | 22.0 | 15.60 | 15.30 | 12.40 | 12.70 | 213.9 | 30.18 | 5.6E-09 |
| 85980 | 22.0 | 15.50 | 15.30 | 12.90 | 13.10 | 213.4 | 30.11 | 6.6E-09 |
| 83040 | 22.0 | 15.80 | 15.60 | 11.40 | 11.60 | 215.2 | 30.36 | 6.7E-09 |

**Average Of Last Four Hydraulic Conductivity (cm/sec):** 6.3E-09

| | Initial | Final |
|---|---|---|
| **Saturation (%)** | 94.1 | 100.9 |
| **Moisture Content (%):** | 26.1 | 29.5 |
| **Dry Density Of Specimen (pcf):** | 95.3 | 93.3 |

**Soil Classification:** CH Fat clay

## General

**Remarks:** Control parameters meet the testing requirements.

The results included in this report relate only to the items inspected or tested. Sample plan outlined in project specifications as applicable. Additionally, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without the prior written approval.

BRAUN INTERTEC
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# Hydraulic Conductivity

**ASTM D5084**

11001 Hampshire Avenue S
Minneapolis, MN 55438
Phone: 952-995-2000

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

## Sample Information

**Sample Number:** 491930
**Alternate ID:** SC-46
**Sample From:** Stockpile
**Sampled By:** Client
**Sample Location :** Select Clay Stockpile, Sample 46
**Sample Date:** 10/28/2022
**Received Date:** 10/28/2022
**Lab:** 1502 Grumman Lane, Bismarck, ND
**Tested Date:** 11/23/2022
**Tested By:** Seokaran, Kanhai

## Laboratory Data

**Type Of Specimen:** Remolded
**Back Pressure (psi):** 81.00
**Permeant Liquid:** Water
**Specific Gravity:** 2.65 ( Assumed )
**Saturation B Coefficient:** 1.00
**Effective Pressure (psi):** 8.00
**Method:** Method C Falling Head Rising Tailwater

| Elapsed Time (sec) | Average Test Temp. (°C) | Influent Reading Initial (cm) | Influent Reading Final (cm) | Effluent Reading Initial (cm) | Effluent Reading Final (cm) | Average Head Loss (cm) | Hydraulic Gradient | Hydraulic Conductivity @ 20 °C (cm/sec) |
|---|---|---|---|---|---|---|---|---|
| 12600 | 22.0 | 19.45 | 19.05 | 13.60 | 14.00 | 216.5 | 38.33 | 1.8E-08 |
| 6660 | 22.0 | 19.05 | 18.85 | 14.00 | 14.20 | 215.9 | 38.23 | 1.7E-08 |
| 15360 | 22.0 | 18.85 | 18.35 | 14.20 | 14.70 | 215.2 | 38.10 | 1.9E-08 |
| 12780 | 22.0 | 18.35 | 17.90 | 14.70 | 15.15 | 214.2 | 37.93 | 2.0E-08 |

**Average Of Last Four Hydraulic Conductivity (cm/sec):** 1.8E-08

| | Initial | Final |
|---|---|---|
| **Saturation (%)** | 86.7 | 101.5 |
| **Moisture Content (%):** | 27.2 | 32.1 |
| **Dry Density Of Specimen (pcf):** | 90.4 | 90.0 |

**Soil Classification:** CH Fat clay

## General

**Results:** The test is for informational purposes.

**Remarks:** Control parameters meet the testing requirements.

The results included in this report relate only to the items inspected or tested. Sample plan outlined in project specifications as applicable. Additionally, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without the prior written approval.

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# Hydraulic Conductivity

**ASTM D5084**

11001 Hampshire Avenue S
Minneapolis, MN 55438
Phone: 952-995-2000

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2303912
Minnkota Cell 5
Center, ND

## Sample Information

**Sample Number:** 528518
**Alternate ID:** SC-66
**Sampled By:** Vang, Yang
**Sample Location :** SC-66
**Sample Date:** 06/19/2023
**Received Date:** 06/19/2023
**Lab:** 11001 Hampshire Ave S, Bloomington, MN
**Tested Date:** 08/10/2023
**Tested By:** Seokaran, Kanhai

## Laboratory Data

**Type Of Specimen:** Remolded
**Back Pressure (psi):** 81.00
**Permeant Liquid:** Water
**Specific Gravity:** 2.65 ( Assumed )
**Saturation B Coefficient:** 1.00
**Effective Pressure (psi):** 8.00
**Method:** Method C Falling Head Rising Tailwater

| Elapsed Time (sec) | Average Test Temp. (°C) | Influent Reading Initial (cm) | Influent Reading Final (cm) | Effluent Reading Initial (cm) | Effluent Reading Final (cm) | Average Head Loss (cm) | Hydraulic Gradient | Hydraulic Conductivity @ 20 °C (cm/sec) |
|---|---|---|---|---|---|---|---|---|
| 339000 | 22.0 | 17.95 | 17.65 | 15.30 | 15.60 | 283.7 | 40.40 | 1.9E-09 |
| 88260 | 22.0 | 17.65 | 17.55 | 15.60 | 15.70 | 283.3 | 40.35 | 2.5E-09 |
| 39240 | 22.0 | 17.55 | 17.50 | 15.70 | 15.75 | 283.2 | 40.32 | 2.8E-09 |
| 46260 | 22.0 | 17.50 | 17.45 | 15.75 | 15.80 | 283.1 | 40.31 | 2.3E-09 |

**Average Of Last Four Hydraulic Conductivity (cm/sec):** 2.4E-09

**Maximum Specified:** 1E-07

| | Initial | Final |
|---|---|---|
| **Saturation (%)** | 89.2 | 104.5 |
| **Moisture Content (%):** | 21.1 | 26.9 |
| **Dry Density Of Specimen (pcf):** | 101.7 | 98.4 |

**Soil Classification:** CH Fat clay

## General

**Results:** Pass - The above test results meet the referenced specifications.

**Remarks:** Control parameters meet the testing requirements.

The results included in this report relate only to the items inspected or tested. Sample plan outlined in project specifications as applicable. Additionally, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without the prior written approval.

# Select Clay Proctors

BRAUN INTERTEC
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# Standard Proctor M-D Relationship

**ASTM D698**

**Report Date:** 07/15/2022

1502 Grumman Lane
Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

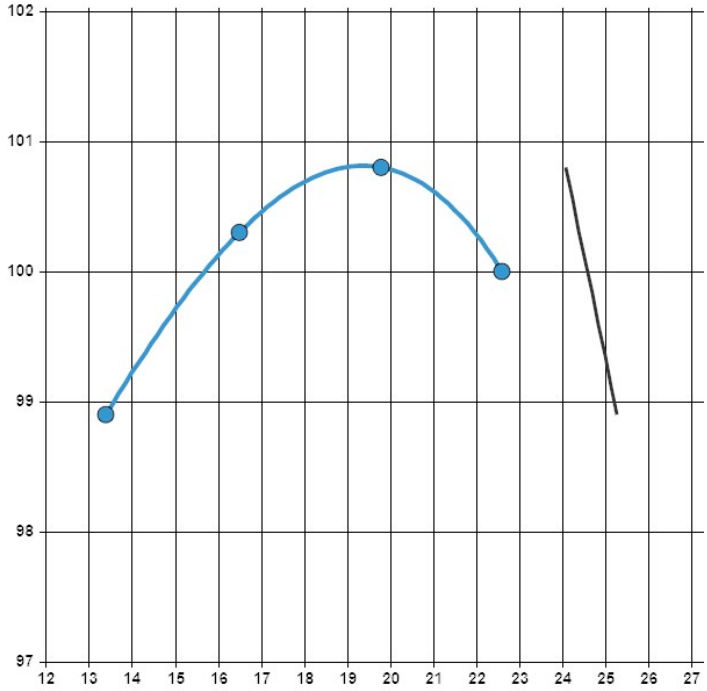
**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 459455 | **Alternate ID:** | P-01 |
| **Sample From:** | Not Given | **Sampled By:** | Client |
| **Location:** | Other | | |
| **Location Details:** | Select Clay Stockpile, Sample 1 | | |
| **Sample Date:** | 07/11/2022 | | |
| **Received Date:** | 07/12/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 07/15/2022 | **Tested By:** | Ficek, Kevin |

## Laboratory Data




| | | | |
|---|---|---|---|
| **Proctor ID:** | P-01 | | |
| **Maximum Dry Density (pcf):** | 100.8 | | |
| **Optimum Moisture (%):** | 19.4 | | |
| **Method:** | Method A | | |
| **Preparation Method:** | Moist | | |
| **Rammer Type:** | Manual Round | | |
| **Specific Gravity:** | 2.65 | | |
| **Specific Gravity Source:** | Assumed | | |
| **Liquid Limit:** | 53 | **Plastic Limit:** | 18 |
| **Plastic Index:** | 35 | | |
| **Passes #200 (%):** | 94.0 | **Retained #200 (%):** | 6.0 |
| **Retained On 3/4 (%):** | 0 | **Retained On 3/8 (%):** | 0 |
| **Retained On #4 (%):** | 0 | **Passing #4 (%):** | 100 |

**Classification:** CH Fat Clay

## General

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1502 Grumman Lane
Bismarck, ND 58504
Phone: 701-255-7180

# Standard Proctor M-D Relationship

**ASTM D698**

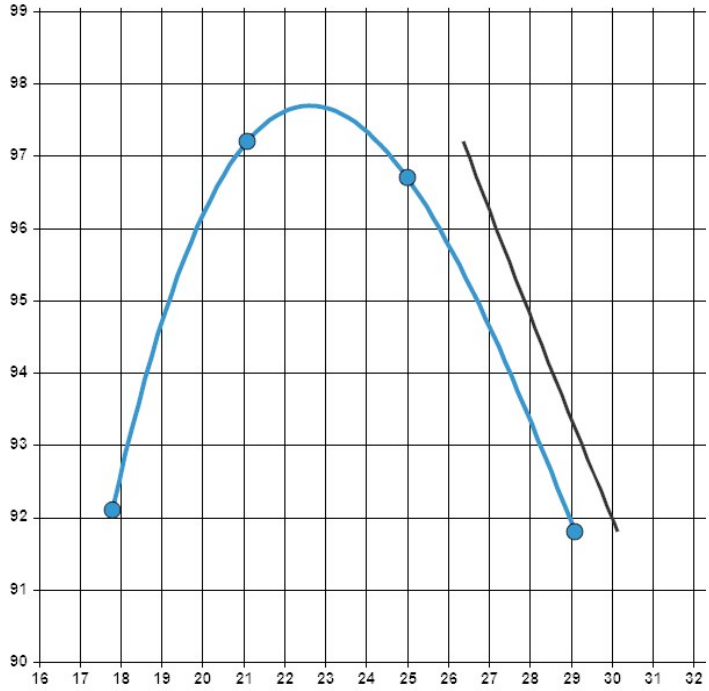
**Report Date:** 07/15/2022

| **Client:** | **Project:** |
|---|---|
| Minnkota Power Cooperative, Inc.<br>5301 32nd Ave S<br>Grand Forks, ND 58201 | B2205914<br>Cell 5 Phase 1A<br>Milton Young Station<br>Center, ND |

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 459456 | **Alternate ID:** | P-02 |
| **Sample From:** | Not Given | **Sampled By:** | Client |
| **Location:** | Other | | |
| **Location Details:** | Select Clay Stockpile, Sample 2 | | |
| **Sample Date:** | 07/11/2022 | | |
| **Received Date:** | 07/12/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 07/15/2022 | **Tested By:** | Ficek, Kevin |

## Laboratory Data




| | | | |
|---|---|---|---|
| **Proctor ID:** | P-02 | | |
| **Maximum Dry Density (pcf):** | 97.7 | | |
| **Optimum Moisture (%):** | 22.6 | | |
| **Method:** | Method A | | |
| **Preparation Method:** | Moist | | |
| **Rammer Type:** | Manual Round | | |
| **Specific Gravity:** | 2.65 | | |
| **Specific Gravity Source:** | Assumed | | |
| **Liquid Limit:** | 57 | **Plastic Limit:** | 19 |
| **Plastic Index:** | 38 | | |
| **Passes #200 (%):** | 98.3 | **Retained #200 (%):** | 1.7 |
| **Retained On 3/4 (%):** | 0 | **Retained On 3/8 (%):** | 0 |
| **Retained On #4 (%):** | 0 | **Passing #4 (%):** | 100 |

**Classification:** CH Fat Clay

## General

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BRAUN INTERTEC
The Science You Build On.

# Standard Proctor M-D Relationship

**ASTM D698**

**Report Date:** 07/22/2022

1502 Grumman Lane
Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

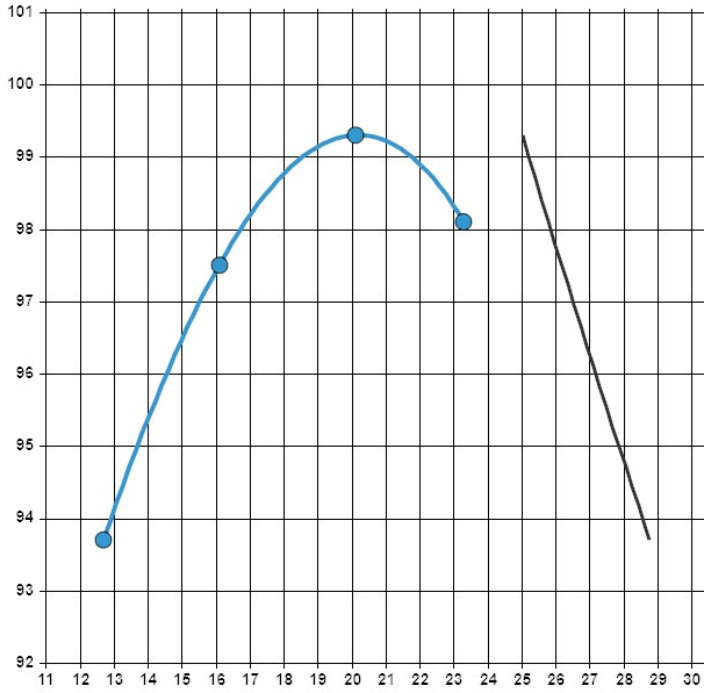
**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 460948 | **Alternate ID:** | P-03 |
| **Sample From:** | Stockpile | **Sampled By:** | Client |
| **Location Details:** | Select Clay Stockpile, Sample 3 | | |
| **Sample Date:** | 07/12/2022 | | |
| **Received Date:** | 07/12/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 07/22/2022 | **Tested By:** | Ficek, Kevin |

## Laboratory Data




| | | | |
|---|---|---|---|
| **Proctor ID:** | P-03 | | |
| **Maximum Dry Density (pcf):** | 99.3 | | |
| **Optimum Moisture (%):** | 20.2 | | |
| **Method:** | Method A | | |
| **Preparation Method:** | Moist | | |
| **Rammer Type:** | Manual Round | | |
| **Specific Gravity:** | 2.65 | | |
| **Specific Gravity Source:** | Assumed | | |
| **Liquid Limit:** | 53 | **Plastic Limit:** | 16 |
| **Plastic Index:** | 37 | | |
| **Passes #200 (%):** | 97.2 | **Retained #200 (%):** | 2.8 |
| **Retained On 3/4 (%):** | 0 | **Retained On 3/8 (%):** | 0 |
| **Retained On #4 (%):** | 0 | **Passing #4 (%):** | 100 |

**Classification:** CH Fat Clay

## General

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# Standard Proctor M-D Relationship

**ASTM D698**

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1502 Grumman Lane
Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

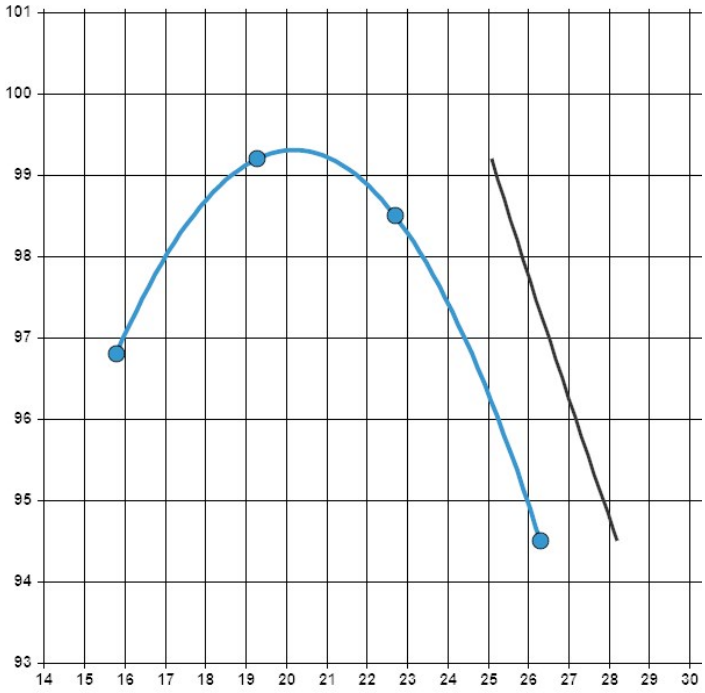
**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 460949 | **Alternate ID:** | P-04 |
| **Sample From:** | Stockpile | **Sampled By:** | Client |
| **Location Details:** | Select Clay Stockpile, Sample 4 | | |
| **Sample Date:** | 07/12/2022 | | |
| **Received Date:** | 07/12/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 07/22/2022 | **Tested By:** | Ficek, Kevin |

## Laboratory Data




| | | | |
|---|---|---|---|
| **Proctor ID:** | P-04 | | |
| **Maximum Dry Density (pcf):** | 99.3 | | |
| **Optimum Moisture (%):** | 20.2 | | |
| **Method:** | Method A | | |
| **Preparation Method:** | Moist | | |
| **Rammer Type:** | Manual Round | | |
| **Specific Gravity:** | 2.65 | | |
| **Specific Gravity Source:** | Assumed | | |
| **Liquid Limit:** | 54 | **Plastic Limit:** | 16 |
| **Plastic Index:** | 38 | | |
| **Passes #200 (%):** | 98.6 | **Retained #200 (%):** | 1.4 |
| **Retained On 3/4 (%):** | 0 | **Retained On 3/8 (%):** | 0 |
| **Retained On #4 (%):** | 0 | **Passing #4 (%):** | 100 |

**Classification:** CH Fat Clay

## General

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# Standard Proctor M-D Relationship

**ASTM D698**

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1502 Grumman Lane
Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

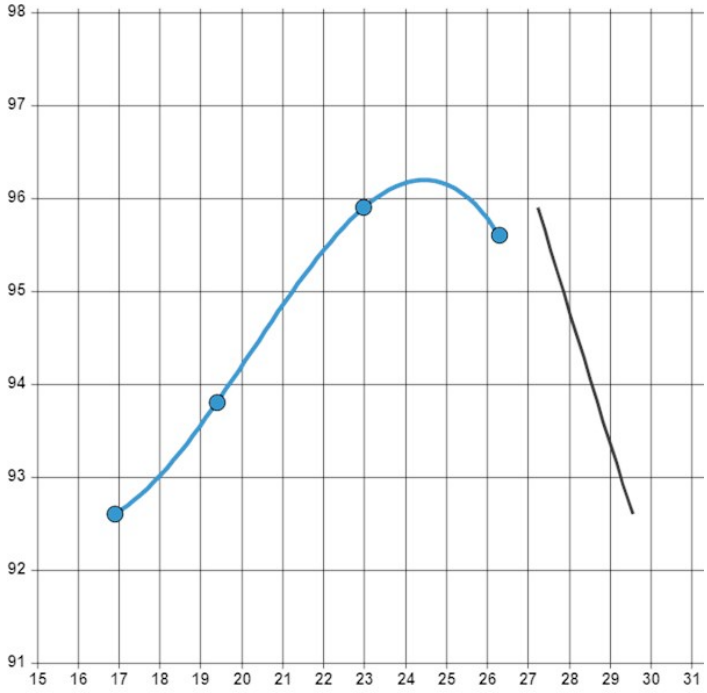
**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 460950 | **Alternate ID:** | P-05 |
| **Sample From:** | Stockpile | **Sampled By:** | Client |
| **Location Details:** | Select Clay Stockpile, Sample 5 | | |
| **Sample Date:** | 07/12/2022 | | |
| **Received Date:** | 07/12/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 07/22/2022 | **Tested By:** | Austin, Jon |

## Laboratory Data




| | | | |
|---|---|---|---|
| **Proctor ID:** | P-05 | | |
| **Maximum Dry Density (pcf):** | 96.2 | | |
| **Optimum Moisture (%):** | 24.5 | | |
| **Method:** | Method A | | |
| **Preparation Method:** | Moist | | |
| **Rammer Type:** | Manual Round | | |
| **Specific Gravity:** | 2.65 | | |
| **Specific Gravity Source:** | Assumed | | |
| **Liquid Limit:** | 66 | **Plastic Limit:** | 18 |
| **Plastic Index:** | 48 | | |
| **Passes #200 (%):** | 96.6 | **Retained #200 (%):** | 3.4 |
| **Retained On 3/4 (%):** | 0 | **Retained On 3/8 (%):** | 0 |
| **Retained On #4 (%):** | 0 | **Passing #4 (%):** | 100 |

**Classification:** CH Fat Clay

## General

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1502 Grumman Lane
Bismarck, ND 58504
Phone: 701-255-7180

# Standard Proctor M-D Relationship

**ASTM D698**

**Report Date:** 07/22/2022

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

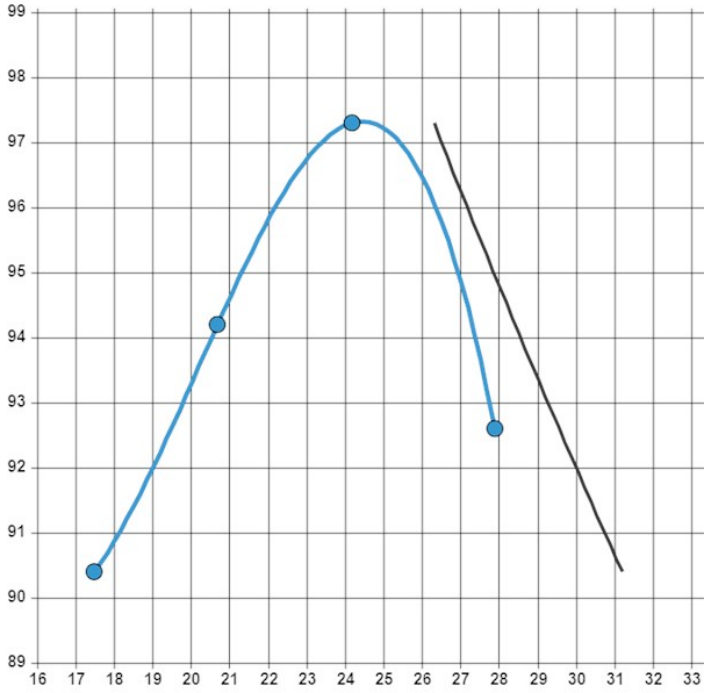
**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 460951 | **Alternate ID:** | P-06 |
| **Sample From:** | Stockpile | **Sampled By:** | Client |
| **Location Details:** | Select Clay Stockpile, Sample 6 | | |
| **Sample Date:** | 07/12/2022 | | |
| **Received Date:** | 07/12/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 07/22/2022 | **Tested By:** | Austin, Jon |

## Laboratory Data




| | | | |
|---|---|---|---|
| **Proctor ID:** | P-06 | | |
| **Maximum Dry Density (pcf):** | 97.3 | | |
| **Optimum Moisture (%):** | 24.5 | | |
| **Method:** | Method A | | |
| **Preparation Method:** | Moist | | |
| **Rammer Type:** | Manual Round | | |
| **Specific Gravity:** | 2.65 | | |
| **Specific Gravity Source:** | Assumed | | |
| **Liquid Limit:** | 61 | **Plastic Limit:** | 18 |
| **Plastic Index:** | 43 | | |
| **Passes #200 (%):** | 85.7 | **Retained #200 (%):** | 14.3 |
| **Retained On 3/4 (%):** | 0 | **Retained On 3/8 (%):** | 0 |
| **Retained On #4 (%):** | 0 | **Passing #4 (%):** | 100 |

**Classification:** CH Fat clay with sand

## General

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# Standard Proctor M-D Relationship

**ASTM D698**

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1502 Grumman Lane
Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

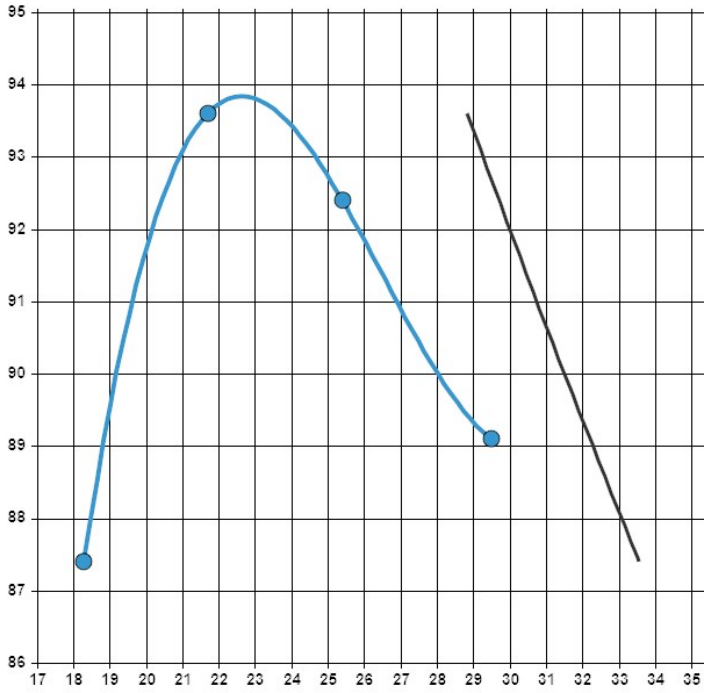
**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 460952 | **Alternate ID:** | P-07 |
| **Sample From:** | Stockpile | **Sampled By:** | Client |
| **Location Details:** | Select Clay Stockpile, Sample 7 | | |
| **Sample Date:** | 07/12/2022 | | |
| **Received Date:** | 07/12/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 07/22/2022 | **Tested By:** | Ficek, Kevin |

## Laboratory Data




| | | | |
|---|---|---|---|
| **Proctor ID:** | P-07 | | |
| **Maximum Dry Density (pcf):** | 93.8 | | |
| **Optimum Moisture (%):** | 22.6 | | |
| **Method:** | Method A | | |
| **Preparation Method:** | Moist | | |
| **Rammer Type:** | Manual Round | | |
| **Specific Gravity:** | 2.65 | | |
| **Specific Gravity Source:** | Assumed | | |
| **Liquid Limit:** | 67 | **Plastic Limit:** | 19 |
| **Plastic Index:** | 48 | | |
| **Passes #200 (%):** | 98.9 | **Retained #200 (%):** | 1.1 |
| **Retained On 3/4 (%):** | 0 | **Retained On 3/8 (%):** | 0 |
| **Retained On #4 (%):** | 0 | **Passing #4 (%):** | 100 |

**Classification:** CH Fat Clay

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# Standard Proctor M-D Relationship

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Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

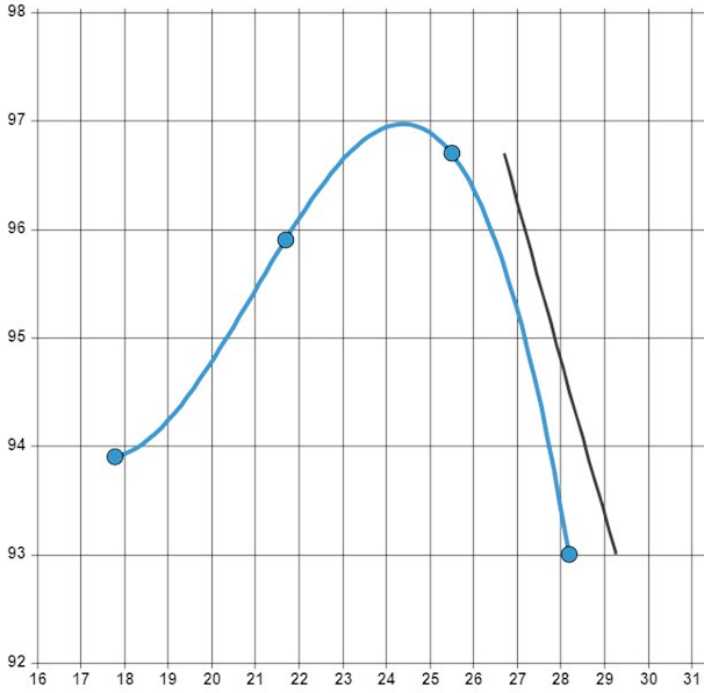
**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 460953 | **Alternate ID:** | P-08 |
| **Sample From:** | Stockpile | **Sampled By:** | Client |
| **Location Details:** | Select Clay Stockpile, Sample 8 | | |
| **Sample Date:** | 07/14/2022 | | |
| **Received Date:** | 07/14/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 07/22/2022 | **Tested By:** | Austin, Jon |

## Laboratory Data




| | | | |
|---|---|---|---|
| **Proctor ID:** | P-08 | | |
| **Maximum Dry Density (pcf):** | 97.0 | | |
| **Optimum Moisture (%):** | 24.4 | | |
| **Method:** | Method A | | |
| **Preparation Method:** | Moist | | |
| **Rammer Type:** | Manual Round | | |
| **Specific Gravity:** | 2.65 | | |
| **Specific Gravity Source:** | Assumed | | |
| **Liquid Limit:** | 58 | **Plastic Limit:** | 17 |
| **Plastic Index:** | 41 | | |
| **Passes #200 (%):** | 96.0 | **Retained #200 (%):** | 4.0 |
| **Retained On 3/4 (%):** | 0 | **Retained On 3/8 (%):** | 0 |
| **Retained On #4 (%):** | 0 | **Passing #4 (%):** | 100 |

**Classification:** CH Fat Clay

## General

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BRAUN INTERTEC
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# Standard Proctor M-D Relationship

**ASTM D698**

**Report Date:** 07/29/2022

1502 Grumman Lane
Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

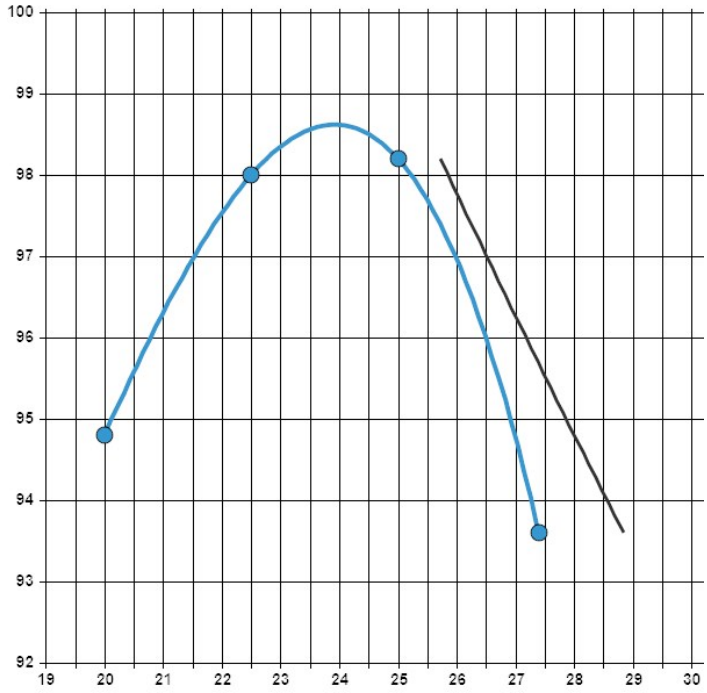
**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 460954 | **Alternate ID:** | P-09 |
| **Sample From:** | Stockpile | **Sampled By:** | Client |
| **Location Details:** | Select Clay Stockpile, Sample 9 | | |
| **Sample Date:** | 07/18/2022 | | |
| **Received Date:** | 07/18/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 07/29/2022 | **Tested By:** | Ficek, Kevin |

## Laboratory Data




| | | | |
|---|---|---|---|
| **Proctor ID:** | P-09 | | |
| **Maximum Dry Density (pcf):** | 98.6 | | |
| **Optimum Moisture (%):** | 23.9 | | |
| **Method:** | Method A | | |
| **Total Retained:** | 0 % on #4 Sieve | | |
| **Preparation Method:** | Moist | | |
| **Rammer Type:** | Manual Round | | |
| **Specific Gravity:** | 2.65 | | |
| **Specific Gravity Source:** | Assumed | | |
| **Liquid Limit:** | 57 | **Plastic Limit:** | 18 |
| **Plastic Index:** | 39 | | |
| **Passes #200 (%):** | 99.1 | **Retained #200 (%):** | 0.9 |

**Classification:** CH Fat Clay

## General

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# Standard Proctor M-D Relationship

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Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

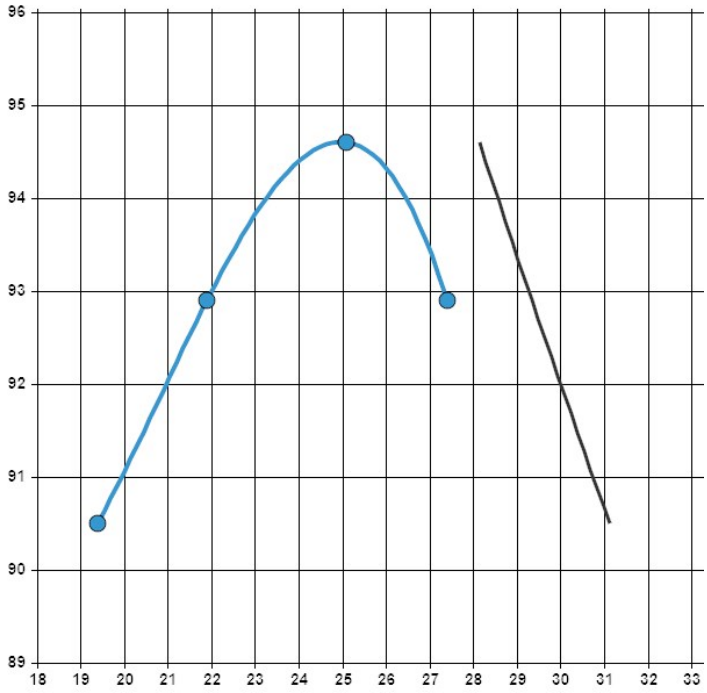
**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 460956 | **Alternate ID:** | P-10 |
| **Sample From:** | Stockpile | **Sampled By:** | Client |
| **Location Details:** | Select Clay Stockpile, Sample 10 | | |
| **Sample Date:** | 07/18/2022 | | |
| **Received Date:** | 07/18/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 07/29/2022 | **Tested By:** | Ficek, Kevin |

## Laboratory Data




| | | | |
|---|---|---|---|
| **Proctor ID:** | P-10 | | |
| **Maximum Dry Density (pcf):** | 94.6 | | |
| **Optimum Moisture (%):** | 25.0 | | |
| **Method:** | Method A | | |
| **Total Retained:** | 0 % on #4 Sieve | | |
| **Preparation Method:** | Moist | | |
| **Rammer Type:** | Manual Round | | |
| **Specific Gravity:** | 2.65 | | |
| **Specific Gravity Source:** | Assumed | | |
| **Liquid Limit:** | 65 | **Plastic Limit:** | 20 |
| **Plastic Index:** | 45 | | |
| **Passes #200 (%):** | 100.0 | **Retained #200 (%):** | 0.0 |

**Classification:** CH Fat Clay

## General

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Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

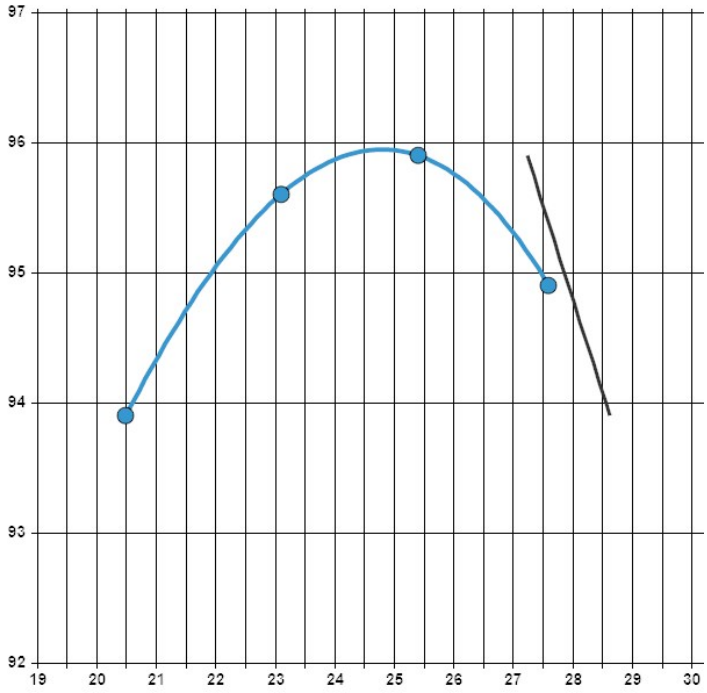
**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 460957 | **Alternate ID:** | P-11 |
| **Sample From:** | Stockpile | **Sampled By:** | Client |
| **Location Details:** | Select Clay Stockpile, Sample 11 | | |
| **Sample Date:** | 07/18/2022 | | |
| **Received Date:** | 07/18/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 07/29/2022 | **Tested By:** | Ficek, Kevin |

## Laboratory Data




| | | | |
|---|---|---|---|
| **Proctor ID:** | P-11 | | |
| **Maximum Dry Density (pcf):** | 95.9 | | |
| **Optimum Moisture (%):** | 24.8 | | |
| **Method:** | Method A | | |
| **Preparation Method:** | Moist | | |
| **Rammer Type:** | Manual Round | | |
| **Specific Gravity:** | 2.65 | | |
| **Specific Gravity Source:** | Assumed | | |
| **Liquid Limit:** | 63 | **Plastic Limit:** | 19 |
| **Plastic Index:** | 44 | | |
| **Passes #200 (%):** | 99.1 | **Retained #200 (%):** | 0.9 |
| **Retained On 3/4 (%):** | 0 | **Retained On 3/8 (%):** | 0 |
| **Retained On #4 (%):** | 0 | **Passing #4 (%):** | 100 |

**Classification:** CH Fat Clay

## General

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**ASTM D698**

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Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

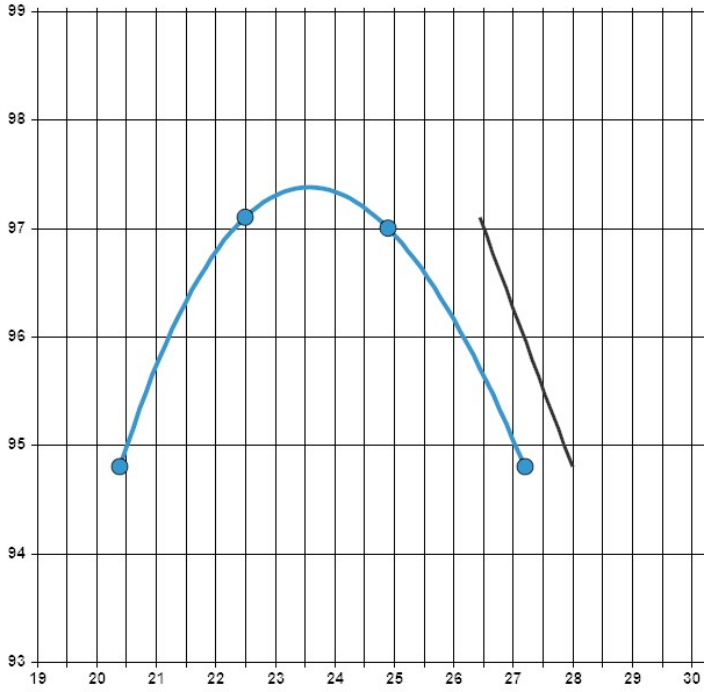
**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 460958 | **Alternate ID:** | P-12 |
| **Sample From:** | Stockpile | **Sampled By:** | Client |
| **Location Details:** | Select Clay Stockpile, Sample 12 | | |
| **Sample Date:** | 07/18/2022 | | |
| **Received Date:** | 07/18/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 07/29/2022 | **Tested By:** | Ficek, Kevin |

## Laboratory Data




| | | | |
|---|---|---|---|
| **Proctor ID:** | P-12 | | |
| **Maximum Dry Density (pcf):** | 97.4 | | |
| **Optimum Moisture (%):** | 23.6 | | |
| **Method:** | Method A | | |
| **Preparation Method:** | Moist | | |
| **Rammer Type:** | Manual Round | | |
| **Specific Gravity:** | 2.65 | | |
| **Specific Gravity Source:** | Assumed | | |
| **Liquid Limit:** | 60 | **Plastic Limit:** | 18 |
| **Plastic Index:** | 42 | | |
| **Passes #200 (%):** | 98.3 | **Retained #200 (%):** | 1.7 |
| **Retained On 3/4 (%):** | 0 | **Retained On 3/8 (%):** | 0 |
| **Retained On #4 (%):** | 0 | **Passing #4 (%):** | 100 |

**Classification:** CH Fat Clay

## General

The results included in this report relate only to the items inspected or tested. Sample plan outlined in project specifications as applicable. Additionally, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without the prior written approval.

BRAUN INTERTEC
The Science You Build On.

# Standard Proctor M-D Relationship

**ASTM D698**

**Report Date:** 08/04/2022

1502 Grumman Lane
Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

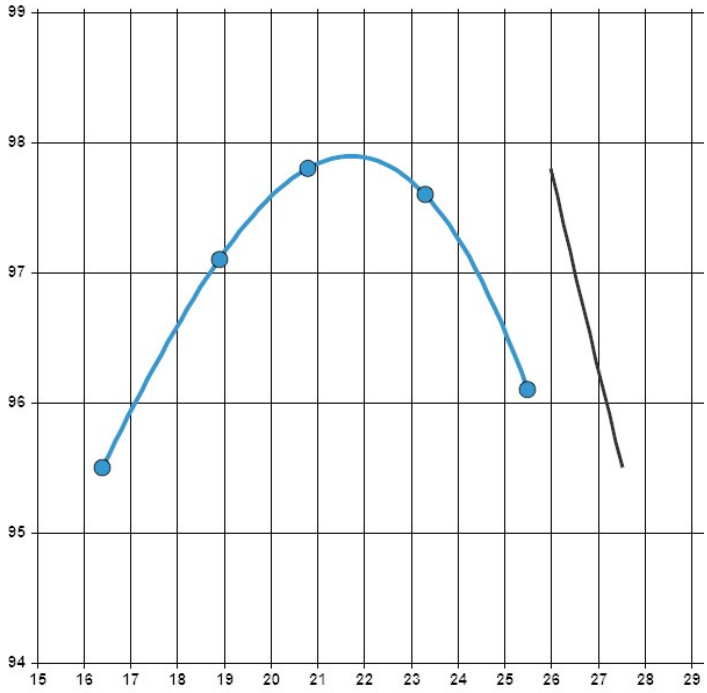
**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 464326 | **Alternate ID:** | SC-16 |
| **Sample From:** | Not Given | **Sampled By:** | Client |
| **Location Details:** | Select Clay Stockpile, Sample 16 | | |
| **Sample Date:** | 07/27/2022 | | |
| **Received Date:** | 07/28/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 07/29/2022 | **Tested By:** | Ficek, Kevin |

## Laboratory Data




| | | | |
|---|---|---|---|
| **Proctor ID:** | SC-16 | | |
| **Maximum Dry Density (pcf):** | 97.9 | | |
| **Optimum Moisture (%):** | 21.7 | | |
| **Method:** | Method A | | |
| **Preparation Method:** | Moist | | |
| **Rammer Type:** | Manual Round | | |
| **Specific Gravity:** | 2.65 | | |
| **Specific Gravity Source:** | Assumed | | |
| **Liquid Limit:** | 53 | **Plastic Limit:** | 19 |
| **Plastic Index:** | 34 | | |
| **Passes #200 (%):** | 98.5 | **Retained #200 (%):** | 1.5 |
| **Retained On 3/4 (%):** | 0 | **Retained On 3/8 (%):** | 0 |
| **Retained On #4 (%):** | 0 | **Passing #4 (%):** | 100 |

**Classification:** CH Fat Clay

## General

**Remarks:** The test is for informational purposes.

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BRAUN INTERTEC
The Science You Build On.

# Standard Proctor M-D Relationship

**ASTM D698**

**Report Date:** 05/24/2023

2908 Morrison Ave.
Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

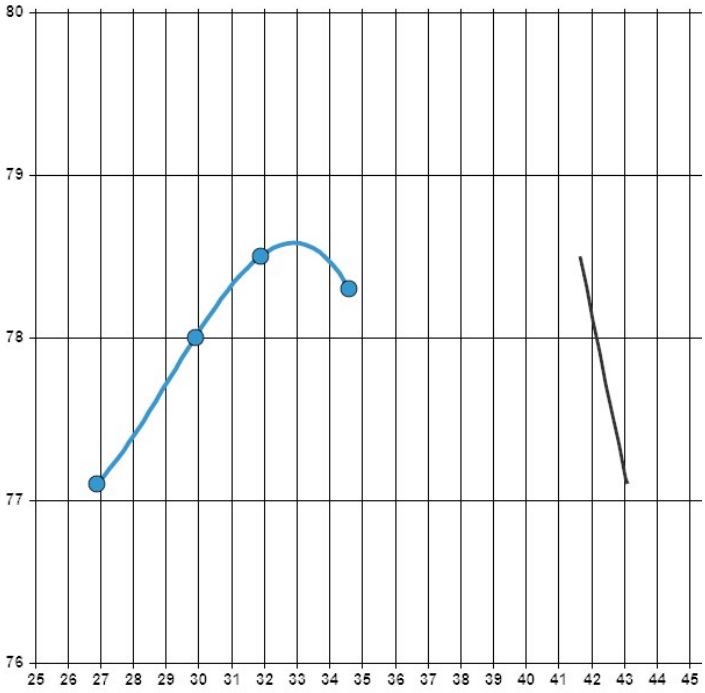
**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
Center, ND

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 517473 | **Alternate ID:** | P-20 |
| **Sample From:** | In Place | **Sampled By:** | Wenko, Steve |
| **Location Details:** | Zone 26, 2016' | | |
| **Sample Date:** | 05/02/2023 | | |
| **Received Date:** | 05/02/2023 | **Lab:** | 2908 Morrison Ave. Suite 3, Bismarck, ND |
| **Tested Date:** | 05/10/2023 | **Tested By:** | Ficek, Kevin |

## Laboratory Data




| | | | |
|---|---|---|---|
| **Proctor ID:** | P-20 | | |
| **Maximum Dry Density (pcf):** | 78.6 | | |
| **Optimum Moisture (%):** | 32.9 | | |
| **Method:** | Method A | | |
| **Preparation Method:** | Moist | | |
| **Rammer Type:** | Manual Round | | |
| **Specific Gravity:** | 2.65 | | |
| **Specific Gravity Source:** | Assumed | | |
| **Liquid Limit:** | 89 | **Plastic Limit:** | 27 |
| **Plastic Index:** | 62 | | |
| **Passes #200 (%):** | 98.0 | **Retained #200 (%):** | 2.0 |
| **Retained On 3/4 (%):** | 0 | **Retained On 3/8 (%):** | 0 |
| **Retained On #4 (%):** | 0 | **Passing #4 (%):** | 100 |

**Classification:** CH Fat Clay

## General

**Remarks:** The test is for informational purposes.

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BRAUN INTERTEC
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# Standard Proctor M-D Relationship

**ASTM D698**

**Report Date:** 06/19/2023

2908 Morrison Ave.
Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

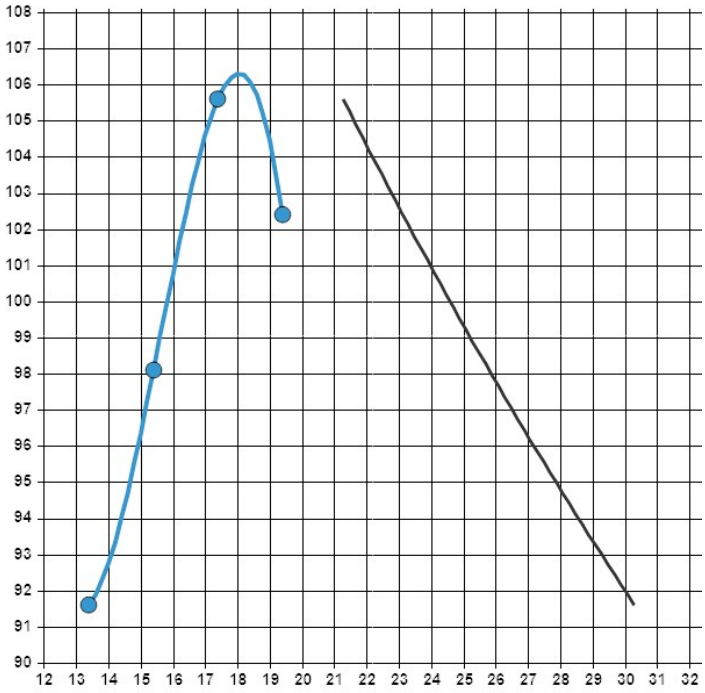
**Project:**

B2303912
Minnkota Cell 5
Center, ND

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 528518 | **Alternate ID:** | SC-66 |
| | | **Sampled By:** | Vang, Yang |
| **Location Details:** | SC-66 | | |
| **Sample Date:** | 06/19/2023 | | |
| **Received Date:** | 06/19/2023 | **Lab:** | 11001 Hampshire Ave S, Bloomington, MN |
| **Tested Date:** | 06/19/2023 | **Tested By:** | Vang, Yang |

## Laboratory Data




| | | | |
|---|---|---|---|
| **Proctor ID:** | P-21-std | | |
| **Maximum Dry Density (pcf):** | 106.3 | | |
| **Optimum Moisture (%):** | 18.1 | | |
| **Method:** | Method A | | |
| **Preparation Method:** | Moist | | |
| **Rammer Type:** | Manual Round | | |
| **Specific Gravity:** | 2.65 | | |
| **Specific Gravity Source:** | Assumed | | |
| **Passes #200 (%):** | 99.0 | **Retained #200 (%):** | 1.0 |
| **Retained On 3/4 (%):** | 0 | **Retained On 3/8 (%):** | 0 |
| **Retained On #4 (%):** | 1 | **Passing #4 (%):** | 99 |

**Classification:** CL Lean clay, dark brown

## General

**Remarks:** The % passing the #200 is for informational purposes only.

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# Standard Proctor M-D Relationship

**ASTM D698**

**Report Date:** 07/21/2023

2908 Morrison Ave.
Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

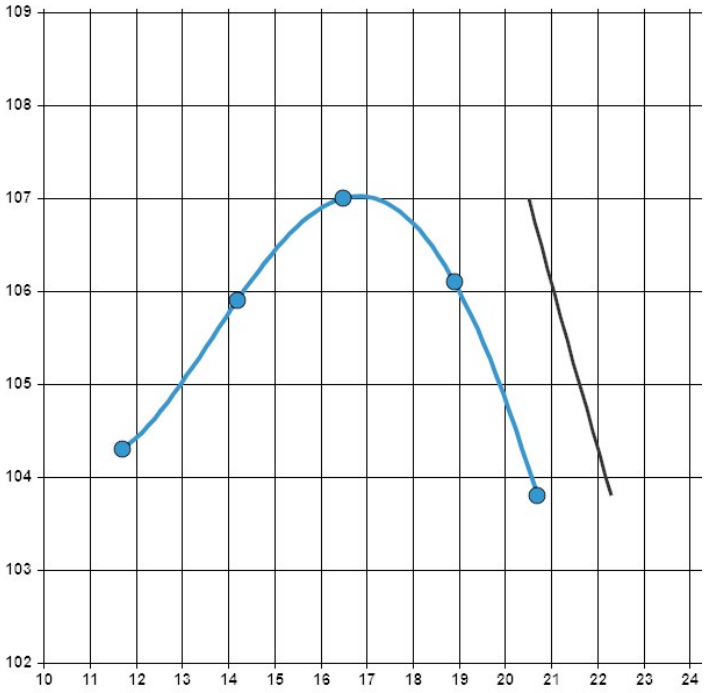
**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
Center, ND

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 537183 | **Alternate ID:** | P-22 (SC-74) |
| **Sample From:** | In Place | **Sampled By:** | Bruce, Dalton |
| **Location Details:** | N Wall Cell 5, E Half | | |
| **Sample Date:** | 07/14/2023 | | |
| **Received Date:** | 07/14/2023 | **Lab:** | 2908 Morrison Ave. Suite 3, Bismarck, ND |
| **Tested Date:** | 07/20/2023 | **Tested By:** | Ficek, Kevin |

## Laboratory Data




| | |
|---|---|
| **Proctor ID:** | P-22 |
| **Maximum Dry Density (pcf):** | 107.0 |
| **Optimum Moisture (%):** | 16.8 |
| **Method:** | Method A |
| **Preparation Method:** | Moist |
| **Rammer Type:** | Manual Round |
| **Specific Gravity:** | 2.65 |
| **Specific Gravity Source:** | Assumed |

| | | | |
|---|---|---|---|
| **Passes #200 (%):** | 53.8 | **Retained #200 (%):** | 46.2 |
| **Retained On 3/4 (%):** | 0 | **Retained On 3/8 (%):** | 0 |
| **Retained On #4 (%):** | 0 | **Passing #4 (%):** | 100 |

**Classification:** CL Sandy lean clay

## General

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BRAUN INTERTEC
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# Standard Proctor M-D Relationship

**ASTM D698**

**Report Date:** 09/23/2022

1502 Grumman Lane
Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

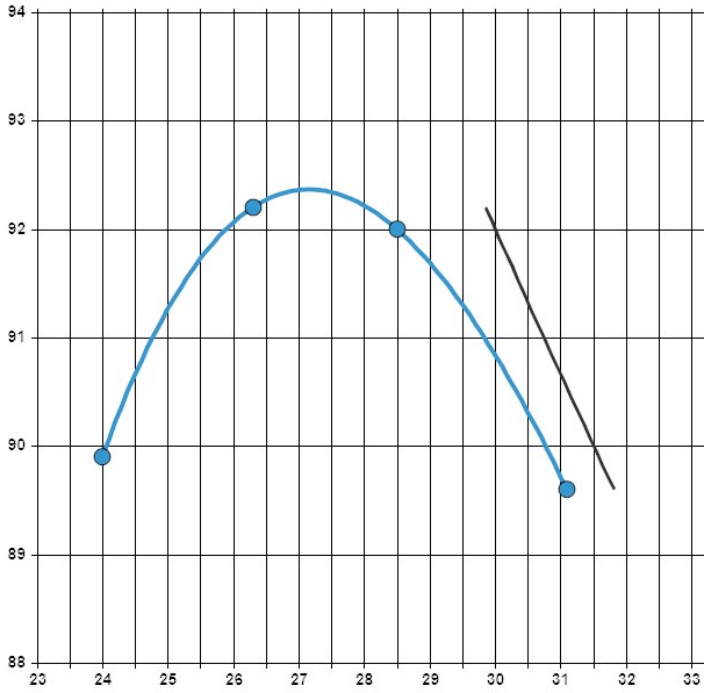
**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 479415 | **Alternate ID:** | SC-23 |
| **Sample From:** | Not Given | **Sampled By:** | Client |
| **Location Details:** | Select Clay Stockpile, Sample 23 | | |
| **Sample Date:** | 09/12/2022 | | |
| **Received Date:** | 09/12/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 09/23/2022 | **Tested By:** | Ficek, Kevin |

## Laboratory Data




| | | | |
|---|---|---|---|
| **Proctor ID:** | SC-23 | | |
| **Maximum Dry Density (pcf):** | 92.4 | | |
| **Optimum Moisture (%):** | 27.2 | | |
| **Method:** | Method A | | |
| **Preparation Method:** | Moist | | |
| **Rammer Type:** | Manual Round | | |
| **Specific Gravity:** | 2.65 | | |
| **Specific Gravity Source:** | Assumed | | |
| **Liquid Limit:** | 72 | **Plastic Limit:** | 21 |
| **Plastic Index:** | 51 | | |
| **Passes #200 (%):** | 99.1 | **Retained #200 (%):** | 0.9 |
| **Retained On 3/4 (%):** | 0 | **Retained On 3/8 (%):** | 0 |
| **Retained On #4 (%):** | 0 | **Passing #4 (%):** | 100 |

**Classification:** CH Fat Clay

## General

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# Standard Proctor M-D Relationship

**ASTM D698**

**Report Date:** 09/23/2022

1502 Grumman Lane
Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

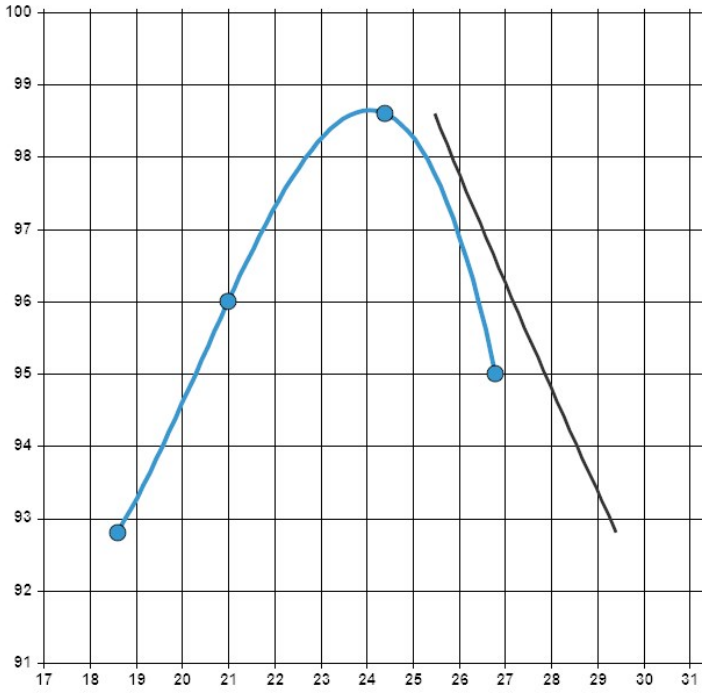
**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 479421 | **Alternate ID:** | SC-28 |
| **Sample From:** | Not Given | **Sampled By:** | Client |
| **Location Details:** | Select Clay Stockpile, Sample 28 | | |
| **Sample Date:** | 09/14/2022 | | |
| **Received Date:** | 09/15/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 09/23/2022 | **Tested By:** | Ficek, Kevin |

## Laboratory Data




| | | | |
|---|---|---|---|
| **Proctor ID:** | SC-28 | | |
| **Maximum Dry Density (pcf):** | 98.6 | | |
| **Optimum Moisture (%):** | 24.1 | | |
| **Method:** | Method A | | |
| **Preparation Method:** | Moist | | |
| **Rammer Type:** | Manual Round | | |
| **Specific Gravity:** | 2.65 | | |
| **Specific Gravity Source:** | Assumed | | |
| **Liquid Limit:** | 63 | **Plastic Limit:** | 17 |
| **Plastic Index:** | 46 | | |
| **Passes #200 (%):** | 99.3 | **Retained #200 (%):** | 0.7 |
| **Retained On 3/4 (%):** | 0 | **Retained On 3/8 (%):** | 0 |
| **Retained On #4 (%):** | 0 | **Passing #4 (%):** | 100 |

**Classification:** CH Fat Clay

## General

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BRAUN INTERTEC
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# Standard Proctor M-D Relationship

**ASTM D698**

**Report Date:** 10/11/2022

1502 Grumman Lane
Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

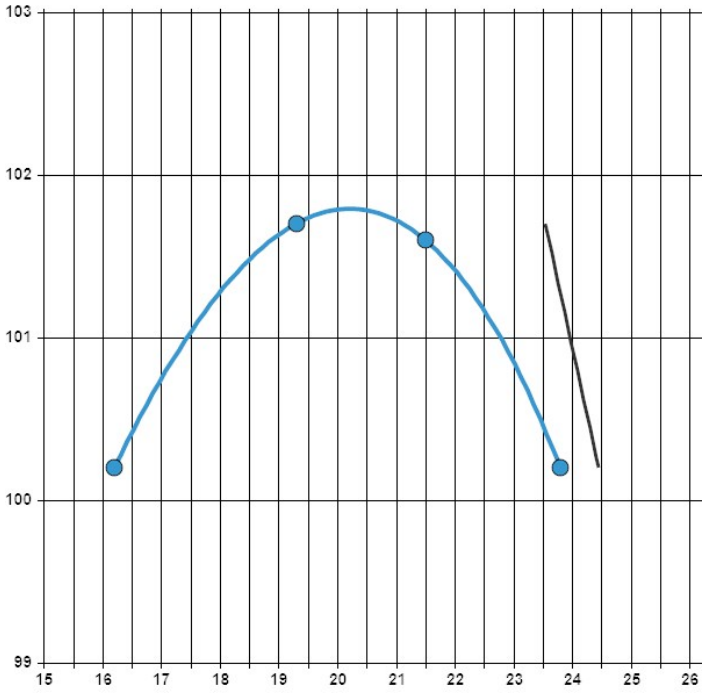
**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 482387 | **Alternate ID:** | SC-34 |
| **Sample From:** | In Place | **Sampled By:** | Client |
| **Location Details:** | Select Clay Stockpile, Sample 34 | | |
| **Sample Date:** | 09/30/2022 | | |
| **Received Date:** | 09/30/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 10/11/2022 | **Tested By:** | Ficek, Kevin |

## Laboratory Data




| | | | |
|---|---|---|---|
| **Proctor ID:** | SC-34 | | |
| **Maximum Dry Density (pcf):** | 101.8 | | |
| **Optimum Moisture (%):** | 20.2 | | |
| **Method:** | Method A | | |
| **Preparation Method:** | Moist | | |
| **Rammer Type:** | Manual Round | | |
| **Specific Gravity:** | 2.65 | | |
| **Specific Gravity Source:** | Assumed | | |
| **Liquid Limit:** | 55 | **Plastic Limit:** | 16 |
| **Plastic Index:** | 39 | | |
| **Passes #200 (%):** | 99.4 | **Retained #200 (%):** | 0.6 |
| **Retained On 3/4 (%):** | 0 | **Retained On 3/8 (%):** | 0 |
| **Retained On #4 (%):** | 0 | **Passing #4 (%):** | 100 |

**Classification:** CH Fat Clay

## General

**Remarks:** The % passing the #200 is for informational purposes only.

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BRAUN INTERTEC
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# Standard Proctor M-D Relationship

**ASTM D698**

**Report Date:** 11/01/2022

1502 Grumman Lane
Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

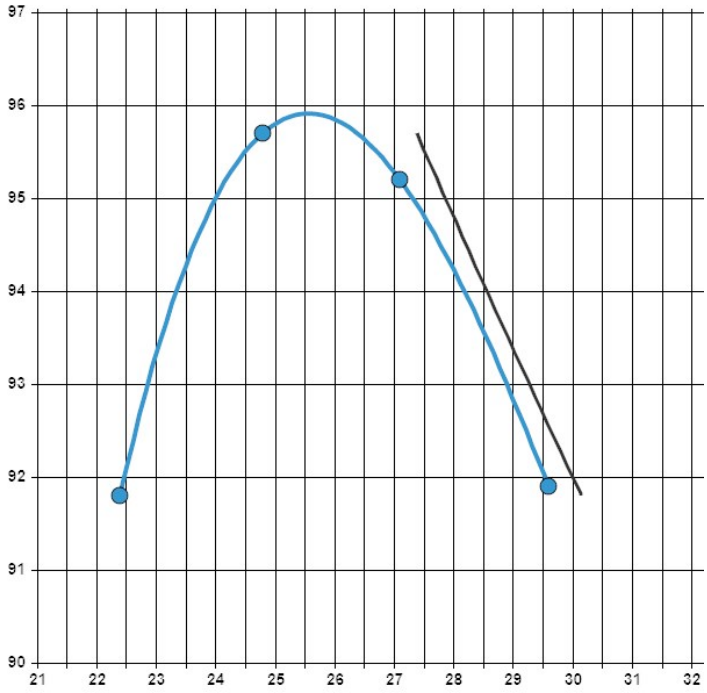
**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 488507 | **Alternate ID:** | SC-40 |
| **Sample From:** | In Place | **Sampled By:** | Client |
| **Location Details:** | Select Clay Stockpile, Sample 40 | | |
| **Sample Date:** | 10/19/2022 | | |
| **Received Date:** | 10/19/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 11/01/2022 | **Tested By:** | Ficek, Kevin |

## Laboratory Data




| | | | |
|---|---|---|---|
| **Proctor ID:** | SC-40 | | |
| **Maximum Dry Density (pcf):** | 95.9 | | |
| **Optimum Moisture (%):** | 25.6 | | |
| **Method:** | Method A | | |
| **Preparation Method:** | Moist | | |
| **Rammer Type:** | Manual Round | | |
| **Specific Gravity:** | 2.65 | | |
| **Specific Gravity Source:** | Assumed | | |
| **Liquid Limit:** | 115 | **Plastic Limit:** | 20 |
| **Plastic Index:** | 95 | | |
| **Passes #200 (%):** | 100.0 | **Retained #200 (%):** | 0.0 |
| **Retained On 3/4 (%):** | 0 | **Retained On 3/8 (%):** | 0 |
| **Retained On #4 (%):** | 0 | **Passing #4 (%):** | 100 |

**Classification:** CH Fat Clay

## General

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BRAUN INTERTEC
The Science You Build On.

1502 Grumman Lane
Bismarck, ND 58504
Phone: 701-255-7180

# Standard Proctor M-D Relationship

**ASTM D698**

**Report Date:** 11/23/2022

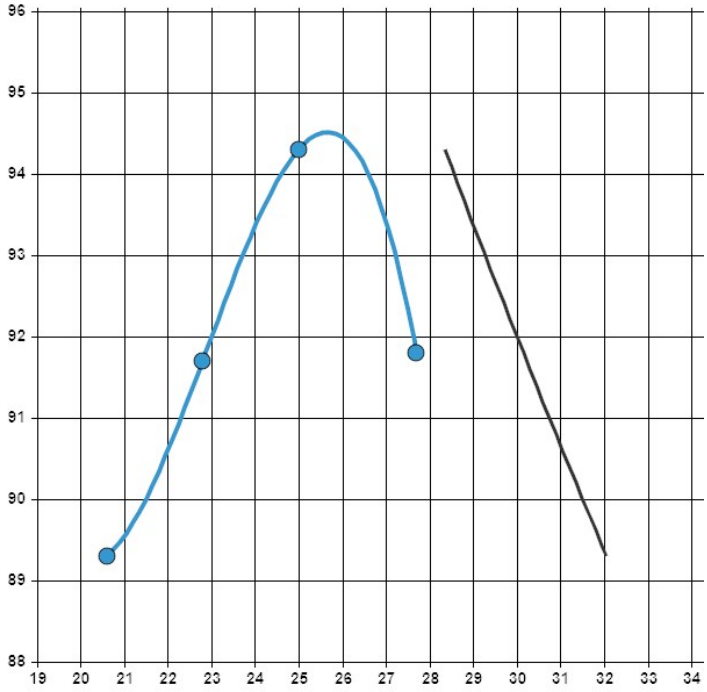
**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 491930 | **Alternate ID:** | SC-46 |
| **Sample From:** | Stockpile | **Sampled By:** | Client |
| **Location Details:** | Select Clay Stockpile, Sample 46 | | |
| **Sample Date:** | 10/28/2022 | | |
| **Received Date:** | 10/28/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 11/23/2022 | **Tested By:** | Ficek, Kevin |

## Laboratory Data




| | | | |
|---|---|---|---|
| **Proctor ID:** | SC-46 | | |
| **Maximum Dry Density (pcf):** | 94.5 | | |
| **Optimum Moisture (%):** | 25.7 | | |
| **Method:** | Method A | | |
| **Preparation Method:** | Moist | | |
| **Rammer Type:** | Manual Round | | |
| **Specific Gravity:** | 2.65 | | |
| **Specific Gravity Source:** | Assumed | | |
| **Liquid Limit:** | 66 | **Plastic Limit:** | 19 |
| **Plastic Index:** | 47 | | |
| **Passes #200 (%):** | 97.3 | **Retained #200 (%):** | 2.7 |
| **Retained On 3/4 (%):** | 1 | **Retained On 3/8 (%):** | 1 |
| **Retained On #4 (%):** | 1 | **Passing #4 (%):** | 99 |

**Classification:** CH Fat Clay

## General

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BRAUN INTERTEC
The Science You Build On.

1502 Grumman Lane
Bismarck, ND 58504
Phone: 701-255-7180

# Standard Proctor M-D Relationship

**ASTM D698**

**Report Date:** 11/23/2022

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

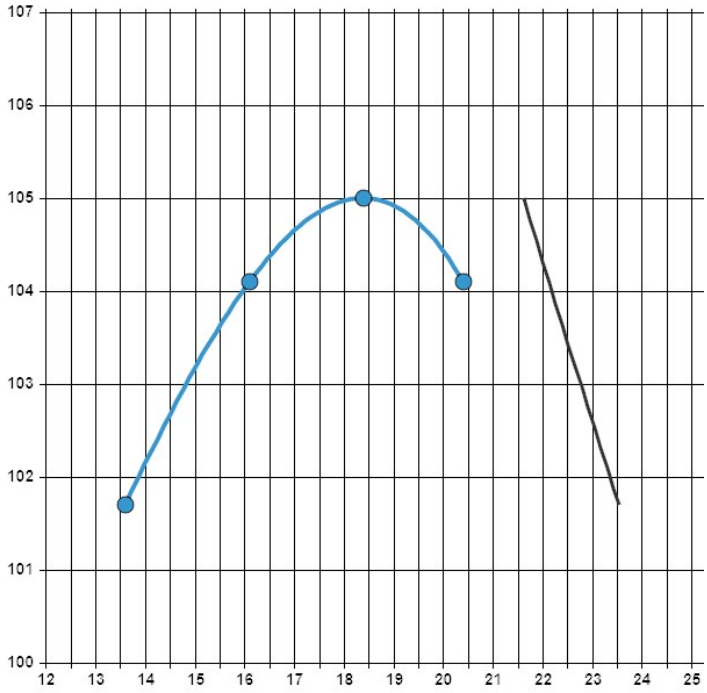
**Project:**

B2205914
Cell 5 Phase 1A
Milton Young Station
Center, ND

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 491936 | **Alternate ID:** | SC-52 |
| **Sample From:** | Stockpile | **Sampled By:** | Client |
| **Location Details:** | Select Clay Stockpile, Sample 52 | | |
| **Sample Date:** | 10/28/2022 | | |
| **Received Date:** | 10/28/2022 | **Lab:** | 1502 Grumman Lane, Bismarck, ND |
| **Tested Date:** | 11/23/2022 | **Tested By:** | Ficek, Kevin |

## Laboratory Data




| | | | |
|---|---|---|---|
| **Proctor ID:** | SC-52 | | |
| **Maximum Dry Density (pcf):** | 105.0 | | |
| **Optimum Moisture (%):** | 18.4 | | |
| **Method:** | Method A | | |
| **Preparation Method:** | Moist | | |
| **Rammer Type:** | Manual Round | | |
| **Specific Gravity:** | 2.65 | | |
| **Specific Gravity Source:** | Assumed | | |
| **Liquid Limit:** | 54 | **Plastic Limit:** | 18 |
| **Plastic Index:** | 36 | | |
| **Passes #200 (%):** | 95.7 | **Retained #200 (%):** | 4.3 |
| **Retained On 3/4 (%):** | 0 | **Retained On 3/8 (%):** | 0 |
| **Retained On #4 (%):** | 0 | **Passing #4 (%):** | 100 |

**Classification:** CH Fat Clay

## General

**Remarks:** The test is for informational purposes.

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# Select Clay Field Test Results

Clay Field Test Results Summary
Cell 5 Phase 1

| Test No. | Retest of | Date | Lift | Proctor Reference No. | In-Place Moisture Content (%) | In-Place Dry Denisty (pcf) | Percent Compaction | Optimum Moisture | Passing Test # (Overall) |
|---|---|---|---|---|---|---|---|---|---|
| Z-1 | | | | | | | | | |
| 10 | - | 5/1/2023 | 1 | 16 | 24.7% | 98.3 | 97% | 20.2% | 1 |
| 49 | - | 5/1/2023 | 2 | 16 | 22.1% | 97.9 | 96% | 20.2% | 2 |
| 50 | - | 5/1/2023 | 3 | 19 | 20.9% | 103.4 | 98% | 18.4% | 3 |
| 51 | - | 5/1/2023 | 4 | 16 | 22.0% | 101.2 | 99% | 20.2% | 4 |
| 52 | - | 5/1/2023 | 5 | 7 | 23.8% | 92.2 | 98% | 22.6% | 5 |
| 90 | - | 5/2/2023 | 6 | 18 | 29.9% | 92.6 | 98% | 25.7% | 6 |
| 91 | - | 5/2/2023 | 7 | 14 | 34.1% | 88.1 | 95% | 27.2% | 7 |
| 92 | - | 5/2/2023 | 8 | 14 | 31.3% | 88.5 | 96% | 27.2% | 8 |
| 419 | - | 5/8/2023 | 2 | 16 | 25.1% | 97.9 | 96% | 20.2% | 9 |
| Z-2 | | | | | | | | | |
| 11 | - | 5/1/2023 | 1 | 16 | 22.9% | 101.2 | 99% | 20.2% | 10 |
| 21 | - | 5/1/2023 | 2 | 16 | 21.9% | 101.6 | 100% | 20.2% | 11 |
| 53 | - | 5/1/2023 | 3 | 19 | 18.0% | 106.9 | 102% | 18.4% | - |
| 54 | 53 | 5/1/2023 | 3 | 19 | 20.9% | 105.4 | 100% | 18.4% | 12 |
| 55 | - | 5/1/2023 | 4 | 19 | 20.4% | 105.7 | 101% | 18.4% | 13 |
| 56 | - | 5/1/2023 | 5 | 16 | 22.4% | 101.0 | 99% | 20.2% | 14 |
| 93 | - | 5/2/2023 | 6 | 18 | 28.9% | 93.9 | 99% | 25.7% | 15 |
| 94 | - | 5/2/2023 | 7 | 14 | 31.3% | 89.5 | 97% | 27.2% | 16 |
| 549 | - | 5/11/2023 | 1 | 7 | 27.1% | 91.4 | 97% | 22.6% | 17 |
| 557 | - | 5/11/2023 | 2 | 16 | 22.6% | 100.8 | 99% | 20.2% | 18 |
| 564 | - | 5/11/2023 | 3 | 16 | 23.5% | 100.9 | 99% | 20.2% | 19 |
| 572 | - | 6/12/2023 | 6 | 16 | 21.8% | 101.5 | 100% | 20.2% | 20 |
| 580 | - | 6/12/2023 | 7 | 16 | 22.7% | 97.3 | 96% | 20.2% | 21 |
| 693 | - | 6/14/2023 | 8 | 19 | 19.7% | 103.1 | 98% | 18.4% | 22 |
| Z-3 | | | | | | | | | |
| 12 | - | 5/1/2023 | 1 | 16 | 24.0% | 98.5 | 97% | 20.2% | 23 |
| 22 | - | 5/1/2023 | 2 | 19 | 23.1% | 102.1 | 97% | 18.4% | 24 |
| 57 | - | 5/1/2023 | 3 | 19 | 20.2% | 105.3 | 100% | 18.4% | 25 |
| 58 | - | 5/1/2023 | 4 | 16 | 22.6% | 101.3 | 100% | 20.2% | 26 |
| 59 | - | 5/1/2023 | 5 | 16 | 23.6% | 98.9 | 97% | 20.2% | 27 |
| 95 | - | 5/2/2023 | 6 | 16 | 24.4% | 98.8 | 97% | 20.2% | 28 |
| 96 | - | 5/2/2023 | 7 | 14 | 28.7% | 90.1 | 98% | 27.2% | 29 |
| 97 | - | 5/2/2023 | 8 | 15 | 34.4% | 85.7 | 87% | 24.1% | - |
| 98 | 97 | 5/2/2023 | 8 | 15 | 25.0% | 95.7 | 97% | 24.1% | 30 |
| 550 | - | 5/11/2023 | 1 | 13 | 25.7% | 96.2 | 98% | 21.7% | 31 |
| 556 | - | 5/11/2023 | 2 | 16 | 20.9% | 100.4 | 99% | 20.2% | 32 |
| 566 | - | 5/11/2023 | 3 | 16 | 22.5% | 99.6 | 98% | 20.2% | 33 |
| 573 | - | 6/12/2023 | 6 | 19 | 18.7% | 103.4 | 98% | 18.4% | 34 |
| 582 | - | 6/12/2023 | 7 | 16 | 23.6% | 99.2 | 97% | 20.2% | 35 |
| 590 | - | 6/12/2023 | 8 | 16 | 22.9% | 96.8 | 95% | 20.2% | 36 |
| Z-4 | | | | | | | | | |
| 13 | - | 5/1/2023 | 1 | 19 | 22.3% | 104.3 | 99% | 18.4% | 37 |
| 23 | - | 5/1/2023 | 2 | 19 | 19.9% | 105.9 | 101% | 18.4% | 38 |
| 60 | - | 5/1/2023 | 3 | 19 | 22.1% | 102.5 | 98% | 18.4% | 39 |
| 61 | - | 5/1/2023 | 4 | 19 | 21.3% | 104.3 | 99% | 18.4% | 40 |
| 62 | - | 5/1/2023 | 5 | 15 | 26.1% | 96.0 | 97% | 24.1% | 41 |
| 99 | - | 5/2/2023 | 6 | 16 | 22.5% | 100.1 | 98% | 20.2% | 42 |

Clay Field Test Results Summary
Cell 5 Phase 1

| Test No. | Retest of | Date | Lift | Proctor Reference No. | In-Place Moisture Content (%) | In-Place Dry Denisty (pcf) | Percent Compaction | Optimum Moisture | Passing Test # (Overall) |
|---|---|---|---|---|---|---|---|---|---|
| 100 | - | 5/2/2023 | 7 | 14 | 31.4% | 87.7 | 95% | 27.2% | 43 |
| 101 | - | 5/2/2023 | 8 | 14 | 34.6% | 84.0 | 91% | 27.2% | - |
| 102 | 101 | 5/2/2023 | 8 | 14 | 30.8% | 90.2 | 98% | 27.2% | 44 |
| 551 | - | 5/11/2023 | 1 | 19 | 19.1% | 103.0 | 98% | 18.4% | 45 |
| 555 | - | 5/11/2023 | 2 | 16 | 17.9% | 101.4 | 100% | 20.2% | - |
| 558 | 555 | 5/11/2023 | 2 | 16 | 21.2% | 100.9 | 99% | 20.2% | 46 |
| 565 | - | 5/11/2023 | 3 | 16 | 24.1% | 98.7 | 97% | 20.2% | 47 |
| 575 | - | 6/12/2023 | 6 | 19 | 18.6% | 103.4 | 98% | 18.4% | 48 |
| 581 | - | 6/12/2023 | 7 | 16 | 23.9% | 98.1 | 96% | 20.2% | 49 |
| 589 | - | 6/12/2023 | 8 | 16 | 23.5% | 98.1 | 96% | 20.2% | 50 |
| Z-5 | | | | | | | | | |
| 1 | - | 5/1/2023 | 1 | 16 | 23.7% | 101.9 | 100% | 20.2% | 51 |
| 14 | - | 5/1/2023 | 2 | 19 | 19.6% | 105.9 | 101% | 18.4% | 52 |
| 24 | - | 5/1/2023 | 3 | 16 | 22.6% | 99.9 | 98% | 20.2% | 53 |
| 25 | - | 5/1/2023 | 4 | 16 | 23.3% | 96.9 | 95% | 20.2% | 54 |
| 26 | - | 5/1/2023 | 5 | 19 | 21.9% | 105.2 | 100% | 18.4% | 55 |
| 63 | - | 5/2/2023 | 6 | 16 | 22.5% | 100.1 | 98% | 20.2% | 56 |
| 64 | - | 5/2/2023 | 7 | 14 | 30.4% | 91.3 | 99% | 27.2% | 57 |
| 65 | - | 5/2/2023 | 8 | 14 | 31.1% | 87.8 | 95% | 27.2% | 58 |
| 552 | - | 5/11/2023 | 1 | 7 | 27.4% | 90.3 | 96% | 22.6% | 59 |
| 554 | - | 5/11/2023 | 2 | 13 | 24.5% | 97.2 | 99% | 21.7% | 60 |
| 567 | - | 5/11/2023 | 3 | 16 | 20.9% | 99.0 | 97% | 20.2% | 61 |
| 574 | - | 6/12/2023 | 6 | 19 | 18.5% | 102.6 | 98% | 18.4% | 62 |
| 583 | - | 6/12/2023 | 7 | 13 | 23.6% | 93.6 | 96% | 21.7% | 63 |
| 591 | - | 6/12/2023 | 8 | 2 | 25.6% | 96.1 | 98% | 22.6% | 64 |
| Z-6 | | | | | | | | | |
| 8 | - | 5/1/2023 | 1 | 16 | 19.1% | 96.3 | 95% | 20.2% | - |
| 9 | 8 | 5/1/2023 | 1 | 19 | 22.1% | 103.7 | 99% | 18.4% | 65 |
| 45 | - | 5/1/2023 | 2 | 15 | 24.5% | 95.0 | 96% | 24.1% | 66 |
| 46 | - | 5/1/2023 | 3 | 19 | 19.7% | 104.0 | 99% | 18.4% | 67 |
| 47 | - | 5/1/2023 | 4 | 16 | 23.1% | 96.3 | 95% | 20.2% | 68 |
| 48 | - | 5/1/2023 | 5 | 16 | 23.6% | 98.4 | 97% | 20.2% | 69 |
| 87 | - | 5/2/2023 | 6 | 15 | 25.1% | 97.5 | 99% | 24.1% | 70 |
| 88 | - | 5/2/2023 | 7 | 14 | 30.9% | 89.7 | 97% | 27.2% | 71 |
| 89 | - | 5/2/2023 | 8 | 14 | 29.4% | 91.2 | 99% | 27.2% | 72 |
| 426 | - | 5/8/2023 | 1 | 15 | 26.7% | 96.0 | 97% | 24.1% | 73 |
| 432 | - | 5/8/2023 | 2 | 9 | 25.4% | 97.9 | 99% | 23.9% | 74 |
| 440 | - | 5/9/2023 | 3 | 11 | 26.1% | 94.7 | 99% | 24.8% | 75 |
| 446 | - | 5/9/2023 | 4 | 16 | 25.0% | 100.2 | 98% | 20.2% | 76 |
| 451 | - | 5/9/2023 | 5 | 1 | 23.8% | 99.2 | 98% | 19.4% | 77 |
| 457 | - | 5/9/2023 | 6 | 1 | 24.3% | 99.5 | 99% | 19.4% | 78 |
| 463 | - | 5/9/2023 | 7 | 6 | 25.6% | 97.3 | 100% | 24.5% | 79 |
| 469 | - | 5/9/2023 | 8 | 12 | 25.4% | 95.3 | 98% | 23.6% | 80 |
| 475 | - | 5/9/2023 | 9 | 3 | 24.1% | 98.6 | 99% | 20.2% | 81 |
| Z-7 | | | | | | | | | |
| 418 | - | 5/8/2023 | 2 | 19 | 22.3% | 104.0 | 99% | 18.4% | 82 |
| 424 | - | 5/8/2023 | 1 | 6 | 28.8% | 93.3 | 96% | 24.5% | 83 |
| 433 | - | 5/8/2023 | 2 | 16 | 24.6% | 99.0 | 97% | 20.2% | 84 |

Clay Field Test Results Summary
Cell 5 Phase 1

| Test No. | Retest of | Date | Lift | Proctor Reference No. | In-Place Moisture Content (%) | In-Place Dry Denisty (pcf) | Percent Compaction | Optimum Moisture | Passing Test # (Overall) |
|---|---|---|---|---|---|---|---|---|---|
| 439 | - | 5/9/2023 | 3 | 3 | 23.1% | 97.6 | 98% | 20.2% | 85 |
| 445 | - | 5/9/2023 | 4 | 7 | 27.2% | 92.9 | 99% | 22.6% | 86 |
| 452 | - | 5/9/2023 | 5 | 19 | 21.1% | 101.9 | 97% | 18.4% | 87 |
| 458 | - | 5/9/2023 | 6 | 3 | 22.4% | 97.3 | 98% | 20.2% | 88 |
| 464 | - | 5/9/2023 | 7 | 7 | 25.8% | 93.1 | 99% | 22.6% | 89 |
| 470 | - | 5/9/2023 | 8 | 13 | 22.1% | 96.9 | 99% | 21.7% | 90 |
| 476 | - | 5/9/2023 | 9 | 18 | 27.1% | 90.7 | 96% | 25.7% | 91 |
| Z-8 | | | | | | | | | |
| 417 | - | 5/8/2023 | 2 | 19 | 20.4% | 101.0 | 96% | 18.4% | 92 |
| 548 | - | 5/11/2023 | 1 | 16 | 23.5% | 99.6 | 98% | 20.2% | 93 |
| 561 | - | 5/11/2023 | 2 | 9 | 26.4% | 95.6 | 97% | 23.9% | 94 |
| 563 | - | 5/11/2023 | 3 | 19 | 19.1% | 106.8 | 102% | 18.4% | 95 |
| 571 | - | 6/12/2023 | 4 | 19 | 20.2% | 104.2 | 99% | 18.4% | 96 |
| 579 | - | 6/12/2023 | 5 | 16 | 23.6% | 99.9 | 98% | 20.2% | 97 |
| 587 | - | 6/12/2023 | 6 | 13 | 21.9% | 95.9 | 98% | 21.7% | 98 |
| 588 | - | 6/12/2023 | 7 | 19 | 20.8% | 101.5 | 97% | 18.4% | 99 |
| 692 | - | 6/14/2023 | 8 | 19 | 18.8% | 106.0 | 101% | 18.4% | 100 |
| Z-9 | | | | | | | | | |
| 547 | - | 5/11/2023 | 1 | 7 | 30.1% | 91.0 | 97% | 22.6% | 101 |
| 560 | - | 5/11/2023 | 2 | 9 | 26.4% | 93.6 | 95% | 23.9% | 102 |
| 562 | - | 5/11/2023 | 3 | 13 | 24.4% | 97.1 | 99% | 21.7% | 103 |
| 570 | - | 6/12/2023 | 4 | 19 | 18.8% | 106.0 | 101% | 18.4% | 104 |
| 578 | - | 6/12/2023 | 5 | 19 | 20.4% | 104.5 | 100% | 18.4% | 105 |
| 586 | - | 6/12/2023 | 6 | 16 | 20.4% | 99.6 | 98% | 20.2% | 106 |
| 690 | - | 6/14/2023 | 7 | 16 | 22.6% | 101.1 | 99% | 20.2% | 107 |
| 691 | - | 6/14/2023 | 8 | 16 | 22.7% | 101.5 | 100% | 20.2% | 108 |
| Z-10 | | | | | | | | | |
| 2 | - | 5/1/2023 | 1 | 16 | 23.8% | 100.8 | 99% | 20.2% | 109 |
| 15 | - | 5/1/2023 | 2 | 19 | 21.8% | 104.2 | 99% | 18.4% | 110 |
| 27 | - | 5/1/2023 | 3 | 19 | 19.0% | 105.8 | 101% | 18.4% | 111 |
| 28 | - | 5/1/2023 | 4 | 15 | 24.3% | 96.1 | 97% | 24.1% | 112 |
| 29 | - | 5/1/2023 | 5 | 16 | 23.3% | 101.7 | 100% | 20.2% | 113 |
| 66 | - | 5/2/2023 | 6 | 14 | 31.0% | 89.3 | 97% | 27.2% | 114 |
| 67 | - | 5/2/2023 | 7 | 14 | 36.4% | 83.3 | 90% | 27.2% | - |
| 68 | 67 | 5/2/2023 | 7 | 14 | 34.5% | 87.5 | 95% | 27.2% | 115 |
| 69 | - | 5/2/2023 | 8 | 14 | 31.4% | 88.3 | 96% | 27.2% | 116 |
| 553 | - | 5/11/2023 | 1 | 5 | 26.9% | 94.8 | 99% | 24.5% | 117 |
| 559 | - | 5/11/2023 | 2 | 16 | 22.2% | 101.5 | 100% | 20.2% | 118 |
| 568 | - | 5/11/2023 | 3 | 16 | 23.6% | 101.0 | 99% | 20.2% | 119 |
| 576 | - | 6/12/2023 | 6 | 19 | 20.2% | 103.7 | 99% | 18.4% | 120 |
| 584 | - | 6/12/2023 | 7 | 19 | 19.9% | 105.1 | 100% | 18.4% | 121 |
| 592 | - | 6/12/2023 | 8 | 16 | 23.5% | 98.3 | 97% | 20.2% | 122 |
| Z-11 | | | | | | | | | |
| 7 | - | 5/1/2023 | 1 | 16 | 22.2% | 100.3 | 99% | 20.2% | 123 |
| 20 | - | 5/1/2023 | 2 | 16 | 22.1% | 100.3 | 99% | 20.2% | 124 |
| 42 | - | 5/1/2023 | 3 | 16 | 22.7% | 101.1 | 99% | 20.2% | 125 |
| 43 | - | 5/1/2023 | 4 | 16 | 23.0% | 99.8 | 98% | 20.2% | 126 |
| 44 | - | 5/1/2023 | 5 | 16 | 24.2% | 97.4 | 96% | 20.2% | 127 |

Clay Field Test Results Summary
Cell 5 Phase 1

| Test No. | Retest of | Date | Lift | Proctor Reference No. | In-Place Moisture Content (%) | In-Place Dry Denisty (pcf) | Percent Compaction | Optimum Moisture | Passing Test # (Overall) |
|---|---|---|---|---|---|---|---|---|---|
| 84 | - | 5/2/2023 | 6 | 14 | 31.1% | 88.3 | 96% | 27.2% | 128 |
| 85 | - | 5/2/2023 | 7 | 14 | 30.2% | 89.6 | 97% | 27.2% | 129 |
| 86 | - | 5/2/2023 | 8 | 15 | 25.7% | 96.4 | 98% | 24.1% | 130 |
| 425 | - | 5/8/2023 | 1 | 17 | 28.7% | 91.5 | 95% | 25.6% | 131 |
| 431 | - | 5/8/2023 | 2 | 11 | 27.8% | 95.8 | 100% | 24.8% | 132 |
| 438 | - | 5/8/2023 | 3 | 9 | 25.9% | 97.0 | 98% | 23.9% | 133 |
| 444 | - | 5/9/2023 | 4 | 15 | 25.2% | 100.5 | 102% | 24.1% | 134 |
| 450 | - | 5/9/2023 | 5 | 12 | 27.2% | 94.7 | 97% | 23.6% | 135 |
| 456 | - | 5/9/2023 | 6 | 2 | 23.1% | 96.1 | 98% | 22.6% | 136 |
| 462 | - | 5/9/2023 | 7 | 3 | 22.4% | 96.0 | 97% | 20.2% | 137 |
| 468 | - | 5/9/2023 | 8 | 16 | 21.4% | 99.8 | 98% | 20.2% | 138 |
| 474 | - | 5/9/2023 | 9 | 19 | 22.3% | 103.8 | 99% | 18.4% | 139 |
| Z-12 | | | | | | | | | |
| 6 | - | 5/1/2023 | 1 | 19 | 22.4% | 103.8 | 99% | 18.4% | 140 |
| 19 | - | 5/1/2023 | 2 | 19 | 20.6% | 102.6 | 98% | 18.4% | 141 |
| 39 | - | 5/1/2023 | 3 | 19 | 21.0% | 103.8 | 99% | 18.4% | 142 |
| 40 | - | 5/1/2023 | 4 | 19 | 21.0% | 103.9 | 99% | 18.4% | 143 |
| 41 | - | 5/1/2023 | 5 | 15 | 25.1% | 96.9 | 98% | 24.1% | 144 |
| 81 | - | 5/2/2023 | 6 | 14 | 30.1% | 88.1 | 95% | 27.2% | 145 |
| 82 | - | 5/2/2023 | 7 | 14 | 30.9% | 91.2 | 99% | 27.2% | 146 |
| 83 | - | 5/2/2023 | 8 | 14 | 29.8% | 91.6 | 99% | 27.2% | 147 |
| 423 | - | 5/8/2023 | 1 | 13 | 27.9% | 92.6 | 95% | 21.7% | 148 |
| 430 | - | 5/8/2023 | 2 | 11 | 27.0% | 95.8 | 100% | 24.8% | 149 |
| 437 | - | 5/8/2023 | 3 | 11 | 27.7% | 91.4 | 95% | 24.8% | 150 |
| 443 | - | 5/9/2023 | 4 | 3 | 23.3% | 98.4 | 99% | 20.2% | 151 |
| 449 | - | 5/9/2023 | 5 | 12 | 26.7% | 95.9 | 98% | 23.6% | 152 |
| 455 | - | 5/9/2023 | 6 | 7 | 25.6% | 93.1 | 99% | 22.6% | 153 |
| 461 | - | 5/9/2023 | 7 | 19 | 21.8% | 103.5 | 99% | 18.4% | 154 |
| 467 | - | 5/9/2023 | 8 | 1 | 23.7% | 100.8 | 100% | 19.4% | 155 |
| 473 | - | 5/9/2023 | 9 | 1 | 23.6% | 99.7 | 99% | 19.4% | 156 |
| Z-13 | | | | | | | | | |
| 5 | - | 5/1/2023 | 1 | 19 | 20.9% | 105.1 | 100% | 18.4% | 157 |
| 18 | - | 5/1/2023 | 2 | 19 | 20.1% | 106.9 | 102% | 18.4% | 158 |
| 36 | - | 5/1/2023 | 3 | 16 | 23.7% | 99.8 | 98% | 20.2% | 159 |
| 37 | - | 5/1/2023 | 4 | 16 | 21.8% | 100.5 | 99% | 20.2% | 160 |
| 38 | - | 5/1/2023 | 5 | 16 | 24.5% | 100.9 | 99% | 20.2% | 161 |
| 77 | - | 5/2/2023 | 6 | 14 | 31.6% | 87.6 | 95% | 27.2% | 162 |
| 78 | - | 5/2/2023 | 7 | 14 | 32.1% | 87.8 | 95% | 27.2% | 163 |
| 79 | - | 5/2/2023 | 8 | 14 | 33.1% | 85.8 | 93% | 27.2% | - |
| 80 | 79 | 5/2/2023 | 8 | 14 | 29.7% | 87.8 | 95% | 27.2% | 164 |
| 422 | - | 5/8/2023 | 1 | 9 | 27.9% | 95.0 | 96% | 23.9% | 165 |
| 429 | - | 5/8/2023 | 2 | 11 | 28.9% | 92.2 | 96% | 24.8% | 166 |
| 436 | - | 5/8/2023 | 3 | 11 | 27.4% | 92.3 | 96% | 24.8% | 167 |
| 442 | - | 5/9/2023 | 4 | 7 | 26.3% | 92.0 | 98% | 22.6% | 168 |
| 448 | - | 5/9/2023 | 5 | 10 | 27.8% | 92.4 | 98% | 25.0% | 169 |
| 454 | - | 5/9/2023 | 6 | 1 | 22.8% | 98.9 | 98% | 19.4% | 170 |
| 460 | - | 5/9/2023 | 7 | 1 | 24.3% | 98.7 | 98% | 19.4% | 171 |
| 466 | - | 5/9/2023 | 8 | 10 | 27.2% | 93.4 | 99% | 25.0% | 172 |

Clay Field Test Results Summary
Cell 5 Phase 1

| Test No. | Retest of | Date | Lift | Proctor Reference No. | In-Place Moisture Content (%) | In-Place Dry Denisty (pcf) | Percent Compaction | Optimum Moisture | Passing Test # (Overall) |
|---|---|---|---|---|---|---|---|---|---|
| 472 | - | 5/9/2023 | 9 | 16 | 21.9% | 101.0 | 99% | 20.2% | 173 |
| Z-14 | | | | | | | | | |
| 4 | - | 5/1/2023 | 1 | 19 | 22.7% | 105.5 | 100% | 18.4% | 174 |
| 17 | - | 5/1/2023 | 2 | 19 | 19.6% | 103.3 | 98% | 18.4% | 175 |
| 33 | - | 5/1/2023 | 3 | 19 | 22.5% | 102.4 | 98% | 18.4% | 176 |
| 34 | - | 5/1/2023 | 4 | 19 | 19.6% | 106.5 | 101% | 18.4% | 177 |
| 35 | - | 5/1/2023 | 5 | 16 | 22.4% | 101.1 | 99% | 20.2% | 178 |
| 73 | - | 5/2/2023 | 6 | 14 | 30.8% | 92.6 | 100% | 27.2% | 179 |
| 74 | - | 5/2/2023 | 7 | 14 | 30.5% | 91.0 | 98% | 27.2% | 180 |
| 75 | - | 5/2/2023 | 8 | 14 | 34.8% | 86.1 | 93% | 27.2% | - |
| 76 | 75 | 5/2/2023 | 8 | 14 | 31.9% | 88.2 | 95% | 27.2% | 181 |
| 416 | - | 5/8/2023 | 2 | 19 | 20.2% | 102.5 | 98% | 18.4% | 182 |
| 421 | - | 5/8/2023 | 1 | 16 | 24.0% | 96.8 | 95% | 20.2% | 183 |
| 428 | - | 5/8/2023 | 2 | 9 | 27.6% | 94.0 | 95% | 23.9% | 184 |
| 435 | - | 5/8/2023 | 3 | 9 | 26.4% | 95.1 | 96% | 23.9% | 185 |
| 441 | - | 5/9/2023 | 4 | 7 | 23.3% | 91.0 | 97% | 22.6% | 186 |
| 447 | - | 5/9/2023 | 5 | 1 | 22.3% | 97.2 | 96% | 19.4% | 187 |
| 453 | - | 5/9/2023 | 6 | 12 | 24.3% | 96.8 | 99% | 23.6% | 188 |
| 459 | - | 5/9/2023 | 7 | 18 | 27.3% | 89.8 | 95% | 25.7% | 189 |
| 465 | - | 5/9/2023 | 8 | 8 | 25.4% | 97.0 | 100% | 24.4% | 190 |
| 471 | - | 5/9/2023 | 9 | 1 | 22.6% | 99.4 | 99% | 19.4% | 191 |
| Z-15 | | | | | | | | | |
| 3 | - | 5/1/2023 | 1 | 19 | 22.9% | 102.9 | 98% | 18.4% | 192 |
| 16 | - | 5/1/2023 | 2 | 19 | 23.1% | 102.1 | 97% | 18.4% | 193 |
| 30 | - | 5/1/2023 | 3 | 16 | 23.1% | 100.3 | 99% | 20.2% | 194 |
| 31 | - | 5/1/2023 | 4 | 15 | 25.6% | 98.2 | 100% | 24.1% | 195 |
| 32 | - | 5/1/2023 | 5 | 15 | 24.6% | 97.7 | 99% | 24.1% | 196 |
| 70 | - | 5/2/2023 | 6 | 15 | 26.9% | 97.1 | 98% | 24.1% | 197 |
| 71 | - | 5/2/2023 | 7 | 18 | 28.3% | 92.3 | 98% | 25.7% | 198 |
| 72 | - | 5/2/2023 | 8 | 14 | 30.8% | 87.8 | 95% | 27.2% | 199 |
| 415 | - | 5/8/2023 | 2 | 16 | 23.3% | 99.5 | 98% | 20.2% | 200 |
| 420 | - | 5/8/2023 | 1 | 16 | 24.3% | 97.5 | 96% | 20.2% | 201 |
| 427 | - | 5/8/2023 | 2 | 9 | 28.7% | 94.2 | 96% | 23.9% | 202 |
| 434 | - | 5/8/2023 | 3 | 9 | 27.4% | 94.3 | 96% | 23.9% | 203 |
| 569 | - | 6/12/2023 | 6 | 19 | 20.2% | 103.5 | 99% | 18.4% | 204 |
| 577 | - | 6/12/2023 | 7 | 19 | 21.5% | 102.3 | 97% | 18.4% | 205 |
| 585 | - | 6/12/2023 | 8 | 16 | 22.8% | 98.7 | 97% | 20.2% | 206 |
| Z-16 | | | | | | | | | |
| 103 | - | 5/2/2023 | 1 | 19 | 30.9% | 86.6 | 82% | 18.4% | - |
| 104 | 103 | 5/2/2023 | 1 | 18 | 29.8% | 91.6 | 97% | 25.7% | 207 |
| 105 | - | 5/2/2023 | 2 | 15 | 26.4% | 93.2 | 95% | 24.1% | 208 |
| 106 | - | 5/2/2023 | 3 | 19 | 20.7% | 101.0 | 96% | 18.4% | 209 |
| 147 | - | 5/3/2023 | 4 | 14 | 27.9% | 89.6 | 97% | 27.2% | 210 |
| 148 | - | 5/3/2023 | 5 | 7 | 26.0% | 94.1 | 100% | 22.6% | 211 |
| 149 | - | 5/3/2023 | 6 | 17 | 26.8% | 92.0 | 96% | 25.6% | 212 |
| 150 | - | 5/3/2023 | 7 | 14 | 28.5% | 87.7 | 95% | 27.2% | 213 |
| 151 | - | 5/3/2023 | 8 | 12 | 24.6% | 92.1 | 95% | 23.6% | 214 |
| 211 | - | 5/3/2023 | 9 | 6 | 25.9% | 95.2 | 98% | 24.5% | 215 |

Clay Field Test Results Summary
Cell 5 Phase 1

| Test No. | Retest of | Date | Lift | Proctor Reference No. | In-Place Moisture Content (%) | In-Place Dry Denisty (pcf) | Percent Compaction | Optimum Moisture | Passing Test # (Overall) |
|---|---|---|---|---|---|---|---|---|---|
| 212 | - | 5/3/2023 | 10 | 16 | 21.3% | 98.2 | 96% | 20.2% | 216 |
| 213 | - | 5/3/2023 | 11 | 19 | 18.4% | 104.1 | 99% | 18.4% | 217 |
| 214 | - | 5/3/2023 | 12 | 1 | 21.1% | 99.4 | 99% | 19.4% | 218 |
| 215 | - | 5/3/2023 | 13 | 19 | 19.5% | 104.3 | 99% | 18.4% | 219 |
| 216 | - | 5/3/2023 | 14 | 16 | 22.9% | 99.8 | 98% | 20.2% | 220 |
| 217 | - | 5/3/2023 | 15 | 19 | 17.1% | 102.3 | 97% | 18.4% | - |
| 250 | 217 | 5/4/2023 | 15 | 16 | 24.2% | 98.3 | 97% | 20.2% | 221 |
| 257 | - | 5/4/2023 | 16 | 16 | 23.4% | 97.1 | 95% | 20.2% | 222 |
| 268 | - | 5/4/2023 | 17 | 19 | 20.5% | 102.9 | 98% | 18.4% | 223 |
| 277 | - | 5/4/2023 | 18 | 19 | 19.6% | 101.8 | 97% | 18.4% | 224 |
| 286 | - | 5/4/2023 | 19 | 19 | 19.8% | 104.0 | 99% | 18.4% | 225 |
| 295 | - | 5/4/2023 | 20 | 19 | 20.3% | 101.5 | 97% | 18.4% | 226 |
| 302 | - | 5/4/2023 | 21 | 16 | 21.2% | 99.7 | 98% | 20.2% | 227 |
| 312 | - | 5/4/2023 | 22 | 19 | 21.5% | 101.3 | 96% | 18.4% | 228 |
| 322 | - | 5/4/2023 | 23 | 19 | 20.1% | 105.0 | 100% | 18.4% | 229 |
| 331 | - | 5/4/2023 | 24 | 19 | 20.0% | 102.1 | 97% | 18.4% | 230 |
| 340 | - | 5/4/2023 | 25 | 19 | 22.4% | 101.5 | 97% | 18.4% | 231 |
| 349 | - | 5/5/2023 | 26 | 19 | 20.8% | 103.1 | 98% | 18.4% | 232 |
| 358 | - | 5/5/2023 | 27 | 19 | 21.1% | 101.9 | 97% | 18.4% | 233 |
| 367 | - | 5/5/2023 | 28 | 16 | 20.2% | 99.9 | 98% | 20.2% | 234 |
| 376 | - | 5/5/2023 | 29 | 13 | 26.2% | 92.8 | 95% | 21.7% | 235 |
| 385 | - | 5/8/2023 | 30 | 19 | 19.2% | 103.7 | 99% | 18.4% | 236 |
| 394 | - | 5/8/2023 | 31 | 19 | 24.9% | 99.5 | 95% | 18.4% | 237 |
| 403 | - | 5/8/2023 | 32 | 16 | 24.2% | 97.2 | 95% | 20.2% | 238 |
| 412 | - | 5/8/2023 | 33 | 19 | 22.7% | 101.5 | 97% | 18.4% | 239 |
| 480 | - | 5/10/2023 | 34 | 16 | 21.1% | 100.5 | 99% | 20.2% | 240 |
| 489 | - | 5/10/2023 | 35 | 16 | 23.9% | 99.6 | 98% | 20.2% | 241 |
| 498 | - | 5/10/2023 | 36 | 16 | 24.2% | 99.4 | 98% | 20.2% | 242 |
| 507 | - | 5/10/2023 | 37 | 3 | 24.4% | 95.9 | 97% | 20.2% | 243 |
| 516 | - | 5/10/2023 | 38 | 16 | 21.6% | 101.8 | 100% | 20.2% | 244 |
| 525 | - | 5/10/2023 | 39 | 7 | 25.9% | 91.4 | 97% | 22.6% | 245 |
| 534 | - | 5/10/2023 | 40 | 16 | 23.5% | 101.3 | 100% | 20.2% | 246 |
| 544 | - | 5/10/2023 | 41 | 19 | 19.6% | 105.2 | 100% | 18.4% | 247 |
| 598 | - | 6/12/2023 | 42 | 19 | 20.3% | 105.0 | 100% | 18.4% | 248 |
| 606 | - | 6/13/2023 | 43 | 16 | 23.8% | 100.9 | 99% | 20.2% | 249 |
| 614 | - | 6/13/2023 | 44 | 19 | 21.9% | 101.2 | 96% | 18.4% | 250 |
| 622 | - | 6/13/2023 | 45 | 19 | 21.7% | 103.0 | 98% | 18.4% | 251 |
| 630 | - | 6/13/2023 | 46 | 19 | 20.2% | 104.2 | 99% | 18.4% | 252 |
| 638 | - | 6/13/2023 | 47 | 19 | 22.0% | 102.3 | 97% | 18.4% | 253 |
| 646 | - | 6/13/2023 | 48 | 19 | 23.1% | 101.2 | 96% | 18.4% | 254 |
| 654 | - | 6/13/2023 | 49 | 16 | 24.0% | 100.8 | 99% | 20.2% | 255 |
| 663 | - | 6/14/2023 | 50 | 16 | 23.4% | 101.3 | 100% | 20.2% | 256 |
| 671 | - | 6/14/2023 | 51 | 19 | 19.9% | 105.2 | 100% | 18.4% | 257 |
| 679 | - | 6/14/2023 | 52 | 19 | 18.8% | 103.6 | 99% | 18.4% | 258 |
| 687 | - | 6/14/2023 | 53 | 16 | 22.6% | 101.1 | 99% | 20.2% | 259 |
| 699 | - | 6/14/2023 | 54 | 16 | 21.4% | 101.3 | 100% | 20.2% | 260 |
| 707 | - | 6/14/2023 | 55 | 19 | 20.8% | 103.7 | 99% | 18.4% | 261 |
| 720 | - | 6/14/2023 | 57 | 19 | 18.4% | 103.2 | 98% | 18.4% | 262 |

Clay Field Test Results Summary
Cell 5 Phase 1

| Test No. | Retest of | Date | Lift | Proctor Reference No. | In-Place Moisture Content (%) | In-Place Dry Denisty (pcf) | Percent Compaction | Optimum Moisture | Passing Test # (Overall) |
|---|---|---|---|---|---|---|---|---|---|
| 721 | - | 6/14/2023 | 56 | 19 | 22.6% | 103.2 | 98% | 18.4% | 263 |
| 731 | - | 6/15/2023 | 58 | 16 | 21.8% | 102.7 | 101% | 20.2% | 264 |
| 739 | - | 6/15/2023 | 59 | 3 | 24.9% | 94.8 | 95% | 20.2% | 265 |
| 747 | - | 6/15/2023 | 60 | 3 | 21.1% | 97.4 | 98% | 20.2% | 266 |
| 755 | - | 6/15/2023 | 61 | 16 | 23.2% | 97.3 | 96% | 20.2% | 267 |
| 763 | - | 6/15/2023 | 62 | 3 | 24.2% | 95.0 | 96% | 20.2% | 268 |
| 771 | - | 6/15/2023 | 63 | 16 | 21.9% | 102.4 | 101% | 20.2% | 269 |
| 784 | - | 6/15/2023 | 64 | 19 | 18.7% | 102.5 | 98% | 18.4% | 270 |
| 785 | - | 6/15/2023 | 65 | 19 | 22.3% | 103.6 | 99% | 18.4% | 271 |
| 795 | - | 6/19/2023 | 66 | 16 | 23.4% | 99.1 | 97% | 20.2% | 272 |
| 803 | - | 6/19/2023 | 67 | 5 | 26.9% | 92.5 | 96% | 24.5% | 273 |
| 811 | - | 6/19/2023 | 68 | 14 | 27.5% | 91.4 | 99% | 27.2% | 274 |
| 819 | - | 6/19/2023 | 69 | 16 | 23.9% | 99.7 | 98% | 20.2% | 275 |
| 827 | - | 6/19/2023 | 70 | 19 | 22.6% | 102.2 | 97% | 18.4% | 276 |
| 835 | - | 6/19/2023 | 71 | 3 | 20.5% | 98.8 | 99% | 20.2% | 277 |
| 848 | - | 6/19/2023 | 73 | 16 | 22.1% | 100.3 | 99% | 20.2% | 278 |
| 849 | - | 6/19/2023 | 72 | 3 | 22.6% | 97.3 | 98% | 20.2% | 279 |
| 859 | - | 6/20/2023 | 74 | 16 | 23.2% | 99.8 | 98% | 20.2% | 280 |
| 867 | - | 6/20/2023 | 75 | 18 | 27.4% | 93.6 | 99% | 25.7% | 281 |
| 875 | - | 6/20/2023 | 76 | 15 | 24.7% | 95.9 | 97% | 24.1% | 282 |
| 883 | - | 6/20/2023 | 77 | 16 | 22.8% | 97.1 | 95% | 20.2% | 283 |
| 891 | - | 6/20/2023 | 78 | 19 | 21.0% | 104.8 | 100% | 18.4% | 284 |
| 899 | - | 6/20/2023 | 79 | 19 | 21.4% | 103.4 | 98% | 18.4% | 285 |
| 907 | - | 6/20/2023 | 80 | 21 | 19.9% | 105.3 | 99% | 18.1% | 286 |
| 915 | - | 6/20/2023 | 81 | 19 | 20.3% | 100.1 | 95% | 18.4% | 287 |
| 928 | - | 6/21/2023 | 83 | 19 | 22.6% | 104.4 | 99% | 18.4% | 288 |
| 929 | - | 6/21/2023 | 82 | 16 | 22.4% | 101.1 | 99% | 20.2% | 289 |
| 939 | - | 6/21/2023 | 84 | 3 | 26.2% | 97.4 | 98% | 20.2% | 290 |
| 947 | - | 6/21/2023 | 85 | 19 | 22.7% | 102.1 | 97% | 18.4% | 291 |
| 955 | - | 6/21/2023 | 86 | 3 | 24.9% | 97.1 | 98% | 20.2% | 292 |
| 963 | - | 6/21/2023 | 87 | 3 | 23.7% | 98.4 | 99% | 20.2% | 293 |
| 971 | - | 6/21/2023 | 88 | 3 | 22.6% | 99.8 | 101% | 20.2% | 294 |
| 979 | - | 6/21/2023 | 89 | 16 | 20.4% | 101.0 | 99% | 20.2% | 295 |
| 987 | - | 6/21/2023 | 90 | 3 | 24.1% | 98.2 | 99% | 20.2% | 296 |
| 1000 | - | 6/21/2023 | 91 | 19 | 20.1% | 101.5 | 97% | 18.4% | 297 |
| 1008 | - | 6/26/2023 | 92 | 16 | 24.2% | 100.1 | 98% | 20.2% | 298 |
| 1016 | - | 6/26/2023 | 93 | 16 | 22.3% | 100.9 | 99% | 20.2% | 299 |
| 1024 | - | 6/26/2023 | 94 | 19 | 20.9% | 104.5 | 100% | 18.4% | 300 |
| 1032 | - | 6/26/2023 | 95 | 19 | 21.5% | 105.6 | 101% | 18.4% | 301 |
| 1045 | - | 6/26/2023 | 96 | 19 | 20.1% | 101.1 | 96% | 18.4% | 302 |
| 1046 | - | 6/26/2023 | 97 | 19 | 20.0% | 102.8 | 98% | 18.4% | 303 |
| 1056 | - | 6/27/2023 | 98 | 19 | 23.5% | 102.0 | 97% | 18.4% | 304 |
| 1064 | - | 6/27/2023 | 99 | 16 | 20.6% | 99.8 | 98% | 20.2% | 305 |
| 1072 | - | 6/27/2023 | 100 | 19 | 21.6% | 102.9 | 98% | 18.4% | 306 |
| 1080 | - | 6/27/2023 | 101 | 19 | 23.3% | 101.9 | 97% | 18.4% | 307 |
| 1088 | - | 6/27/2023 | 102 | 19 | 21.9% | 105.0 | 100% | 18.4% | 308 |
| 1095 | - | 6/27/2023 | 103 | 19 | 21.6% | 100.0 | 95% | 18.4% | 309 |
| 1106 | - | 6/27/2023 | 104 | 19 | 21.4% | 100.7 | 96% | 18.4% | 310 |

Clay Field Test Results Summary
Cell 5 Phase 1

| Test No. | Retest of | Date | Lift | Proctor Reference No. | In-Place Moisture Content (%) | In-Place Dry Denisty (pcf) | Percent Compaction | Optimum Moisture | Passing Test # (Overall) |
|---|---|---|---|---|---|---|---|---|---|
| 1107 | - | 6/27/2023 | 105 | 19 | 23.4% | 99.5 | 95% | 18.4% | 311 |
| 1115 | - | 6/28/2023 | 106 | 19 | 19.6% | 104.3 | 99% | 18.4% | 312 |
| 1122 | - | 6/28/2023 | 107 | 16 | 21.9% | 100.6 | 99% | 20.2% | 313 |
| 1129 | - | 6/28/2023 | 108 | 16 | 22.4% | 101.7 | 100% | 20.2% | 314 |
| 1136 | - | 6/28/2023 | 109 | 16 | 24.8% | 97.2 | 95% | 20.2% | 315 |
| 1143 | - | 6/28/2023 | 110 | 19 | 20.3% | 105.2 | 100% | 18.4% | 316 |
| 1150 | - | 6/28/2023 | 111 | 7 | 26.9% | 92.4 | 99% | 22.6% | 317 |
| 1157 | - | 6/28/2023 | 112 | 7 | 27.2% | 92.7 | 99% | 22.6% | 318 |
| 1169 | - | 6/28/2023 | 113 | 16 | 21.0% | 100.2 | 98% | 20.2% | 319 |
| 1170 | - | 6/28/2023 | 114 | 3 | 24.8% | 95.7 | 96% | 20.2% | 320 |
| 1178 | - | 6/29/2023 | 115 | 19 | 20.5% | 103.7 | 99% | 18.4% | 321 |
| 1185 | - | 6/29/2023 | 116 | 19 | 21.2% | 101.4 | 97% | 18.4% | 322 |
| 1192 | - | 6/29/2023 | 117 | 19 | 21.5% | 100.8 | 96% | 18.4% | 323 |
| 1200 | - | 6/29/2023 | 118 | 3 | 21.6% | 97.8 | 98% | 20.2% | 324 |
| 1212 | - | 6/29/2023 | 119 | 3 | 24.0% | 95.3 | 96% | 20.2% | 325 |
| 1213 | - | 6/29/2023 | 120 | 3 | 22.4% | 95.5 | 96% | 20.2% | 326 |
| 1221 | - | 6/30/2023 | 121 | 16 | 25.6% | 98.2 | 96% | 20.2% | 327 |
| 1233 | - | 6/30/2023 | 122 | 3 | 22.7% | 98.4 | 99% | 20.2% | 328 |
| 1234 | - | 6/30/2023 | 123 | 3 | 23.1% | 96.1 | 97% | 20.2% | 329 |
| 1247 | - | 6/30/2023 | 124 | 19 | 21.5% | 103.1 | 98% | 18.4% | 330 |
| 1248 | - | 6/30/2023 | 125 | 19 | 21.1% | 100.8 | 96% | 18.4% | 331 |
| 1259 | - | 6/30/2023 | 126 | 3 | 23.8% | 96.9 | 98% | 20.2% | 332 |
| 1269 | - | 6/30/2023 | 127 | 3 | 22.5% | 99.0 | 100% | 20.2% | 333 |
| 1272 | - | 7/6/2023 | 128 | 21 | 19.5% | 107.3 | 101% | 18.1% | 334 |
| 1273 | - | 7/6/2023 | 129 | 21 | 18.2% | 107.7 | 101% | 18.1% | 335 |
| 1291 | - | 7/14/2023 | 130 | 19 | 21.2% | 103.7 | 99% | 18.4% | 336 |
| Z-17 | | | | | | | | | |
| 107 | - | 5/2/2023 | 1 | 14 | 30.5% | 87.6 | 95% | 27.2% | 337 |
| 108 | - | 5/2/2023 | 2 | 14 | 27.3% | 86.5 | 94% | 27.2% | - |
| 109 | 108 | 5/2/2023 | 2 | 14 | 27.2% | 91.1 | 99% | 27.2% | 338 |
| 110 | - | 5/2/2023 | 3 | 19 | 22.4% | 102.9 | 98% | 18.4% | 339 |
| 152 | - | 5/3/2023 | 4 | 19 | 19.4% | 105.5 | 100% | 18.4% | 340 |
| 153 | - | 5/3/2023 | 5 | 16 | 21.9% | 97.1 | 95% | 20.2% | 341 |
| 154 | - | 5/3/2023 | 6 | 15 | 25.5% | 98.1 | 99% | 24.1% | 342 |
| 155 | - | 5/3/2023 | 7 | 7 | 27.1% | 89.9 | 96% | 22.6% | 343 |
| 156 | - | 5/3/2023 | 8 | 7 | 25.1% | 91.4 | 97% | 22.6% | 344 |
| 218 | - | 5/3/2023 | 9 | 13 | 23.2% | 94.7 | 97% | 21.7% | 345 |
| 219 | - | 5/3/2023 | 10 | 1 | 17.8% | 102.8 | 102% | 19.4% | - |
| 220 | 219 | 5/3/2023 | 10 | 1 | 20.0% | 99.7 | 99% | 19.4% | 346 |
| 221 | - | 5/3/2023 | 11 | 19 | 18.4% | 100.4 | 96% | 18.4% | 347 |
| 222 | - | 5/3/2023 | 12 | 1 | 16.8% | 103.7 | 103% | 19.4% | - |
| 223 | 222 | 5/3/2023 | 12 | 1 | 19.5% | 98.5 | 98% | 19.4% | 348 |
| 224 | - | 5/3/2023 | 13 | 16 | 22.5% | 99.6 | 98% | 20.2% | 349 |
| 225 | - | 5/3/2023 | 14 | 13 | 21.6% | 93.8 | 96% | 21.7% | - |
| 226 | 225 | 5/3/2023 | 14 | 13 | 21.7% | 93.7 | 96% | 21.7% | 350 |
| 227 | - | 5/3/2023 | 15 | 19 | 21.3% | 101.2 | 96% | 18.4% | 351 |
| 258 | - | 5/4/2023 | 16 | 16 | 20.6% | 99.8 | 98% | 20.2% | 352 |
| 267 | - | 5/4/2023 | 17 | 19 | 20.5% | 103.0 | 98% | 18.4% | 353 |

Clay Field Test Results Summary
Cell 5 Phase 1

| Test No. | Retest of | Date | Lift | Proctor Reference No. | In-Place Moisture Content (%) | In-Place Dry Denisty (pcf) | Percent Compaction | Optimum Moisture | Passing Test # (Overall) |
|---|---|---|---|---|---|---|---|---|---|
| 276 | - | 5/4/2023 | 18 | 19 | 21.0% | 103.1 | 98% | 18.4% | 354 |
| 285 | - | 5/4/2023 | 19 | 19 | 21.7% | 101.3 | 96% | 18.4% | 355 |
| 294 | - | 5/4/2023 | 20 | 19 | 20.4% | 104.2 | 99% | 18.4% | 356 |
| 303 | - | 5/4/2023 | 21 | 19 | 17.5% | 103.6 | 99% | 18.4% | - |
| 305 | 303 | 5/4/2023 | 21 | 19 | 18.7% | 104.6 | 100% | 18.4% | 357 |
| 313 | - | 5/4/2023 | 22 | 19 | 17.4% | 104.4 | 99% | 18.4% | - |
| 315 | 313 | 5/4/2023 | 22 | 19 | 19.3% | 106.5 | 101% | 18.4% | 358 |
| 323 | - | 5/4/2023 | 23 | 19 | 22.0% | 100.4 | 96% | 18.4% | 359 |
| 332 | - | 5/4/2023 | 24 | 19 | 22.2% | 101.2 | 96% | 18.4% | 360 |
| 341 | - | 5/4/2023 | 25 | 19 | 20.5% | 103.9 | 99% | 18.4% | 361 |
| 350 | - | 5/5/2023 | 26 | 19 | 23.9% | 100.8 | 96% | 18.4% | 362 |
| 359 | - | 5/5/2023 | 27 | 19 | 21.7% | 101.1 | 96% | 18.4% | 363 |
| 368 | - | 5/5/2023 | 28 | 9 | 23.9% | 94.8 | 96% | 23.9% | 364 |
| 377 | - | 5/5/2023 | 29 | 3 | 25.5% | 96.1 | 97% | 20.2% | 365 |
| 386 | - | 5/8/2023 | 30 | 16 | 24.4% | 96.3 | 95% | 20.2% | 366 |
| 395 | - | 5/8/2023 | 31 | 3 | 22.4% | 95.4 | 96% | 20.2% | 367 |
| 404 | - | 5/8/2023 | 32 | 6 | 27.4% | 93.1 | 96% | 24.5% | 368 |
| 413 | - | 5/8/2023 | 33 | 16 | 24.7% | 97.5 | 96% | 20.2% | 369 |
| 481 | - | 5/10/2023 | 34 | 19 | 19.4% | 105.8 | 101% | 18.4% | 370 |
| 490 | - | 5/10/2023 | 35 | 16 | 25.7% | 97.8 | 96% | 20.2% | 371 |
| 499 | - | 5/10/2023 | 36 | 7 | 25.9% | 91.4 | 97% | 22.6% | 372 |
| 508 | - | 5/10/2023 | 37 | 16 | 21.3% | 101.6 | 100% | 20.2% | 373 |
| 517 | - | 5/10/2023 | 38 | 19 | 20.2% | 103.4 | 98% | 18.4% | 374 |
| 526 | - | 5/10/2023 | 39 | 19 | 22.6% | 102.9 | 98% | 18.4% | 375 |
| 535 | - | 5/10/2023 | 40 | 16 | 24.1% | 101.3 | 100% | 20.2% | 376 |
| 545 | - | 5/10/2023 | 41 | 16 | 23.2% | 100.6 | 99% | 20.2% | 377 |
| 599 | - | 6/12/2023 | 42 | 19 | 21.0% | 103.3 | 98% | 18.4% | 378 |
| 607 | - | 6/13/2023 | 43 | 16 | 22.7% | 100.4 | 99% | 20.2% | 379 |
| 615 | - | 6/13/2023 | 44 | 19 | 22.4% | 103.3 | 98% | 18.4% | 380 |
| 623 | - | 6/13/2023 | 45 | 19 | 21.2% | 102.8 | 98% | 18.4% | 381 |
| 631 | - | 6/13/2023 | 46 | 19 | 20.3% | 105.7 | 101% | 18.4% | 382 |
| 639 | - | 6/13/2023 | 47 | 19 | 25.4% | 100.7 | 96% | 18.4% | 383 |
| 647 | - | 6/13/2023 | 48 | 19 | 23.3% | 103.1 | 98% | 18.4% | 384 |
| 655 | - | 6/13/2023 | 49 | 16 | 20.2% | 100.8 | 99% | 20.2% | 385 |
| 664 | - | 6/14/2023 | 50 | 16 | 23.9% | 99.3 | 98% | 20.2% | 386 |
| 672 | - | 6/14/2023 | 51 | 19 | 21.4% | 102.3 | 97% | 18.4% | 387 |
| 680 | - | 6/14/2023 | 52 | 16 | 24.6% | 99.0 | 97% | 20.2% | 388 |
| 688 | - | 6/14/2023 | 53 | 16 | 23.5% | 99.2 | 97% | 20.2% | 389 |
| 700 | - | 6/14/2023 | 54 | 19 | 19.6% | 104.8 | 100% | 18.4% | 390 |
| 708 | - | 6/14/2023 | 55 | 16 | 25.3% | 99.0 | 97% | 20.2% | 391 |
| 722 | - | 6/14/2023 | 57 | 19 | 20.6% | 103.4 | 98% | 18.4% | 392 |
| 723 | - | 6/14/2023 | 56 | 19 | 22.5% | 102.7 | 98% | 18.4% | 393 |
| 732 | - | 6/15/2023 | 58 | 16 | 23.0% | 99.1 | 97% | 20.2% | 394 |
| 740 | - | 6/15/2023 | 59 | 19 | 23.7% | 100.4 | 96% | 18.4% | 395 |
| 748 | - | 6/15/2023 | 60 | 16 | 20.5% | 103.5 | 102% | 20.2% | 396 |
| 756 | - | 6/15/2023 | 61 | 16 | 24.6% | 99.0 | 97% | 20.2% | 397 |
| 764 | - | 6/15/2023 | 62 | 16 | 24.5% | 100.0 | 98% | 20.2% | 398 |
| 772 | - | 6/15/2023 | 63 | 3 | 21.6% | 98.7 | 99% | 20.2% | 399 |

Clay Field Test Results Summary
Cell 5 Phase 1

| Test No. | Retest of | Date | Lift | Proctor Reference No. | In-Place Moisture Content (%) | In-Place Dry Denisty (pcf) | Percent Compaction | Optimum Moisture | Passing Test # (Overall) |
|---|---|---|---|---|---|---|---|---|---|
| 786 | - | 6/15/2023 | 64 | 19 | 22.9% | 102.3 | 97% | 18.4% | 400 |
| 787 | - | 6/15/2023 | 65 | 16 | 23.6% | 98.6 | 97% | 20.2% | 401 |
| 796 | - | 6/19/2023 | 66 | 16 | 22.8% | 101.4 | 100% | 20.2% | 402 |
| 804 | - | 6/19/2023 | 67 | 16 | 23.3% | 98.9 | 97% | 20.2% | 403 |
| 812 | - | 6/19/2023 | 68 | 16 | 22.4% | 101.4 | 100% | 20.2% | 404 |
| 820 | - | 6/19/2023 | 69 | 19 | 20.0% | 103.4 | 98% | 18.4% | 405 |
| 828 | - | 6/19/2023 | 70 | 19 | 20.6% | 104.1 | 99% | 18.4% | 406 |
| 836 | - | 6/19/2023 | 71 | 3 | 22.4% | 98.0 | 99% | 20.2% | 407 |
| 850 | - | 6/19/2023 | 73 | 19 | 19.8% | 101.6 | 97% | 18.4% | 408 |
| 851 | - | 6/19/2023 | 72 | 16 | 23.5% | 99.7 | 98% | 20.2% | 409 |
| 860 | - | 6/20/2023 | 74 | 19 | 20.6% | 104.5 | 100% | 18.4% | 410 |
| 868 | - | 6/20/2023 | 75 | 8 | 24.7% | 95.9 | 99% | 24.4% | 411 |
| 876 | - | 6/20/2023 | 76 | 16 | 20.4% | 98.1 | 96% | 20.2% | 412 |
| 884 | - | 6/20/2023 | 77 | 16 | 22.7% | 101.1 | 99% | 20.2% | 413 |
| 892 | - | 6/20/2023 | 78 | 19 | 21.0% | 103.6 | 99% | 18.4% | 414 |
| 900 | - | 6/20/2023 | 79 | 16 | 21.3% | 101.9 | 100% | 20.2% | 415 |
| 908 | - | 6/20/2023 | 80 | 19 | 20.8% | 103.4 | 98% | 18.4% | 416 |
| 916 | - | 6/20/2023 | 81 | 16 | 20.9% | 101.8 | 100% | 20.2% | 417 |
| 930 | - | 6/21/2023 | 83 | 19 | 21.1% | 104.4 | 99% | 18.4% | 418 |
| 931 | - | 6/21/2023 | 82 | 16 | 22.7% | 101.2 | 99% | 20.2% | 419 |
| 940 | - | 6/21/2023 | 84 | 3 | 24.1% | 98.5 | 99% | 20.2% | 420 |
| 948 | - | 6/21/2023 | 85 | 16 | 23.0% | 99.4 | 98% | 20.2% | 421 |
| 956 | - | 6/21/2023 | 86 | 19 | 20.1% | 101.5 | 97% | 18.4% | 422 |
| 964 | - | 6/21/2023 | 87 | 3 | 23.8% | 99.4 | 100% | 20.2% | 423 |
| 972 | - | 6/21/2023 | 88 | 3 | 25.5% | 97.6 | 98% | 20.2% | 424 |
| 980 | - | 6/21/2023 | 89 | 19 | 20.3% | 103.9 | 99% | 18.4% | 425 |
| 988 | - | 6/21/2023 | 90 | 19 | 21.9% | 102.5 | 98% | 18.4% | 426 |
| 1001 | - | 6/21/2023 | 91 | 16 | 20.6% | 101.6 | 100% | 20.2% | 427 |
| 1009 | - | 6/26/2023 | 92 | 16 | 23.3% | 99.5 | 98% | 20.2% | 428 |
| 1017 | - | 6/26/2023 | 93 | 3 | 24.7% | 97.9 | 99% | 20.2% | 429 |
| 1025 | - | 6/26/2023 | 94 | 16 | 22.3% | 100.6 | 99% | 20.2% | 430 |
| 1033 | - | 6/26/2023 | 95 | 19 | 20.9% | 103.9 | 99% | 18.4% | 431 |
| 1047 | - | 6/26/2023 | 96 | 19 | 21.0% | 105.0 | 100% | 18.4% | 432 |
| 1048 | - | 6/26/2023 | 97 | 19 | 21.4% | 104.7 | 100% | 18.4% | 433 |
| 1057 | - | 6/27/2023 | 98 | 19 | 22.8% | 101.6 | 97% | 18.4% | 434 |
| 1065 | - | 6/27/2023 | 99 | 19 | 22.5% | 101.9 | 97% | 18.4% | 435 |
| 1073 | - | 6/27/2023 | 100 | 3 | 22.1% | 99.1 | 100% | 20.2% | 436 |
| 1081 | - | 6/27/2023 | 101 | 19 | 22.1% | 103.0 | 98% | 18.4% | 437 |
| 1089 | - | 6/27/2023 | 102 | 3 | 23.2% | 95.8 | 96% | 20.2% | 438 |
| 1096 | - | 6/27/2023 | 103 | 19 | 23.2% | 100.2 | 95% | 18.4% | 439 |
| 1108 | - | 6/27/2023 | 104 | 16 | 22.8% | 99.3 | 98% | 20.2% | 440 |
| 1109 | - | 6/27/2023 | 105 | 19 | 24.3% | 100.2 | 95% | 18.4% | 441 |
| 1116 | - | 6/28/2023 | 106 | 19 | 22.1% | 101.7 | 97% | 18.4% | 442 |
| 1123 | - | 6/28/2023 | 107 | 19 | 21.3% | 102.5 | 98% | 18.4% | 443 |
| 1130 | - | 6/28/2023 | 108 | 16 | 22.4% | 100.2 | 98% | 20.2% | 444 |
| 1137 | - | 6/28/2023 | 109 | 3 | 24.3% | 95.2 | 96% | 20.2% | 445 |
| 1144 | - | 6/28/2023 | 110 | 19 | 21.2% | 101.1 | 96% | 18.4% | 446 |
| 1151 | - | 6/28/2023 | 111 | 16 | 23.6% | 100.3 | 99% | 20.2% | 447 |

Clay Field Test Results Summary
Cell 5 Phase 1

| Test No. | Retest of | Date | Lift | Proctor Reference No. | In-Place Moisture Content (%) | In-Place Dry Denisty (pcf) | Percent Compaction | Optimum Moisture | Passing Test # (Overall) |
|---|---|---|---|---|---|---|---|---|---|
| 1158 | - | 6/28/2023 | 112 | 3 | 24.3% | 96.8 | 97% | 20.2% | 448 |
| 1171 | - | 6/28/2023 | 113 | 8 | 24.8% | 93.6 | 96% | 24.4% | 449 |
| 1172 | - | 6/28/2023 | 114 | 14 | 27.7% | 90.5 | 98% | 27.2% | 450 |
| 1179 | - | 6/29/2023 | 115 | 3 | 24.2% | 99.1 | 100% | 20.2% | 451 |
| 1186 | - | 6/29/2023 | 116 | 19 | 20.8% | 100.9 | 96% | 18.4% | 452 |
| 1193 | - | 6/29/2023 | 117 | 3 | 22.6% | 94.4 | 95% | 20.2% | 453 |
| 1201 | - | 6/29/2023 | 118 | 3 | 23.2% | 94.7 | 95% | 20.2% | 454 |
| 1214 | - | 6/29/2023 | 119 | 3 | 24.7% | 98.3 | 99% | 20.2% | 455 |
| 1215 | - | 6/29/2023 | 120 | 3 | 24.4% | 97.4 | 98% | 20.2% | 456 |
| 1222 | - | 6/30/2023 | 121 | 19 | 21.0% | 102.7 | 98% | 18.4% | 457 |
| 1235 | - | 6/30/2023 | 122 | 3 | 24.6% | 96.2 | 97% | 20.2% | 458 |
| 1236 | - | 6/30/2023 | 123 | 19 | 20.9% | 100.9 | 96% | 18.4% | 459 |
| 1249 | - | 6/30/2023 | 124 | 3 | 23.2% | 99.3 | 100% | 20.2% | 460 |
| 1250 | - | 6/30/2023 | 125 | 19 | 22.7% | 101.8 | 97% | 18.4% | 461 |
| 1260 | - | 6/30/2023 | 126 | 3 | 22.9% | 97.2 | 98% | 20.2% | 462 |
| 1270 | - | 6/30/2023 | 127 | 21 | 19.8% | 105.6 | 99% | 18.1% | 463 |
| 1274 | - | 7/6/2023 | 128 | 16 | 22.7% | 100.2 | 98% | 20.2% | 464 |
| 1275 | - | 7/6/2023 | 129 | 21 | 20.2% | 106.8 | 100% | 18.1% | 465 |
| 1292 | - | 7/14/2023 | 130 | 19 | 21.9% | 102.2 | 97% | 18.4% | 466 |
| Z-18 | | | | | | | | | |
| 111 | - | 5/2/2023 | 1 | 15 | 25.2% | 95.6 | 97% | 24.1% | 467 |
| 112 | - | 5/2/2023 | 2 | 14 | 27.3% | 83.4 | 90% | 27.2% | - |
| 113 | 112 | 5/2/2023 | 2 | 14 | 28.8% | 87.4 | 95% | 27.2% | 468 |
| 114 | - | 5/2/2023 | 3 | 15 | 26.5% | 95.1 | 96% | 24.1% | 469 |
| 157 | - | 5/3/2023 | 4 | 14 | 29.5% | 91.1 | 99% | 27.2% | 470 |
| 158 | - | 5/3/2023 | 5 | 3 | 17.7% | 102.6 | 103% | 20.2% | - |
| 159 | 158 | 5/3/2023 | 5 | 3 | 22.6% | 96.7 | 97% | 20.2% | 471 |
| 160 | - | 5/3/2023 | 6 | 17 | 28.6% | 92.3 | 96% | 25.6% | 472 |
| 161 | - | 5/3/2023 | 7 | 14 | 29.5% | 91.9 | 99% | 27.2% | 473 |
| 162 | - | 5/3/2023 | 8 | 14 | 27.9% | 87.5 | 95% | 27.2% | 474 |
| 228 | - | 5/3/2023 | 9 | 12 | 26.0% | 95.5 | 98% | 23.6% | 475 |
| 229 | - | 5/3/2023 | 10 | 19 | 21.3% | 102.9 | 98% | 18.4% | 476 |
| 230 | - | 5/3/2023 | 11 | 19 | 19.1% | 99.4 | 95% | 18.4% | 477 |
| 231 | - | 5/3/2023 | 12 | 12 | 24.9% | 94.9 | 97% | 23.6% | 478 |
| 232 | - | 5/3/2023 | 13 | 19 | 19.5% | 104.9 | 100% | 18.4% | 479 |
| 233 | - | 5/3/2023 | 14 | 19 | 20.7% | 104.2 | 99% | 18.4% | 480 |
| 234 | - | 5/3/2023 | 15 | 19 | 20.3% | 100.9 | 96% | 18.4% | 481 |
| 259 | - | 5/4/2023 | 16 | 16 | 21.7% | 98.7 | 97% | 20.2% | 482 |
| 266 | - | 5/4/2023 | 17 | 19 | 20.6% | 101.8 | 97% | 18.4% | 483 |
| 275 | - | 5/4/2023 | 18 | 19 | 21.4% | 101.2 | 96% | 18.4% | 484 |
| 284 | - | 5/4/2023 | 19 | 19 | 19.0% | 104.8 | 100% | 18.4% | 485 |
| 293 | - | 5/4/2023 | 20 | 19 | 22.1% | 103.4 | 98% | 18.4% | 486 |
| 304 | - | 5/4/2023 | 21 | 19 | 21.2% | 102.5 | 98% | 18.4% | 487 |
| 314 | - | 5/4/2023 | 22 | 19 | 20.0% | 100.8 | 96% | 18.4% | 488 |
| 324 | - | 5/4/2023 | 23 | 19 | 21.4% | 101.6 | 97% | 18.4% | 489 |
| 333 | - | 5/4/2023 | 24 | 19 | 20.1% | 105.1 | 100% | 18.4% | 490 |
| 342 | - | 5/4/2023 | 25 | 16 | 23.6% | 97.7 | 96% | 20.2% | 491 |
| 351 | - | 5/5/2023 | 26 | 1 | 21.1% | 98.1 | 97% | 19.4% | 492 |

Clay Field Test Results Summary
Cell 5 Phase 1

| Test No. | Retest of | Date | Lift | Proctor Reference No. | In-Place Moisture Content (%) | In-Place Dry Denisty (pcf) | Percent Compaction | Optimum Moisture | Passing Test # (Overall) |
|---|---|---|---|---|---|---|---|---|---|
| 360 | - | 5/5/2023 | 27 | 3 | 24.4% | 94.6 | 95% | 20.2% | 493 |
| 369 | - | 5/5/2023 | 28 | 9 | 23.9% | 97.4 | 99% | 23.9% | 494 |
| 378 | - | 5/5/2023 | 29 | 1 | 20.2% | 95.6 | 95% | 19.4% | 495 |
| 387 | - | 5/8/2023 | 30 | 16 | 22.1% | 99.4 | 98% | 20.2% | 496 |
| 396 | - | 5/8/2023 | 31 | 3 | 26.0% | 95.7 | 96% | 20.2% | 497 |
| 405 | - | 5/8/2023 | 32 | 9 | 26.0% | 97.2 | 99% | 23.9% | 498 |
| 414 | - | 5/8/2023 | 33 | 16 | 22.9% | 99.0 | 97% | 20.2% | 499 |
| 482 | - | 5/10/2023 | 34 | 8 | 26.0% | 95.1 | 98% | 24.4% | 500 |
| 491 | - | 5/10/2023 | 35 | 11 | 27.2% | 92.5 | 96% | 24.8% | 501 |
| 500 | - | 5/10/2023 | 36 | 7 | 24.6% | 90.9 | 97% | 22.6% | 502 |
| 509 | - | 5/10/2023 | 37 | 19 | 20.4% | 100.2 | 95% | 18.4% | 503 |
| 518 | - | 5/10/2023 | 38 | 16 | 21.2% | 99.1 | 97% | 20.2% | 504 |
| 527 | - | 5/10/2023 | 39 | 13 | 25.2% | 94.3 | 96% | 21.7% | 505 |
| 536 | - | 5/10/2023 | 40 | 16 | 21.7% | 100.0 | 98% | 20.2% | 506 |
| 546 | - | 5/10/2023 | 41 | 16 | 25.0% | 97.1 | 95% | 20.2% | 507 |
| 600 | - | 6/12/2023 | 42 | 19 | 22.0% | 100.9 | 96% | 18.4% | 508 |
| 608 | - | 6/13/2023 | 43 | 19 | 23.6% | 102.5 | 98% | 18.4% | 509 |
| 616 | - | 6/13/2023 | 44 | 16 | 23.0% | 100.5 | 99% | 20.2% | 510 |
| 624 | - | 6/13/2023 | 45 | 16 | 22.1% | 101.4 | 100% | 20.2% | 511 |
| 632 | - | 6/13/2023 | 46 | 19 | 20.2% | 103.7 | 99% | 18.4% | 512 |
| 640 | - | 6/13/2023 | 47 | 19 | 21.4% | 103.5 | 99% | 18.4% | 513 |
| 648 | - | 6/13/2023 | 48 | 16 | 21.8% | 101.3 | 100% | 20.2% | 514 |
| 656 | - | 6/13/2023 | 49 | 19 | 23.4% | 102.6 | 98% | 18.4% | 515 |
| 665 | - | 6/14/2023 | 50 | 19 | 22.4% | 100.9 | 96% | 18.4% | 516 |
| 673 | - | 6/14/2023 | 51 | 16 | 21.7% | 99.5 | 98% | 20.2% | 517 |
| 681 | - | 6/14/2023 | 52 | 16 | 21.8% | 97.8 | 96% | 20.2% | 518 |
| 689 | - | 6/14/2023 | 53 | 19 | 19.0% | 102.9 | 98% | 18.4% | 519 |
| 701 | - | 6/14/2023 | 54 | 19 | 22.0% | 102.5 | 98% | 18.4% | 520 |
| 709 | - | 6/14/2023 | 55 | 16 | 22.5% | 100.6 | 99% | 20.2% | 521 |
| 724 | - | 6/14/2023 | 57 | 19 | 19.3% | 102.3 | 97% | 18.4% | 522 |
| 725 | - | 6/14/2023 | 57 | 19 | 22.6% | 102.1 | 97% | 18.4% | 523 |
| 733 | - | 6/15/2023 | 58 | 16 | 20.2% | 101.9 | 100% | 20.2% | 524 |
| 741 | - | 6/15/2023 | 59 | 3 | 22.6% | 102.3 | 103% | 20.2% | 525 |
| 749 | - | 6/15/2023 | 60 | 2 | 24.3% | 99.0 | 101% | 22.6% | 526 |
| 757 | - | 6/15/2023 | 61 | 3 | 22.7% | 99.7 | 100% | 20.2% | 527 |
| 765 | - | 6/15/2023 | 62 | 16 | 24.3% | 100.5 | 99% | 20.2% | 528 |
| 773 | - | 6/15/2023 | 64 | 3 | 25.4% | 96.4 | 97% | 20.2% | 529 |
| 788 | - | 6/15/2023 | 64 | 19 | 20.1% | 100.7 | 96% | 18.4% | 530 |
| 789 | - | 6/15/2023 | 65 | 19 | 20.8% | 102.2 | 97% | 18.4% | 531 |
| 797 | - | 6/19/2023 | 66 | 3 | 24.4% | 98.7 | 99% | 20.2% | 532 |
| 805 | - | 6/19/2023 | 67 | 3 | 22.4% | 97.0 | 98% | 20.2% | 533 |
| 813 | - | 6/19/2023 | 68 | 2 | 25.4% | 97.1 | 99% | 22.6% | 534 |
| 821 | - | 6/19/2023 | 69 | 3 | 24.9% | 98.4 | 99% | 20.2% | 535 |
| 829 | - | 6/19/2023 | 70 | 2 | 25.6% | 95.3 | 98% | 22.6% | 536 |
| 837 | - | 6/19/2023 | 71 | 19 | 21.4% | 101.3 | 96% | 18.4% | 537 |
| 852 | - | 6/19/2023 | 73 | 1 | 19.9% | 99.0 | 98% | 19.4% | 538 |
| 853 | - | 6/19/2023 | 72 | 16 | 22.3% | 101.9 | 100% | 20.2% | 539 |
| 861 | - | 6/20/2023 | 74 | 3 | 24.2% | 94.9 | 96% | 20.2% | 540 |

Clay Field Test Results Summary
Cell 5 Phase 1

| Test No. | Retest of | Date | Lift | Proctor Reference No. | In-Place Moisture Content (%) | In-Place Dry Denisty (pcf) | Percent Compaction | Optimum Moisture | Passing Test # (Overall) |
|---|---|---|---|---|---|---|---|---|---|
| 869 | - | 6/20/2023 | 75 | 11 | 28.4% | 95.5 | 100% | 24.8% | 541 |
| 877 | - | 6/20/2023 | 76 | 16 | 21.0% | 99.1 | 97% | 20.2% | 542 |
| 885 | - | 6/20/2023 | 77 | 3 | 20.9% | 94.7 | 95% | 20.2% | 543 |
| 893 | - | 6/20/2023 | 78 | 19 | 20.9% | 104.4 | 99% | 18.4% | 544 |
| 901 | - | 6/20/2023 | 79 | 16 | 21.6% | 101.7 | 100% | 20.2% | 545 |
| 909 | - | 6/20/2023 | 80 | 16 | 21.7% | 100.4 | 99% | 20.2% | 546 |
| 917 | - | 6/20/2023 | 81 | 21 | 20.2% | 105.7 | 99% | 18.1% | 547 |
| 932 | - | 6/21/2023 | 83 | 21 | 20.0% | 105.2 | 99% | 18.1% | 548 |
| 933 | - | 6/21/2023 | 82 | 19 | 21.4% | 102.4 | 98% | 18.4% | 549 |
| 941 | - | 6/21/2023 | 84 | 19 | 22.2% | 102.3 | 97% | 18.4% | 550 |
| 949 | - | 6/21/2023 | 85 | 16 | 23.8% | 100.6 | 99% | 20.2% | 551 |
| 957 | - | 6/21/2023 | 86 | 19 | 23.3% | 102.5 | 98% | 18.4% | 552 |
| 965 | - | 6/21/2023 | 87 | 16 | 21.3% | 101.7 | 100% | 20.2% | 553 |
| 973 | - | 6/21/2023 | 88 | 16 | 22.5% | 101.1 | 99% | 20.2% | 554 |
| 981 | - | 6/21/2023 | 89 | 16 | 23.1% | 101.0 | 99% | 20.2% | 555 |
| 989 | - | 6/21/2023 | 90 | 16 | 22.7% | 101.5 | 100% | 20.2% | 556 |
| 1002 | - | 6/21/2023 | 91 | 16 | 21.1% | 99.7 | 98% | 20.2% | 557 |
| 1010 | - | 6/26/2023 | 92 | 19 | 22.0% | 104.4 | 99% | 18.4% | 558 |
| 1018 | - | 6/26/2023 | 93 | 19 | 22.8% | 102.9 | 98% | 18.4% | 559 |
| 1026 | - | 6/26/2023 | 94 | 19 | 20.9% | 102.4 | 98% | 18.4% | 560 |
| 1034 | - | 6/26/2023 | 95 | 19 | 20.2% | 102.2 | 97% | 18.4% | 561 |
| 1049 | - | 6/26/2023 | 96 | 19 | 20.1% | 104.1 | 99% | 18.4% | 562 |
| 1050 | - | 6/26/2023 | 97 | 19 | 21.3% | 101.4 | 97% | 18.4% | 563 |
| 1058 | - | 6/27/2023 | 98 | 19 | 21.5% | 101.9 | 97% | 18.4% | 564 |
| 1066 | - | 6/27/2023 | 99 | 19 | 23.0% | 101.2 | 96% | 18.4% | 565 |
| 1074 | - | 6/27/2023 | 100 | 19 | 22.8% | 102.2 | 97% | 18.4% | 566 |
| 1082 | - | 6/27/2023 | 101 | 19 | 22.4% | 102.3 | 97% | 18.4% | 567 |
| 2196 | - | 8/11/2023 | 101 | 21 | 20.0% | 109.4 | 103% | 18.1% | 568 |
| 2198 | - | 8/11/2023 | 102 | 21 | 20.0% | 109.1 | 103% | 18.1% | 569 |
| 2216 | - | 8/11/2023 | 103 | 21 | 20.2% | 109.1 | 103% | 18.1% | 570 |
| 2229 | - | 8/11/2023 | 104 | 16 | 22.0% | 101.4 | 100% | 20.2% | 571 |
| 2245 | - | 8/14/2023 | 105 | 19 | 22.9% | 103.7 | 99% | 18.4% | 572 |
| 2246 | - | 8/14/2023 | 106 | 19 | 22.5% | 105.2 | 100% | 18.4% | 573 |
| 2268 | - | 8/14/2023 | 107 | 16 | 23.5% | 100.6 | 99% | 20.2% | 574 |
| 2281 | - | 8/14/2023 | 108 | 19 | 22.0% | 104.8 | 100% | 18.4% | 575 |
| 2294 | - | 8/14/2023 | 109 | 19 | 22.1% | 105.6 | 101% | 18.4% | 576 |
| 2307 | - | 8/14/2023 | 110 | 21 | 20.9% | 106.7 | 100% | 18.1% | 577 |
| 2326 | - | 8/14/2023 | 111 | 3 | 27.3% | 95.1 | 96% | 20.2% | 578 |
| 2333 | - | 8/15/2023 | 112 | 16 | 23.0% | 102.7 | 101% | 20.2% | 579 |
| 2336 | - | 8/15/2023 | 113 | 16 | 21.8% | 102.8 | 101% | 20.2% | 580 |
| 2343 | - | 8/15/2023 | 114 | 16 | 24.2% | 101.4 | 100% | 20.2% | 581 |
| 2346 | - | 8/15/2023 | 115 | 21 | 20.4% | 106.2 | 100% | 18.1% | 582 |
| 2349 | - | 8/15/2023 | 116 | 16 | 21.7% | 102.6 | 101% | 20.2% | 583 |
| 2356 | - | 8/15/2023 | 117 | 16 | 24.1% | 101.4 | 100% | 20.2% | 584 |
| 2359 | - | 8/15/2023 | 118 | 3 | 23.7% | 98.5 | 99% | 20.2% | 585 |
| 2370 | - | 8/15/2023 | 119 | 16 | 21.3% | 102.8 | 101% | 20.2% | 586 |
| 2373 | - | 8/15/2023 | 120 | 3 | 21.5% | 98.6 | 99% | 20.2% | 587 |
| 2384 | - | 8/15/2023 | 121 | 16 | 22.6% | 101.4 | 100% | 20.2% | 588 |

Clay Field Test Results Summary
Cell 5 Phase 1

| Test No. | Retest of | Date | Lift | Proctor Reference No. | In-Place Moisture Content (%) | In-Place Dry Denisty (pcf) | Percent Compaction | Optimum Moisture | Passing Test # (Overall) |
|---|---|---|---|---|---|---|---|---|---|
| 2387 | - | 8/15/2023 | 122 | 16 | 22.3% | 104.5 | 103% | 20.2% | 589 |
| 2389 | - | 8/15/2023 | 123 | 16 | 23.0% | 103.4 | 102% | 20.2% | 590 |
| 2397 | - | 8/15/2023 | 124 | 21 | 20.2% | 106.6 | 100% | 18.1% | 591 |
| 2399 | - | 8/15/2023 | 125 | 16 | 22.1% | 100.3 | 99% | 20.2% | 592 |
| 2401 | - | 8/15/2023 | 126 | 16 | 22.3% | 101.3 | 100% | 20.2% | 593 |
| 2409 | - | 8/15/2023 | 127 | 16 | 22.5% | 100.4 | 99% | 20.2% | 594 |
| 2417 | - | 8/16/2023 | 128 | 16 | 23.8% | 100.1 | 98% | 20.2% | 595 |
| 2419 | - | 8/16/2023 | 129 | 1 | 20.5% | 100.8 | 100% | 19.4% | 596 |
| 2421 | - | 8/16/2023 | 130 | 21 | 20.5% | 105.9 | 100% | 18.1% | 597 |
| 2429 | - | 8/16/2023 | 131 | 3 | 24.5% | 98.3 | 99% | 20.2% | 598 |
| 2431 | - | 8/16/2023 | 132 | 1 | 24.0% | 100.5 | 100% | 19.4% | 599 |
| 2439 | - | 8/16/2023 | 133 | 19 | 21.4% | 105.1 | 100% | 18.4% | 600 |
| 2443 | - | 8/16/2023 | 134 | 19 | 19.8% | 104.8 | 100% | 18.4% | 601 |
| 2449 | - | 8/16/2023 | 135 | 21 | 20.5% | 105.8 | 100% | 18.1% | 602 |
| 2451 | - | 8/16/2023 | 136 | 16 | 23.2% | 102.4 | 101% | 20.2% | 603 |
| 2458 | - | 8/16/2023 | 137 | 19 | 21.1% | 104.6 | 100% | 18.4% | 604 |
| 2465 | - | 8/16/2023 | 138 | 16 | 22.5% | 104.0 | 102% | 20.2% | 605 |
| 2472 | - | 8/16/2023 | 139 | 1 | 23.9% | 100.9 | 100% | 19.4% | 606 |
| 2479 | - | 8/16/2023 | 140 | 16 | 23.0% | 101.8 | 100% | 20.2% | 607 |
| 2481 | - | 8/17/2023 | 141 | 1 | 23.3% | 100.3 | 100% | 19.4% | 608 |
| 2493 | - | 8/17/2023 | 142 | 3 | 22.7% | 98.5 | 99% | 20.2% | 609 |
| 2505 | - | 8/17/2023 | 143 | 16 | 22.1% | 104.9 | 103% | 20.2% | 610 |
| 2517 | - | 8/17/2023 | 144 | 1 | 23.5% | 100.5 | 100% | 19.4% | 611 |
| 2529 | - | 8/17/2023 | 145 | 16 | 23.1% | 102.9 | 101% | 20.2% | 612 |
| 2541 | - | 8/17/2023 | 146 | 19 | 21.3% | 105.2 | 100% | 18.4% | 613 |
| 2552 | - | 8/17/2023 | 147 | 16 | 22.5% | 103.3 | 101% | 20.2% | 614 |
| 2558 | - | 8/18/2023 | 148 | 1 | 24.3% | 100.0 | 99% | 19.4% | 615 |
| 2569 | - | 8/18/2023 | 149 | 16 | 21.4% | 103.6 | 102% | 20.2% | 616 |
| 2580 | - | 8/18/2023 | 150 | 1 | 20.0% | 101.6 | 101% | 19.4% | 617 |
| 2591 | - | 8/18/2023 | 151 | 1 | 21.1% | 104.0 | 103% | 19.4% | 618 |
| 2602 | - | 8/18/2023 | 152 | 1 | 23.7% | 100.9 | 100% | 19.4% | 619 |
| 2613 | - | 8/18/2023 | 153 | 3 | 22.6% | 99.3 | 100% | 20.2% | 620 |
| 2624 | - | 8/18/2023 | 154 | 16 | 21.4% | 103.3 | 101% | 20.2% | 621 |
| 2635 | - | 8/19/2023 | 155 | 1 | 24.6% | 100.7 | 100% | 19.4% | 622 |
| 2646 | - | 8/21/2023 | 156 | 3 | 25.2% | 98.2 | 99% | 20.2% | 623 |
| 2657 | - | 8/21/2023 | 157 | 3 | 21.1% | 97.5 | 98% | 20.2% | 624 |
| 2668 | - | 8/21/2023 | 158 | 3 | 23.7% | 99.4 | 100% | 20.2% | 625 |
| 2679 | - | 8/21/2023 | 159 | 16 | 24.5% | 100.9 | 99% | 20.2% | 626 |
| 2690 | - | 8/21/2023 | 160 | 3 | 23.8% | 96.9 | 98% | 20.2% | 627 |
| 2699 | - | 8/22/2023 | 161 | 16 | 23.2% | 103.1 | 101% | 20.2% | 628 |
| 2712 | - | 8/22/2023 | 162 | 16 | 22.2% | 102.7 | 101% | 20.2% | 629 |
| 2718 | - | 8/22/2023 | 163 | 3 | 23.5% | 98.7 | 99% | 20.2% | 630 |
| 2724 | - | 8/22/2023 | 164 | 16 | 22.5% | 101.8 | 100% | 20.2% | 631 |
| 2730 | - | 8/22/2023 | 165 | 19 | 20.9% | 105.3 | 100% | 18.4% | 632 |
| 2741 | - | 8/22/2023 | 166 | 19 | 22.2% | 105.4 | 100% | 18.4% | 633 |
| 2747 | - | 8/22/2023 | 167 | 16 | 23.1% | 103.0 | 101% | 20.2% | 634 |
| 2758 | - | 8/24/2023 | 168 | 19 | 19.2% | 101.7 | 97% | 18.4% | 635 |
| 2764 | - | 8/24/2023 | 169 | 19 | 20.0% | 105.6 | 101% | 18.4% | 636 |

Clay Field Test Results Summary
Cell 5 Phase 1

| Test No. | Retest of | Date | Lift | Proctor Reference No. | In-Place Moisture Content (%) | In-Place Dry Denisty (pcf) | Percent Compaction | Optimum Moisture | Passing Test # (Overall) |
|---|---|---|---|---|---|---|---|---|---|
| 2770 | - | 8/24/2023 | 170 | 16 | 22.5% | 102.2 | 100% | 20.2% | 637 |
| 2776 | - | 8/24/2023 | 171 | 16 | 22.0% | 101.8 | 100% | 20.2% | 638 |
| 2782 | - | 8/24/2023 | 172 | 1 | 24.4% | 100.1 | 99% | 19.4% | 639 |
| 2792 | - | 8/25/2023 | 173 | 3 | 22.7% | 99.3 | 100% | 20.2% | 640 |
| 2803 | - | 8/25/2023 | 174 | 16 | 22.8% | 101.6 | 100% | 20.2% | 641 |
| Z-19 | | | | | | | | | |
| 1817 | - | 8/7/2023 | 1 | 19 | 21.9% | 101.9 | 97% | 18.4% | 642 |
| 1818 | - | 8/7/2023 | 2 | 3 | 23.6% | 98.6 | 99% | 20.2% | 643 |
| 1819 | - | 8/7/2023 | 3 | 3 | 24.2% | 99.6 | 100% | 20.2% | 644 |
| 1820 | - | 8/7/2023 | 4 | 3 | 25.4% | 97.0 | 98% | 20.2% | 645 |
| 1821 | - | 8/7/2023 | 5 | 3 | 24.5% | 97.9 | 99% | 20.2% | 646 |
| 1822 | - | 8/7/2023 | 6 | 7 | 27.2% | 93.8 | 100% | 22.6% | 647 |
| 1823 | - | 8/7/2023 | 7 | 3 | 25.8% | 95.6 | 96% | 20.2% | 648 |
| 1824 | - | 8/7/2023 | 8 | 19 | 22.2% | 101.5 | 97% | 18.4% | 649 |
| 1825 | - | 8/7/2023 | 9 | 19 | 21.6% | 100.1 | 95% | 18.4% | 650 |
| 1831 | - | 8/7/2023 | 10 | 19 | 21.1% | 100.9 | 96% | 18.4% | 651 |
| 1832 | - | 8/7/2023 | 11 | 19 | 22.1% | 100.9 | 96% | 18.4% | 652 |
| 1833 | - | 8/7/2023 | 12 | 19 | 20.1% | 101.7 | 97% | 18.4% | 653 |
| 1834 | - | 8/7/2023 | 13 | 19 | 21.6% | 105.0 | 100% | 18.4% | 654 |
| 1835 | - | 8/7/2023 | 14 | 19 | 23.9% | 100.7 | 96% | 18.4% | 655 |
| 1836 | - | 8/7/2023 | 15 | 19 | 22.1% | 100.8 | 96% | 18.4% | 656 |
| 1837 | - | 8/7/2023 | 16 | 19 | 22.2% | 100.0 | 95% | 18.4% | 657 |
| 1838 | - | 8/7/2023 | 17 | 19 | 21.5% | 100.5 | 96% | 18.4% | 658 |
| 1839 | - | 8/7/2023 | 18 | 19 | 22.8% | 102.6 | 98% | 18.4% | 659 |
| 1840 | - | 8/7/2023 | 19 | 19 | 21.9% | 103.7 | 99% | 18.4% | 660 |
| 1841 | - | 8/7/2023 | 20 | 3 | 22.9% | 98.2 | 99% | 20.2% | 661 |
| 1842 | - | 8/7/2023 | 21 | 19 | 21.6% | 101.4 | 97% | 18.4% | 662 |
| 1843 | - | 8/7/2023 | 22 | 3 | 23.7% | 95.5 | 96% | 20.2% | 663 |
| 1844 | - | 8/7/2023 | 23 | 19 | 22.3% | 101.3 | 96% | 18.4% | 664 |
| 1845 | - | 8/7/2023 | 24 | 19 | 22.2% | 102.1 | 97% | 18.4% | 665 |
| 1846 | - | 8/7/2023 | 25 | 19 | 23.0% | 101.1 | 96% | 18.4% | 666 |
| 1847 | - | 8/7/2023 | 26 | 19 | 23.0% | 103.1 | 98% | 18.4% | 667 |
| 1848 | - | 8/7/2023 | 27 | 19 | 21.7% | 103.8 | 99% | 18.4% | 668 |
| 1856 | - | 8/7/2023 | 28 | 19 | 22.4% | 100.6 | 96% | 18.4% | 669 |
| 1857 | - | 8/7/2023 | 29 | 19 | 21.2% | 100.0 | 95% | 18.4% | 670 |
| 1858 | - | 8/7/2023 | 30 | 19 | 21.0% | 102.4 | 98% | 18.4% | 671 |
| 1859 | - | 8/7/2023 | 31 | 19 | 22.2% | 101.8 | 97% | 18.4% | 672 |
| 1864 | - | 8/7/2023 | 32 | 19 | 23.1% | 102.1 | 97% | 18.4% | 673 |
| 1865 | - | 8/7/2023 | 33 | 19 | 23.8% | 100.4 | 96% | 18.4% | 674 |
| 1877 | - | 8/7/2023 | 34 | 19 | 22.7% | 103.8 | 99% | 18.4% | 675 |
| 1889 | - | 8/7/2023 | 35 | 19 | 23.7% | 101.1 | 96% | 18.4% | 676 |
| 1901 | - | 8/7/2023 | 36 | 19 | 23.3% | 101.5 | 97% | 18.4% | 677 |
| 1913 | - | 8/7/2023 | 37 | 19 | 22.4% | 102.9 | 98% | 18.4% | 678 |
| 1914 | - | 8/8/2023 | 38 | 19 | 21.8% | 105.3 | 100% | 18.4% | 679 |
| 1926 | - | 8/8/2023 | 39 | 19 | 21.3% | 105.1 | 100% | 18.4% | 680 |
| 1938 | - | 8/8/2023 | 40 | 3 | 24.8% | 99.5 | 100% | 20.2% | 681 |
| 1950 | - | 8/8/2023 | 41 | 19 | 21.1% | 104.0 | 99% | 18.4% | 682 |
| 1962 | - | 8/8/2023 | 42 | 19 | 21.3% | 105.0 | 100% | 18.4% | 683 |

Clay Field Test Results Summary
Cell 5 Phase 1

| Test No. | Retest of | Date | Lift | Proctor Reference No. | In-Place Moisture Content (%) | In-Place Dry Denisty (pcf) | Percent Compaction | Optimum Moisture | Passing Test # (Overall) |
|---|---|---|---|---|---|---|---|---|---|
| 1974 | - | 8/8/2023 | 43 | 16 | 23.3% | 101.8 | 100% | 20.2% | 684 |
| 1986 | - | 8/8/2023 | 44 | 19 | 22.1% | 104.3 | 99% | 18.4% | 685 |
| 1998 | - | 8/8/2023 | 45 | 19 | 20.8% | 101.7 | 97% | 18.4% | 686 |
| 2010 | - | 8/9/2023 | 46 | 3 | 24.3% | 99.4 | 100% | 20.2% | 687 |
| 2022 | - | 8/9/2023 | 47 | 19 | 23.4% | 102.3 | 97% | 18.4% | 688 |
| 2034 | - | 8/9/2023 | 48 | 3 | 24.5% | 97.2 | 98% | 20.2% | 689 |
| 2046 | - | 8/9/2023 | 49 | 19 | 22.5% | 104.7 | 100% | 18.4% | 690 |
| 2058 | - | 8/9/2023 | 50 | 19 | 20.8% | 103.2 | 98% | 18.4% | 691 |
| 2070 | - | 8/9/2023 | 51 | 21 | 18.7% | 109.8 | 103% | 18.1% | 692 |
| 2082 | - | 8/9/2023 | 52 | 19 | 20.9% | 104.4 | 99% | 18.4% | 693 |
| 2088 | - | 8/10/2023 | 53 | 3 | 22.0% | 96.7 | 97% | 20.2% | 694 |
| 2100 | - | 8/10/2023 | 54 | 7 | 25.3% | 92.2 | 98% | 22.6% | 695 |
| 2112 | - | 8/10/2023 | 55 | 16 | 22.2% | 101.5 | 100% | 20.2% | 696 |
| 2124 | - | 8/10/2023 | 56 | 19 | 22.3% | 104.8 | 100% | 18.4% | 697 |
| 2136 | - | 8/10/2023 | 57 | 3 | 21.3% | 96.8 | 97% | 20.2% | 698 |
| 2148 | - | 8/10/2023 | 58 | 19 | 19.8% | 105.4 | 100% | 18.4% | 699 |
| 2160 | - | 8/11/2023 | 59 | 19 | 21.2% | 105.0 | 100% | 18.4% | 700 |
| 2172 | - | 8/11/2023 | 60 | 21 | 21.7% | 105.9 | 100% | 18.1% | 701 |
| 2184 | - | 8/11/2023 | 61 | 21 | 20.5% | 106.6 | 100% | 18.1% | 702 |
| 2197 | - | 8/11/2023 | 62 | 21 | 21.0% | 105.7 | 99% | 18.1% | 703 |
| 2199 | - | 8/11/2023 | 63 | 16 | 21.9% | 100.1 | 98% | 20.2% | 704 |
| 2217 | - | 8/11/2023 | 64 | 21 | 19.6% | 107.4 | 101% | 18.1% | 705 |
| 2230 | - | 8/11/2023 | 65 | 19 | 21.1% | 103.3 | 98% | 18.4% | 706 |
| 2247 | - | 8/14/2023 | 66 | 19 | 21.5% | 104.9 | 100% | 18.4% | 707 |
| 2248 | - | 8/14/2023 | 67 | 19 | 20.8% | 105.3 | 100% | 18.4% | 708 |
| 2269 | - | 8/14/2023 | 68 | 21 | 21.8% | 105.6 | 99% | 18.1% | 709 |
| 2282 | - | 8/14/2023 | 69 | 16 | 21.9% | 103.7 | 102% | 20.2% | 710 |
| 2295 | - | 8/14/2023 | 70 | 16 | 22.2% | 103.9 | 102% | 20.2% | 711 |
| 2308 | - | 8/14/2023 | 71 | 3 | 24.7% | 96.3 | 97% | 20.2% | 712 |
| 2327 | - | 8/14/2023 | 72 | 16 | 23.1% | 101.4 | 100% | 20.2% | 713 |
| 2334 | - | 8/15/2023 | 73 | 21 | 20.4% | 106.2 | 100% | 18.1% | 714 |
| 2335 | - | 8/15/2023 | 74 | 19 | 20.6% | 104.5 | 100% | 18.4% | 715 |
| 2337 | - | 8/15/2023 | 75 | 21 | 21.4% | 106.1 | 100% | 18.1% | 716 |
| 2338 | - | 8/15/2023 | 76 | 19 | 22.5% | 105.1 | 100% | 18.4% | 717 |
| 2344 | - | 8/15/2023 | 77 | 19 | 20.7% | 104.2 | 99% | 18.4% | 718 |
| 2345 | - | 8/15/2023 | 78 | 21 | 19.8% | 105.9 | 100% | 18.1% | 719 |
| 2347 | - | 8/15/2023 | 79 | 16 | 21.9% | 103.7 | 102% | 20.2% | 720 |
| 2348 | - | 8/15/2023 | 80 | 21 | 20.7% | 106.4 | 100% | 18.1% | 721 |
| 2350 | - | 8/15/2023 | 81 | 19 | 20.5% | 104.1 | 99% | 18.4% | 722 |
| 2351 | - | 8/15/2023 | 82 | 16 | 22.5% | 101.8 | 100% | 20.2% | 723 |
| 2357 | - | 8/15/2023 | 83 | 16 | 22.3% | 103.0 | 101% | 20.2% | 724 |
| 2358 | - | 8/15/2023 | 84 | 19 | 21.8% | 105.5 | 100% | 18.4% | 725 |
| 2360 | - | 8/15/2023 | 85 | 3 | 26.7% | 97.8 | 98% | 20.2% | 726 |
| 2361 | - | 8/15/2023 | 86 | 3 | 22.1% | 97.9 | 99% | 20.2% | 727 |
| 2371 | - | 8/15/2023 | 87 | 7 | 24.7% | 92.7 | 99% | 22.6% | 728 |
| 2372 | - | 8/15/2023 | 88 | 7 | 24.3% | 93.6 | 100% | 22.6% | 729 |
| 2374 | - | 8/15/2023 | 89 | 16 | 23.2% | 100.8 | 99% | 20.2% | 730 |
| 2375 | - | 8/15/2023 | 90 | 16 | 22.8% | 101.0 | 99% | 20.2% | 731 |

Clay Field Test Results Summary
Cell 5 Phase 1

| Test No. | Retest of | Date | Lift | Proctor Reference No. | In-Place Moisture Content (%) | In-Place Dry Denisty (pcf) | Percent Compaction | Optimum Moisture | Passing Test # (Overall) |
|---|---|---|---|---|---|---|---|---|---|
| 2385 | - | 8/15/2023 | 91 | 16 | 22.4% | 104.1 | 102% | 20.2% | 732 |
| 2386 | - | 8/15/2023 | 92 | 21 | 19.5% | 105.8 | 100% | 18.1% | 733 |
| 2388 | - | 8/15/2023 | 93 | 16 | 22.4% | 102.4 | 101% | 20.2% | 734 |
| 2390 | - | 8/15/2023 | 94 | 21 | 20.3% | 105.8 | 100% | 18.1% | 735 |
| 2398 | - | 8/15/2023 | 95 | 1 | 20.7% | 104.2 | 103% | 19.4% | 736 |
| 2400 | - | 8/15/2023 | 96 | 21 | 21.1% | 106.0 | 100% | 18.1% | 737 |
| 2402 | - | 8/15/2023 | 97 | 19 | 19.2% | 101.4 | 97% | 18.4% | 738 |
| 2410 | - | 8/15/2023 | 98 | 21 | 18.7% | 105.9 | 100% | 18.1% | 739 |
| 2418 | - | 8/16/2023 | 99 | 1 | 20.0% | 103.8 | 103% | 19.4% | 740 |
| 2420 | - | 8/16/2023 | 100 | 3 | 23.7% | 99.5 | 100% | 20.2% | 741 |
| 2422 | - | 8/16/2023 | 101 | 16 | 22.9% | 100.9 | 99% | 20.2% | 742 |
| 2430 | - | 8/16/2023 | 102 | 16 | 22.7% | 103.4 | 102% | 20.2% | 743 |
| 2432 | - | 8/16/2023 | 103 | 16 | 21.4% | 101.9 | 100% | 20.2% | 744 |
| 2440 | - | 8/16/2023 | 104 | 1 | 23.3% | 100.5 | 100% | 19.4% | 745 |
| 2444 | - | 8/16/2023 | 105 | 16 | 21.7% | 102.5 | 101% | 20.2% | 746 |
| 2450 | - | 8/16/2023 | 106 | 1 | 21.9% | 100.3 | 100% | 19.4% | 747 |
| 2452 | - | 8/16/2023 | 107 | 16 | 23.5% | 101.5 | 100% | 20.2% | 748 |
| 2459 | - | 8/16/2023 | 108 | 19 | 20.1% | 104.7 | 100% | 18.4% | 749 |
| 2466 | - | 8/16/2023 | 109 | 21 | 20.6% | 106.0 | 100% | 18.1% | 750 |
| 2473 | - | 8/16/2023 | 110 | 16 | 23.5% | 101.3 | 100% | 20.2% | 751 |
| 2480 | - | 8/16/2023 | 111 | 1 | 21.4% | 99.8 | 99% | 19.4% | 752 |
| 2482 | - | 8/17/2023 | 112 | 3 | 23.8% | 97.2 | 98% | 20.2% | 753 |
| 2494 | - | 8/17/2023 | 113 | 16 | 22.2% | 101.5 | 100% | 20.2% | 754 |
| 2506 | - | 8/17/2023 | 114 | 16 | 22.6% | 104.0 | 102% | 20.2% | 755 |
| 2518 | - | 8/17/2023 | 115 | 16 | 22.3% | 102.5 | 101% | 20.2% | 756 |
| 2530 | - | 8/17/2023 | 116 | 1 | 23.3% | 100.5 | 100% | 19.4% | 757 |
| 2542 | - | 8/17/2023 | 117 | 19 | 20.4% | 104.5 | 100% | 18.4% | 758 |
| 2553 | - | 8/17/2023 | 118 | 1 | 19.9% | 102.8 | 102% | 19.4% | 759 |
| 2559 | - | 8/18/2023 | 119 | 16 | 23.5% | 103.0 | 101% | 20.2% | 760 |
| 2570 | - | 8/18/2023 | 120 | 16 | 22.3% | 102.3 | 100% | 20.2% | 761 |
| 2581 | - | 8/18/2023 | 121 | 1 | 22.5% | 100.2 | 99% | 19.4% | 762 |
| 2592 | - | 8/18/2023 | 122 | 16 | 22.3% | 101.0 | 99% | 20.2% | 763 |
| 2603 | - | 8/18/2023 | 123 | 1 | 23.3% | 99.9 | 99% | 19.4% | 764 |
| 2614 | - | 8/18/2023 | 124 | 16 | 21.6% | 104.2 | 102% | 20.2% | 765 |
| 2625 | - | 8/18/2023 | 125 | 16 | 21.8% | 103.6 | 102% | 20.2% | 766 |
| 2636 | - | 8/19/2023 | 126 | 16 | 24.4% | 102.4 | 101% | 20.2% | 767 |
| 2647 | - | 8/21/2023 | 127 | 1 | 21.6% | 100.6 | 100% | 19.4% | 768 |
| 2658 | - | 8/21/2023 | 128 | 16 | 22.7% | 104.5 | 103% | 20.2% | 769 |
| 2669 | - | 8/21/2023 | 129 | 21 | 21.1% | 106.4 | 100% | 18.1% | 770 |
| 2680 | - | 8/21/2023 | 130 | 21 | 20.6% | 106.3 | 100% | 18.1% | 771 |
| 2691 | - | 8/21/2023 | 131 | 16 | 23.1% | 102.4 | 101% | 20.2% | 772 |
| 2700 | - | 8/22/2023 | 132 | 21 | 21.5% | 106.0 | 100% | 18.1% | 773 |
| 2713 | - | 8/22/2023 | 133 | 16 | 23.0% | 102.2 | 100% | 20.2% | 774 |
| 2719 | - | 8/22/2023 | 134 | 3 | 20.7% | 96.8 | 97% | 20.2% | 775 |
| 2725 | - | 8/22/2023 | 135 | 1 | 20.9% | 102.0 | 101% | 19.4% | 776 |
| 2731 | - | 8/22/2023 | 136 | 3 | 26.7% | 94.6 | 95% | 20.2% | 777 |
| 2742 | - | 8/22/2023 | 137 | 19 | 21.9% | 105.6 | 101% | 18.4% | 778 |
| 2748 | - | 8/22/2023 | 138 | 21 | 21.2% | 106.3 | 100% | 18.1% | 779 |

Clay Field Test Results Summary
Cell 5 Phase 1

| Test No. | Retest of | Date | Lift | Proctor Reference No. | In-Place Moisture Content (%) | In-Place Dry Denisty (pcf) | Percent Compaction | Optimum Moisture | Passing Test # (Overall) |
|---|---|---|---|---|---|---|---|---|---|
| 2759 | - | 8/24/2023 | 139 | 3 | 21.3% | 99.2 | 100% | 20.2% | 780 |
| 2765 | - | 8/24/2023 | 140 | 16 | 22.0% | 101.5 | 100% | 20.2% | 781 |
| 2771 | - | 8/24/2023 | 141 | 16 | 22.9% | 101.4 | 100% | 20.2% | 782 |
| 2777 | - | 8/24/2023 | 142 | 16 | 23.2% | 102.8 | 101% | 20.2% | 783 |
| 2783 | - | 8/24/2023 | 143 | 16 | 22.0% | 103.4 | 102% | 20.2% | 784 |
| 2793 | - | 8/25/2023 | 144 | 3 | 25.3% | 97.6 | 98% | 20.2% | 785 |
| 2804 | - | 8/25/2023 | 145 | 3 | 24.4% | 97.3 | 98% | 20.2% | 786 |
| Z-20 | | | | | | | | | |
| 1293 | - | 7/24/2023 | 1 | 3 | 25.5% | 96.2 | 97% | 20.2% | 787 |
| 1296 | - | 7/24/2023 | 2 | 7 | 27.6% | 93.4 | 100% | 22.6% | 788 |
| 1299 | - | 7/24/2023 | 3 | 1 | 22.9% | 100.2 | 99% | 19.4% | 789 |
| 1302 | - | 7/24/2023 | 4 | 3 | 23.1% | 96.8 | 97% | 20.2% | 790 |
| 1305 | - | 7/24/2023 | 5 | 3 | 23.1% | 97.2 | 98% | 20.2% | 791 |
| 1308 | - | 7/24/2023 | 6 | 3 | 23.7% | 97.6 | 98% | 20.2% | 792 |
| 1313 | - | 7/24/2023 | 7 | 3 | 24.1% | 97.5 | 98% | 20.2% | 793 |
| 1318 | - | 7/24/2023 | 8 | 3 | 24.7% | 96.5 | 97% | 20.2% | 794 |
| 1323 | - | 7/24/2023 | 9 | 7 | 25.6% | 90.7 | 97% | 22.6% | 795 |
| 1328 | - | 7/25/2023 | 10 | 19 | 21.9% | 104.0 | 99% | 18.4% | 796 |
| 1333 | - | 7/25/2023 | 11 | 3 | 25.6% | 99.4 | 100% | 20.2% | 797 |
| 1338 | - | 7/25/2023 | 12 | 16 | 24.5% | 100.9 | 99% | 20.2% | 798 |
| 1343 | - | 7/25/2023 | 13 | 16 | 22.6% | 101.7 | 100% | 20.2% | 799 |
| 1353 | - | 7/25/2023 | 14 | 3 | 24.8% | 97.2 | 98% | 20.2% | 800 |
| 1358 | - | 7/25/2023 | 15 | 19 | 21.2% | 102.6 | 98% | 18.4% | 801 |
| 1363 | - | 7/25/2023 | 16 | 19 | 23.2% | 101.0 | 96% | 18.4% | 802 |
| 1368 | - | 7/25/2023 | 17 | 19 | 20.8% | 104.0 | 99% | 18.4% | 803 |
| 1373 | - | 7/25/2023 | 18 | 3 | 20.7% | 98.2 | 99% | 20.2% | 804 |
| 1378 | - | 7/25/2023 | 19 | 7 | 25.4% | 93.4 | 100% | 22.6% | 805 |
| 1383 | - | 7/25/2023 | 20 | 19 | 24.3% | 99.8 | 95% | 18.4% | 806 |
| 1388 | - | 7/26/2023 | 21 | 19 | 22.5% | 101.0 | 96% | 18.4% | 807 |
| 1393 | - | 7/26/2023 | 22 | 19 | 23.2% | 100.5 | 96% | 18.4% | 808 |
| 1398 | - | 7/26/2023 | 23 | 3 | 23.3% | 98.7 | 99% | 20.2% | 809 |
| 1403 | - | 7/26/2023 | 24 | 3 | 23.4% | 98.5 | 99% | 20.2% | 810 |
| 1408 | - | 7/26/2023 | 25 | 19 | 22.5% | 100.3 | 96% | 18.4% | 811 |
| 1413 | - | 7/26/2023 | 26 | 3 | 26.1% | 96.4 | 97% | 20.2% | 812 |
| 1418 | - | 7/26/2023 | 27 | 3 | 22.8% | 97.4 | 98% | 20.2% | 813 |
| 1423 | - | 7/26/2023 | 28 | 19 | 22.3% | 102.7 | 98% | 18.4% | 814 |
| 1428 | - | 7/26/2023 | 29 | 19 | 23.6% | 100.6 | 96% | 18.4% | 815 |
| 1433 | - | 7/26/2023 | 30 | 3 | 23.7% | 98.8 | 99% | 20.2% | 816 |
| 1438 | - | 7/26/2023 | 31 | 19 | 22.9% | 102.9 | 98% | 18.4% | 817 |
| 1443 | - | 7/26/2023 | 32 | 19 | 19.7% | 102.2 | 97% | 18.4% | 818 |
| 1448 | - | 7/26/2023 | 33 | 21 | 20.7% | 105.5 | 99% | 18.1% | 819 |
| 1453 | - | 7/27/2023 | 34 | 3 | 24.7% | 96.0 | 97% | 20.2% | 820 |
| 1458 | - | 7/27/2023 | 35 | 3 | 23.4% | 96.6 | 97% | 20.2% | 821 |
| 1463 | - | 7/27/2023 | 36 | 19 | 21.5% | 100.5 | 96% | 18.4% | 822 |
| 1468 | - | 7/27/2023 | 37 | 21 | 20.7% | 106.1 | 100% | 18.1% | 823 |
| 1473 | - | 7/27/2023 | 38 | 21 | 20.6% | 104.5 | 98% | 18.1% | 824 |
| 1478 | - | 7/27/2023 | 39 | 19 | 22.8% | 101.0 | 96% | 18.4% | 825 |
| 1483 | - | 7/27/2023 | 40 | 3 | 23.7% | 98.8 | 99% | 20.2% | 826 |

Clay Field Test Results Summary
Cell 5 Phase 1

| Test No. | Retest of | Date | Lift | Proctor Reference No. | In-Place Moisture Content (%) | In-Place Dry Denisty (pcf) | Percent Compaction | Optimum Moisture | Passing Test # (Overall) |
|---|---|---|---|---|---|---|---|---|---|
| 1488 | - | 7/27/2023 | 41 | 7 | 25.2% | 90.0 | 96% | 22.6% | 827 |
| 1493 | - | 7/27/2023 | 42 | 19 | 22.0% | 102.5 | 98% | 18.4% | 828 |
| 1498 | - | 7/27/2023 | 43 | 19 | 19.5% | 1003.4 | 956% | 18.4% | 829 |
| 1503 | - | 7/27/2023 | 44 | 19 | 19.0% | 104.4 | 99% | 18.4% | 830 |
| 1508 | - | 7/27/2023 | 45 | 19 | 19.8% | 104.8 | 100% | 18.4% | 831 |
| 1519 | - | 7/31/2023 | 46 | 19 | 19.4% | 104.0 | 99% | 18.4% | 832 |
| 1530 | - | 7/31/2023 | 47 | 19 | 23.4% | 99.9 | 95% | 18.4% | 833 |
| 1541 | - | 7/31/2023 | 48 | 19 | 22.6% | 100.2 | 95% | 18.4% | 834 |
| 1552 | - | 7/31/2023 | 49 | 3 | 23.8% | 97.1 | 98% | 20.2% | 835 |
| 1563 | - | 7/31/2023 | 50 | 3 | 21.0% | 99.0 | 100% | 20.2% | 836 |
| 1574 | - | 7/31/2023 | 51 | 3 | 24.7% | 94.6 | 95% | 20.2% | 837 |
| 1585 | - | 7/31/2023 | 52 | 19 | 20.4% | 105.2 | 100% | 18.4% | 838 |
| 1609 | - | 8/1/2023 | 53 | 3 | 21.4% | 99.6 | 100% | 20.2% | 839 |
| 1622 | - | 8/1/2023 | 54 | 19 | 22.7% | 101.6 | 97% | 18.4% | 840 |
| 1635 | - | 8/1/2023 | 55 | 3 | 22.3% | 98.9 | 100% | 20.2% | 841 |
| 1648 | - | 8/1/2023 | 56 | 7 | 26.9% | 90.8 | 97% | 22.6% | 842 |
| 1661 | - | 8/1/2023 | 57 | 19 | 21.2% | 104.2 | 99% | 18.4% | 843 |
| 1672 | - | 8/1/2023 | 58 | 21 | 20.4% | 106.5 | 100% | 18.1% | 844 |
| 1683 | - | 8/1/2023 | 59 | 19 | 21.3% | 101.4 | 97% | 18.4% | 845 |
| 1694 | - | 8/2/2023 | 60 | 3 | 263.0% | 96.1 | 97% | 20.2% | 846 |
| 1705 | - | 8/2/2023 | 61 | 9 | 24.3% | 94.2 | 96% | 23.9% | 847 |
| 1716 | - | 8/2/2023 | 62 | 19 | 19.1% | 100.4 | 96% | 18.4% | 848 |
| 1727 | - | 8/2/2023 | 63 | 3 | 23.1% | 95.3 | 96% | 20.2% | 849 |
| 1738 | - | 8/2/2023 | 64 | 7 | 25.9% | 93.7 | 100% | 22.6% | 850 |
| 1755 | - | 8/3/2023 | 65 | 19 | 23.3% | 101.4 | 97% | 18.4% | 851 |
| 1766 | - | 8/3/2023 | 66 | 3 | 24.8% | 100.0 | 101% | 20.2% | 852 |
| 1777 | - | 8/3/2023 | 67 | 19 | 22.8% | 100.6 | 96% | 18.4% | 853 |
| 1788 | - | 8/3/2023 | 68 | 19 | 23.1% | 100.7 | 96% | 18.4% | 854 |
| 1799 | - | 8/3/2023 | 69 | 19 | 20.5% | 102.1 | 97% | 18.4% | 855 |
| 1810 | - | 8/3/2023 | 70 | 3 | 25.9% | 95.1 | 96% | 20.2% | 856 |
| 1826 | - | 8/7/2023 | 71 | 19 | 21.2% | 105.3 | 100% | 18.4% | 857 |
| 1849 | - | 8/7/2023 | 72 | 19 | 21.2% | 105.2 | 100% | 18.4% | 858 |
| 1866 | - | 8/7/2023 | 73 | 19 | 21.7% | 104.0 | 99% | 18.4% | 859 |
| 1878 | - | 8/7/2023 | 74 | 19 | 23.6% | 101.3 | 96% | 18.4% | 860 |
| 1890 | - | 8/7/2023 | 75 | 19 | 20.1% | 103.3 | 98% | 18.4% | 861 |
| 1902 | - | 8/7/2023 | 76 | 19 | 21.8% | 103.4 | 98% | 18.4% | 862 |
| 1915 | - | 8/8/2023 | 77 | 19 | 22.3% | 102.6 | 98% | 18.4% | 863 |
| 1927 | - | 8/8/2023 | 78 | 21 | 20.4% | 105.9 | 100% | 18.1% | 864 |
| 1939 | - | 8/8/2023 | 79 | 19 | 21.4% | 104.5 | 100% | 18.4% | 865 |
| 1951 | - | 8/8/2023 | 80 | 19 | 22.0% | 105.1 | 100% | 18.4% | 866 |
| 1963 | - | 8/8/2023 | 81 | 19 | 20.1% | 104.6 | 100% | 18.4% | 867 |
| 1975 | - | 8/8/2023 | 82 | 19 | 20.1% | 105.5 | 100% | 18.4% | 868 |
| 1987 | - | 8/8/2023 | 83 | 19 | 21.0% | 104.6 | 100% | 18.4% | 869 |
| 1999 | - | 8/8/2023 | 84 | 19 | 21.0% | 102.8 | 98% | 18.4% | 870 |
| 2011 | - | 8/9/2023 | 85 | 19 | 22.6% | 102.6 | 98% | 18.4% | 871 |
| 2023 | - | 8/9/2023 | 86 | 19 | 24.1% | 102.1 | 97% | 18.4% | 872 |
| 2035 | - | 8/9/2023 | 87 | 19 | 21.6% | 104.4 | 99% | 18.4% | 873 |
| 2047 | - | 8/9/2023 | 88 | 19 | 21.3% | 102.9 | 98% | 18.4% | 874 |

Clay Field Test Results Summary
Cell 5 Phase 1

| Test No. | Retest of | Date | Lift | Proctor Reference No. | In-Place Moisture Content (%) | In-Place Dry Denisty (pcf) | Percent Compaction | Optimum Moisture | Passing Test # (Overall) |
|---|---|---|---|---|---|---|---|---|---|
| 2059 | - | 8/9/2023 | 89 | 19 | 21.4% | 104.4 | 99% | 18.4% | 875 |
| 2071 | - | 8/9/2023 | 90 | 16 | 23.5% | 101.8 | 100% | 20.2% | 876 |
| 2083 | - | 8/9/2023 | 91 | 21 | 21.2% | 106.1 | 100% | 18.1% | 877 |
| 2089 | - | 8/10/2023 | 92 | 19 | 21.9% | 103.6 | 99% | 18.4% | 878 |
| 2101 | - | 8/10/2023 | 93 | 16 | 23.2% | 100.2 | 98% | 20.2% | 879 |
| 2113 | - | 8/10/2023 | 94 | 16 | 21.1% | 100.8 | 99% | 20.2% | 880 |
| 2125 | - | 8/10/2023 | 95 | 21 | 21.8% | 105.6 | 99% | 18.1% | 881 |
| 2137 | - | 8/10/2023 | 96 | 21 | 21.3% | 106.3 | 100% | 18.1% | 882 |
| 2149 | - | 8/10/2023 | 97 | 19 | 20.8% | 105.1 | 100% | 18.4% | 883 |
| 2161 | - | 8/11/2023 | 98 | 19 | 21.2% | 105.3 | 100% | 18.4% | 884 |
| 2173 | - | 8/11/2023 | 99 | 19 | 22.2% | 103.1 | 98% | 18.4% | 885 |
| 2185 | - | 8/11/2023 | 100 | 21 | 20.2% | 106.6 | 100% | 18.1% | 886 |
| 2200 | - | 8/11/2023 | 101 | 21 | 20.4% | 106.1 | 100% | 18.1% | 887 |
| 2201 | - | 8/11/2023 | 102 | 21 | 19.6% | 107.6 | 101% | 18.1% | 888 |
| 2218 | - | 8/11/2023 | 103 | 21 | 19.1% | 105.8 | 100% | 18.1% | 889 |
| 2231 | - | 8/11/2023 | 104 | 16 | 22.1% | 102.2 | 100% | 20.2% | 890 |
| 2249 | - | 8/14/2023 | 105 | 3 | 23.9% | 96.8 | 97% | 20.2% | 891 |
| 2250 | - | 8/14/2023 | 106 | 19 | 21.5% | 102.9 | 98% | 18.4% | 892 |
| 2270 | - | 8/14/2023 | 107 | 21 | 20.3% | 108.4 | 102% | 18.1% | 893 |
| 2283 | - | 8/14/2023 | 108 | 16 | 23.8% | 100.1 | 98% | 20.2% | 894 |
| 2296 | - | 8/14/2023 | 109 | 19 | 22.2% | 105.6 | 101% | 18.4% | 895 |
| 2309 | - | 8/14/2023 | 110 | 19 | 19.7% | 104.6 | 100% | 18.4% | 896 |
| 2328 | - | 8/14/2023 | 111 | 19 | 21.5% | 104.4 | 99% | 18.4% | 897 |
| 2483 | - | 8/17/2023 | 112 | 1 | 19.9% | 100.4 | 100% | 19.4% | 898 |
| 2495 | - | 8/17/2023 | 113 | 16 | 24.5% | 101.3 | 100% | 20.2% | 899 |
| 2507 | - | 8/17/2023 | 114 | 16 | 23.5% | 103.8 | 102% | 20.2% | 900 |
| 2519 | - | 8/17/2023 | 115 | 3 | 24.2% | 94.8 | 95% | 20.2% | 901 |
| 2531 | - | 8/17/2023 | 116 | 1 | 24.3% | 100.9 | 100% | 19.4% | 902 |
| 2543 | - | 8/17/2023 | 117 | 21 | 21.1% | 106.2 | 100% | 18.1% | 903 |
| 2554 | - | 8/17/2023 | 118 | 16 | 22.8% | 103.3 | 101% | 20.2% | 904 |
| 2560 | - | 8/18/2023 | 119 | 21 | 20.6% | 106.5 | 100% | 18.1% | 905 |
| 2571 | - | 8/18/2023 | 120 | 16 | 21.8% | 101.3 | 100% | 20.2% | 906 |
| 2582 | - | 8/18/2023 | 121 | 16 | 22.0% | 103.9 | 102% | 20.2% | 907 |
| 2593 | - | 8/18/2023 | 122 | 16 | 22.1% | 104.7 | 103% | 20.2% | 908 |
| 2604 | - | 8/18/2023 | 123 | 19 | 19.8% | 104.3 | 99% | 18.4% | 909 |
| 2615 | - | 8/18/2023 | 124 | 16 | 22.0% | 102.1 | 100% | 20.2% | 910 |
| 2626 | - | 8/18/2023 | 125 | 19 | 20.7% | 105.1 | 100% | 18.4% | 911 |
| 2637 | - | 8/19/2023 | 126 | 21 | 21.7% | 105.9 | 100% | 18.1% | 912 |
| 2648 | - | 8/21/2023 | 127 | 21 | 20.1% | 106.3 | 100% | 18.1% | 913 |
| 2659 | - | 8/21/2023 | 128 | 1 | 19.4% | 103.2 | 102% | 19.4% | 914 |
| 2670 | - | 8/21/2023 | 129 | 16 | 22.4% | 103.9 | 102% | 20.2% | 915 |
| 2681 | - | 8/21/2023 | 130 | 16 | 22.5% | 103.9 | 102% | 20.2% | 916 |
| 2692 | - | 8/21/2023 | 131 | 16 | 22.4% | 101.5 | 100% | 20.2% | 917 |
| 2701 | - | 8/22/2023 | 132 | 16 | 23.5% | 101.8 | 100% | 20.2% | 918 |
| 2714 | - | 8/22/2023 | 133 | 16 | 21.9% | 103.6 | 102% | 20.2% | 919 |
| 2720 | - | 8/22/2023 | 134 | 21 | 20.3% | 107.1 | 101% | 18.1% | 920 |
| 2726 | - | 8/22/2023 | 135 | 16 | 21.3% | 104.0 | 102% | 20.2% | 921 |
| 2732 | - | 8/22/2023 | 136 | 16 | 21.7% | 105.1 | 103% | 20.2% | 922 |

Clay Field Test Results Summary
Cell 5 Phase 1

| Test No. | Retest of | Date | Lift | Proctor Reference No. | In-Place Moisture Content (%) | In-Place Dry Denisty (pcf) | Percent Compaction | Optimum Moisture | Passing Test # (Overall) |
|---|---|---|---|---|---|---|---|---|---|
| 2743 | - | 8/22/2023 | 137 | 16 | 23.1% | 102.0 | 100% | 20.2% | 923 |
| 2749 | - | 8/22/2023 | 138 | 16 | 21.2% | 103.7 | 102% | 20.2% | 924 |
| 2760 | - | 8/24/2023 | 139 | 21 | 20.1% | 108.2 | 102% | 18.1% | 925 |
| 2766 | - | 8/24/2023 | 140 | 21 | 20.9% | 106.7 | 100% | 18.1% | 926 |
| 2772 | - | 8/24/2023 | 141 | 1 | 20.3% | 103.6 | 103% | 19.4% | 927 |
| 2778 | - | 8/24/2023 | 142 | 1 | 20.1% | 100.3 | 100% | 19.4% | 928 |
| 2784 | - | 8/24/2023 | 143 | 1 | 20.2% | 103.5 | 103% | 19.4% | 929 |
| 2794 | - | 8/25/2023 | 144 | 16 | 21.9% | 101.6 | 100% | 20.2% | 930 |
| 2805 | - | 8/25/2023 | 145 | 19 | 19.4% | 103.8 | 99% | 18.4% | 931 |
| Z-21 | | | | | | | | | |
| 1513 | - | 7/31/2023 | 1 | 19 | 21.6% | 100.4 | 96% | 18.4% | 932 |
| 1524 | - | 7/31/2023 | 2 | 3 | 24.1% | 98.3 | 99% | 20.2% | 933 |
| 1535 | - | 7/31/2023 | 3 | 18 | 25.9% | 89.8 | 95% | 25.7% | 934 |
| 1546 | - | 7/31/2023 | 4 | 19 | 21.0% | 103.4 | 98% | 18.4% | 935 |
| 1557 | - | 7/31/2023 | 5 | 19 | 22.3% | 102.0 | 97% | 18.4% | 936 |
| 1568 | - | 7/31/2023 | 6 | 3 | 22.6% | 96.2 | 97% | 20.2% | 937 |
| 1579 | - | 7/31/2023 | 7 | 7 | 26.0% | 91.2 | 97% | 22.6% | 938 |
| 1591 | - | 7/31/2023 | 8 | 19 | 20.2% | 102.2 | 97% | 18.4% | 939 |
| 1602 | - | 8/1/2023 | 9 | 21 | 20.3% | 104.0 | 98% | 18.1% | 940 |
| 1615 | - | 8/1/2023 | 10 | 3 | 21.5% | 96.1 | 97% | 20.2% | 941 |
| 1628 | - | 8/1/2023 | 11 | 19 | 22.1% | 101.6 | 97% | 18.4% | 942 |
| 1641 | - | 8/1/2023 | 12 | 19 | 22.8% | 101.5 | 97% | 18.4% | 943 |
| 1654 | - | 8/1/2023 | 13 | 3 | 26.5% | 95.5 | 96% | 20.2% | 944 |
| 1667 | - | 8/1/2023 | 14 | 14 | 30.2% | 87.7 | 95% | 27.2% | 945 |
| 1678 | - | 8/1/2023 | 15 | 19 | 23.1% | 101.6 | 97% | 18.4% | 946 |
| 1689 | - | 8/2/2023 | 16 | 3 | 25.9% | 94.9 | 96% | 20.2% | 947 |
| 1700 | - | 8/2/2023 | 17 | 14 | 29.6% | 88.9 | 96% | 27.2% | 948 |
| 1711 | - | 8/2/2023 | 18 | 3 | 23.4% | 99.4 | 100% | 20.2% | 949 |
| 1722 | - | 8/2/2023 | 19 | 3 | 22.7% | 99.9 | 101% | 20.2% | 950 |
| 1733 | - | 8/2/2023 | 20 | 3 | 24.4% | 98.1 | 99% | 20.2% | 951 |
| 1744 | - | 8/2/2023 | 21 | 3 | 24.1% | 98.4 | 99% | 20.2% | 952 |
| 1750 | - | 8/3/2023 | 22 | 3 | 27.0% | 96.3 | 97% | 20.2% | 953 |
| 1761 | - | 8/3/2023 | 23 | 19 | 21.9% | 101.5 | 97% | 18.4% | 954 |
| 1772 | - | 8/3/2023 | 24 | 3 | 23.9% | 99.1 | 100% | 20.2% | 955 |
| 1783 | - | 8/3/2023 | 25 | 7 | 27.6% | 94.3 | 101% | 22.6% | 956 |
| 1794 | - | 8/3/2023 | 26 | 3 | 25.4% | 97.4 | 98% | 20.2% | 957 |
| 1805 | - | 8/3/2023 | 27 | 3 | 24.1% | 99.1 | 100% | 20.2% | 958 |
| 1816 | - | 8/3/2023 | 28 | 3 | 26.4% | 97.5 | 98% | 20.2% | 959 |
| 1863 | - | 8/7/2023 | 29 | 7 | 26.1% | 90.8 | 97% | 22.6% | 960 |
| 1876 | - | 8/7/2023 | 30 | 3 | 23.9% | 98.8 | 99% | 20.2% | 961 |
| 1885 | - | 8/7/2023 | 31 | 3 | 25.7% | 94.8 | 95% | 20.2% | 962 |
| 1895 | - | 8/7/2023 | 32 | 3 | 21.9% | 98.0 | 99% | 20.2% | 963 |
| 1907 | - | 8/7/2023 | 33 | 19 | 21.4% | 104.9 | 100% | 18.4% | 964 |
| 1920 | - | 8/8/2023 | 34 | 3 | 23.8% | 99.7 | 100% | 20.2% | 965 |
| 1932 | - | 8/8/2023 | 35 | 19 | 21.0% | 101.2 | 96% | 18.4% | 966 |
| 1949 | - | 8/8/2023 | 36 | 21 | 19.0% | 105.8 | 100% | 18.1% | 967 |
| 1961 | - | 8/8/2023 | 37 | 21 | 20.3% | 106.4 | 100% | 18.1% | 968 |
| 1973 | - | 8/8/2023 | 38 | 19 | 23.0% | 102.6 | 98% | 18.4% | 969 |

Clay Field Test Results Summary
Cell 5 Phase 1

| Test No. | Retest of | Date | Lift | Proctor Reference No. | In-Place Moisture Content (%) | In-Place Dry Denisty (pcf) | Percent Compaction | Optimum Moisture | Passing Test # (Overall) |
|---|---|---|---|---|---|---|---|---|---|
| 1985 | - | 8/8/2023 | 39 | 19 | 23.8% | 102.3 | 97% | 18.4% | 970 |
| 1997 | - | 8/8/2023 | 40 | 16 | 24.1% | 101.2 | 99% | 20.2% | 971 |
| 2009 | - | 8/8/2023 | 41 | 19 | 20.9% | 103.1 | 98% | 18.4% | 972 |
| 2021 | - | 8/9/2023 | 42 | 16 | 23.2% | 101.6 | 100% | 20.2% | 973 |
| 2033 | - | 8/9/2023 | 43 | 19 | 21.9% | 102.9 | 98% | 18.4% | 974 |
| 2045 | - | 8/9/2023 | 44 | 19 | 21.6% | 103.3 | 98% | 18.4% | 975 |
| 2057 | - | 8/9/2023 | 45 | 19 | 22.4% | 103.4 | 98% | 18.4% | 976 |
| 2069 | - | 8/9/2023 | 46 | 21 | 22.3% | 106.6 | 100% | 18.1% | 977 |
| 2081 | - | 8/9/2023 | 47 | 19 | 21.3% | 103.0 | 98% | 18.4% | 978 |
| 2099 | - | 8/10/2023 | 48 | 21 | 21.7% | 105.8 | 100% | 18.1% | 979 |
| 2111 | - | 8/10/2023 | 49 | 21 | 21.6% | 105.9 | 100% | 18.1% | 980 |
| 2123 | - | 8/10/2023 | 50 | 21 | 20.6% | 108.2 | 102% | 18.1% | 981 |
| 2135 | - | 8/10/2023 | 51 | 19 | 21.3% | 104.0 | 99% | 18.4% | 982 |
| 2147 | - | 8/10/2023 | 52 | 19 | 20.5% | 104.9 | 100% | 18.4% | 983 |
| 2159 | - | 8/10/2023 | 53 | 16 | 22.3% | 101.6 | 100% | 20.2% | 984 |
| 2171 | - | 8/11/2023 | 54 | 19 | 21.4% | 105.3 | 100% | 18.4% | 985 |
| 2183 | - | 8/11/2023 | 55 | 16 | 24.8% | 99.9 | 98% | 20.2% | 986 |
| 2195 | - | 8/11/2023 | 56 | 21 | 20.4% | 107.5 | 101% | 18.1% | 987 |
| 2215 | - | 8/11/2023 | 57 | 19 | 22.3% | 102.9 | 98% | 18.4% | 988 |
| 2228 | - | 8/11/2023 | 58 | 19 | 20.6% | 102.2 | 97% | 18.4% | 989 |
| 2241 | - | 8/11/2023 | 59 | 19 | 22.1% | 104.1 | 99% | 18.4% | 990 |
| 2266 | - | 8/14/2023 | 60 | 21 | 20.1% | 108.7 | 102% | 18.1% | 991 |
| 2267 | - | 8/14/2023 | 61 | 21 | 20.5% | 107.7 | 101% | 18.1% | 992 |
| 2280 | - | 8/14/2023 | 62 | 19 | 20.9% | 105.0 | 100% | 18.4% | 993 |
| 2293 | - | 8/14/2023 | 63 | 16 | 22.2% | 103.2 | 101% | 20.2% | 994 |
| 2306 | - | 8/14/2023 | 64 | 16 | 22.6% | 103.7 | 102% | 20.2% | 995 |
| 2319 | - | 8/14/2023 | 65 | 19 | 19.3% | 105.1 | 100% | 18.4% | 996 |
| 2325 | - | 8/14/2023 | 66 | 16 | 21.1% | 104.7 | 103% | 20.2% | 997 |
| 2342 | - | 8/15/2023 | 67 | 21 | 21.7% | 105.9 | 100% | 18.1% | 998 |
| 2355 | - | 8/15/2023 | 68 | 16 | 22.9% | 103.1 | 101% | 20.2% | 999 |
| 2369 | - | 8/15/2023 | 69 | 21 | 20.6% | 106.2 | 100% | 18.1% | 1000 |
| 2383 | - | 8/15/2023 | 70 | 16 | 21.6% | 103.6 | 102% | 20.2% | 1001 |
| 2396 | - | 8/15/2023 | 71 | 16 | 21.6% | 104.5 | 103% | 20.2% | 1002 |
| 2408 | - | 8/15/2023 | 72 | 19 | 18.6% | 105.0 | 100% | 18.4% | 1003 |
| 2416 | - | 8/15/2023 | 73 | 21 | 20.9% | 106.5 | 100% | 18.1% | 1004 |
| 2428 | - | 8/16/2023 | 74 | 21 | 20.8% | 107.5 | 101% | 18.1% | 1005 |
| 2438 | - | 8/16/2023 | 75 | 21 | 19.1% | 107.2 | 101% | 18.1% | 1006 |
| 2448 | - | 8/16/2023 | 76 | 1 | 20.0% | 104.1 | 103% | 19.4% | 1007 |
| 3256 | - | 9/8/2023 | 77 | 1 | 22.4% | 99.6 | 99% | 19.4% | 1008 |
| 3257 | - | 9/8/2023 | 78 | 3 | 24.3% | 98.5 | 99% | 20.2% | 1009 |
| 3261 | - | 9/9/2023 | 79 | 1 | 22.5% | 100.9 | 100% | 19.4% | 1010 |
| 3262 | - | 9/9/2023 | 80 | 3 | 23.3% | 97.5 | 98% | 20.2% | 1011 |
| 3264 | - | 9/9/2023 | 81 | 1 | 22.7% | 99.8 | 99% | 19.4% | 1012 |
| 3266 | - | 9/9/2023 | 82 | 1 | 20.6% | 98.1 | 97% | 19.4% | 1013 |
| 3268 | - | 9/9/2023 | 83 | 13 | 24.4% | 95.8 | 98% | 21.7% | 1014 |
| 3270 | - | 9/9/2023 | 84 | 3 | 23.2% | 97.8 | 98% | 20.2% | 1015 |
| 3272 | - | 9/9/2023 | 85 | 13 | 23.2% | 96.0 | 98% | 21.7% | 1016 |
| 3274 | - | 9/9/2023 | 86 | 2 | 23.6% | 97.1 | 99% | 22.6% | 1017 |

Clay Field Test Results Summary
Cell 5 Phase 1

| Test No. | Retest of | Date | Lift | Proctor Reference No. | In-Place Moisture Content (%) | In-Place Dry Denisty (pcf) | Percent Compaction | Optimum Moisture | Passing Test # (Overall) |
|---|---|---|---|---|---|---|---|---|---|
| 3276 | - | 9/11/2023 | 87 | 1 | 23.4% | 100.8 | 100% | 19.4% | 1018 |
| 3278 | - | 9/11/2023 | 88 | 1 | 21.2% | 100.5 | 100% | 19.4% | 1019 |
| 3281 | - | 9/11/2023 | 89 | 3 | 24.7% | 96.4 | 97% | 20.2% | 1020 |
| 3284 | - | 9/11/2023 | 90 | 3 | 23.5% | 99.4 | 100% | 20.2% | 1021 |
| 3287 | - | 9/11/2023 | 91 | 1 | 21.7% | 100.2 | 99% | 19.4% | 1022 |
| 3290 | - | 9/11/2023 | 92 | 3 | 23.7% | 98.6 | 99% | 20.2% | 1023 |
| 3293 | - | 9/11/2023 | 93 | 16 | 24.4% | 100.3 | 99% | 20.2% | 1024 |
| 3296 | - | 9/11/2023 | 94 | 3 | 22.1% | 99.5 | 100% | 20.2% | 1025 |
| 3299 | - | 9/11/2023 | 95 | 3 | 23.3% | 99.5 | 100% | 20.2% | 1026 |
| 3302 | - | 9/11/2023 | 96 | 1 | 22.1% | 101.0 | 100% | 19.4% | 1027 |
| 3305 | - | 9/11/2023 | 97 | 3 | 25.5% | 95.9 | 97% | 20.2% | 1028 |
| 3308 | - | 9/11/2023 | 98 | 3 | 21.0% | 96.6 | 97% | 20.2% | 1029 |
| 3311 | - | 9/11/2023 | 99 | 3 | 23.6% | 98.1 | 99% | 20.2% | 1030 |
| 3314 | - | 9/11/2023 | 100 | 3 | 22.6% | 94.5 | 95% | 20.2% | 1031 |
| 3317 | - | 9/11/2023 | 101 | 3 | 24.5% | 95.8 | 96% | 20.2% | 1032 |
| 3319 | - | 9/12/2023 | 102 | 3 | 24.2% | 97.1 | 98% | 20.2% | 1033 |
| 3322 | - | 9/12/2023 | 103 | 3 | 25.4% | 95.6 | 96% | 20.2% | 1034 |
| 3325 | - | 9/12/2023 | 104 | 3 | 22.8% | 98.5 | 99% | 20.2% | 1035 |
| 3328 | - | 9/12/2023 | 105 | 7 | 26.9% | 90.1 | 96% | 22.6% | 1036 |
| 3331 | - | 9/12/2023 | 106 | 1 | 22.3% | 100.2 | 99% | 19.4% | 1037 |
| 3334 | - | 9/12/2023 | 107 | 1 | 22.6% | 98.8 | 98% | 19.4% | 1038 |
| 3337 | - | 9/12/2023 | 108 | 1 | 23.4% | 99.4 | 99% | 19.4% | 1039 |
| 3340 | - | 9/12/2023 | 109 | 1 | 21.7% | 98.9 | 98% | 19.4% | 1040 |
| 3343 | - | 9/12/2023 | 110 | 1 | 23.6% | 98.9 | 98% | 19.4% | 1041 |
| 3346 | - | 9/12/2023 | 111 | 1 | 23.0% | 97.1 | 96% | 19.4% | 1042 |
| 3349 | - | 9/12/2023 | 112 | 10 | 28.3% | 91.9 | 97% | 25.0% | 1043 |
| 3352 | - | 9/12/2023 | 113 | 1 | 24.0% | 96.9 | 96% | 19.4% | 1044 |
| 3355 | - | 9/12/2023 | 114 | 1 | 22.5% | 99.8 | 99% | 19.4% | 1045 |
| 3358 | - | 9/12/2023 | 115 | 2 | 23.8% | 94.5 | 97% | 22.6% | 1046 |
| 3361 | - | 9/12/2023 | 116 | 10 | 27.7% | 91.0 | 96% | 25.0% | 1047 |
| 3364 | - | 9/12/2023 | 117 | 1 | 24.2% | 95.9 | 95% | 19.4% | 1048 |
| 3367 | - | 9/12/2023 | 118 | 1 | 25.5% | 96.5 | 96% | 19.4% | 1049 |
| 3370 | - | 9/12/2023 | 119 | 1 | 22.9% | 96.9 | 96% | 19.4% | 1050 |
| 3373 | - | 9/12/2023 | 120 | 7 | 23.4% | 90.9 | 97% | 22.6% | 1051 |
| 3378 | - | 9/12/2023 | 121 | 1 | 21.3% | 101.2 | 100% | 19.4% | 1052 |
| 3381 | - | 9/12/2023 | 122 | 1 | 22.1% | 98.7 | 98% | 19.4% | 1053 |
| 3384 | - | 9/12/2023 | 123 | 10 | 25.8% | 93.1 | 98% | 25.0% | 1054 |
| 3387 | - | 9/12/2023 | 124 | 1 | 23.0% | 100.0 | 99% | 19.4% | 1055 |
| 3390 | - | 9/13/2023 | 124 | 3 | 25.7% | 96.7 | 97% | 20.2% | 1056 |
| 3393 | - | 9/13/2023 | 125 | 3 | 23.6% | 95.5 | 96% | 20.2% | 1057 |
| 3396 | - | 9/13/2023 | 126 | 3 | 23.0% | 99.6 | 100% | 20.2% | 1058 |
| 3399 | - | 9/13/2023 | 127 | 3 | 22.6% | 100.1 | 101% | 20.2% | 1059 |
| 3402 | - | 9/13/2023 | 128 | 3 | 24.6% | 95.3 | 96% | 20.2% | 1060 |
| 3405 | - | 9/13/2023 | 129 | 3 | 23.7% | 97.8 | 98% | 20.2% | 1061 |
| 3408 | - | 9/13/2023 | 130 | 3 | 23.4% | 97.2 | 98% | 20.2% | 1062 |
| 3411 | - | 9/13/2023 | 131 | 3 | 23.5% | 99.7 | 100% | 20.2% | 1063 |
| Z-22 | | | | | | | | | |
| 115 | - | 5/2/2023 | 1 | 14 | 27.9% | 92.2 | 100% | 27.2% | 1064 |

Clay Field Test Results Summary
Cell 5 Phase 1

| Test No. | Retest of | Date | Lift | Proctor Reference No. | In-Place Moisture Content (%) | In-Place Dry Denisty (pcf) | Percent Compaction | Optimum Moisture | Passing Test # (Overall) |
|---|---|---|---|---|---|---|---|---|---|
| 116 | - | 5/2/2023 | 2 | 17 | 28.6% | 92.1 | 96% | 25.6% | 1065 |
| 117 | - | 5/2/2023 | 3 | 14 | 29.2% | 91.7 | 99% | 27.2% | 1066 |
| 118 | - | 5/2/2023 | 4 | 19 | 20.5% | 106.1 | 101% | 18.4% | 1067 |
| 141 | - | 5/3/2023 | 5 | 7 | 26.2% | 92.6 | 99% | 22.6% | 1068 |
| 163 | - | 5/3/2023 | 6 | 19 | 20.8% | 102.0 | 97% | 18.4% | 1069 |
| 164 | - | 5/3/2023 | 7 | 19 | 18.4% | 105.7 | 101% | 18.4% | 1070 |
| 165 | - | 5/3/2023 | 8 | 13 | 24.8% | 93.8 | 96% | 21.7% | 1071 |
| 166 | - | 5/3/2023 | 9 | 19 | 21.7% | 104.3 | 99% | 18.4% | 1072 |
| 235 | - | 5/3/2023 | 10 | 19 | 22.2% | 102.0 | 97% | 18.4% | 1073 |
| 236 | - | 5/3/2023 | 11 | 13 | 24.5% | 92.7 | 95% | 21.7% | 1074 |
| 237 | - | 5/3/2023 | 12 | 13 | 24.6% | 96.4 | 98% | 21.7% | 1075 |
| 238 | - | 5/3/2023 | 13 | 19 | 21.0% | 104.9 | 100% | 18.4% | 1076 |
| 239 | - | 5/3/2023 | 14 | 14 | 28.4% | 91.4 | 99% | 27.2% | 1077 |
| 240 | - | 5/3/2023 | 15 | 14 | 29.2% | 90.6 | 98% | 27.2% | 1078 |
| 251 | - | 5/4/2023 | 16 | 19 | 20.7% | 100.2 | 95% | 18.4% | 1079 |
| 260 | - | 5/4/2023 | 17 | 19 | 23.0% | 101.8 | 97% | 18.4% | 1080 |
| 269 | - | 5/4/2023 | 18 | 19 | 22.1% | 102.0 | 97% | 18.4% | 1081 |
| 278 | - | 5/4/2023 | 19 | 19 | 22.3% | 101.1 | 96% | 18.4% | 1082 |
| 287 | - | 5/4/2023 | 20 | 19 | 21.8% | 103.1 | 98% | 18.4% | 1083 |
| 296 | - | 5/4/2023 | 21 | 19 | 20.9% | 104.0 | 99% | 18.4% | 1084 |
| 306 | - | 5/4/2023 | 22 | 19 | 18.9% | 103.7 | 99% | 18.4% | 1085 |
| 316 | - | 5/4/2023 | 23 | 3 | 23.6% | 96.2 | 97% | 20.2% | 1086 |
| 325 | - | 5/4/2023 | 24 | 19 | 19.7% | 105.0 | 100% | 18.4% | 1087 |
| 334 | - | 5/4/2023 | 25 | 1 | 19.7% | 99.3 | 99% | 19.4% | 1088 |
| 343 | - | 5/5/2023 | 26 | 19 | 19.6% | 103.9 | 99% | 18.4% | 1089 |
| 352 | - | 5/5/2023 | 27 | 16 | 22.6% | 97.0 | 95% | 20.2% | 1090 |
| 361 | - | 5/5/2023 | 28 | 3 | 23.0% | 95.2 | 96% | 20.2% | 1091 |
| 370 | - | 5/5/2023 | 29 | 3 | 20.2% | 95.2 | 96% | 20.2% | 1092 |
| 379 | - | 5/5/2023 | 30 | 2 | 27.3% | 94.0 | 96% | 22.6% | 1093 |
| 388 | - | 5/8/2023 | 31 | 16 | 25.1% | 98.0 | 96% | 20.2% | 1094 |
| 397 | - | 5/8/2023 | 32 | 19 | 20.7% | 103.6 | 99% | 18.4% | 1095 |
| 406 | - | 5/8/2023 | 33 | 3 | 24.2% | 97.8 | 98% | 20.2% | 1096 |
| 483 | - | 5/10/2023 | 34 | 13 | 25.6% | 93.8 | 96% | 21.7% | 1097 |
| 492 | - | 5/10/2023 | 35 | 11 | 27.5% | 92.2 | 96% | 24.8% | 1098 |
| 501 | - | 5/10/2023 | 36 | 1 | 20.3% | 100.4 | 100% | 19.4% | 1099 |
| 510 | - | 5/10/2023 | 37 | 13 | 24.1% | 96.8 | 99% | 21.7% | 1100 |
| 519 | - | 5/10/2023 | 38 | 7 | 28.7% | 89.2 | 95% | 22.6% | 1101 |
| 528 | - | 5/10/2023 | 39 | 13 | 22.3% | 96.2 | 98% | 21.7% | 1102 |
| 537 | - | 5/10/2023 | 40 | 16 | 23.1% | 85.9 | 84% | 20.2% | - |
| 540 | 537 | 5/10/2023 | 40 | 16 | 23.6% | 97.5 | 96% | 20.2% | 1103 |
| 3255 | - | 9/8/2023 | 41 | 16 | 22.9% | 101.5 | 100% | 20.2% | 1104 |
| 3258 | - | 9/8/2023 | 42 | 16 | 21.5% | 102.3 | 100% | 20.2% | 1105 |
| 3259 | - | 9/9/2023 | 43 | 1 | 24.5% | 100.7 | 100% | 19.4% | 1106 |
| 3260 | - | 9/9/2023 | 44 | 3 | 24.8% | 97.2 | 98% | 20.2% | 1107 |
| 3263 | - | 9/9/2023 | 45 | 1 | 20.1% | 99.2 | 98% | 19.4% | 1108 |
| 3265 | - | 9/9/2023 | 46 | 1 | 21.2% | 101.4 | 101% | 19.4% | 1109 |
| 3267 | - | 9/9/2023 | 47 | 1 | 22.8% | 99.8 | 99% | 19.4% | 1110 |
| 3269 | - | 9/9/2023 | 48 | 3 | 21.3% | 99.1 | 100% | 20.2% | 1111 |

Clay Field Test Results Summary
Cell 5 Phase 1

| Test No. | Retest of | Date | Lift | Proctor Reference No. | In-Place Moisture Content (%) | In-Place Dry Denisty (pcf) | Percent Compaction | Optimum Moisture | Passing Test # (Overall) |
|---|---|---|---|---|---|---|---|---|---|
| 3271 | - | 9/9/2023 | 49 | 13 | 25.2% | 95.0 | 97% | 21.7% | 1112 |
| 3273 | - | 9/9/2023 | 50 | 2 | 23.1% | 97.5 | 100% | 22.6% | 1113 |
| 3275 | - | 9/11/2023 | 51 | 16 | 22.2% | 103.0 | 101% | 20.2% | 1114 |
| 3277 | - | 9/11/2023 | 52 | 1 | 23.2% | 100.4 | 100% | 19.4% | 1115 |
| 3279 | - | 9/11/2023 | 53 | 13 | 24.5% | 95.9 | 98% | 21.7% | 1116 |
| 3280 | - | 9/11/2023 | 54 | 3 | 23.4% | 99.3 | 100% | 20.2% | 1117 |
| 3282 | - | 9/11/2023 | 55 | 3 | 23.9% | 96.7 | 97% | 20.2% | 1118 |
| 3283 | - | 9/11/2023 | 56 | 3 | 23.2% | 99.7 | 100% | 20.2% | 1119 |
| 3285 | - | 9/11/2023 | 57 | 1 | 23.2% | 100.2 | 99% | 19.4% | 1120 |
| 3286 | - | 9/11/2023 | 58 | 13 | 24.6% | 94.2 | 96% | 21.7% | 1121 |
| 3288 | - | 9/11/2023 | 59 | 13 | 23.9% | 93.7 | 96% | 21.7% | 1122 |
| 3289 | - | 9/11/2023 | 60 | 13 | 24.3% | 96.2 | 98% | 21.7% | 1123 |
| 3291 | - | 9/11/2023 | 61 | 3 | 21.9% | 99.7 | 100% | 20.2% | 1124 |
| 3292 | - | 9/11/2023 | 62 | 16 | 21.2% | 101.6 | 100% | 20.2% | 1125 |
| 3294 | - | 9/11/2023 | 63 | 16 | 21.4% | 101.2 | 99% | 20.2% | 1126 |
| 3295 | - | 9/11/2023 | 64 | 3 | 25.0% | 98.8 | 99% | 20.2% | 1127 |
| 3297 | - | 9/11/2023 | 65 | 10 | 27.4% | 91.6 | 97% | 25.0% | 1128 |
| 3298 | - | 9/11/2023 | 66 | 3 | 24.6% | 97.7 | 98% | 20.2% | 1129 |
| 3300 | - | 9/11/2023 | 67 | 3 | 24.3% | 95.2 | 96% | 20.2% | 1130 |
| 3301 | - | 9/11/2023 | 68 | 3 | 23.7% | 94.7 | 95% | 20.2% | 1131 |
| 3303 | - | 9/11/2023 | 69 | 3 | 22.2% | 99.2 | 100% | 20.2% | 1132 |
| 3304 | - | 9/11/2023 | 70 | 3 | 24.7% | 95.0 | 96% | 20.2% | 1133 |
| 3306 | - | 9/11/2023 | 71 | 3 | 21.7% | 94.4 | 95% | 20.2% | 1134 |
| 3307 | - | 9/11/2023 | 72 | 7 | 23.0% | 92.8 | 99% | 22.6% | 1135 |
| 3309 | - | 9/11/2023 | 73 | 3 | 20.2% | 99.0 | 100% | 20.2% | 1136 |
| 3310 | - | 9/11/2023 | 74 | 1 | 21.9% | 100.8 | 100% | 19.4% | 1137 |
| 3312 | - | 9/11/2023 | 75 | 3 | 22.4% | 99.9 | 101% | 20.2% | 1138 |
| 3313 | - | 9/11/2023 | 76 | 10 | 27.8% | 90.3 | 95% | 25.0% | 1139 |
| 3315 | - | 9/11/2023 | 77 | 3 | 24.1% | 95.3 | 96% | 20.2% | 1140 |
| 3316 | - | 9/11/2023 | 78 | 3 | 24.2% | 97.0 | 98% | 20.2% | 1141 |
| 3318 | - | 9/11/2023 | 79 | 3 | 22.4% | 98.7 | 99% | 20.2% | 1142 |
| 3320 | - | 9/12/2023 | 80 | 3 | 23.8% | 97.3 | 98% | 20.2% | 1143 |
| 3321 | - | 9/12/2023 | 81 | 16 | 23.5% | 101.3 | 100% | 20.2% | 1144 |
| 3323 | - | 9/12/2023 | 82 | 3 | 24.9% | 96.1 | 97% | 20.2% | 1145 |
| 3324 | - | 9/12/2023 | 83 | 1 | 20.7% | 101.0 | 100% | 19.4% | 1146 |
| 3326 | - | 9/12/2023 | 84 | 3 | 23.0% | 96.0 | 97% | 20.2% | 1147 |
| 3327 | - | 9/12/2023 | 85 | 3 | 21.3% | 97.8 | 98% | 20.2% | 1148 |
| 3329 | - | 9/12/2023 | 86 | 7 | 25.5% | 93.2 | 99% | 22.6% | 1149 |
| 3330 | - | 9/12/2023 | 87 | 3 | 21.3% | 99.0 | 100% | 20.2% | 1150 |
| 3332 | - | 9/12/2023 | 88 | 1 | 23.6% | 98.4 | 98% | 19.4% | 1151 |
| 3333 | - | 9/12/2023 | 89 | 1 | 21.4% | 100.3 | 100% | 19.4% | 1152 |
| 3335 | - | 9/12/2023 | 90 | 7 | 25.6% | 93.5 | 100% | 22.6% | 1153 |
| 3336 | - | 9/12/2023 | 91 | 1 | 23.9% | 99.9 | 99% | 19.4% | 1154 |
| 3338 | - | 9/12/2023 | 92 | 1 | 24.9% | 97.2 | 96% | 19.4% | 1155 |
| 3339 | - | 9/12/2023 | 93 | 7 | 25.1% | 91.8 | 98% | 22.6% | 1156 |
| 3341 | - | 9/12/2023 | 94 | 1 | 24.3% | 96.8 | 96% | 19.4% | 1157 |
| 3342 | - | 9/12/2023 | 95 | 1 | 21.7% | 98.2 | 97% | 19.4% | 1158 |
| 3344 | - | 9/12/2023 | 96 | 1 | 24.0% | 99.5 | 99% | 19.4% | 1159 |

Clay Field Test Results Summary
Cell 5 Phase 1

| Test No. | Retest of | Date | Lift | Proctor Reference No. | In-Place Moisture Content (%) | In-Place Dry Denisty (pcf) | Percent Compaction | Optimum Moisture | Passing Test # (Overall) |
|---|---|---|---|---|---|---|---|---|---|
| 3345 | - | 9/12/2023 | 97 | 1 | 22.3% | 100.7 | 100% | 19.4% | 1160 |
| 3347 | - | 9/12/2023 | 98 | 1 | 21.7% | 98.5 | 98% | 19.4% | 1161 |
| 3348 | - | 9/12/2023 | 99 | 1 | 22.7% | 96.2 | 95% | 19.4% | 1162 |
| 3350 | - | 9/12/2023 | 100 | 1 | 22.0% | 98.9 | 98% | 19.4% | 1163 |
| 3351 | - | 9/12/2023 | 101 | 10 | 26.6% | 90.9 | 96% | 25.0% | 1164 |
| 3353 | - | 9/12/2023 | 102 | 3 | 22.2% | 95.5 | 96% | 20.2% | 1165 |
| 3354 | - | 9/12/2023 | 103 | 1 | 23.7% | 97.5 | 97% | 19.4% | 1166 |
| 3356 | - | 9/12/2023 | 104 | 2 | 23.9% | 94.7 | 97% | 22.6% | 1167 |
| 3357 | - | 9/12/2023 | 105 | 3 | 21.5% | 96.9 | 98% | 20.2% | 1168 |
| 3359 | - | 9/12/2023 | 106 | 2 | 23.6% | 94.4 | 97% | 22.6% | 1169 |
| 3360 | - | 9/12/2023 | 107 | 1 | 22.3% | 96.9 | 96% | 19.4% | 1170 |
| 3362 | - | 9/12/2023 | 108 | 1 | 21.7% | 97.1 | 96% | 19.4% | 1171 |
| 3363 | - | 9/12/2023 | 109 | 1 | 24.6% | 96.8 | 96% | 19.4% | 1172 |
| 3365 | - | 9/12/2023 | 110 | 1 | 24.2% | 95.9 | 95% | 19.4% | 1173 |
| 3366 | - | 9/12/2023 | 111 | 1 | 21.3% | 98.1 | 97% | 19.4% | 1174 |
| 3368 | - | 9/12/2023 | 112 | 7 | 24.6% | 92.8 | 99% | 22.6% | 1175 |
| 3369 | - | 9/12/2023 | 113 | 2 | 25.1% | 94.8 | 97% | 22.6% | 1176 |
| 3371 | - | 9/12/2023 | 114 | 7 | 25.1% | 91.6 | 98% | 22.6% | 1177 |
| 3372 | - | 9/12/2023 | 115 | 7 | 24.8% | 89.4 | 95% | 22.6% | 1178 |
| 3374 | - | 9/12/2023 | 116 | 7 | 22.8% | 89.6 | 96% | 22.6% | 1179 |
| 3376 | - | 9/12/2023 | 117 | 1 | 22.2% | 99.8 | 99% | 19.4% | 1180 |
| 3379 | - | 9/12/2023 | 118 | 16 | 21.1% | 102.5 | 101% | 20.2% | 1181 |
| 3382 | - | 9/12/2023 | 119 | 2 | 23.3% | 94.1 | 96% | 22.6% | 1182 |
| 3385 | - | 9/12/2023 | 120 | 16 | 21.5% | 101.7 | 100% | 20.2% | 1183 |
| 3388 | - | 9/12/2023 | 121 | 1 | 22.0% | 100.7 | 100% | 19.4% | 1184 |
| 3391 | - | 9/13/2023 | 121 | 3 | 22.6% | 95.0 | 96% | 20.2% | 1185 |
| 3394 | - | 9/13/2023 | 122 | 3 | 22.2% | 97.2 | 98% | 20.2% | 1186 |
| 3397 | - | 9/13/2023 | 123 | 3 | 24.6% | 96.1 | 97% | 20.2% | 1187 |
| 3400 | - | 9/13/2023 | 124 | 3 | 24.2% | 98.9 | 100% | 20.2% | 1188 |
| 3403 | - | 9/13/2023 | 125 | 3 | 25.4% | 95.8 | 96% | 20.2% | 1189 |
| 3406 | - | 9/13/2023 | 126 | 3 | 24.6% | 96.1 | 97% | 20.2% | 1190 |
| 3409 | - | 9/13/2023 | 127 | 3 | 23.4% | 97.1 | 98% | 20.2% | 1191 |
| 3412 | - | 9/13/2023 | 128 | 3 | 25.2% | 95.2 | 96% | 20.2% | 1192 |
| Z-23 | | | | | | | | | |
| 119 | - | 5/2/2023 | 1 | 17 | 27.5% | 94.9 | 99% | 25.6% | 1193 |
| 120 | - | 5/2/2023 | 2 | 16 | 23.4% | 100.7 | 99% | 20.2% | 1194 |
| 121 | - | 5/2/2023 | 3 | 10 | 25.5% | 93.8 | 99% | 25.0% | 1195 |
| 122 | - | 5/2/2023 | 4 | 19 | 19.8% | 106.3 | 101% | 18.4% | 1196 |
| 142 | - | 5/3/2023 | 5 | 15 | 28.0% | 94.3 | 96% | 24.1% | 1197 |
| 167 | - | 5/3/2023 | 6 | 7 | 25.4% | 92.3 | 98% | 22.6% | 1198 |
| 168 | - | 5/3/2023 | 7 | 19 | 18.9% | 103.9 | 99% | 18.4% | 1199 |
| 169 | - | 5/3/2023 | 8 | 15 | 25.9% | 94.0 | 95% | 24.1% | 1200 |
| 170 | - | 5/3/2023 | 9 | 1 | 19.8% | 99.9 | 99% | 19.4% | 1201 |
| 171 | - | 5/3/2023 | 10 | 17 | 26.7% | 95.5 | 100% | 25.6% | 1202 |
| 241 | - | 5/3/2023 | 11 | 15 | 25.1% | 94.6 | 96% | 24.1% | 1203 |
| 242 | - | 5/3/2023 | 12 | 13 | 24.4% | 96.7 | 99% | 21.7% | 1204 |
| 243 | - | 5/3/2023 | 13 | 19 | 18.5% | 105.2 | 100% | 18.4% | 1205 |
| 244 | - | 5/3/2023 | 14 | 19 | 20.4% | 104.5 | 100% | 18.4% | 1206 |

Clay Field Test Results Summary
Cell 5 Phase 1

| Test No. | Retest of | Date | Lift | Proctor Reference No. | In-Place Moisture Content (%) | In-Place Dry Denisty (pcf) | Percent Compaction | Optimum Moisture | Passing Test # (Overall) |
|---|---|---|---|---|---|---|---|---|---|
| 245 | - | 5/3/2023 | 15 | 19 | 19.6% | 101.6 | 97% | 18.4% | 1207 |
| 252 | - | 5/4/2023 | 16 | 19 | 18.6% | 105.6 | 101% | 18.4% | 1208 |
| 261 | - | 5/4/2023 | 17 | 19 | 21.3% | 102.2 | 97% | 18.4% | 1209 |
| 270 | - | 5/4/2023 | 18 | 16 | 23.0% | 99.7 | 98% | 20.2% | 1210 |
| 279 | - | 5/4/2023 | 19 | 19 | 21.2% | 102.6 | 98% | 18.4% | 1211 |
| 288 | - | 5/4/2023 | 20 | 19 | 20.7% | 104.4 | 99% | 18.4% | 1212 |
| 297 | - | 5/4/2023 | 21 | 19 | 21.0% | 103.5 | 99% | 18.4% | 1213 |
| 307 | - | 5/4/2023 | 22 | 19 | 22.4% | 99.8 | 95% | 18.4% | 1214 |
| 317 | - | 5/4/2023 | 23 | 19 | 19.1% | 101.9 | 97% | 18.4% | 1215 |
| 326 | - | 5/4/2023 | 24 | 19 | 19.4% | 105.4 | 100% | 18.4% | 1216 |
| 335 | - | 5/4/2023 | 25 | 16 | 21.7% | 98.1 | 96% | 20.2% | 1217 |
| 344 | - | 5/5/2023 | 26 | 19 | 22.1% | 100.4 | 96% | 18.4% | 1218 |
| 353 | - | 5/5/2023 | 27 | 16 | 25.2% | 99.1 | 97% | 20.2% | 1219 |
| 362 | - | 5/5/2023 | 28 | 3 | 26.2% | 95.6 | 96% | 20.2% | 1220 |
| 371 | - | 5/5/2023 | 29 | 3 | 20.2% | 97.3 | 98% | 20.2% | 1221 |
| 380 | - | 5/5/2023 | 30 | 7 | 24.6% | 92.5 | 99% | 22.6% | 1222 |
| 389 | - | 5/8/2023 | 31 | 16 | 24.3% | 99.6 | 98% | 20.2% | 1223 |
| 398 | - | 5/8/2023 | 32 | 19 | 19.2% | 100.1 | 95% | 18.4% | 1224 |
| 407 | - | 5/8/2023 | 33 | 3 | 24.0% | 98.6 | 99% | 20.2% | 1225 |
| 484 | - | 5/10/2023 | 34 | 16 | 22.3% | 97.5 | 96% | 20.2% | 1226 |
| 493 | - | 5/10/2023 | 35 | 16 | 22.3% | 97.1 | 95% | 20.2% | 1227 |
| 502 | - | 5/10/2023 | 36 | 9 | 26.4% | 94.7 | 96% | 23.9% | 1228 |
| 511 | - | 5/10/2023 | 37 | 16 | 21.8% | 100.4 | 99% | 20.2% | 1229 |
| 520 | - | 5/10/2023 | 38 | 13 | 24.1% | 95.5 | 98% | 21.7% | 1230 |
| 529 | - | 5/10/2023 | 39 | 16 | 21.2% | 101.2 | 99% | 20.2% | 1231 |
| 538 | - | 5/10/2023 | 40 | 1 | 22.1% | 99.1 | 98% | 19.4% | 1232 |
| 593 | - | 6/12/2023 | 41 | 19 | 21.0% | 103.9 | 99% | 18.4% | 1233 |
| 601 | - | 6/13/2023 | 42 | 16 | 23.1% | 101.4 | 100% | 20.2% | 1234 |
| 609 | - | 6/13/2023 | 43 | 19 | 24.5% | 100.1 | 95% | 18.4% | 1235 |
| 617 | - | 6/13/2023 | 44 | 16 | 22.3% | 100.6 | 99% | 20.2% | 1236 |
| 625 | - | 6/13/2023 | 45 | 19 | 21.1% | 103.4 | 98% | 18.4% | 1237 |
| 633 | - | 6/13/2023 | 46 | 16 | 21.8% | 100.2 | 98% | 20.2% | 1238 |
| 641 | - | 6/13/2023 | 47 | 19 | 23.0% | 102.7 | 98% | 18.4% | 1239 |
| 649 | - | 6/13/2023 | 48 | 16 | 22.7% | 100.2 | 98% | 20.2% | 1240 |
| 657 | - | 6/14/2023 | 49 | 16 | 22.8% | 100.8 | 99% | 20.2% | 1241 |
| 666 | - | 6/14/2023 | 50 | 16 | 24.7% | 101.7 | 100% | 20.2% | 1242 |
| 674 | - | 6/14/2023 | 51 | 16 | 24.6% | 99.2 | 97% | 20.2% | 1243 |
| 682 | - | 6/14/2023 | 52 | 16 | 22.9% | 100.4 | 99% | 20.2% | 1244 |
| 694 | - | 6/14/2023 | 53 | 19 | 20.7% | 104.2 | 99% | 18.4% | 1245 |
| 702 | - | 6/14/2023 | 54 | 19 | 19.6% | 104.8 | 100% | 18.4% | 1246 |
| 710 | - | 6/14/2023 | 56 | 19 | 21.2% | 103.9 | 99% | 18.4% | 1247 |
| 711 | - | 6/14/2023 | 55 | 19 | 19.1% | 109.9 | 105% | 18.4% | 1248 |
| 726 | - | 6/15/2023 | 57 | 16 | 22.7% | 98.3 | 97% | 20.2% | 1249 |
| 734 | - | 6/15/2023 | 58 | 16 | 22.4% | 101.5 | 100% | 20.2% | 1250 |
| 742 | - | 6/15/2023 | 59 | 3 | 24.2% | 98.1 | 99% | 20.2% | 1251 |
| 750 | - | 6/15/2023 | 60 | 3 | 23.6% | 95.9 | 97% | 20.2% | 1252 |
| 758 | - | 6/15/2023 | 61 | 3 | 25.8% | 96.2 | 97% | 20.2% | 1253 |
| 766 | - | 6/15/2023 | 62 | 19 | 23.8% | 99.7 | 95% | 18.4% | 1254 |

Clay Field Test Results Summary
Cell 5 Phase 1

| Test No. | Retest of | Date | Lift | Proctor Reference No. | In-Place Moisture Content (%) | In-Place Dry Denisty (pcf) | Percent Compaction | Optimum Moisture | Passing Test # (Overall) |
|---|---|---|---|---|---|---|---|---|---|
| 774 | - | 6/15/2023 | 63 | 16 | 21.3% | 103.9 | 102% | 20.2% | 1255 |
| 775 | - | 6/15/2023 | 64 | 3 | 24.1% | 98.4 | 99% | 20.2% | 1256 |
| 790 | - | 6/19/2023 | 65 | 16 | 21.6% | 101.7 | 100% | 20.2% | 1257 |
| 798 | - | 6/19/2023 | 66 | 3 | 24.2% | 98.9 | 100% | 20.2% | 1258 |
| 806 | - | 6/19/2023 | 67 | 19 | 21.9% | 103.6 | 99% | 18.4% | 1259 |
| 814 | - | 6/19/2023 | 68 | 3 | 23.4% | 98.7 | 99% | 20.2% | 1260 |
| 822 | - | 6/19/2023 | 69 | 19 | 22.0% | 102.0 | 97% | 18.4% | 1261 |
| 830 | - | 6/19/2023 | 70 | 16 | 21.4% | 100.0 | 98% | 20.2% | 1262 |
| 838 | - | 6/19/2023 | 72 | 19 | 20.5% | 104.1 | 99% | 18.4% | 1263 |
| 839 | - | 6/19/2023 | 71 | 16 | 21.1% | 101.3 | 100% | 20.2% | 1264 |
| 854 | - | 6/20/2023 | 73 | 3 | 20.2% | 99.3 | 100% | 20.2% | 1265 |
| 862 | - | 6/20/2023 | 74 | 19 | 21.8% | 102.7 | 98% | 18.4% | 1266 |
| 870 | - | 6/20/2023 | 75 | 3 | 24.8% | 97.2 | 98% | 20.2% | 1267 |
| 878 | - | 6/20/2023 | 76 | 16 | 21.8% | 98.2 | 96% | 20.2% | 1268 |
| 886 | - | 6/20/2023 | 77 | 8 | 24.5% | 94.6 | 98% | 24.4% | 1269 |
| 894 | - | 6/20/2023 | 78 | 16 | 21.9% | 101.5 | 100% | 20.2% | 1270 |
| 902 | - | 6/20/2023 | 79 | 16 | 20.8% | 99.5 | 98% | 20.2% | 1271 |
| 910 | - | 6/20/2023 | 80 | 19 | 21.3% | 103.4 | 98% | 18.4% | 1272 |
| 918 | - | 6/21/2023 | 82 | 19 | 21.3% | 103.8 | 99% | 18.4% | 1273 |
| 919 | - | 6/21/2023 | 81 | 21 | 21.1% | 105.6 | 99% | 18.1% | 1274 |
| 934 | - | 6/21/2023 | 83 | 16 | 24.3% | 100.2 | 98% | 20.2% | 1275 |
| 942 | - | 6/21/2023 | 84 | 3 | 22.3% | 98.8 | 99% | 20.2% | 1276 |
| 950 | - | 6/21/2023 | 85 | 16 | 23.3% | 100.6 | 99% | 20.2% | 1277 |
| 958 | - | 6/21/2023 | 86 | 3 | 24.7% | 95.4 | 96% | 20.2% | 1278 |
| 966 | - | 6/21/2023 | 87 | 16 | 22.0% | 101.5 | 100% | 20.2% | 1279 |
| 974 | - | 6/21/2023 | 88 | 12 | 24.4% | 96.0 | 99% | 23.6% | 1280 |
| 982 | - | 6/21/2023 | 89 | 16 | 24.5% | 99.6 | 98% | 20.2% | 1281 |
| 990 | - | 6/21/2023 | 91 | 19 | 22.7% | 102.2 | 97% | 18.4% | 1282 |
| 991 | - | 6/21/2023 | 90 | 3 | 22.6% | 98.0 | 99% | 20.2% | 1283 |
| 1003 | - | 6/26/2023 | 92 | 19 | 19.6% | 102.8 | 98% | 18.4% | 1284 |
| 1011 | - | 6/26/2023 | 93 | 19 | 23.1% | 103.1 | 98% | 18.4% | 1285 |
| 1019 | - | 6/26/2023 | 94 | 11 | 25.0% | 94.9 | 99% | 24.8% | 1286 |
| 1027 | - | 6/26/2023 | 95 | 3 | 25.4% | 97.5 | 98% | 20.2% | 1287 |
| 1035 | - | 6/26/2023 | 96 | 16 | 21.1% | 101.2 | 99% | 20.2% | 1288 |
| 1036 | - | 6/26/2023 | 97 | 19 | 20.7% | 103.1 | 98% | 18.4% | 1289 |
| 1051 | - | 6/27/2023 | 98 | 19 | 20.3% | 106.0 | 101% | 18.4% | 1290 |
| 1059 | - | 6/27/2023 | 99 | 19 | 23.5% | 101.0 | 96% | 18.4% | 1291 |
| 1067 | - | 6/27/2023 | 100 | 19 | 21.3% | 101.5 | 97% | 18.4% | 1292 |
| 1075 | - | 6/27/2023 | 101 | 19 | 23.5% | 100.0 | 95% | 18.4% | 1293 |
| 1083 | - | 6/27/2023 | 102 | 16 | 22.9% | 101.9 | 100% | 20.2% | 1294 |
| 1090 | - | 6/27/2023 | 103 | 16 | 24.6% | 101.7 | 100% | 20.2% | 1295 |
| 1097 | - | 6/27/2023 | 104 | 19 | 20.7% | 104.1 | 99% | 18.4% | 1296 |
| 1098 | - | 6/27/2023 | 105 | 19 | 21.5% | 103.9 | 99% | 18.4% | 1297 |
| 1110 | - | 6/28/2023 | 106 | 19 | 22.1% | 102.7 | 98% | 18.4% | 1298 |
| 1117 | - | 6/28/2023 | 107 | 19 | 21.4% | 102.9 | 98% | 18.4% | 1299 |
| 1124 | - | 6/28/2023 | 108 | 19 | 22.1% | 105.2 | 100% | 18.4% | 1300 |
| 1131 | - | 6/28/2023 | 109 | 16 | 24.6% | 99.8 | 98% | 20.2% | 1301 |
| 1138 | - | 6/28/2023 | 110 | 16 | 24.1% | 101.6 | 100% | 20.2% | 1302 |

Clay Field Test Results Summary
Cell 5 Phase 1

| Test No. | Retest of | Date | Lift | Proctor Reference No. | In-Place Moisture Content (%) | In-Place Dry Denisty (pcf) | Percent Compaction | Optimum Moisture | Passing Test # (Overall) |
|---|---|---|---|---|---|---|---|---|---|
| 1145 | - | 6/28/2023 | 111 | 3 | 22.9% | 99.2 | 100% | 20.2% | 1303 |
| 1152 | - | 6/28/2023 | 112 | 16 | 22.6% | 100.6 | 99% | 20.2% | 1304 |
| 1159 | - | 6/28/2023 | 113 | 19 | 20.7% | 102.6 | 98% | 18.4% | 1305 |
| 1160 | - | 6/28/2023 | 114 | 3 | 24.9% | 98.0 | 99% | 20.2% | 1306 |
| 1173 | - | 6/29/2023 | 115 | 19 | 18.9% | 104.1 | 99% | 18.4% | 1307 |
| 1180 | - | 6/29/2023 | 116 | 21 | 20.5% | 105.6 | 99% | 18.1% | 1308 |
| 1187 | - | 6/29/2023 | 117 | 19 | 20.9% | 103.0 | 98% | 18.4% | 1309 |
| 1194 | - | 6/29/2023 | 118 | 3 | 24.2% | 95.8 | 96% | 20.2% | 1310 |
| 1202 | - | 6/29/2023 | 119 | 3 | 25.9% | 95.2 | 96% | 20.2% | 1311 |
| 1203 | - | 6/29/2023 | 120 | 19 | 23.6% | 99.8 | 95% | 18.4% | 1312 |
| 1216 | - | 6/30/2023 | 121 | 19 | 21.8% | 101.8 | 97% | 18.4% | 1313 |
| 1223 | - | 6/30/2023 | 122 | 19 | 21.8% | 100.7 | 96% | 18.4% | 1314 |
| 1224 | - | 6/30/2023 | 123 | 7 | 23.7% | 92.6 | 99% | 22.6% | 1315 |
| 1237 | - | 6/30/2023 | 124 | 3 | 23.8% | 96.8 | 97% | 20.2% | 1316 |
| 1238 | - | 6/30/2023 | 125 | 3 | 24.6% | 97.7 | 98% | 20.2% | 1317 |
| 1251 | - | 6/30/2023 | 126 | 19 | 22.0% | 101.7 | 97% | 18.4% | 1318 |
| 1261 | - | 6/30/2023 | 127 | 21 | 21.0% | 105.4 | 99% | 18.1% | 1319 |
| 1276 | - | 7/13/2023 | 128 | 7 | 22.7% | 90.7 | 97% | 22.6% | 1320 |
| 1277 | - | 7/13/2023 | 129 | 1 | 19.7% | 96.4 | 96% | 19.4% | 1321 |
| 1290 | - | 7/14/2023 | 130 | 19 | 21.8% | 102.2 | 97% | 18.4% | 1322 |
| Z-24 | | | | | | | | | |
| 123 | - | 5/2/2023 | 1 | 14 | 32.1% | 86.2 | 93% | 27.2% | - |
| 124 | 123 | 5/2/2023 | 1 | 14 | 30.9% | 89.7 | 97% | 27.2% | 1323 |
| 125 | - | 5/2/2023 | 2 | 15 | 25.9% | 95.6 | 97% | 24.1% | 1324 |
| 126 | - | 5/2/2023 | 3 | 10 | 25.2% | 90.2 | 95% | 25.0% | 1325 |
| 127 | - | 5/2/2023 | 4 | 19 | 21.0% | 103.9 | 99% | 18.4% | 1326 |
| 143 | - | 5/3/2023 | 5 | 7 | 25.2% | 92.6 | 99% | 22.6% | 1327 |
| 172 | - | 5/3/2023 | 6 | 16 | 22.3% | 98.0 | 96% | 20.2% | 1328 |
| 173 | - | 5/3/2023 | 7 | 15 | 27.5% | 94.5 | 96% | 24.1% | 1329 |
| 174 | - | 5/3/2023 | 8 | 4 | 23.0% | 98.6 | 99% | 20.2% | 1330 |
| 175 | - | 5/3/2023 | 9 | 19 | 19.3% | 102.8 | 98% | 18.4% | 1331 |
| 176 | - | 5/3/2023 | 10 | 19 | 19.1% | 103.8 | 99% | 18.4% | 1332 |
| 177 | - | 5/3/2023 | 11 | 15 | 25.4% | 97.4 | 99% | 24.1% | 1333 |
| 178 | - | 5/3/2023 | 12 | 3 | 22.1% | 98.3 | 99% | 20.2% | 1334 |
| 246 | - | 5/3/2023 | 13 | 19 | 21.7% | 101.1 | 96% | 18.4% | 1335 |
| 247 | - | 5/3/2023 | 14 | 19 | 15.7% | 107.7 | 103% | 18.4% | - |
| 248 | 247 | 5/3/2023 | 14 | 19 | 21.4% | 103.3 | 98% | 18.4% | 1336 |
| 249 | - | 5/3/2023 | 15 | 16 | 22.7% | 100.0 | 98% | 20.2% | 1337 |
| 253 | - | 5/4/2023 | 16 | 19 | 19.4% | 104.0 | 99% | 18.4% | 1338 |
| 262 | - | 5/4/2023 | 17 | 16 | 24.3% | 97.1 | 95% | 20.2% | 1339 |
| 271 | - | 5/4/2023 | 18 | 16 | 25.5% | 97.8 | 96% | 20.2% | 1340 |
| 280 | - | 5/4/2023 | 19 | 16 | 23.6% | 99.6 | 98% | 20.2% | 1341 |
| 289 | - | 5/4/2023 | 20 | 16 | 24.0% | 98.3 | 97% | 20.2% | 1342 |
| 298 | - | 5/4/2023 | 21 | 19 | 18.6% | 105.3 | 100% | 18.4% | 1343 |
| 308 | - | 5/4/2023 | 22 | 19 | 20.9% | 103.2 | 98% | 18.4% | 1344 |
| 318 | - | 5/4/2023 | 23 | 19 | 19.2% | 102.4 | 98% | 18.4% | 1345 |
| 327 | - | 5/4/2023 | 24 | 19 | 22.4% | 103.0 | 98% | 18.4% | 1346 |
| 336 | - | 5/4/2023 | 25 | 19 | 22.6% | 102.1 | 97% | 18.4% | 1347 |

Clay Field Test Results Summary
Cell 5 Phase 1

| Test No. | Retest of | Date | Lift | Proctor Reference No. | In-Place Moisture Content (%) | In-Place Dry Denisty (pcf) | Percent Compaction | Optimum Moisture | Passing Test # (Overall) |
|---|---|---|---|---|---|---|---|---|---|
| 345 | - | 5/5/2023 | 26 | 16 | 23.5% | 98.8 | 97% | 20.2% | 1348 |
| 354 | - | 5/5/2023 | 27 | 16 | 24.7% | 97.3 | 96% | 20.2% | 1349 |
| 363 | - | 5/5/2023 | 28 | 14 | 29.1% | 89.2 | 97% | 27.2% | 1350 |
| 372 | - | 5/5/2023 | 29 | 16 | 20.2% | 97.8 | 96% | 20.2% | 1351 |
| 381 | - | 5/5/2023 | 30 | 3 | 26.3% | 96.3 | 97% | 20.2% | 1352 |
| 390 | - | 5/8/2023 | 31 | 3 | 24.5% | 96.7 | 97% | 20.2% | 1353 |
| 399 | - | 5/8/2023 | 32 | 3 | 24.0% | 94.5 | 95% | 20.2% | 1354 |
| 408 | - | 5/8/2023 | 33 | 3 | 24.6% | 98.0 | 99% | 20.2% | 1355 |
| 485 | - | 5/10/2023 | 34 | 13 | 26.1% | 96.1 | 98% | 21.7% | 1356 |
| 494 | - | 5/10/2023 | 35 | 16 | 20.9% | 99.4 | 98% | 20.2% | 1357 |
| 503 | - | 5/10/2023 | 36 | 16 | 21.4% | 101.4 | 100% | 20.2% | 1358 |
| 512 | - | 5/10/2023 | 37 | 13 | 22.6% | 96.1 | 98% | 21.7% | 1359 |
| 521 | - | 5/10/2023 | 38 | 13 | 26.6% | 94.5 | 97% | 21.7% | 1360 |
| 530 | - | 5/10/2023 | 39 | 16 | 22.9% | 102.2 | 100% | 20.2% | 1361 |
| 539 | - | 5/10/2023 | 40 | 19 | 20.1% | 103.9 | 99% | 18.4% | 1362 |
| 594 | - | 6/12/2023 | 41 | 16 | 21.9% | 100.5 | 99% | 20.2% | 1363 |
| 602 | - | 6/13/2023 | 42 | 16 | 22.0% | 99.2 | 97% | 20.2% | 1364 |
| 610 | - | 6/13/2023 | 43 | 19 | 21.8% | 104.5 | 100% | 18.4% | 1365 |
| 618 | - | 6/13/2023 | 44 | 19 | 21.3% | 104.3 | 99% | 18.4% | 1366 |
| 626 | - | 6/13/2023 | 45 | 19 | 21.4% | 103.5 | 99% | 18.4% | 1367 |
| 634 | - | 6/13/2023 | 46 | 16 | 22.0% | 100.9 | 99% | 20.2% | 1368 |
| 642 | - | 6/13/2023 | 47 | 19 | 24.0% | 101.2 | 96% | 18.4% | 1369 |
| 650 | - | 6/13/2023 | 48 | 16 | 22.5% | 100.2 | 98% | 20.2% | 1370 |
| 658 | - | 6/14/2023 | 49 | 19 | 21.3% | 104.9 | 100% | 18.4% | 1371 |
| 667 | - | 6/14/2023 | 50 | 16 | 22.4% | 100.9 | 99% | 20.2% | 1372 |
| 675 | - | 6/14/2023 | 51 | 16 | 24.2% | 99.0 | 97% | 20.2% | 1373 |
| 683 | - | 6/14/2023 | 52 | 19 | 21.0% | 102.7 | 98% | 18.4% | 1374 |
| 695 | - | 6/14/2023 | 53 | 16 | 22.4% | 101.8 | 100% | 20.2% | 1375 |
| 703 | - | 6/14/2023 | 54 | 19 | 21.8% | 104.0 | 99% | 18.4% | 1376 |
| 712 | - | 6/14/2023 | 56 | 16 | 24.5% | 98.5 | 97% | 20.2% | 1377 |
| 713 | - | 6/14/2023 | 55 | 19 | 20.1% | 101.2 | 96% | 18.4% | 1378 |
| 727 | - | 6/15/2023 | 57 | 16 | 25.1% | 100.0 | 98% | 20.2% | 1379 |
| 735 | - | 6/15/2023 | 58 | 19 | 21.7% | 101.5 | 97% | 18.4% | 1380 |
| 743 | - | 6/15/2023 | 59 | 16 | 22.0% | 96.4 | 95% | 20.2% | 1381 |
| 751 | - | 6/15/2023 | 60 | 16 | 25.4% | 99.1 | 97% | 20.2% | 1382 |
| 759 | - | 6/15/2023 | 61 | 3 | 26.2% | 98.4 | 99% | 20.2% | 1383 |
| 767 | - | 6/15/2023 | 62 | 16 | 21.9% | 103.3 | 101% | 20.2% | 1384 |
| 776 | - | 6/15/2023 | 63 | 16 | 21.5% | 104.1 | 102% | 20.2% | 1385 |
| 777 | - | 6/15/2023 | 64 | 19 | 21.3% | 101.9 | 97% | 18.4% | 1386 |
| 791 | - | 6/19/2023 | 65 | 16 | 22.7% | 101.5 | 100% | 20.2% | 1387 |
| 799 | - | 6/19/2023 | 66 | 16 | 24.2% | 99.8 | 98% | 20.2% | 1388 |
| 807 | - | 6/19/2023 | 67 | 16 | 22.3% | 99.3 | 98% | 20.2% | 1389 |
| 815 | - | 6/19/2023 | 68 | 16 | 22.4% | 101.9 | 100% | 20.2% | 1390 |
| 823 | - | 6/19/2023 | 69 | 19 | 20.9% | 103.0 | 98% | 18.4% | 1391 |
| 831 | - | 6/19/2023 | 70 | 16 | 21.7% | 99.7 | 98% | 20.2% | 1392 |
| 840 | - | 6/19/2023 | 72 | 3 | 23.1% | 97.5 | 98% | 20.2% | 1393 |
| 841 | - | 6/19/2023 | 71 | 13 | 22.4% | 95.8 | 98% | 21.7% | 1394 |
| 855 | - | 6/20/2023 | 73 | 5 | 24.5% | 96.2 | 100% | 24.5% | 1395 |

Clay Field Test Results Summary
Cell 5 Phase 1

| Test No. | Retest of | Date | Lift | Proctor Reference No. | In-Place Moisture Content (%) | In-Place Dry Denisty (pcf) | Percent Compaction | Optimum Moisture | Passing Test # (Overall) |
|---|---|---|---|---|---|---|---|---|---|
| 863 | - | 6/20/2023 | 74 | 10 | 26.8% | 92.1 | 97% | 25.0% | 1396 |
| 871 | - | 6/20/2023 | 75 | 11 | 25.9% | 94.5 | 99% | 24.8% | 1397 |
| 879 | - | 6/20/2023 | 76 | 16 | 22.5% | 98.4 | 97% | 20.2% | 1398 |
| 887 | - | 6/20/2023 | 77 | 3 | 22.7% | 97.7 | 98% | 20.2% | 1399 |
| 895 | - | 6/20/2023 | 78 | 19 | 21.7% | 102.5 | 98% | 18.4% | 1400 |
| 903 | - | 6/20/2023 | 79 | 16 | 21.9% | 100.9 | 99% | 20.2% | 1401 |
| 911 | - | 6/20/2023 | 80 | 19 | 21.7% | 104.6 | 100% | 18.4% | 1402 |
| 920 | - | 6/21/2023 | 82 | 19 | 20.7% | 103.6 | 99% | 18.4% | 1403 |
| 921 | - | 6/21/2023 | 81 | 19 | 23.2% | 102.8 | 98% | 18.4% | 1404 |
| 935 | - | 6/21/2023 | 83 | 19 | 19.2% | 103.8 | 99% | 18.4% | 1405 |
| 943 | - | 6/21/2023 | 84 | 3 | 22.6% | 98.6 | 99% | 20.2% | 1406 |
| 951 | - | 6/21/2023 | 85 | 16 | 21.5% | 101.0 | 99% | 20.2% | 1407 |
| 959 | - | 6/21/2023 | 86 | 3 | 24.0% | 96.9 | 98% | 20.2% | 1408 |
| 967 | - | 6/21/2023 | 87 | 16 | 21.0% | 101.4 | 100% | 20.2% | 1409 |
| 975 | - | 6/21/2023 | 88 | 3 | 24.1% | 99.1 | 100% | 20.2% | 1410 |
| 983 | - | 6/21/2023 | 89 | 7 | 26.6% | 91.0 | 97% | 22.6% | 1411 |
| 992 | - | 6/21/2023 | 91 | 16 | 23.8% | 100.6 | 99% | 20.2% | 1412 |
| 993 | - | 6/21/2023 | 90 | 19 | 23.1% | 102.3 | 97% | 18.4% | 1413 |
| 1004 | - | 6/26/2023 | 92 | 16 | 20.2% | 100.7 | 99% | 20.2% | 1414 |
| 1012 | - | 6/26/2023 | 93 | 3 | 24.2% | 98.3 | 99% | 20.2% | 1415 |
| 1020 | - | 6/26/2023 | 94 | 7 | 27.7% | 93.8 | 100% | 22.6% | 1416 |
| 1028 | - | 6/26/2023 | 95 | 16 | 23.4% | 101.5 | 100% | 20.2% | 1417 |
| 1037 | - | 6/26/2023 | 96 | 19 | 21.1% | 102.2 | 97% | 18.4% | 1418 |
| 1038 | - | 6/26/2023 | 97 | 19 | 20.5% | 104.6 | 100% | 18.4% | 1419 |
| 1052 | - | 6/27/2023 | 98 | 19 | 20.9% | 103.5 | 99% | 18.4% | 1420 |
| 1060 | - | 6/27/2023 | 99 | 3 | 23.5% | 98.0 | 99% | 20.2% | 1421 |
| 1068 | - | 6/27/2023 | 100 | 19 | 22.9% | 102.6 | 98% | 18.4% | 1422 |
| 1076 | - | 6/27/2023 | 101 | 19 | 21.8% | 102.4 | 98% | 18.4% | 1423 |
| 1084 | - | 6/27/2023 | 102 | 19 | 22.5% | 104.4 | 99% | 18.4% | 1424 |
| 1091 | - | 6/27/2023 | 103 | 19 | 22.1% | 103.1 | 98% | 18.4% | 1425 |
| 1099 | - | 6/27/2023 | 104 | 19 | 21.6% | 102.5 | 98% | 18.4% | 1426 |
| 1100 | - | 6/27/2023 | 105 | 19 | 21.8% | 103.2 | 98% | 18.4% | 1427 |
| 1111 | - | 6/28/2023 | 106 | 16 | 21.5% | 99.3 | 98% | 20.2% | 1428 |
| 1118 | - | 6/28/2023 | 107 | 19 | 23.6% | 100.4 | 96% | 18.4% | 1429 |
| 1125 | - | 6/28/2023 | 108 | 16 | 23.9% | 99.5 | 98% | 20.2% | 1430 |
| 1132 | - | 6/28/2023 | 109 | 3 | 26.2% | 96.5 | 97% | 20.2% | 1431 |
| 1139 | - | 6/28/2023 | 110 | 16 | 24.9% | 98.7 | 97% | 20.2% | 1432 |
| 1146 | - | 6/28/2023 | 111 | 3 | 24.7% | 96.9 | 98% | 20.2% | 1433 |
| 1153 | - | 6/28/2023 | 112 | 3 | 24.3% | 96.3 | 97% | 20.2% | 1434 |
| 1161 | - | 6/28/2023 | 113 | 3 | 25.0% | 99.2 | 100% | 20.2% | 1435 |
| 1162 | - | 6/28/2023 | 114 | 3 | 24.9% | 96.9 | 98% | 20.2% | 1436 |
| 1174 | - | 6/29/2023 | 115 | 19 | 20.0% | 101.6 | 97% | 18.4% | 1437 |
| 1181 | - | 6/29/2023 | 116 | 19 | 18.9% | 104.1 | 99% | 18.4% | 1438 |
| 1188 | - | 6/29/2023 | 117 | 19 | 22.7% | 100.6 | 96% | 18.4% | 1439 |
| 1195 | - | 6/29/2023 | 118 | 3 | 22.3% | 95.8 | 96% | 20.2% | 1440 |
| 1204 | - | 6/29/2023 | 119 | 3 | 23.7% | 96.3 | 97% | 20.2% | 1441 |
| 1205 | - | 6/29/2023 | 120 | 3 | 21.8% | 98.3 | 99% | 20.2% | 1442 |
| 1217 | - | 6/30/2023 | 121 | 19 | 20.6% | 101.2 | 96% | 18.4% | 1443 |

Clay Field Test Results Summary
Cell 5 Phase 1

| Test No. | Retest of | Date | Lift | Proctor Reference No. | In-Place Moisture Content (%) | In-Place Dry Denisty (pcf) | Percent Compaction | Optimum Moisture | Passing Test # (Overall) |
|---|---|---|---|---|---|---|---|---|---|
| 1225 | - | 6/30/2023 | 122 | 10 | 26.1% | 94.4 | 100% | 25.0% | 1444 |
| 1226 | - | 6/30/2023 | 123 | 3 | 25.5% | 95.9 | 97% | 20.2% | 1445 |
| 1239 | - | 6/30/2023 | 124 | 3 | 24.0% | 97.6 | 98% | 20.2% | 1446 |
| 1240 | - | 6/30/2023 | 125 | 3 | 22.8% | 95.7 | 96% | 20.2% | 1447 |
| 1252 | - | 6/30/2023 | 126 | 13 | 23.1% | 93.4 | 95% | 21.7% | 1448 |
| 1253 | - | 6/30/2023 | 127 | 3 | 23.1% | 98.4 | 99% | 20.2% | 1449 |
| 1262 | - | 6/30/2023 | 128 | 19 | 21.1% | 101.1 | 96% | 18.4% | 1450 |
| 1263 | - | 6/30/2023 | 129 | 19 | 20.9% | 103.2 | 98% | 18.4% | 1451 |
| 1287 | - | 7/14/2023 | 130 | 19 | 21.2% | 102.6 | 98% | 18.4% | 1452 |
| 1288 | - | 7/14/2023 | 131 | 19 | 18.4% | 103.3 | 98% | 18.4% | 1453 |
| 1289 | - | 7/14/2023 | 132 | 21 | 19.4% | 107.9 | 102% | 18.1% | 1454 |
| Z-25 | | | | | | | | | |
| 128 | - | 5/2/2023 | 1 | 14 | 30.6% | 88.3 | 96% | 27.2% | 1455 |
| 129 | - | 5/2/2023 | 2 | 15 | 25.4% | 94.2 | 96% | 24.1% | 1456 |
| 130 | - | 5/2/2023 | 3 | 14 | 26.6% | 88.3 | 96% | 27.2% | - |
| 131 | 130 | 5/2/2023 | 3 | 14 | 27.9% | 90.1 | 98% | 27.2% | 1457 |
| 144 | - | 5/3/2023 | 4 | 3 | 21.4% | 96.0 | 97% | 20.2% | 1458 |
| 179 | - | 5/3/2023 | 5 | 16 | 20.6% | 99.9 | 98% | 20.2% | 1459 |
| 180 | - | 5/3/2023 | 6 | 15 | 27.2% | 94.4 | 96% | 24.1% | 1460 |
| 181 | - | 5/3/2023 | 7 | 15 | 26.3% | 93.8 | 95% | 24.1% | 1461 |
| 182 | - | 5/3/2023 | 8 | 13 | 21.9% | 93.4 | 95% | 21.7% | 1462 |
| 183 | - | 5/3/2023 | 9 | 16 | 23.1% | 99.0 | 97% | 20.2% | 1463 |
| 184 | - | 5/3/2023 | 10 | 19 | 21.6% | 101.5 | 97% | 18.4% | 1464 |
| 185 | - | 5/3/2023 | 11 | 3 | 20.9% | 98.9 | 100% | 20.2% | 1465 |
| 186 | - | 5/3/2023 | 12 | 1 | 20.6% | 98.7 | 98% | 19.4% | 1466 |
| 187 | - | 5/3/2023 | 13 | 1 | 15.2% | 106.3 | 105% | 19.4% | - |
| 188 | 187 | 5/3/2023 | 13 | 1 | 20.8% | 97.7 | 97% | 19.4% | 1467 |
| 189 | - | 5/3/2023 | 14 | 19 | 21.5% | 103.8 | 99% | 18.4% | 1468 |
| 254 | - | 5/4/2023 | 15 | 19 | 18.9% | 100.2 | 95% | 18.4% | 1469 |
| 263 | - | 5/4/2023 | 16 | 16 | 21.6% | 98.5 | 97% | 20.2% | 1470 |
| 272 | - | 5/4/2023 | 17 | 17 | 28.4% | 92.5 | 96% | 25.6% | 1471 |
| 281 | - | 5/4/2023 | 18 | 4 | 23.0% | 96.2 | 97% | 20.2% | 1472 |
| 290 | - | 5/4/2023 | 19 | 19 | 20.4% | 102.5 | 98% | 18.4% | 1473 |
| 299 | - | 5/4/2023 | 20 | 19 | 21.6% | 102.4 | 98% | 18.4% | 1474 |
| 309 | - | 5/4/2023 | 21 | 19 | 21.1% | 104.1 | 99% | 18.4% | 1475 |
| 319 | - | 5/4/2023 | 22 | 19 | 21.7% | 102.8 | 98% | 18.4% | 1476 |
| 328 | - | 5/4/2023 | 23 | 19 | 18.7% | 104.9 | 100% | 18.4% | 1477 |
| 337 | - | 5/4/2023 | 24 | 16 | 21.0% | 101.3 | 100% | 20.2% | 1478 |
| 346 | - | 5/5/2023 | 25 | 19 | 20.9% | 103.9 | 99% | 18.4% | 1479 |
| 355 | - | 5/5/2023 | 26 | 19 | 23.0% | 102.2 | 97% | 18.4% | 1480 |
| 364 | - | 5/5/2023 | 27 | 19 | 20.9% | 103.0 | 98% | 18.4% | 1481 |
| 373 | - | 5/5/2023 | 28 | 3 | 24.6% | 96.9 | 98% | 20.2% | 1482 |
| 382 | - | 5/5/2023 | 29 | 19 | 22.4% | 101.8 | 97% | 18.4% | 1483 |
| 391 | - | 5/8/2023 | 30 | 19 | 20.0% | 103.5 | 99% | 18.4% | 1484 |
| 400 | - | 5/8/2023 | 31 | 19 | 23.2% | 100.2 | 95% | 18.4% | 1485 |
| 409 | - | 5/8/2023 | 32 | 6 | 26.1% | 96.2 | 99% | 24.5% | 1486 |
| 477 | - | 5/10/2023 | 33 | 16 | 22.6% | 100.3 | 99% | 20.2% | 1487 |
| 486 | - | 5/10/2023 | 34 | 16 | 23.8% | 101.4 | 100% | 20.2% | 1488 |

Clay Field Test Results Summary
Cell 5 Phase 1

| Test No. | Retest of | Date | Lift | Proctor Reference No. | In-Place Moisture Content (%) | In-Place Dry Denisty (pcf) | Percent Compaction | Optimum Moisture | Passing Test # (Overall) |
|---|---|---|---|---|---|---|---|---|---|
| 495 | - | 5/10/2023 | 35 | 11 | 28.4% | 95.0 | 99% | 24.8% | 1489 |
| 504 | - | 5/10/2023 | 36 | 15 | 26.7% | 96.0 | 97% | 24.1% | 1490 |
| 513 | - | 5/10/2023 | 37 | 9 | 25.4% | 97.6 | 99% | 23.9% | 1491 |
| 522 | - | 5/10/2023 | 38 | 19 | 21.9% | 104.8 | 100% | 18.4% | 1492 |
| 531 | - | 5/10/2023 | 39 | 16 | 20.8% | 101.7 | 100% | 20.2% | 1493 |
| 541 | - | 5/10/2023 | 40 | 16 | 22.4% | 102.3 | 100% | 20.2% | 1494 |
| 595 | - | 6/12/2023 | 41 | 19 | 19.6% | 105.2 | 100% | 18.4% | 1495 |
| 603 | - | 6/13/2023 | 42 | 19 | 22.6% | 102.8 | 98% | 18.4% | 1496 |
| 611 | - | 6/13/2023 | 43 | 19 | 21.5% | 102.9 | 98% | 18.4% | 1497 |
| 619 | - | 6/13/2023 | 44 | 16 | 22.5% | 100.7 | 99% | 20.2% | 1498 |
| 627 | - | 6/13/2023 | 45 | 16 | 22.3% | 100.4 | 99% | 20.2% | 1499 |
| 635 | - | 6/13/2023 | 46 | 16 | 23.5% | 100.5 | 99% | 20.2% | 1500 |
| 643 | - | 6/13/2023 | 47 | 19 | 22.1% | 102.5 | 98% | 18.4% | 1501 |
| 651 | - | 6/13/2023 | 48 | 16 | 23.0% | 101.7 | 100% | 20.2% | 1502 |
| 659 | - | 6/14/2023 | 49 | 19 | 22.4% | 103.8 | 99% | 18.4% | 1503 |
| 668 | - | 6/14/2023 | 50 | 19 | 21.8% | 104.6 | 100% | 18.4% | 1504 |
| 676 | - | 6/14/2023 | 51 | 16 | 24.2% | 99.0 | 97% | 20.2% | 1505 |
| 684 | - | 6/14/2023 | 52 | 16 | 23.0% | 101.1 | 99% | 20.2% | 1506 |
| 696 | - | 6/14/2023 | 53 | 16 | 22.6% | 98.2 | 96% | 20.2% | 1507 |
| 704 | - | 6/14/2023 | 54 | 19 | 21.0% | 104.2 | 99% | 18.4% | 1508 |
| 714 | - | 6/14/2023 | 56 | 19 | 19.4% | 104.1 | 99% | 18.4% | 1509 |
| 715 | - | 6/14/2023 | 55 | 19 | 21.0% | 104.1 | 99% | 18.4% | 1510 |
| 728 | - | 6/15/2023 | 57 | 16 | 22.6% | 97.9 | 96% | 20.2% | 1511 |
| 736 | - | 6/15/2023 | 58 | 16 | 20.4% | 102.9 | 101% | 20.2% | 1512 |
| 744 | - | 6/15/2023 | 59 | 3 | 21.9% | 100.1 | 101% | 20.2% | 1513 |
| 752 | - | 6/15/2023 | 60 | 3 | 24.6% | 99.3 | 100% | 20.2% | 1514 |
| 760 | - | 6/15/2023 | 61 | 16 | 22.6% | 102.1 | 100% | 20.2% | 1515 |
| 768 | - | 6/15/2023 | 62 | 16 | 21.3% | 100.1 | 98% | 20.2% | 1516 |
| 778 | - | 6/15/2023 | 63 | 16 | 20.7% | 105.0 | 103% | 20.2% | 1517 |
| 779 | - | 6/15/2023 | 64 | 19 | 24.2% | 100.4 | 96% | 18.4% | 1518 |
| 792 | - | 6/19/2023 | 65 | 2 | 22.9% | 96.6 | 99% | 22.6% | 1519 |
| 800 | - | 6/19/2023 | 66 | 2 | 24.0% | 97.7 | 100% | 22.6% | 1520 |
| 808 | - | 6/19/2023 | 67 | 16 | 23.9% | 98.3 | 97% | 20.2% | 1521 |
| 816 | - | 6/19/2023 | 68 | 19 | 20.7% | 104.7 | 100% | 18.4% | 1522 |
| 824 | - | 6/19/2023 | 69 | 19 | 22.3% | 103.2 | 98% | 18.4% | 1523 |
| 832 | - | 6/19/2023 | 70 | 2 | 25.1% | 97.5 | 100% | 22.6% | 1524 |
| 842 | - | 6/19/2023 | 72 | 8 | 25.4% | 92.7 | 96% | 24.4% | 1525 |
| 843 | - | 6/19/2023 | 71 | 13 | 22.5% | 97.1 | 99% | 21.7% | 1526 |
| 856 | - | 6/20/2023 | 73 | 9 | 23.9% | 98.6 | 100% | 23.9% | 1527 |
| 864 | - | 6/20/2023 | 74 | 12 | 25.1% | 96.3 | 99% | 23.6% | 1528 |
| 872 | - | 6/20/2023 | 75 | 10 | 25.1% | 90.9 | 96% | 25.0% | 1529 |
| 880 | - | 6/20/2023 | 76 | 16 | 23.5% | 98.1 | 96% | 20.2% | 1530 |
| 888 | - | 6/20/2023 | 77 | 16 | 22.8% | 100.2 | 98% | 20.2% | 1531 |
| 896 | - | 6/20/2023 | 78 | 16 | 20.2% | 99.8 | 98% | 20.2% | 1532 |
| 904 | - | 6/20/2023 | 79 | 19 | 18.8% | 101.7 | 97% | 18.4% | 1533 |
| 912 | - | 6/20/2023 | 80 | 16 | 20.8% | 98.9 | 97% | 20.2% | 1534 |
| 922 | - | 6/21/2023 | 82 | 16 | 22.2% | 101.8 | 100% | 20.2% | 1535 |
| 923 | - | 6/21/2023 | 81 | 19 | 22.7% | 102.9 | 98% | 18.4% | 1536 |

Clay Field Test Results Summary
Cell 5 Phase 1

| Test No. | Retest of | Date | Lift | Proctor Reference No. | In-Place Moisture Content (%) | In-Place Dry Denisty (pcf) | Percent Compaction | Optimum Moisture | Passing Test # (Overall) |
|---|---|---|---|---|---|---|---|---|---|
| 936 | - | 6/21/2023 | 83 | 19 | 23.9% | 101.6 | 97% | 18.4% | 1537 |
| 944 | - | 6/21/2023 | 84 | 16 | 21.9% | 101.1 | 99% | 20.2% | 1538 |
| 952 | - | 6/21/2023 | 85 | 3 | 22.7% | 97.0 | 98% | 20.2% | 1539 |
| 960 | - | 6/21/2023 | 86 | 19 | 22.0% | 103.2 | 98% | 18.4% | 1540 |
| 968 | - | 6/21/2023 | 87 | 3 | 24.2% | 99.2 | 100% | 20.2% | 1541 |
| 976 | - | 6/21/2023 | 88 | 3 | 21.5% | 96.1 | 97% | 20.2% | 1542 |
| 984 | - | 6/21/2023 | 89 | 19 | 22.1% | 103.6 | 99% | 18.4% | 1543 |
| 994 | - | 6/21/2023 | 91 | 16 | 22.3% | 101.8 | 100% | 20.2% | 1544 |
| 995 | - | 6/21/2023 | 90 | 21 | 22.0% | 105.3 | 99% | 18.1% | 1545 |
| 1005 | - | 6/26/2023 | 92 | 19 | 21.0% | 103.0 | 98% | 18.4% | 1546 |
| 1013 | - | 6/26/2023 | 93 | 19 | 21.9% | 104.2 | 99% | 18.4% | 1547 |
| 1021 | - | 6/26/2023 | 94 | 16 | 23.4% | 100.1 | 98% | 20.2% | 1548 |
| 1029 | - | 6/26/2023 | 95 | 19 | 21.0% | 105.0 | 100% | 18.4% | 1549 |
| 1039 | - | 6/26/2023 | 96 | 19 | 20.9% | 104.3 | 99% | 18.4% | 1550 |
| 1040 | - | 6/26/2023 | 97 | 19 | 21.3% | 103.9 | 99% | 18.4% | 1551 |
| 1053 | - | 6/27/2023 | 98 | 19 | 21.2% | 102.6 | 98% | 18.4% | 1552 |
| 1061 | - | 6/27/2023 | 99 | 19 | 20.1% | 108.2 | 103% | 18.4% | 1553 |
| 1069 | - | 6/27/2023 | 100 | 19 | 20.8% | 106.8 | 102% | 18.4% | 1554 |
| 1077 | - | 6/27/2023 | 101 | 19 | 24.7% | 99.8 | 95% | 18.4% | 1555 |
| 1085 | - | 6/27/2023 | 102 | 19 | 23.0% | 102.2 | 97% | 18.4% | 1556 |
| 1092 | - | 6/27/2023 | 103 | 19 | 22.5% | 104.5 | 100% | 18.4% | 1557 |
| 1271 | - | 6/27/2023 | 104 | 19 | 21.8% | 104.9 | 100% | 18.4% | 1558 |
| 1101 | - | 6/27/2023 | 105 | 19 | 21.5% | 104.6 | 100% | 18.4% | 1559 |
| 1112 | - | 6/28/2023 | 106 | 19 | 21.8% | 100.7 | 96% | 18.4% | 1560 |
| 1119 | - | 6/28/2023 | 107 | 19 | 23.1% | 99.9 | 95% | 18.4% | 1561 |
| 1126 | - | 6/28/2023 | 108 | 16 | 23.6% | 101.4 | 100% | 20.2% | 1562 |
| 1133 | - | 6/28/2023 | 109 | 3 | 25.0% | 97.7 | 98% | 20.2% | 1563 |
| 1140 | - | 6/28/2023 | 110 | 16 | 24.4% | 100.1 | 98% | 20.2% | 1564 |
| 1147 | - | 6/28/2023 | 111 | 3 | 22.3% | 97.2 | 98% | 20.2% | 1565 |
| 1154 | - | 6/28/2023 | 112 | 19 | 20.0% | 101.2 | 96% | 18.4% | 1566 |
| 1163 | - | 6/28/2023 | 114 | 16 | 21.8% | 99.6 | 98% | 20.2% | 1567 |
| 1164 | - | 6/28/2023 | 113 | 19 | 21.6% | 103.8 | 99% | 18.4% | 1568 |
| 1175 | - | 6/29/2023 | 115 | 3 | 22.5% | 97.8 | 98% | 20.2% | 1569 |
| 1182 | - | 6/29/2023 | 116 | 19 | 22.3% | 104.1 | 99% | 18.4% | 1570 |
| 1189 | - | 6/29/2023 | 117 | 3 | 23.1% | 97.0 | 98% | 20.2% | 1571 |
| 1196 | - | 6/29/2023 | 118 | 7 | 22.7% | 92.7 | 99% | 22.6% | 1572 |
| 1206 | - | 6/29/2023 | 119 | 3 | 23.0% | 99.6 | 100% | 20.2% | 1573 |
| 1207 | - | 6/29/2023 | 120 | 3 | 23.4% | 97.6 | 98% | 20.2% | 1574 |
| 1218 | - | 6/30/2023 | 121 | 19 | 20.2% | 104.5 | 100% | 18.4% | 1575 |
| 1227 | - | 6/30/2023 | 122 | 19 | 22.5% | 100.9 | 96% | 18.4% | 1576 |
| 1228 | - | 6/30/2023 | 123 | 19 | 23.0% | 101.3 | 96% | 18.4% | 1577 |
| 1241 | - | 6/30/2023 | 124 | 19 | 22.6% | 101.9 | 97% | 18.4% | 1578 |
| 1242 | - | 6/30/2023 | 125 | 19 | 22.8% | 102.5 | 98% | 18.4% | 1579 |
| 1254 | - | 6/30/2023 | 126 | 19 | 22.0% | 103.3 | 98% | 18.4% | 1580 |
| 1255 | - | 6/30/2023 | 127 | 19 | 21.1% | 102.3 | 97% | 18.4% | 1581 |
| 1264 | - | 6/30/2023 | 128 | 19 | 21.2% | 100.7 | 96% | 18.4% | 1582 |
| 1265 | - | 6/30/2023 | 129 | 3 | 20.3% | 97.2 | 98% | 20.2% | 1583 |
| 1284 | - | 7/14/2023 | 130 | 19 | 19.3% | 101.1 | 96% | 18.4% | 1584 |

Clay Field Test Results Summary
Cell 5 Phase 1

| Test No. | Retest of | Date | Lift | Proctor Reference No. | In-Place Moisture Content (%) | In-Place Dry Denisty (pcf) | Percent Compaction | Optimum Moisture | Passing Test # (Overall) |
|---|---|---|---|---|---|---|---|---|---|
| 1285 | - | 7/14/2023 | 131 | 19 | 21.2% | 101.9 | 97% | 18.4% | 1585 |
| 1286 | - | 7/14/2023 | 132 | 19 | 22.1% | 103.3 | 98% | 18.4% | 1586 |
| Z-26 | | | | | | | | | |
| 132 | - | 5/2/2023 | 1 | 14 | 33.0% | 81.8 | 89% | 27.2% | - |
| 133 | 132 | 5/2/2023 | 1 | 14 | 29.6% | 87.7 | 95% | 27.2% | 1587 |
| 134 | - | 5/2/2023 | 2 | 17 | 26.5% | 91.3 | 95% | 25.6% | 1588 |
| 135 | - | 5/2/2023 | 3 | 14 | 34.3% | 79.9 | 86% | 27.2% | - |
| 136 | 135 | 5/2/2023 | 3 | 14 | 27.8% | 88.2 | 95% | 27.2% | 1589 |
| 145 | - | 5/3/2023 | 4 | 16 | 21.6% | 98.9 | 97% | 20.2% | 1590 |
| 190 | - | 5/3/2023 | 5 | 15 | 25.9% | 94.3 | 96% | 24.1% | 1591 |
| 191 | - | 5/3/2023 | 6 | 15 | 27.0% | 94.5 | 96% | 24.1% | 1592 |
| 192 | - | 5/3/2023 | 7 | 9 | 28.6% | 93.4 | 95% | 23.9% | 1593 |
| 193 | - | 5/3/2023 | 8 | 16 | 22.1% | 101.5 | 100% | 20.2% | 1594 |
| 194 | - | 5/3/2023 | 9 | 16 | 22.1% | 97.9 | 96% | 20.2% | 1595 |
| 195 | - | 5/3/2023 | 10 | 19 | 19.8% | 104.8 | 100% | 18.4% | 1596 |
| 196 | - | 5/3/2023 | 11 | 19 | 19.8% | 105.2 | 100% | 18.4% | 1597 |
| 197 | - | 5/3/2023 | 12 | 12 | 26.2% | 95.3 | 98% | 23.6% | 1598 |
| 198 | - | 5/3/2023 | 13 | 16 | 22.2% | 100.4 | 99% | 20.2% | 1599 |
| 199 | - | 5/3/2023 | 14 | 19 | 22.3% | 102.5 | 98% | 18.4% | 1600 |
| 255 | - | 5/4/2023 | 15 | 19 | 19.2% | 103.7 | 99% | 18.4% | 1601 |
| 264 | - | 5/4/2023 | 16 | 19 | 21.6% | 103.8 | 99% | 18.4% | 1602 |
| 273 | - | 5/4/2023 | 17 | 19 | 20.8% | 100.5 | 96% | 18.4% | 1603 |
| 282 | - | 5/4/2023 | 18 | 16 | 23.6% | 96.8 | 95% | 20.2% | 1604 |
| 291 | - | 5/4/2023 | 19 | 19 | 19.7% | 102.3 | 97% | 18.4% | 1605 |
| 300 | - | 5/4/2023 | 20 | 19 | 23.4% | 100.1 | 95% | 18.4% | 1606 |
| 310 | - | 5/4/2023 | 21 | 19 | 19.9% | 105.1 | 100% | 18.4% | 1607 |
| 320 | - | 5/4/2023 | 22 | 19 | 21.2% | 102.3 | 97% | 18.4% | 1608 |
| 329 | - | 5/4/2023 | 23 | 16 | 24.4% | 97.6 | 96% | 20.2% | 1609 |
| 338 | - | 5/4/2023 | 24 | 19 | 22.2% | 100.9 | 96% | 18.4% | 1610 |
| 347 | - | 5/5/2023 | 25 | 16 | 22.9% | 98.3 | 97% | 20.2% | 1611 |
| 356 | - | 5/5/2023 | 26 | 19 | 22.0% | 99.6 | 95% | 18.4% | 1612 |
| 365 | - | 5/5/2023 | 27 | 13 | 21.7% | 96.4 | 98% | 21.7% | 1613 |
| 374 | - | 5/5/2023 | 28 | 2 | 26.5% | 94.1 | 96% | 22.6% | 1614 |
| 383 | - | 5/5/2023 | 29 | 16 | 22.0% | 100.3 | 99% | 20.2% | 1615 |
| 392 | - | 5/8/2023 | 30 | 19 | 21.0% | 105.0 | 100% | 18.4% | 1616 |
| 401 | - | 5/8/2023 | 31 | 19 | 21.5% | 102.3 | 97% | 18.4% | 1617 |
| 410 | - | 5/8/2023 | 32 | 3 | 24.4% | 98.8 | 99% | 20.2% | 1618 |
| 478 | - | 5/10/2023 | 33 | 19 | 20.0% | 105.9 | 101% | 18.4% | 1619 |
| 487 | - | 5/10/2023 | 34 | 16 | 22.9% | 101.0 | 99% | 20.2% | 1620 |
| 496 | - | 5/10/2023 | 35 | 9 | 26.0% | 96.7 | 98% | 23.9% | 1621 |
| 505 | - | 5/10/2023 | 36 | 15 | 24.9% | 97.5 | 99% | 24.1% | 1622 |
| 514 | - | 5/10/2023 | 37 | 9 | 26.8% | 94.0 | 95% | 23.9% | 1623 |
| 523 | - | 5/10/2023 | 38 | 16 | 23.5% | 98.0 | 96% | 20.2% | 1624 |
| 532 | - | 5/10/2023 | 39 | 19 | 22.9% | 104.0 | 99% | 18.4% | 1625 |
| 542 | - | 5/10/2023 | 40 | 16 | 24.2% | 99.0 | 97% | 20.2% | 1626 |
| 596 | - | 6/12/2023 | 41 | 16 | 23.0% | 97.9 | 96% | 20.2% | 1627 |
| 604 | - | 6/13/2023 | 42 | 9 | 24.9% | 96.2 | 98% | 23.9% | 1628 |
| 612 | - | 6/13/2023 | 43 | 16 | 23.3% | 101.3 | 100% | 20.2% | 1629 |

Clay Field Test Results Summary
Cell 5 Phase 1

| Test No. | Retest of | Date | Lift | Proctor Reference No. | In-Place Moisture Content (%) | In-Place Dry Denisty (pcf) | Percent Compaction | Optimum Moisture | Passing Test # (Overall) |
|---|---|---|---|---|---|---|---|---|---|
| 620 | - | 6/13/2023 | 44 | 16 | 23.0% | 100.5 | 99% | 20.2% | 1630 |
| 628 | - | 6/13/2023 | 45 | 16 | 24.1% | 99.4 | 98% | 20.2% | 1631 |
| 636 | - | 6/13/2023 | 46 | 19 | 21.5% | 102.5 | 98% | 18.4% | 1632 |
| 644 | - | 6/13/2023 | 47 | 19 | 22.1% | 102.9 | 98% | 18.4% | 1633 |
| 652 | - | 6/13/2023 | 48 | 16 | 23.0% | 101.7 | 100% | 20.2% | 1634 |
| 660 | - | 6/14/2023 | 49 | 19 | 22.0% | 103.8 | 99% | 18.4% | 1635 |
| 669 | - | 6/14/2023 | 50 | 19 | 21.8% | 104.6 | 100% | 18.4% | 1636 |
| 677 | - | 6/14/2023 | 51 | 19 | 20.3% | 104.9 | 100% | 18.4% | 1637 |
| 685 | - | 6/14/2023 | 52 | 16 | 24.4% | 97.6 | 96% | 20.2% | 1638 |
| 697 | - | 6/14/2023 | 53 | 16 | 24.0% | 100.3 | 99% | 20.2% | 1639 |
| 705 | - | 6/14/2023 | 54 | 19 | 21.0% | 104.1 | 99% | 18.4% | 1640 |
| 716 | - | 6/14/2023 | 56 | 16 | 20.8% | 99.7 | 98% | 20.2% | 1641 |
| 717 | - | 6/14/2023 | 55 | 19 | 19.1% | 107.6 | 102% | 18.4% | 1642 |
| 729 | - | 6/15/2023 | 57 | 19 | 23.6% | 100.9 | 96% | 18.4% | 1643 |
| 737 | - | 6/15/2023 | 58 | 3 | 24.2% | 100.9 | 102% | 20.2% | 1644 |
| 745 | - | 6/15/2023 | 59 | 3 | 26.2% | 94.7 | 95% | 20.2% | 1645 |
| 753 | - | 6/15/2023 | 60 | 3 | 22.3% | 96.0 | 97% | 20.2% | 1646 |
| 761 | - | 6/15/2023 | 61 | 13 | 22.9% | 98.9 | 101% | 21.7% | 1647 |
| 769 | - | 6/15/2023 | 62 | 19 | 20.3% | 101.5 | 97% | 18.4% | 1648 |
| 780 | - | 6/15/2023 | 63 | 19 | 23.5% | 102.4 | 98% | 18.4% | 1649 |
| 781 | - | 6/15/2023 | 64 | 16 | 24.5% | 98.3 | 97% | 20.2% | 1650 |
| 793 | - | 6/19/2023 | 65 | 2 | 24.3% | 97.5 | 100% | 22.6% | 1651 |
| 801 | - | 6/19/2023 | 66 | 11 | 24.9% | 92.8 | 97% | 24.8% | 1652 |
| 809 | - | 6/19/2023 | 67 | 19 | 21.1% | 104.5 | 100% | 18.4% | 1653 |
| 817 | - | 6/19/2023 | 68 | 19 | 21.1% | 104.2 | 99% | 18.4% | 1654 |
| 825 | - | 6/19/2023 | 69 | 16 | 24.2% | 99.7 | 98% | 20.2% | 1655 |
| 833 | - | 6/19/2023 | 70 | 3 | 21.7% | 98.8 | 99% | 20.2% | 1656 |
| 844 | - | 6/19/2023 | 72 | 13 | 21.8% | 97.6 | 100% | 21.7% | 1657 |
| 845 | - | 6/19/2023 | 71 | 16 | 21.8% | 99.8 | 98% | 20.2% | 1658 |
| 857 | - | 6/20/2023 | 73 | 19 | 22.8% | 102.8 | 98% | 18.4% | 1659 |
| 865 | - | 6/20/2023 | 74 | 3 | 23.4% | 94.7 | 95% | 20.2% | 1660 |
| 873 | - | 6/20/2023 | 75 | 16 | 20.9% | 98.4 | 97% | 20.2% | 1661 |
| 881 | - | 6/20/2023 | 76 | 16 | 22.7% | 102.0 | 100% | 20.2% | 1662 |
| 889 | - | 6/20/2023 | 77 | 16 | 22.0% | 100.8 | 99% | 20.2% | 1663 |
| 897 | - | 6/20/2023 | 78 | 21 | 19.2% | 106.2 | 100% | 18.1% | 1664 |
| 905 | - | 6/20/2023 | 79 | 19 | 21.2% | 104.3 | 99% | 18.4% | 1665 |
| 913 | - | 6/20/2023 | 80 | 19 | 20.0% | 103.6 | 99% | 18.4% | 1666 |
| 924 | - | 6/21/2023 | 82 | 19 | 21.4% | 103.2 | 98% | 18.4% | 1667 |
| 925 | - | 6/21/2023 | 81 | 16 | 21.9% | 101.6 | 100% | 20.2% | 1668 |
| 937 | - | 6/21/2023 | 83 | 16 | 24.2% | 100.8 | 99% | 20.2% | 1669 |
| 945 | - | 6/21/2023 | 84 | 19 | 21.3% | 104.5 | 100% | 18.4% | 1670 |
| 953 | - | 6/21/2023 | 85 | 3 | 25.4% | 97.1 | 98% | 20.2% | 1671 |
| 961 | - | 6/21/2023 | 86 | 16 | 23.9% | 100.4 | 99% | 20.2% | 1672 |
| 969 | - | 6/21/2023 | 87 | 3 | 25.2% | 97.8 | 98% | 20.2% | 1673 |
| 977 | - | 6/21/2023 | 88 | 16 | 21.7% | 100.9 | 99% | 20.2% | 1674 |
| 985 | - | 6/21/2023 | 89 | 3 | 23.2% | 99.0 | 100% | 20.2% | 1675 |
| 996 | - | 6/21/2023 | 91 | 16 | 21.5% | 102.3 | 100% | 20.2% | 1676 |
| 997 | - | 6/21/2023 | 90 | 19 | 21.5% | 102.3 | 97% | 18.4% | 1677 |

Clay Field Test Results Summary
Cell 5 Phase 1

| Test No. | Retest of | Date | Lift | Proctor Reference No. | In-Place Moisture Content (%) | In-Place Dry Denisty (pcf) | Percent Compaction | Optimum Moisture | Passing Test # (Overall) |
|---|---|---|---|---|---|---|---|---|---|
| 1006 | - | 6/26/2023 | 92 | 16 | 22.5% | 100.8 | 99% | 20.2% | 1678 |
| 1014 | - | 6/26/2023 | 93 | 16 | 22.2% | 101.2 | 99% | 20.2% | 1679 |
| 1022 | - | 6/26/2023 | 94 | 3 | 24.0% | 96.7 | 97% | 20.2% | 1680 |
| 1030 | - | 6/26/2023 | 95 | 16 | 22.6% | 101.1 | 99% | 20.2% | 1681 |
| 1041 | - | 6/26/2023 | 96 | 19 | 20.2% | 104.5 | 100% | 18.4% | 1682 |
| 1042 | - | 6/26/2023 | 97 | 19 | 21.1% | 105.5 | 100% | 18.4% | 1683 |
| 1054 | - | 6/27/2023 | 98 | 19 | 21.1% | 105.0 | 100% | 18.4% | 1684 |
| 1062 | - | 6/27/2023 | 99 | 19 | 22.9% | 100.5 | 96% | 18.4% | 1685 |
| 1070 | - | 6/27/2023 | 100 | 19 | 22.5% | 100.1 | 95% | 18.4% | 1686 |
| 1078 | - | 6/27/2023 | 101 | 19 | 21.5% | 104.6 | 100% | 18.4% | 1687 |
| 1086 | - | 6/27/2023 | 102 | 19 | 21.7% | 105.4 | 100% | 18.4% | 1688 |
| 1093 | - | 6/27/2023 | 103 | 19 | 24.3% | 101.3 | 96% | 18.4% | 1689 |
| 1102 | - | 6/27/2023 | 104 | 19 | 20.6% | 106.1 | 101% | 18.4% | 1690 |
| 1103 | - | 6/27/2023 | 105 | 19 | 20.6% | 106.1 | 101% | 18.4% | 1691 |
| 1113 | - | 6/28/2023 | 106 | 19 | 23.4% | 100.4 | 96% | 18.4% | 1692 |
| 1120 | - | 6/28/2023 | 107 | 3 | 24.8% | 97.1 | 98% | 20.2% | 1693 |
| 1127 | - | 6/28/2023 | 108 | 16 | 21.9% | 97.5 | 96% | 20.2% | 1694 |
| 1134 | - | 6/28/2023 | 109 | 16 | 23.8% | 99.6 | 98% | 20.2% | 1695 |
| 1141 | - | 6/28/2023 | 110 | 16 | 23.0% | 100.4 | 99% | 20.2% | 1696 |
| 1148 | - | 6/28/2023 | 111 | 3 | 24.4% | 96.3 | 97% | 20.2% | 1697 |
| 1155 | - | 6/28/2023 | 112 | 19 | 19.8% | 102.6 | 98% | 18.4% | 1698 |
| 1165 | - | 6/28/2023 | 113 | 19 | 20.9% | 105.3 | 100% | 18.4% | 1699 |
| 1166 | - | 6/28/2023 | 114 | 19 | 22.7% | 103.0 | 98% | 18.4% | 1700 |
| 1176 | - | 6/29/2023 | 115 | 3 | 24.4% | 97.8 | 98% | 20.2% | 1701 |
| 1183 | - | 6/29/2023 | 116 | 19 | 20.1% | 103.9 | 99% | 18.4% | 1702 |
| 1190 | - | 6/29/2023 | 117 | 7 | 27.5% | 93.4 | 100% | 22.6% | 1703 |
| 1197 | - | 6/29/2023 | 118 | 19 | 21.6% | 103.5 | 99% | 18.4% | 1704 |
| 1208 | - | 6/29/2023 | 119 | 19 | 19.1% | 102.8 | 98% | 18.4% | 1705 |
| 1209 | - | 6/29/2023 | 120 | 19 | 19.5% | 101.0 | 96% | 18.4% | 1706 |
| 1219 | - | 6/30/2023 | 121 | 19 | 22.3% | 103.5 | 99% | 18.4% | 1707 |
| 1229 | - | 6/30/2023 | 122 | 19 | 23.8% | 100.9 | 96% | 18.4% | 1708 |
| 1230 | - | 6/30/2023 | 123 | 19 | 23.5% | 101.3 | 96% | 18.4% | 1709 |
| 1243 | - | 6/30/2023 | 124 | 3 | 24.4% | 97.2 | 98% | 20.2% | 1710 |
| 1244 | - | 6/30/2023 | 125 | 19 | 23.4% | 99.9 | 95% | 18.4% | 1711 |
| 1256 | - | 6/30/2023 | 126 | 3 | 25.1% | 98.7 | 99% | 20.2% | 1712 |
| 1257 | - | 6/30/2023 | 127 | 19 | 22.1% | 101.3 | 96% | 18.4% | 1713 |
| 1266 | - | 6/30/2023 | 128 | 19 | 21.7% | 100.7 | 96% | 18.4% | 1714 |
| 1267 | - | 6/30/2023 | 129 | 3 | 20.3% | 99.6 | 100% | 20.2% | 1715 |
| 1281 | - | 7/14/2023 | 130 | 19 | 18.7% | 104.9 | 100% | 18.4% | 1716 |
| 1282 | - | 7/14/2023 | 131 | 19 | 21.3% | 100.7 | 96% | 18.4% | 1717 |
| 1283 | - | 7/14/2023 | 132 | 19 | 19.4% | 102.4 | 98% | 18.4% | 1718 |
| Z-27 | | | | | | | | | |
| 137 | - | 5/2/2023 | 1 | 10 | 27.7% | 91.2 | 96% | 25.0% | 1719 |
| 138 | - | 5/2/2023 | 2 | 14 | 27.9% | 87.8 | 95% | 27.2% | 1720 |
| 139 | - | 5/2/2023 | 3 | 16 | 28.7% | 84.1 | 83% | 20.2% | - |
| 140 | 139 | 5/2/2023 | 3 | 16 | 24.1% | 99.8 | 98% | 20.2% | 1721 |
| 146 | - | 5/3/2023 | 4 | 16 | 21.4% | 99.4 | 98% | 20.2% | 1722 |
| 200 | - | 5/3/2023 | 5 | 14 | 30.4% | 84.0 | 91% | 27.2% | - |

Clay Field Test Results Summary
Cell 5 Phase 1

| Test No. | Retest of | Date | Lift | Proctor Reference No. | In-Place Moisture Content (%) | In-Place Dry Denisty (pcf) | Percent Compaction | Optimum Moisture | Passing Test # (Overall) |
|---|---|---|---|---|---|---|---|---|---|
| 201 | 200 | 5/3/2023 | 5 | 14 | 28.6% | 87.4 | 95% | 27.2% | 1723 |
| 202 | - | 5/3/2023 | 6 | 15 | 25.4% | 94.7 | 96% | 24.1% | 1724 |
| 203 | - | 5/3/2023 | 7 | 5 | 27.8% | 91.4 | 95% | 24.5% | 1725 |
| 204 | - | 5/3/2023 | 8 | 15 | 28.0% | 95.7 | 97% | 24.1% | 1726 |
| 205 | - | 5/3/2023 | 9 | 16 | 23.4% | 98.3 | 97% | 20.2% | 1727 |
| 206 | - | 5/3/2023 | 10 | 19 | 19.2% | 102.9 | 98% | 18.4% | 1728 |
| 207 | - | 5/3/2023 | 11 | 19 | 18.5% | 104.4 | 99% | 18.4% | 1729 |
| 208 | - | 5/3/2023 | 12 | 19 | 20.1% | 102.1 | 97% | 18.4% | 1730 |
| 209 | - | 5/3/2023 | 13 | 16 | 22.1% | 101.1 | 99% | 20.2% | 1731 |
| 210 | - | 5/3/2023 | 14 | 19 | 22.3% | 100.3 | 96% | 18.4% | 1732 |
| 256 | - | 5/4/2023 | 15 | 16 | 20.7% | 98.7 | 97% | 20.2% | 1733 |
| 265 | - | 5/4/2023 | 16 | 1 | 19.5% | 96.4 | 96% | 19.4% | 1734 |
| 274 | - | 5/4/2023 | 17 | 6 | 26.3% | 94.4 | 97% | 24.5% | 1735 |
| 283 | - | 5/4/2023 | 18 | 7 | 24.4% | 91.4 | 97% | 22.6% | 1736 |
| 292 | - | 5/4/2023 | 19 | 19 | 19.7% | 103.8 | 99% | 18.4% | 1737 |
| 301 | - | 5/4/2023 | 20 | 19 | 20.4% | 103.6 | 99% | 18.4% | 1738 |
| 311 | - | 5/4/2023 | 21 | 1 | 19.8% | 98.7 | 98% | 19.4% | 1739 |
| 321 | - | 5/4/2023 | 22 | 19 | 19.9% | 102.3 | 97% | 18.4% | 1740 |
| 330 | - | 5/4/2023 | 23 | 1 | 19.5% | 98.5 | 98% | 19.4% | 1741 |
| 339 | - | 5/4/2023 | 24 | 16 | 23.9% | 96.8 | 95% | 20.2% | 1742 |
| 348 | - | 5/5/2023 | 25 | 19 | 21.0% | 102.1 | 97% | 18.4% | 1743 |
| 357 | - | 5/5/2023 | 26 | 19 | 19.6% | 101.2 | 96% | 18.4% | 1744 |
| 366 | - | 5/5/2023 | 27 | 16 | 20.2% | 100.0 | 98% | 20.2% | 1745 |
| 375 | - | 5/5/2023 | 28 | 3 | 22.9% | 95.3 | 96% | 20.2% | 1746 |
| 384 | - | 5/5/2023 | 29 | 1 | 21.4% | 98.6 | 98% | 19.4% | 1747 |
| 393 | - | 5/8/2023 | 30 | 16 | 24.5% | 98.4 | 97% | 20.2% | 1748 |
| 402 | - | 5/8/2023 | 31 | 19 | 20.1% | 106.0 | 101% | 18.4% | 1749 |
| 411 | - | 5/8/2023 | 32 | 16 | 23.1% | 98.5 | 97% | 20.2% | 1750 |
| 479 | - | 5/10/2023 | 33 | 1 | 20.3% | 99.4 | 99% | 19.4% | 1751 |
| 488 | - | 5/10/2023 | 34 | 3 | 22.4% | 96.6 | 97% | 20.2% | 1752 |
| 497 | - | 5/10/2023 | 35 | 11 | 25.7% | 92.6 | 97% | 24.8% | 1753 |
| 506 | - | 5/10/2023 | 36 | 9 | 25.2% | 98.1 | 99% | 23.9% | 1754 |
| 515 | - | 5/10/2023 | 37 | 9 | 24.5% | 97.2 | 99% | 23.9% | 1755 |
| 524 | - | 5/10/2023 | 38 | 16 | 25.5% | 97.9 | 96% | 20.2% | 1756 |
| 533 | - | 5/10/2023 | 39 | 16 | 24.6% | 99.6 | 98% | 20.2% | 1757 |
| 543 | - | 5/10/2023 | 40 | 16 | 22.8% | 97.4 | 96% | 20.2% | 1758 |
| 597 | - | 6/12/2023 | 41 | 19 | 20.0% | 104.3 | 99% | 18.4% | 1759 |
| 605 | - | 6/13/2023 | 42 | 9 | 24.9% | 96.2 | 98% | 23.9% | 1760 |
| 613 | - | 6/13/2023 | 43 | 16 | 23.3% | 101.3 | 100% | 20.2% | 1761 |
| 621 | - | 6/13/2023 | 44 | 16 | 22.6% | 101.2 | 99% | 20.2% | 1762 |
| 629 | - | 6/13/2023 | 45 | 16 | 23.6% | 100.8 | 99% | 20.2% | 1763 |
| 637 | - | 6/13/2023 | 46 | 19 | 23.0% | 102.1 | 97% | 18.4% | 1764 |
| 645 | - | 6/13/2023 | 47 | 19 | 23.0% | 102.4 | 98% | 18.4% | 1765 |
| 653 | - | 6/13/2023 | 48 | 19 | 21.9% | 104.3 | 99% | 18.4% | 1766 |
| 661 | - | 6/14/2023 | 49 | 16 | 22.0% | 100.1 | 98% | 20.2% | 1767 |
| 662 | - | 6/14/2023 | 50 | 16 | 22.8% | 100.8 | 99% | 20.2% | 1768 |
| 670 | - | 6/14/2023 | 51 | 16 | 22.1% | 99.7 | 98% | 20.2% | 1769 |
| 678 | - | 6/14/2023 | 52 | 16 | 24.9% | 98.3 | 97% | 20.2% | 1770 |

Clay Field Test Results Summary
Cell 5 Phase 1

| Test No. | Retest of | Date | Lift | Proctor Reference No. | In-Place Moisture Content (%) | In-Place Dry Denisty (pcf) | Percent Compaction | Optimum Moisture | Passing Test # (Overall) |
|---|---|---|---|---|---|---|---|---|---|
| 686 | - | 6/14/2023 | 53 | 16 | 22.9% | 99.5 | 98% | 20.2% | 1771 |
| 698 | - | 6/14/2023 | 53 | 19 | 22.2% | 102.2 | 97% | 18.4% | 1772 |
| 706 | - | 6/14/2023 | 54 | 19 | 21.0% | 104.2 | 99% | 18.4% | 1773 |
| 718 | - | 6/14/2023 | 56 | 19 | 21.3% | 105.2 | 100% | 18.4% | 1774 |
| 719 | - | 6/14/2023 | 55 | 19 | 21.1% | 105.6 | 101% | 18.4% | 1775 |
| 730 | - | 6/15/2023 | 57 | 19 | 19.3% | 106.2 | 101% | 18.4% | 1776 |
| 738 | - | 6/15/2023 | 58 | 3 | 23.2% | 96.7 | 97% | 20.2% | 1777 |
| 746 | - | 6/15/2023 | 59 | 3 | 22.3% | 102.0 | 103% | 20.2% | 1778 |
| 754 | - | 6/15/2023 | 60 | 3 | 21.9% | 102.0 | 103% | 20.2% | 1779 |
| 762 | - | 6/15/2023 | 61 | 15 | 26.9% | 96.2 | 98% | 24.1% | 1780 |
| 770 | - | 6/15/2023 | 62 | 19 | 21.0% | 102.7 | 98% | 18.4% | 1781 |
| 782 | - | 6/15/2023 | 63 | 19 | 19.8% | 102.7 | 98% | 18.4% | 1782 |
| 783 | - | 6/15/2023 | 64 | 16 | 23.3% | 101.7 | 100% | 20.2% | 1783 |
| 794 | - | 6/19/2023 | 65 | 3 | 22.0% | 96.8 | 97% | 20.2% | 1784 |
| 802 | - | 6/19/2023 | 66 | 2 | 25.6% | 96.3 | 99% | 22.6% | 1785 |
| 810 | - | 6/19/2023 | 67 | 3 | 24.0% | 98.7 | 99% | 20.2% | 1786 |
| 818 | - | 6/19/2023 | 68 | 19 | 21.2% | 102.8 | 98% | 18.4% | 1787 |
| 826 | - | 6/19/2023 | 69 | 19 | 18.9% | 107.6 | 102% | 18.4% | 1788 |
| 834 | - | 6/19/2023 | 70 | 2 | 23.1% | 97.5 | 100% | 22.6% | 1789 |
| 846 | - | 6/19/2023 | 72 | 16 | 22.0% | 99.0 | 97% | 20.2% | 1790 |
| 847 | - | 6/19/2023 | 71 | 10 | 25.6% | 94.7 | 100% | 25.0% | 1791 |
| 858 | - | 6/20/2023 | 73 | 16 | 22.6% | 101.8 | 100% | 20.2% | 1792 |
| 866 | - | 6/20/2023 | 74 | 11 | 25.7% | 95.1 | 99% | 24.8% | 1793 |
| 874 | - | 6/20/2023 | 75 | 10 | 25.3% | 94.3 | 100% | 25.0% | 1794 |
| 882 | - | 6/20/2023 | 76 | 16 | 22.6% | 101.8 | 100% | 20.2% | 1795 |
| 890 | - | 6/20/2023 | 77 | 16 | 20.3% | 101.6 | 100% | 20.2% | 1796 |
| 898 | - | 6/20/2023 | 78 | 19 | 19.3% | 103.7 | 99% | 18.4% | 1797 |
| 906 | - | 6/20/2023 | 79 | 19 | 21.0% | 102.6 | 98% | 18.4% | 1798 |
| 914 | - | 6/20/2023 | 80 | 19 | 19.3% | 102.4 | 98% | 18.4% | 1799 |
| 926 | - | 6/21/2023 | 82 | 21 | 20.8% | 105.6 | 99% | 18.1% | 1800 |
| 927 | - | 6/21/2023 | 81 | 19 | 22.5% | 102.2 | 97% | 18.4% | 1801 |
| 938 | - | 6/21/2023 | 83 | 16 | 21.7% | 101.5 | 100% | 20.2% | 1802 |
| 946 | - | 6/21/2023 | 84 | 16 | 24.4% | 100.0 | 98% | 20.2% | 1803 |
| 954 | - | 6/21/2023 | 85 | 3 | 21.5% | 98.2 | 99% | 20.2% | 1804 |
| 962 | - | 6/21/2023 | 86 | 3 | 24.0% | 96.9 | 98% | 20.2% | 1805 |
| 970 | - | 6/21/2023 | 87 | 16 | 23.5% | 100.3 | 99% | 20.2% | 1806 |
| 978 | - | 6/21/2023 | 88 | 16 | 21.8% | 100.3 | 99% | 20.2% | 1807 |
| 986 | - | 6/21/2023 | 89 | 16 | 22.9% | 101.5 | 100% | 20.2% | 1808 |
| 998 | - | 6/21/2023 | 91 | 3 | 24.2% | 98.0 | 99% | 20.2% | 1809 |
| 999 | - | 6/21/2023 | 90 | 8 | 26.0% | 95.9 | 99% | 24.4% | 1810 |
| 1007 | - | 6/26/2023 | 92 | 2 | 24.7% | 95.9 | 98% | 22.6% | 1811 |
| 1015 | - | 6/26/2023 | 93 | 3 | 24.9% | 97.0 | 98% | 20.2% | 1812 |
| 1023 | - | 6/26/2023 | 94 | 3 | 21.2% | 96.2 | 97% | 20.2% | 1813 |
| 1031 | - | 6/26/2023 | 95 | 19 | 23.1% | 102.9 | 98% | 18.4% | 1814 |
| 1043 | - | 6/26/2023 | 96 | 19 | 20.6% | 102.4 | 98% | 18.4% | 1815 |
| 1044 | - | 6/26/2023 | 97 | 16 | 20.6% | 101.3 | 100% | 20.2% | 1816 |
| 1055 | - | 6/27/2023 | 98 | 19 | 21.2% | 104.7 | 100% | 18.4% | 1817 |
| 1063 | - | 6/27/2023 | 99 | 19 | 18.5% | 106.7 | 102% | 18.4% | 1818 |

Clay Field Test Results Summary
Cell 5 Phase 1

| Test No. | Retest of | Date | Lift | Proctor Reference No. | In-Place Moisture Content (%) | In-Place Dry Denisty (pcf) | Percent Compaction | Optimum Moisture | Passing Test # (Overall) |
|---|---|---|---|---|---|---|---|---|---|
| 1071 | - | 6/27/2023 | 100 | 19 | 20.5% | 104.9 | 100% | 18.4% | 1819 |
| 1079 | - | 6/27/2023 | 101 | 19 | 20.8% | 105.0 | 100% | 18.4% | 1820 |
| 1087 | - | 6/27/2023 | 102 | 19 | 22.0% | 102.5 | 98% | 18.4% | 1821 |
| 1094 | - | 6/27/2023 | 103 | 19 | 20.9% | 102.1 | 97% | 18.4% | 1822 |
| 1104 | - | 6/27/2023 | 104 | 19 | 23.2% | 104.4 | 99% | 18.4% | 1823 |
| 1105 | - | 6/27/2023 | 105 | 19 | 20.0% | 104.7 | 100% | 18.4% | 1824 |
| 1114 | - | 6/28/2023 | 106 | 19 | 22.1% | 102.7 | 98% | 18.4% | 1825 |
| 1121 | - | 6/28/2023 | 107 | 16 | 25.1% | 99.0 | 97% | 20.2% | 1826 |
| 1128 | - | 6/28/2023 | 108 | 16 | 23.3% | 99.4 | 98% | 20.2% | 1827 |
| 1135 | - | 6/28/2023 | 109 | 16 | 25.1% | 97.6 | 96% | 20.2% | 1828 |
| 1142 | - | 6/28/2023 | 110 | 16 | 23.4% | 98.8 | 97% | 20.2% | 1829 |
| 1149 | - | 6/28/2023 | 111 | 16 | 23.8% | 101.8 | 100% | 20.2% | 1830 |
| 1156 | - | 6/28/2023 | 112 | 3 | 24.2% | 97.3 | 98% | 20.2% | 1831 |
| 1167 | - | 6/28/2023 | 113 | 3 | 28.3% | 95.0 | 96% | 20.2% | 1832 |
| 1168 | - | 6/28/2023 | 114 | 3 | 28.0% | 94.9 | 96% | 20.2% | 1833 |
| 1177 | - | 6/29/2023 | 115 | 19 | 18.9% | 104.2 | 99% | 18.4% | 1834 |
| 1184 | - | 6/29/2023 | 116 | 19 | 21.3% | 104.2 | 99% | 18.4% | 1835 |
| 1191 | - | 6/29/2023 | 117 | 19 | 22.4% | 103.3 | 98% | 18.4% | 1836 |
| 1198 | - | 6/29/2023 | 118 | 19 | 19.4% | 105.1 | 100% | 18.4% | 1837 |
| 1199 | - | 6/29/2023 | 118 | 19 | 19.4% | 105.1 | 100% | 18.4% | 1838 |
| 1210 | - | 6/29/2023 | 119 | 3 | 21.1% | 99.4 | 100% | 20.2% | 1839 |
| 1211 | - | 6/29/2023 | 120 | 19 | 22.7% | 100.8 | 96% | 18.4% | 1840 |
| 1220 | - | 6/30/2023 | 121 | 19 | 19.5% | 104.6 | 100% | 18.4% | 1841 |
| 1231 | - | 6/30/2023 | 122 | 19 | 22.6% | 100.0 | 95% | 18.4% | 1842 |
| 1232 | - | 6/30/2023 | 123 | 19 | 21.2% | 102.9 | 98% | 18.4% | 1843 |
| 1245 | - | 6/30/2023 | 124 | 19 | 21.2% | 103.8 | 99% | 18.4% | 1844 |
| 1246 | - | 6/30/2023 | 125 | 3 | 25.1% | 96.3 | 97% | 20.2% | 1845 |
| 1258 | - | 6/30/2023 | 126 | 3 | 23.1% | 98.0 | 99% | 20.2% | 1846 |
| 1268 | - | 6/30/2023 | 127 | 19 | 18.7% | 100.2 | 95% | 18.4% | 1847 |
| 1278 | - | 7/14/2023 | 128 | 19 | 20.5% | 100.7 | 96% | 18.4% | 1848 |
| 1279 | - | 7/14/2023 | 129 | 19 | 21.3% | 100.2 | 95% | 18.4% | 1849 |
| 1280 | - | 7/14/2023 | 130 | 7 | 23.4% | 91.3 | 97% | 22.6% | 1850 |
| Z-28 | | | | | | | | | |
| 3190 | - | 9/6/2023 | 1 | 16 | 21.7% | 103.0 | 101% | 20.2% | 1851 |
| 3206 | - | 9/6/2023 | 2 | 7 | 23.4% | 93.7 | 100% | 22.6% | 1852 |
| 3214 | - | 9/7/2023 | 3 | 1 | 21.7% | 101.0 | 100% | 19.4% | 1853 |
| 3222 | - | 9/7/2023 | 4 | 3 | 22.1% | 98.6 | 99% | 20.2% | 1854 |
| 3230 | - | 9/7/2023 | 5 | 3 | 23.4% | 97.8 | 98% | 20.2% | 1855 |
| 3238 | - | 9/8/2023 | 6 | 3 | 23.1% | 94.5 | 95% | 20.2% | 1856 |
| 3246 | - | 9/8/2023 | 7 | 3 | 22.3% | 98.6 | 99% | 20.2% | 1857 |
| 3254 | - | 9/8/2023 | 8 | 12 | 27.5% | 96.2 | 99% | 23.6% | 1858 |
| Z-29 | | | | | | | | | |
| 3189 | - | 9/6/2023 | 1 | 3 | 22.9% | 97.4 | 98% | 20.2% | 1859 |
| 3205 | - | 9/6/2023 | 2 | 3 | 23.3% | 98.8 | 99% | 20.2% | 1860 |
| 3213 | - | 9/7/2023 | 3 | 1 | 22.6% | 100.6 | 100% | 19.4% | 1861 |
| 3221 | - | 9/7/2023 | 4 | 13 | 25.5% | 96.4 | 98% | 21.7% | 1862 |
| 3229 | - | 9/7/2023 | 5 | 13 | 25.6% | 94.2 | 96% | 21.7% | 1863 |
| 3237 | - | 9/8/2023 | 6 | 10 | 27.2% | 89.6 | 95% | 25.0% | 1864 |

Clay Field Test Results Summary
Cell 5 Phase 1

| Test No. | Retest of | Date | Lift | Proctor Reference No. | In-Place Moisture Content (%) | In-Place Dry Denisty (pcf) | Percent Compaction | Optimum Moisture | Passing Test # (Overall) |
|---|---|---|---|---|---|---|---|---|---|
| 3245 | - | 9/8/2023 | 7 | 3 | 25.4% | 97.3 | 98% | 20.2% | 1865 |
| 3253 | - | 9/8/2023 | 8 | 1 | 22.4% | 100.9 | 100% | 19.4% | 1866 |
| Z-30 | | | | | | | | | |
| 3188 | - | 9/6/2023 | 1 | 1 | 19.8% | 96.8 | 96% | 19.4% | 1867 |
| 3204 | - | 9/6/2023 | 2 | 3 | 23.8% | 99.3 | 100% | 20.2% | 1868 |
| 3212 | - | 9/7/2023 | 3 | 3 | 22.1% | 99.0 | 100% | 20.2% | 1869 |
| 3220 | - | 9/7/2023 | 4 | 1 | 23.4% | 100.8 | 100% | 19.4% | 1870 |
| 3228 | - | 9/7/2023 | 5 | 1 | 23.0% | 100.5 | 100% | 19.4% | 1871 |
| 3236 | - | 9/8/2023 | 6 | 1 | 20.2% | 101.0 | 100% | 19.4% | 1872 |
| 3244 | - | 9/8/2023 | 7 | 3 | 23.9% | 99.2 | 100% | 20.2% | 1873 |
| 3252 | - | 9/8/2023 | 8 | 1 | 23.4% | 100.0 | 99% | 19.4% | 1874 |
| Z-31 | | | | | | | | | |
| 3187 | - | 9/6/2023 | 1 | 16 | 22.3% | 101.6 | 100% | 20.2% | 1875 |
| 3203 | - | 9/6/2023 | 2 | 3 | 25.4% | 96.3 | 97% | 20.2% | 1876 |
| 3211 | - | 9/7/2023 | 3 | 3 | 22.3% | 98.8 | 99% | 20.2% | 1877 |
| 3219 | - | 9/7/2023 | 4 | 7 | 24.9% | 92.4 | 99% | 22.6% | 1878 |
| 3227 | - | 9/7/2023 | 5 | 3 | 21.0% | 97.8 | 98% | 20.2% | 1879 |
| 3235 | - | 9/8/2023 | 6 | 16 | 21.8% | 102.2 | 100% | 20.2% | 1880 |
| 3243 | - | 9/8/2023 | 7 | 3 | 23.6% | 96.3 | 97% | 20.2% | 1881 |
| 3251 | - | 9/8/2023 | 8 | 3 | 23.8% | 98.2 | 99% | 20.2% | 1882 |
| Z-32 | | | | | | | | | |
| 3186 | - | 9/6/2023 | 1 | 1 | 20.6% | 99.9 | 99% | 19.4% | 1883 |
| 3202 | - | 9/6/2023 | 2 | 1 | 23.1% | 101.3 | 100% | 19.4% | 1884 |
| 3210 | - | 9/7/2023 | 3 | 3 | 24.4% | 98.6 | 99% | 20.2% | 1885 |
| 3218 | - | 9/7/2023 | 4 | 13 | 23.4% | 96.2 | 98% | 21.7% | 1886 |
| 3226 | - | 9/7/2023 | 5 | 16 | 21.0% | 102.6 | 101% | 20.2% | 1887 |
| 3234 | - | 9/8/2023 | 6 | 16 | 20.5% | 103.1 | 101% | 20.2% | 1888 |
| 3242 | - | 9/8/2023 | 7 | 3 | 24.1% | 96.7 | 97% | 20.2% | 1889 |
| 3250 | - | 9/8/2023 | 8 | 1 | 22.4% | 100.7 | 100% | 19.4% | 1890 |
| Z-33 | | | | | | | | | |
| 3185 | - | 9/6/2023 | 1 | 16 | 20.8% | 102.9 | 101% | 20.2% | 1891 |
| 3201 | - | 9/6/2023 | 2 | 1 | 21.5% | 101.1 | 100% | 19.4% | 1892 |
| 3209 | - | 9/7/2023 | 3 | 3 | 22.9% | 95.0 | 96% | 20.2% | 1893 |
| 3217 | - | 9/7/2023 | 4 | 1 | 23.7% | 101.2 | 100% | 19.4% | 1894 |
| 3225 | - | 9/7/2023 | 5 | 3 | 23.3% | 96.6 | 97% | 20.2% | 1895 |
| 3233 | - | 9/8/2023 | 6 | 1 | 20.3% | 100.9 | 100% | 19.4% | 1896 |
| 3241 | - | 9/8/2023 | 7 | 1 | 22.0% | 101.1 | 100% | 19.4% | 1897 |
| 3249 | - | 9/8/2023 | 8 | 1 | 21.7% | 100.6 | 100% | 19.4% | 1898 |
| Z-34 | | | | | | | | | |
| 3184 | - | 9/6/2023 | 1 | 1 | 22.9% | 98.9 | 98% | 19.4% | 1899 |
| 3200 | - | 9/6/2023 | 2 | 3 | 24.5% | 99.6 | 100% | 20.2% | 1900 |
| 3208 | - | 9/7/2023 | 3 | 1 | 20.1% | 100.2 | 99% | 19.4% | 1901 |
| 3216 | - | 9/7/2023 | 4 | 13 | 25.1% | 96.7 | 99% | 21.7% | 1902 |
| 3224 | - | 9/7/2023 | 5 | 1 | 22.1% | 101.1 | 100% | 19.4% | 1903 |
| 3232 | - | 9/8/2023 | 6 | 1 | 21.8% | 100.5 | 100% | 19.4% | 1904 |
| 3240 | - | 9/8/2023 | 7 | 3 | 25.3% | 94.5 | 95% | 20.2% | 1905 |
| 3248 | - | 9/8/2023 | 8 | 1 | 20.9% | 100.9 | 100% | 19.4% | 1906 |
| Z-35 | | | | | | | | | |

Clay Field Test Results Summary
Cell 5 Phase 1

| Test No. | Retest of | Date | Lift | Proctor Reference No. | In-Place Moisture Content (%) | In-Place Dry Denisty (pcf) | Percent Compaction | Optimum Moisture | Passing Test # (Overall) |
|---|---|---|---|---|---|---|---|---|---|
| 3183 | - | 9/6/2023 | 1 | 3 | 21.3% | 99.9 | 101% | 20.2% | 1907 |
| 3199 | - | 9/6/2023 | 2 | 3 | 22.5% | 99.7 | 100% | 20.2% | 1908 |
| 3207 | - | 9/7/2023 | 3 | 16 | 22.3% | 103.2 | 101% | 20.2% | 1909 |
| 3215 | - | 9/7/2023 | 4 | 13 | 23.6% | 97.2 | 99% | 21.7% | 1910 |
| 3223 | - | 9/7/2023 | 5 | 3 | 22.6% | 95.4 | 96% | 20.2% | 1911 |
| 3231 | - | 9/8/2023 | 6 | 16 | 21.3% | 102.5 | 101% | 20.2% | 1912 |
| 3239 | - | 9/8/2023 | 7 | 3 | 24.6% | 98.0 | 99% | 20.2% | 1913 |
| 3247 | - | 9/8/2023 | 8 | 1 | 21.9% | 98.0 | 97% | 19.4% | 1914 |
| Z-36 | | | | | | | | | |
| 3134 | - | 9/1/2023 | 1 | 16 | 21.3% | 103.0 | 101% | 20.2% | 1915 |
| 3142 | - | 9/1/2023 | 2 | 3 | 24.3% | 97.7 | 98% | 20.2% | 1916 |
| 3150 | - | 9/1/2023 | 3 | 16 | 22.0% | 102.1 | 100% | 20.2% | 1917 |
| 3158 | - | 9/6/2023 | 4 | 7 | 26.0% | 90.9 | 97% | 22.6% | 1918 |
| 3166 | - | 9/6/2023 | 5 | 7 | 26.8% | 93.2 | 99% | 22.6% | 1919 |
| 3174 | - | 9/6/2023 | 6 | 1 | 22.8% | 100.4 | 100% | 19.4% | 1920 |
| 3182 | - | 9/6/2023 | 7 | 7 | 26.8% | 89.4 | 95% | 22.6% | 1921 |
| 3191 | - | 9/6/2023 | 8 | 1 | 21.7% | 100.0 | 99% | 19.4% | 1922 |
| Z-37 | | | | | | | | | |
| 3133 | - | 9/1/2023 | 1 | 16 | 23.4% | 100.8 | 99% | 20.2% | 1923 |
| 3141 | - | 9/1/2023 | 2 | 16 | 22.0% | 102.8 | 101% | 20.2% | 1924 |
| 3149 | - | 9/1/2023 | 3 | 3 | 24.8% | 95.6 | 96% | 20.2% | 1925 |
| 3157 | - | 9/6/2023 | 4 | 3 | 24.5% | 99.4 | 100% | 20.2% | 1926 |
| 3165 | - | 9/6/2023 | 5 | 1 | 20.9% | 102.0 | 101% | 19.4% | 1927 |
| 3173 | - | 9/6/2023 | 6 | 7 | 23.0% | 92.7 | 99% | 22.6% | 1928 |
| 3181 | - | 9/6/2023 | 7 | 3 | 24.4% | 98.8 | 99% | 20.2% | 1929 |
| 3192 | - | 9/6/2023 | 8 | 7 | 25.6% | 92.9 | 99% | 22.6% | 1930 |
| Z-38 | | | | | | | | | |
| 3132 | - | 9/1/2023 | 1 | 1 | 23.7% | 100.0 | 99% | 19.4% | 1931 |
| 3140 | - | 9/1/2023 | 2 | 3 | 22.2% | 97.7 | 98% | 20.2% | 1932 |
| 3148 | - | 9/1/2023 | 3 | 3 | 21.7% | 99.7 | 100% | 20.2% | 1933 |
| 3156 | - | 9/6/2023 | 4 | 3 | 22.7% | 96.8 | 97% | 20.2% | 1934 |
| 3164 | - | 9/6/2023 | 5 | 3 | 23.7% | 98.8 | 99% | 20.2% | 1935 |
| 3172 | - | 9/6/2023 | 6 | 1 | 22.2% | 102.0 | 101% | 19.4% | 1936 |
| 3180 | - | 9/6/2023 | 7 | 1 | 21.9% | 101.8 | 101% | 19.4% | 1937 |
| 3193 | - | 9/6/2023 | 8 | 1 | 22.7% | 99.9 | 99% | 19.4% | 1938 |
| Z-39 | | | | | | | | | |
| 3131 | - | 9/1/2023 | 1 | 16 | 22.9% | 102.1 | 100% | 20.2% | 1939 |
| 3139 | - | 9/1/2023 | 2 | 3 | 24.3% | 95.2 | 96% | 20.2% | 1940 |
| 3147 | - | 9/1/2023 | 3 | 3 | 22.7% | 99.4 | 100% | 20.2% | 1941 |
| 3155 | - | 9/6/2023 | 4 | 3 | 26.7% | 95.6 | 96% | 20.2% | 1942 |
| 3163 | - | 9/6/2023 | 5 | 3 | 27.0% | 94.6 | 95% | 20.2% | 1943 |
| 3171 | - | 9/6/2023 | 6 | 3 | 24.3% | 97.3 | 98% | 20.2% | 1944 |
| 3179 | - | 9/6/2023 | 7 | 3 | 23.7% | 99.9 | 101% | 20.2% | 1945 |
| 3194 | - | 9/6/2023 | 8 | 14 | 29.1% | 89.5 | 97% | 27.2% | 1946 |
| Z-40 | | | | | | | | | |
| 3130 | - | 9/1/2023 | 1 | 3 | 24.1% | 99.5 | 100% | 20.2% | 1947 |
| 3138 | - | 9/1/2023 | 2 | 16 | 20.9% | 103.1 | 101% | 20.2% | 1948 |
| 3146 | - | 9/1/2023 | 3 | 2 | 25.7% | 94.8 | 97% | 22.6% | 1949 |

Clay Field Test Results Summary
Cell 5 Phase 1

| Test No. | Retest of | Date | Lift | Proctor Reference No. | In-Place Moisture Content (%) | In-Place Dry Denisty (pcf) | Percent Compaction | Optimum Moisture | Passing Test # (Overall) |
|---|---|---|---|---|---|---|---|---|---|
| 3154 | - | 9/6/2023 | 4 | 7 | 26.3% | 91.6 | 98% | 22.6% | 1950 |
| 3162 | - | 9/6/2023 | 5 | 3 | 21.3% | 97.4 | 98% | 20.2% | 1951 |
| 3170 | - | 9/6/2023 | 6 | 3 | 24.9% | 96.2 | 97% | 20.2% | 1952 |
| 3178 | - | 9/6/2023 | 7 | 3 | 23.8% | 97.2 | 98% | 20.2% | 1953 |
| 3195 | - | 9/6/2023 | 8 | 12 | 25.3% | 95.2 | 98% | 23.6% | 1954 |
| Z-41 | | | | | | | | | |
| 3129 | - | 9/1/2023 | 1 | 3 | 24.3% | 97.5 | 98% | 20.2% | 1955 |
| 3137 | - | 9/1/2023 | 2 | 16 | 20.8% | 101.9 | 100% | 20.2% | 1956 |
| 3145 | - | 9/1/2023 | 3 | 2 | 24.8% | 93.9 | 96% | 22.6% | 1957 |
| 3153 | - | 9/6/2023 | 4 | 7 | 23.7% | 89.4 | 95% | 22.6% | 1958 |
| 3161 | - | 9/6/2023 | 5 | 3 | 24.2% | 98.3 | 99% | 20.2% | 1959 |
| 3169 | - | 9/6/2023 | 6 | 3 | 22.0% | 95.2 | 96% | 20.2% | 1960 |
| 3177 | - | 9/6/2023 | 7 | 3 | 24.2% | 97.8 | 98% | 20.2% | 1961 |
| 3196 | - | 9/6/2023 | 8 | 16 | 22.6% | 102.1 | 100% | 20.2% | 1962 |
| Z-42 | | | | | | | | | |
| 3128 | - | 9/1/2023 | 1 | 16 | 22.8% | 101.6 | 100% | 20.2% | 1963 |
| 3136 | - | 9/1/2023 | 2 | 3 | 22.7% | 96.0 | 97% | 20.2% | 1964 |
| 3144 | - | 9/1/2023 | 3 | 3 | 22.9% | 99.2 | 100% | 20.2% | 1965 |
| 3152 | - | 9/6/2023 | 4 | 7 | 22.9% | 91.6 | 98% | 22.6% | 1966 |
| 3160 | - | 9/6/2023 | 5 | 1 | 22.3% | 101.0 | 100% | 19.4% | 1967 |
| 3168 | - | 9/6/2023 | 6 | 1 | 21.8% | 101.0 | 100% | 19.4% | 1968 |
| 3176 | - | 9/6/2023 | 7 | 14 | 29.1% | 92.0 | 100% | 27.2% | 1969 |
| 3197 | - | 9/6/2023 | 8 | 1 | 23.4% | 100.8 | 100% | 19.4% | 1970 |
| Z-43 | | | | | | | | | |
| 3127 | - | 9/1/2023 | 1 | 3 | 23.5% | 97.6 | 98% | 20.2% | 1971 |
| 3135 | - | 9/1/2023 | 2 | 3 | 23.4% | 99.0 | 100% | 20.2% | 1972 |
| 3143 | - | 9/1/2023 | 3 | 3 | 24.3% | 96.2 | 97% | 20.2% | 1973 |
| 3151 | - | 9/6/2023 | 4 | 7 | 24.9% | 92.8 | 99% | 22.6% | 1974 |
| 3159 | - | 9/6/2023 | 5 | 1 | 22.6% | 100.6 | 100% | 19.4% | 1975 |
| 3167 | - | 9/6/2023 | 6 | 3 | 24.2% | 97.6 | 98% | 20.2% | 1976 |
| 3175 | - | 9/6/2023 | 7 | 1 | 23.2% | 98.6 | 98% | 19.4% | 1977 |
| 3198 | - | 9/6/2023 | 8 | 3 | 24.8% | 96.7 | 97% | 20.2% | 1978 |
| Z-44 | | | | | | | | | |
| 2974 | - | 8/28/2023 | 1 | 16 | 23.8% | 97.6 | 96% | 20.2% | 1979 |
| 2989 | - | 8/29/2023 | 2 | 16 | 22.1% | 102.5 | 101% | 20.2% | 1980 |
| 2997 | - | 8/29/2023 | 3 | 16 | 23.1% | 101.9 | 100% | 20.2% | 1981 |
| 3005 | - | 8/29/2023 | 4 | 16 | 22.3% | 100.3 | 99% | 20.2% | 1982 |
| 3013 | - | 8/29/2023 | 5 | 13 | 24.0% | 95.3 | 97% | 21.7% | 1983 |
| 3021 | - | 8/29/2023 | 6 | 16 | 21.5% | 102.1 | 100% | 20.2% | 1984 |
| 3029 | - | 8/29/2023 | 7 | 16 | 21.1% | 99.5 | 98% | 20.2% | 1985 |
| 3126 | - | 9/1/2023 | 8 | 1 | 23.8% | 100.6 | 100% | 19.4% | 1986 |
| Z-45 | | | | | | | | | |
| 2975 | - | 8/28/2023 | 1 | 17 | 26.4% | 92.0 | 96% | 25.6% | 1987 |
| 2988 | - | 8/29/2023 | 2 | 16 | 24.8% | 99.9 | 98% | 20.2% | 1988 |
| 2996 | - | 8/29/2023 | 3 | 16 | 23.4% | 100.4 | 99% | 20.2% | 1989 |
| 3004 | - | 8/29/2023 | 4 | 16 | 22.4% | 102.4 | 101% | 20.2% | 1990 |
| 3012 | - | 8/29/2023 | 5 | 13 | 23.3% | 95.0 | 97% | 21.7% | 1991 |
| 3020 | - | 8/29/2023 | 6 | 16 | 22.8% | 102.7 | 101% | 20.2% | 1992 |

Clay Field Test Results Summary
Cell 5 Phase 1

| Test No. | Retest of | Date | Lift | Proctor Reference No. | In-Place Moisture Content (%) | In-Place Dry Denisty (pcf) | Percent Compaction | Optimum Moisture | Passing Test # (Overall) |
|---|---|---|---|---|---|---|---|---|---|
| 3028 | - | 8/29/2023 | 7 | 16 | 24.4% | 99.6 | 98% | 20.2% | 1993 |
| 3125 | - | 9/1/2023 | 8 | 1 | 23.6% | 100.1 | 99% | 19.4% | 1994 |
| Z-46 | | | | | | | | | |
| 2976 | - | 8/28/2023 | 1 | 17 | 26.5% | 94.6 | 99% | 25.6% | 1995 |
| 2987 | - | 8/29/2023 | 2 | 16 | 23.6% | 99.3 | 98% | 20.2% | 1996 |
| 2995 | - | 8/29/2023 | 3 | 16 | 24.6% | 97.2 | 95% | 20.2% | 1997 |
| 3003 | - | 8/29/2023 | 4 | 16 | 24.1% | 100.3 | 99% | 20.2% | 1998 |
| 3011 | - | 8/29/2023 | 5 | 16 | 24.6% | 98.6 | 97% | 20.2% | 1999 |
| 3019 | - | 8/29/2023 | 6 | 16 | 24.5% | 98.2 | 96% | 20.2% | 2000 |
| 3027 | - | 8/29/2023 | 7 | 16 | 24.2% | 99.9 | 98% | 20.2% | 2001 |
| 3124 | - | 9/1/2023 | 8 | 1 | 23.1% | 99.7 | 99% | 19.4% | 2002 |
| Z-47 | | | | | | | | | |
| 2977 | - | 8/28/2023 | 1 | 13 | 22.5% | 95.5 | 98% | 21.7% | 2003 |
| 2986 | - | 8/29/2023 | 2 | 16 | 24.8% | 97.4 | 96% | 20.2% | 2004 |
| 2994 | - | 8/29/2023 | 3 | 16 | 22.6% | 101.2 | 99% | 20.2% | 2005 |
| 3002 | - | 8/29/2023 | 4 | 16 | 21.8% | 102.9 | 101% | 20.2% | 2006 |
| 3010 | - | 8/29/2023 | 5 | 16 | 24.4% | 97.7 | 96% | 20.2% | 2007 |
| 3018 | - | 8/29/2023 | 6 | 16 | 22.4% | 102.0 | 100% | 20.2% | 2008 |
| 3026 | - | 8/29/2023 | 7 | 16 | 20.9% | 102.9 | 101% | 20.2% | 2009 |
| 3123 | - | 9/1/2023 | 8 | 1 | 20.6% | 96.6 | 96% | 19.4% | 2010 |
| Z-48 | | | | | | | | | |
| 2978 | - | 8/28/2023 | 1 | 13 | 24.5% | 96.5 | 99% | 21.7% | 2011 |
| 2985 | - | 8/29/2023 | 2 | 16 | 23.0% | 100.7 | 99% | 20.2% | 2012 |
| 2993 | - | 8/29/2023 | 3 | 16 | 23.2% | 102.8 | 101% | 20.2% | 2013 |
| 3001 | - | 8/29/2023 | 4 | 16 | 21.9% | 101.4 | 100% | 20.2% | 2014 |
| 3009 | - | 8/29/2023 | 5 | 16 | 22.2% | 101.1 | 99% | 20.2% | 2015 |
| 3017 | - | 8/29/2023 | 6 | 16 | 22.4% | 101.9 | 100% | 20.2% | 2016 |
| 3025 | - | 8/29/2023 | 7 | 16 | 22.9% | 98.0 | 96% | 20.2% | 2017 |
| 3122 | - | 9/1/2023 | 8 | 16 | 22.3% | 101.4 | 100% | 20.2% | 2018 |
| Z-49 | | | | | | | | | |
| 2979 | - | 8/28/2023 | 1 | 13 | 26.1% | 95.7 | 98% | 21.7% | 2019 |
| 2984 | - | 8/29/2023 | 2 | 16 | 24.9% | 98.2 | 96% | 20.2% | 2020 |
| 2992 | - | 8/29/2023 | 3 | 16 | 22.5% | 103.3 | 101% | 20.2% | 2021 |
| 3000 | - | 8/29/2023 | 4 | 16 | 24.6% | 98.1 | 96% | 20.2% | 2022 |
| 3008 | - | 8/29/2023 | 5 | 16 | 23.1% | 100.6 | 99% | 20.2% | 2023 |
| 3016 | - | 8/29/2023 | 6 | 16 | 23.9% | 98.4 | 97% | 20.2% | 2024 |
| 3024 | - | 8/29/2023 | 7 | 16 | 22.4% | 101.3 | 100% | 20.2% | 2025 |
| 3121 | - | 9/1/2023 | 8 | 16 | 24.2% | 100.4 | 99% | 20.2% | 2026 |
| Z-50 | | | | | | | | | |
| 2980 | - | 8/28/2023 | 1 | 16 | 21.3% | 101.5 | 100% | 20.2% | 2027 |
| 2983 | - | 8/29/2023 | 2 | 16 | 26.1% | 96.8 | 95% | 20.2% | 2028 |
| 2991 | - | 8/29/2023 | 3 | 16 | 24.8% | 98.0 | 96% | 20.2% | 2029 |
| 2999 | - | 8/29/2023 | 4 | 16 | 24.5% | 99.0 | 97% | 20.2% | 2030 |
| 3007 | - | 8/29/2023 | 5 | 16 | 21.7% | 102.0 | 100% | 20.2% | 2031 |
| 3015 | - | 8/29/2023 | 6 | 16 | 22.2% | 101.2 | 99% | 20.2% | 2032 |
| 3023 | - | 8/29/2023 | 7 | 16 | 24.8% | 98.6 | 97% | 20.2% | 2033 |
| 3120 | - | 9/1/2023 | 8 | 16 | 24.0% | 97.2 | 95% | 20.2% | 2034 |
| Z-51 | | | | | | | | | |

Clay Field Test Results Summary
Cell 5 Phase 1

| Test No. | Retest of | Date | Lift | Proctor Reference No. | In-Place Moisture Content (%) | In-Place Dry Denisty (pcf) | Percent Compaction | Optimum Moisture | Passing Test # (Overall) |
|---|---|---|---|---|---|---|---|---|---|
| 2981 | - | 8/28/2023 | 1 | 16 | 21.7% | 99.6 | 98% | 20.2% | 2035 |
| 2982 | - | 8/29/2023 | 2 | 16 | 22.7% | 100.7 | 99% | 20.2% | 2036 |
| 2990 | - | 8/29/2023 | 3 | 16 | 23.1% | 100.6 | 99% | 20.2% | 2037 |
| 2998 | - | 8/29/2023 | 4 | 16 | 23.2% | 97.8 | 96% | 20.2% | 2038 |
| 3006 | - | 8/29/2023 | 5 | 16 | 22.0% | 103.1 | 101% | 20.2% | 2039 |
| 3014 | - | 8/29/2023 | 6 | 16 | 23.9% | 98.2 | 96% | 20.2% | 2040 |
| 3022 | - | 8/29/2023 | 7 | 16 | 23.4% | 98.0 | 96% | 20.2% | 2041 |
| 3119 | - | 9/1/2023 | 8 | 16 | 20.2% | 101.9 | 100% | 20.2% | 2042 |
| Z-52 | | | | | | | | | |
| 1294 | - | 7/24/2023 | 1 | 3 | 21.3% | 96.1 | 97% | 20.2% | 2043 |
| 1297 | - | 7/24/2023 | 2 | 3 | 22.6% | 95.5 | 96% | 20.2% | 2044 |
| 1300 | - | 7/24/2023 | 3 | 1 | 23.8% | 96.9 | 96% | 19.4% | 2045 |
| 1303 | - | 7/24/2023 | 4 | 3 | 22.4% | 96.3 | 97% | 20.2% | 2046 |
| 1306 | - | 7/24/2023 | 5 | 7 | 27.6% | 91.7 | 98% | 22.6% | 2047 |
| 1309 | - | 7/24/2023 | 6 | 16 | 24.0% | 101.7 | 100% | 20.2% | 2048 |
| 1314 | - | 7/24/2023 | 7 | 5 | 27.1% | 94.2 | 98% | 24.5% | 2049 |
| 1319 | - | 7/24/2023 | 8 | 15 | 24.7% | 94.0 | 95% | 24.1% | 2050 |
| 1324 | - | 7/24/2023 | 9 | 19 | 19.7% | 102.5 | 98% | 18.4% | 2051 |
| 1329 | - | 7/25/2023 | 10 | 19 | 20.7% | 101.4 | 97% | 18.4% | 2052 |
| 1334 | - | 7/25/2023 | 11 | 19 | 24.1% | 101.2 | 96% | 18.4% | 2053 |
| 1339 | - | 7/25/2023 | 12 | 3 | 24.8% | 96.7 | 97% | 20.2% | 2054 |
| 1344 | - | 7/25/2023 | 13 | 3 | 25.5% | 96.1 | 97% | 20.2% | 2055 |
| 1354 | - | 7/25/2023 | 14 | 3 | 25.3% | 99.0 | 100% | 20.2% | 2056 |
| 1359 | - | 7/25/2023 | 15 | 19 | 21.8% | 101.5 | 97% | 18.4% | 2057 |
| 1364 | - | 7/25/2023 | 16 | 19 | 21.2% | 105.4 | 100% | 18.4% | 2058 |
| 1369 | - | 7/25/2023 | 17 | 19 | 23.0% | 100.2 | 95% | 18.4% | 2059 |
| 1374 | - | 7/25/2023 | 18 | 7 | 26.9% | 90.6 | 97% | 22.6% | 2060 |
| 1379 | - | 7/25/2023 | 19 | 3 | 24.6% | 98.9 | 100% | 20.2% | 2061 |
| 1384 | - | 7/25/2023 | 20 | 19 | 22.7% | 102.9 | 98% | 18.4% | 2062 |
| 1389 | - | 7/26/2023 | 21 | 19 | 20.0% | 103.6 | 99% | 18.4% | 2063 |
| 1394 | - | 7/26/2023 | 22 | 19 | 21.4% | 104.1 | 99% | 18.4% | 2064 |
| 1399 | - | 7/26/2023 | 23 | 19 | 21.7% | 100.4 | 96% | 18.4% | 2065 |
| 1404 | - | 7/26/2023 | 24 | 19 | 23.0% | 99.9 | 95% | 18.4% | 2066 |
| 1409 | - | 7/26/2023 | 25 | 3 | 24.1% | 96.2 | 97% | 20.2% | 2067 |
| 1414 | - | 7/26/2023 | 26 | 3 | 25.1% | 96.9 | 98% | 20.2% | 2068 |
| 1419 | - | 7/26/2023 | 27 | 3 | 21.8% | 98.0 | 99% | 20.2% | 2069 |
| 1424 | - | 7/26/2023 | 28 | 3 | 22.2% | 98.1 | 99% | 20.2% | 2070 |
| 1429 | - | 7/26/2023 | 29 | 19 | 24.0% | 100.5 | 96% | 18.4% | 2071 |
| 1434 | - | 7/26/2023 | 30 | 19 | 22.5% | 102.2 | 97% | 18.4% | 2072 |
| 1439 | - | 7/26/2023 | 31 | 3 | 23.2% | 98.6 | 99% | 20.2% | 2073 |
| 1444 | - | 7/26/2023 | 32 | 19 | 23.8% | 101.0 | 96% | 18.4% | 2074 |
| 1449 | - | 7/26/2023 | 33 | 19 | 23.5% | 100.7 | 96% | 18.4% | 2075 |
| 1454 | - | 7/27/2023 | 34 | 21 | 20.6% | 106.0 | 100% | 18.1% | 2076 |
| 1459 | - | 7/27/2023 | 35 | 19 | 24.2% | 100.5 | 96% | 18.4% | 2077 |
| 1464 | - | 7/27/2023 | 36 | 19 | 21.2% | 101.8 | 97% | 18.4% | 2078 |
| 1469 | - | 7/27/2023 | 37 | 21 | 18.9% | 105.7 | 99% | 18.1% | 2079 |
| 1474 | - | 7/27/2023 | 38 | 21 | 24.0% | 101.4 | 95% | 18.1% | 2080 |
| 1479 | - | 7/27/2023 | 39 | 19 | 21.7% | 103.5 | 99% | 18.4% | 2081 |

Clay Field Test Results Summary
Cell 5 Phase 1

| Test No. | Retest of | Date | Lift | Proctor Reference No. | In-Place Moisture Content (%) | In-Place Dry Denisty (pcf) | Percent Compaction | Optimum Moisture | Passing Test # (Overall) |
|---|---|---|---|---|---|---|---|---|---|
| 1484 | - | 7/27/2023 | 40 | 3 | 20.6% | 97.5 | 98% | 20.2% | 2082 |
| 1489 | - | 7/27/2023 | 41 | 3 | 23.5% | 99.3 | 100% | 20.2% | 2083 |
| 1494 | - | 7/27/2023 | 42 | 19 | 20.6% | 105.6 | 101% | 18.4% | 2084 |
| 1499 | - | 7/27/2023 | 43 | 3 | 24.4% | 99.4 | 100% | 20.2% | 2085 |
| 1504 | - | 7/27/2023 | 44 | 3 | 24.3% | 99.3 | 100% | 20.2% | 2086 |
| 1509 | - | 7/27/2023 | 45 | 21 | 18.3% | 103.0 | 97% | 18.1% | 2087 |
| 1520 | - | 7/31/2023 | 46 | 3 | 24.8% | 99.5 | 100% | 20.2% | 2088 |
| 1531 | - | 7/31/2023 | 47 | 3 | 24.0% | 98.7 | 99% | 20.2% | 2089 |
| 1542 | - | 7/31/2023 | 48 | 3 | 225.0% | 99.5 | 100% | 20.2% | 2090 |
| 1553 | - | 7/31/2023 | 49 | 19 | 21.8% | 102.7 | 98% | 18.4% | 2091 |
| 1564 | - | 7/31/2023 | 50 | 19 | 21.4% | 101.5 | 97% | 18.4% | 2092 |
| 1575 | - | 7/31/2023 | 51 | 10 | 25.3% | 94.1 | 99% | 25.0% | 2093 |
| 1586 | - | 7/31/2023 | 52 | 19 | 21.7% | 104.6 | 100% | 18.4% | 2094 |
| 1608 | - | 8/1/2023 | 53 | 13 | 22.5% | 93.9 | 96% | 21.7% | 2095 |
| 1621 | - | 8/1/2023 | 54 | 13 | 21.9% | 94.1 | 96% | 21.7% | 2096 |
| 1634 | - | 8/1/2023 | 55 | 19 | 19.5% | 102.7 | 98% | 18.4% | 2097 |
| 1647 | - | 8/1/2023 | 56 | 7 | 27.3% | 92.2 | 98% | 22.6% | 2098 |
| 1660 | - | 8/1/2023 | 57 | 19 | 22.8% | 101.8 | 97% | 18.4% | 2099 |
| 1671 | - | 8/1/2023 | 58 | 19 | 18.9% | 101.8 | 97% | 18.4% | 2100 |
| 1682 | - | 8/1/2023 | 59 | 19 | 20.4% | 101.3 | 96% | 18.4% | 2101 |
| 1693 | - | 8/2/2023 | 60 | 14 | 28.6% | 90.8 | 98% | 27.2% | 2102 |
| 1704 | - | 8/2/2023 | 61 | 3 | 21.4% | 95.3 | 96% | 20.2% | 2103 |
| 1715 | - | 8/2/2023 | 62 | 7 | 25.0% | 90.3 | 96% | 22.6% | 2104 |
| 1726 | - | 8/2/2023 | 63 | 19 | 20.1% | 102.3 | 97% | 18.4% | 2105 |
| 1737 | - | 8/2/2023 | 64 | 19 | 18.6% | 105.0 | 100% | 18.4% | 2106 |
| 1754 | - | 8/3/2023 | 65 | 3 | 24.1% | 99.9 | 101% | 20.2% | 2107 |
| 1765 | - | 8/3/2023 | 66 | 3 | 24.0% | 99.8 | 101% | 20.2% | 2108 |
| 1776 | - | 8/3/2023 | 67 | 3 | 24.2% | 98.8 | 99% | 20.2% | 2109 |
| 1787 | - | 8/3/2023 | 68 | 3 | 23.5% | 100.3 | 101% | 20.2% | 2110 |
| 1798 | - | 8/3/2023 | 69 | 3 | 28.1% | 96.0 | 97% | 20.2% | 2111 |
| 1809 | - | 8/3/2023 | 70 | 3 | 21.9% | 98.5 | 99% | 20.2% | 2112 |
| 1827 | - | 8/7/2023 | 71 | 19 | 19.9% | 99.9 | 95% | 18.4% | 2113 |
| 1850 | - | 8/7/2023 | 72 | 19 | 20.4% | 104.4 | 99% | 18.4% | 2114 |
| 1867 | - | 8/7/2023 | 73 | 19 | 21.8% | 104.0 | 99% | 18.4% | 2115 |
| 1879 | - | 8/7/2023 | 74 | 19 | 21.8% | 105.0 | 100% | 18.4% | 2116 |
| 1891 | - | 8/7/2023 | 75 | 19 | 23.0% | 99.9 | 95% | 18.4% | 2117 |
| 1903 | - | 8/7/2023 | 76 | 19 | 22.3% | 101.2 | 96% | 18.4% | 2118 |
| 1916 | - | 8/8/2023 | 77 | 19 | 19.8% | 102.8 | 98% | 18.4% | 2119 |
| 1928 | - | 8/8/2023 | 78 | 19 | 21.1% | 105.2 | 100% | 18.4% | 2120 |
| 1940 | - | 8/8/2023 | 79 | 21 | 22.1% | 105.5 | 99% | 18.1% | 2121 |
| 1952 | - | 8/8/2023 | 80 | 19 | 21.4% | 104.0 | 99% | 18.4% | 2122 |
| 1964 | - | 8/8/2023 | 81 | 21 | 20.2% | 107.0 | 101% | 18.1% | 2123 |
| 1976 | - | 8/8/2023 | 82 | 19 | 21.5% | 104.3 | 99% | 18.4% | 2124 |
| 1988 | - | 8/8/2023 | 83 | 21 | 19.0% | 109.3 | 103% | 18.1% | 2125 |
| 2000 | - | 8/8/2023 | 84 | 16 | 23.6% | 101.5 | 100% | 20.2% | 2126 |
| 2012 | - | 8/9/2023 | 85 | 19 | 21.4% | 104.0 | 99% | 18.4% | 2127 |
| 2024 | - | 8/9/2023 | 86 | 19 | 22.2% | 104.8 | 100% | 18.4% | 2128 |
| 2036 | - | 8/9/2023 | 87 | 16 | 22.0% | 100.8 | 99% | 20.2% | 2129 |

Clay Field Test Results Summary
Cell 5 Phase 1

| Test No. | Retest of | Date | Lift | Proctor Reference No. | In-Place Moisture Content (%) | In-Place Dry Denisty (pcf) | Percent Compaction | Optimum Moisture | Passing Test # (Overall) |
|---|---|---|---|---|---|---|---|---|---|
| 2048 | - | 8/9/2023 | 88 | 19 | 21.9% | 103.4 | 98% | 18.4% | 2130 |
| 2060 | - | 8/9/2023 | 89 | 16 | 21.7% | 100.6 | 99% | 20.2% | 2131 |
| 2072 | - | 8/9/2023 | 90 | 21 | 20.6% | 107.8 | 101% | 18.1% | 2132 |
| 2084 | - | 8/9/2023 | 91 | 19 | 20.8% | 104.9 | 100% | 18.4% | 2133 |
| 2090 | - | 8/10/2023 | 92 | 21 | 21.1% | 106.9 | 101% | 18.1% | 2134 |
| 2102 | - | 8/10/2023 | 93 | 19 | 22.3% | 103.1 | 98% | 18.4% | 2135 |
| 2114 | - | 8/10/2023 | 94 | 19 | 22.0% | 104.7 | 100% | 18.4% | 2136 |
| 2126 | - | 8/10/2023 | 95 | 19 | 21.6% | 104.0 | 99% | 18.4% | 2137 |
| 2138 | - | 8/10/2023 | 96 | 21 | 19.6% | 106.6 | 100% | 18.1% | 2138 |
| 2150 | - | 8/10/2023 | 97 | 21 | 21.3% | 105.8 | 100% | 18.1% | 2139 |
| 2162 | - | 8/11/2023 | 98 | 19 | 22.0% | 105.4 | 100% | 18.4% | 2140 |
| 2174 | - | 8/11/2023 | 99 | 21 | 20.0% | 109.5 | 103% | 18.1% | 2141 |
| 2186 | - | 8/11/2023 | 100 | 19 | 22.3% | 103.2 | 98% | 18.4% | 2142 |
| 2202 | - | 8/11/2023 | 101 | 21 | 20.9% | 106.4 | 100% | 18.1% | 2143 |
| 2203 | - | 8/11/2023 | 102 | 19 | 20.7% | 104.6 | 100% | 18.4% | 2144 |
| 2219 | - | 8/11/2023 | 103 | 3 | 24.8% | 97.1 | 98% | 20.2% | 2145 |
| 2232 | - | 8/11/2023 | 104 | 1 | 20.9% | 102.0 | 101% | 19.4% | 2146 |
| 2251 | - | 8/14/2023 | 105 | 16 | 22.8% | 100.8 | 99% | 20.2% | 2147 |
| 2252 | - | 8/14/2023 | 106 | 19 | 22.7% | 102.8 | 98% | 18.4% | 2148 |
| 2271 | - | 8/14/2023 | 107 | 19 | 22.8% | 104.0 | 99% | 18.4% | 2149 |
| 2284 | - | 8/14/2023 | 108 | 3 | 22.4% | 98.5 | 99% | 20.2% | 2150 |
| 2297 | - | 8/14/2023 | 109 | 19 | 20.6% | 104.8 | 100% | 18.4% | 2151 |
| 2310 | - | 8/14/2023 | 110 | 16 | 21.7% | 103.4 | 102% | 20.2% | 2152 |
| 2329 | - | 8/14/2023 | 111 | 16 | 22.2% | 104.0 | 102% | 20.2% | 2153 |
| 2484 | - | 8/17/2023 | 112 | 16 | 22.3% | 101.9 | 100% | 20.2% | 2154 |
| 2496 | - | 8/17/2023 | 113 | 16 | 22.2% | 102.8 | 101% | 20.2% | 2155 |
| 2508 | - | 8/17/2023 | 114 | 3 | 23.8% | 97.0 | 98% | 20.2% | 2156 |
| 2520 | - | 8/17/2023 | 115 | 3 | 23.1% | 99.0 | 100% | 20.2% | 2157 |
| 2532 | - | 8/17/2023 | 116 | 1 | 20.6% | 103.9 | 103% | 19.4% | 2158 |
| 2544 | - | 8/17/2023 | 117 | 16 | 21.8% | 104.9 | 103% | 20.2% | 2159 |
| 2555 | - | 8/17/2023 | 118 | 1 | 22.8% | 100.4 | 100% | 19.4% | 2160 |
| 2561 | - | 8/18/2023 | 119 | 19 | 19.5% | 105.3 | 100% | 18.4% | 2161 |
| 2572 | - | 8/18/2023 | 120 | 16 | 22.3% | 102.8 | 101% | 20.2% | 2162 |
| 2583 | - | 8/18/2023 | 121 | 19 | 21.1% | 105.2 | 100% | 18.4% | 2163 |
| 2594 | - | 8/18/2023 | 122 | 16 | 21.9% | 103.1 | 101% | 20.2% | 2164 |
| 2605 | - | 8/18/2023 | 123 | 1 | 21.2% | 102.6 | 102% | 19.4% | 2165 |
| 2616 | - | 8/18/2023 | 124 | 1 | 21.1% | 103.9 | 103% | 19.4% | 2166 |
| 2627 | - | 8/18/2023 | 125 | 21 | 20.8% | 106.6 | 100% | 18.1% | 2167 |
| 2638 | - | 8/19/2023 | 126 | 21 | 21.3% | 107.3 | 101% | 18.1% | 2168 |
| 2649 | - | 8/21/2023 | 127 | 16 | 23.4% | 103.8 | 102% | 20.2% | 2169 |
| 2660 | - | 8/21/2023 | 128 | 16 | 22.1% | 103.6 | 102% | 20.2% | 2170 |
| 2671 | - | 8/21/2023 | 129 | 16 | 22.6% | 104.2 | 102% | 20.2% | 2171 |
| 2682 | - | 8/21/2023 | 130 | 16 | 22.5% | 103.9 | 102% | 20.2% | 2172 |
| 2693 | - | 8/21/2023 | 131 | 19 | 22.1% | 105.4 | 100% | 18.4% | 2173 |
| 2702 | - | 8/22/2023 | 132 | 21 | 20.2% | 107.0 | 101% | 18.1% | 2174 |
| 2715 | - | 8/22/2023 | 133 | 3 | 22.2% | 99.0 | 100% | 20.2% | 2175 |
| 2721 | - | 8/22/2023 | 134 | 16 | 23.5% | 102.6 | 101% | 20.2% | 2176 |
| 2727 | - | 8/22/2023 | 135 | 1 | 20.2% | 103.6 | 103% | 19.4% | 2177 |

Clay Field Test Results Summary
Cell 5 Phase 1

| Test No. | Retest of | Date | Lift | Proctor Reference No. | In-Place Moisture Content (%) | In-Place Dry Denisty (pcf) | Percent Compaction | Optimum Moisture | Passing Test # (Overall) |
|---|---|---|---|---|---|---|---|---|---|
| 2733 | - | 8/22/2023 | 136 | 19 | 20.4% | 105.0 | 100% | 18.4% | 2178 |
| 2744 | - | 8/22/2023 | 137 | 16 | 21.2% | 104.3 | 102% | 20.2% | 2179 |
| 2750 | - | 8/22/2023 | 138 | 1 | 23.5% | 101.7 | 101% | 19.4% | 2180 |
| 2761 | - | 8/24/2023 | 139 | 19 | 22.1% | 105.7 | 101% | 18.4% | 2181 |
| 2767 | - | 8/24/2023 | 140 | 3 | 20.5% | 99.3 | 100% | 20.2% | 2182 |
| 2773 | - | 8/24/2023 | 141 | 1 | 19.7% | 99.8 | 99% | 19.4% | 2183 |
| 2779 | - | 8/24/2023 | 142 | 16 | 23.1% | 101.6 | 100% | 20.2% | 2184 |
| 2785 | - | 8/24/2023 | 143 | 19 | 20.0% | 104.5 | 100% | 18.4% | 2185 |
| 2795 | - | 8/25/2023 | 144 | 16 | 23.7% | 101.1 | 99% | 20.2% | 2186 |
| 2806 | - | 8/25/2023 | 145 | 3 | 23.3% | 99.4 | 100% | 20.2% | 2187 |
| Z-53 | | | | | | | | | |
| 1295 | - | 7/24/2023 | 1 | 3 | 23.1% | 96.9 | 98% | 20.2% | 2188 |
| 1298 | - | 7/24/2023 | 2 | 3 | 21.9% | 99.6 | 100% | 20.2% | 2189 |
| 1301 | - | 7/24/2023 | 3 | 3 | 21.9% | 97.5 | 98% | 20.2% | 2190 |
| 1304 | - | 7/24/2023 | 4 | 3 | 23.6% | 98.5 | 99% | 20.2% | 2191 |
| 1307 | - | 7/24/2023 | 5 | 1 | 24.0% | 100.3 | 100% | 19.4% | 2192 |
| 1310 | - | 7/24/2023 | 6 | 3 | 23.6% | 99.3 | 100% | 20.2% | 2193 |
| 1315 | - | 7/24/2023 | 7 | 14 | 29.4% | 91.2 | 99% | 27.2% | 2194 |
| 1320 | - | 7/24/2023 | 8 | 16 | 21.3% | 101.2 | 99% | 20.2% | 2195 |
| 1325 | - | 7/24/2023 | 9 | 19 | 22.0% | 102.5 | 98% | 18.4% | 2196 |
| 1330 | - | 7/25/2023 | 10 | 3 | 20.8% | 98.7 | 99% | 20.2% | 2197 |
| 1335 | - | 7/25/2023 | 11 | 19 | 21.9% | 102.4 | 98% | 18.4% | 2198 |
| 1340 | - | 7/25/2023 | 12 | 16 | 24.4% | 100.6 | 99% | 20.2% | 2199 |
| 1345 | - | 7/25/2023 | 13 | 16 | 22.3% | 100.2 | 98% | 20.2% | 2200 |
| 1355 | - | 7/25/2023 | 14 | 3 | 22.1% | 97.9 | 99% | 20.2% | 2201 |
| 1360 | - | 7/25/2023 | 15 | 19 | 21.9% | 102.0 | 97% | 18.4% | 2202 |
| 1365 | - | 7/25/2023 | 16 | 3 | 21.5% | 99.6 | 100% | 20.2% | 2203 |
| 1370 | - | 7/25/2023 | 17 | 3 | 24.4% | 97.3 | 98% | 20.2% | 2204 |
| 1375 | - | 7/25/2023 | 18 | 19 | 21.7% | 102.7 | 98% | 18.4% | 2205 |
| 1380 | - | 7/25/2023 | 19 | 19 | 21.7% | 104.6 | 100% | 18.4% | 2206 |
| 1385 | - | 7/25/2023 | 20 | 3 | 21.8% | 99.7 | 100% | 20.2% | 2207 |
| 1390 | - | 7/26/2023 | 21 | 21 | 21.4% | 106.0 | 100% | 18.1% | 2208 |
| 1395 | - | 7/26/2023 | 22 | 19 | 21.6% | 104.0 | 99% | 18.4% | 2209 |
| 1400 | - | 7/26/2023 | 23 | 3 | 24.6% | 97.3 | 98% | 20.2% | 2210 |
| 1405 | - | 7/26/2023 | 24 | 7 | 25.6% | 92.7 | 99% | 22.6% | 2211 |
| 1410 | - | 7/26/2023 | 25 | 3 | 23.6% | 95.9 | 97% | 20.2% | 2212 |
| 1415 | - | 7/26/2023 | 26 | 19 | 22.4% | 100.7 | 96% | 18.4% | 2213 |
| 1420 | - | 7/26/2023 | 27 | 19 | 21.6% | 101.3 | 96% | 18.4% | 2214 |
| 1425 | - | 7/26/2023 | 28 | 19 | 19.5% | 104.8 | 100% | 18.4% | 2215 |
| 1430 | - | 7/26/2023 | 29 | 19 | 21.6% | 101.2 | 96% | 18.4% | 2216 |
| 1435 | - | 7/26/2023 | 30 | 3 | 21.7% | 99.5 | 100% | 20.2% | 2217 |
| 1440 | - | 7/26/2023 | 31 | 19 | 21.7% | 102.6 | 98% | 18.4% | 2218 |
| 1445 | - | 7/26/2023 | 32 | 19 | 24.7% | 100.2 | 95% | 18.4% | 2219 |
| 1450 | - | 7/26/2023 | 33 | 19 | 21.6% | 100.7 | 96% | 18.4% | 2220 |
| 1455 | - | 7/27/2023 | 34 | 19 | 22.1% | 100.4 | 96% | 18.4% | 2221 |
| 1460 | - | 7/27/2023 | 35 | 19 | 22.9% | 101.9 | 97% | 18.4% | 2222 |
| 1465 | - | 7/27/2023 | 36 | 19 | 23.2% | 99.8 | 95% | 18.4% | 2223 |
| 1470 | - | 7/27/2023 | 37 | 21 | 20.3% | 106.6 | 100% | 18.1% | 2224 |

Clay Field Test Results Summary
Cell 5 Phase 1

| Test No. | Retest of | Date | Lift | Proctor Reference No. | In-Place Moisture Content (%) | In-Place Dry Denisty (pcf) | Percent Compaction | Optimum Moisture | Passing Test # (Overall) |
|---|---|---|---|---|---|---|---|---|---|
| 1475 | - | 7/27/2023 | 38 | 21 | 20.9% | 103.5 | 97% | 18.1% | 2225 |
| 1480 | - | 7/27/2023 | 39 | 3 | 22.3% | 98.7 | 99% | 20.2% | 2226 |
| 1485 | - | 7/27/2023 | 40 | 3 | 22.3% | 98.3 | 99% | 20.2% | 2227 |
| 1490 | - | 7/27/2023 | 41 | 19 | 21.1% | 101.7 | 97% | 18.4% | 2228 |
| 1495 | - | 7/27/2023 | 42 | 19 | 23.2% | 100.6 | 96% | 18.4% | 2229 |
| 1500 | - | 7/27/2023 | 43 | 19 | 18.9% | 105.6 | 101% | 18.4% | 2230 |
| 1505 | - | 7/27/2023 | 44 | 3 | 27.1% | 94.9 | 96% | 20.2% | 2231 |
| 1510 | - | 7/27/2023 | 45 | 19 | 20.3% | 100.5 | 96% | 18.4% | 2232 |
| 1521 | - | 7/31/2023 | 46 | 19 | 22.1% | 101.5 | 97% | 18.4% | 2233 |
| 1532 | - | 7/31/2023 | 47 | 3 | 22.7% | 98.2 | 99% | 20.2% | 2234 |
| 1543 | - | 7/31/2023 | 48 | 3 | 23.9% | 99.7 | 100% | 20.2% | 2235 |
| 1554 | - | 7/31/2023 | 49 | 3 | 24.3% | 94.9 | 96% | 20.2% | 2236 |
| 1565 | - | 7/31/2023 | 50 | 19 | 21.4% | 102.3 | 97% | 18.4% | 2237 |
| 1576 | - | 7/31/2023 | 51 | 3 | 20.9% | 98.7 | 99% | 20.2% | 2238 |
| 1587 | - | 7/31/2023 | 52 | 19 | 23.2% | 102.6 | 98% | 18.4% | 2239 |
| 1607 | - | 8/1/2023 | 53 | 21 | 18.2% | 103.5 | 97% | 18.1% | 2240 |
| 1620 | - | 8/1/2023 | 54 | 19 | 19.7% | 102.6 | 98% | 18.4% | 2241 |
| 1633 | - | 8/1/2023 | 55 | 19 | 22.2% | 101.3 | 96% | 18.4% | 2242 |
| 1646 | - | 8/1/2023 | 56 | 19 | 21.6% | 100.2 | 95% | 18.4% | 2243 |
| 1659 | - | 8/1/2023 | 57 | 19 | 21.2% | 102.6 | 98% | 18.4% | 2244 |
| 1670 | - | 8/1/2023 | 58 | 14 | 30.5% | 98.5 | 107% | 27.2% | 2245 |
| 1681 | - | 8/1/2023 | 59 | 3 | 25.5% | 95.0 | 96% | 20.2% | 2246 |
| 1692 | - | 8/2/2023 | 60 | 3 | 26.3% | 96.1 | 97% | 20.2% | 2247 |
| 1703 | - | 8/2/2023 | 61 | 7 | 28.8% | 90.2 | 96% | 22.6% | 2248 |
| 1714 | - | 8/2/2023 | 62 | 7 | 23.8% | 93.3 | 99% | 22.6% | 2249 |
| 1725 | - | 8/2/2023 | 63 | 1 | 19.4% | 99.3 | 99% | 19.4% | 2250 |
| 1736 | - | 8/2/2023 | 64 | 3 | 23.3% | 100.5 | 101% | 20.2% | 2251 |
| 1753 | - | 8/3/2023 | 65 | 3 | 25.7% | 95.6 | 96% | 20.2% | 2252 |
| 1764 | - | 8/3/2023 | 66 | 19 | 24.4% | 100.7 | 96% | 18.4% | 2253 |
| 1775 | - | 8/3/2023 | 67 | 3 | 24.5% | 97.5 | 98% | 20.2% | 2254 |
| 1786 | - | 8/3/2023 | 68 | 3 | 24.0% | 98.5 | 99% | 20.2% | 2255 |
| 1797 | - | 8/3/2023 | 69 | 3 | 25.5% | 97.3 | 98% | 20.2% | 2256 |
| 1808 | - | 8/3/2023 | 70 | 7 | 24.3% | 94.3 | 101% | 22.6% | 2257 |
| 1828 | - | 8/7/2023 | 71 | 19 | 21.9% | 100.1 | 95% | 18.4% | 2258 |
| 1851 | - | 8/7/2023 | 72 | 3 | 21.8% | 97.3 | 98% | 20.2% | 2259 |
| 1868 | - | 8/7/2023 | 73 | 3 | 22.1% | 99.5 | 100% | 20.2% | 2260 |
| 1880 | - | 8/7/2023 | 74 | 19 | 22.4% | 102.5 | 98% | 18.4% | 2261 |
| 1892 | - | 8/7/2023 | 75 | 19 | 21.2% | 104.8 | 100% | 18.4% | 2262 |
| 1904 | - | 8/7/2023 | 76 | 19 | 24.1% | 100.0 | 95% | 18.4% | 2263 |
| 1917 | - | 8/8/2023 | 77 | 19 | 21.2% | 105.1 | 100% | 18.4% | 2264 |
| 1929 | - | 8/8/2023 | 78 | 19 | 20.9% | 103.0 | 98% | 18.4% | 2265 |
| 1941 | - | 8/8/2023 | 79 | 21 | 22.8% | 104.6 | 98% | 18.1% | 2266 |
| 1953 | - | 8/8/2023 | 80 | 19 | 22.3% | 102.9 | 98% | 18.4% | 2267 |
| 1965 | - | 8/8/2023 | 81 | 19 | 22.0% | 103.9 | 99% | 18.4% | 2268 |
| 1977 | - | 8/8/2023 | 82 | 21 | 20.4% | 106.4 | 100% | 18.1% | 2269 |
| 1989 | - | 8/8/2023 | 83 | 19 | 22.2% | 104.9 | 100% | 18.4% | 2270 |
| 2001 | - | 8/8/2023 | 84 | 19 | 20.5% | 104.7 | 100% | 18.4% | 2271 |
| 2013 | - | 8/9/2023 | 85 | 16 | 24.2% | 101.2 | 99% | 20.2% | 2272 |

Clay Field Test Results Summary
Cell 5 Phase 1

| Test No. | Retest of | Date | Lift | Proctor Reference No. | In-Place Moisture Content (%) | In-Place Dry Denisty (pcf) | Percent Compaction | Optimum Moisture | Passing Test # (Overall) |
|---|---|---|---|---|---|---|---|---|---|
| 2025 | - | 8/9/2023 | 86 | 19 | 20.6% | 102.6 | 98% | 18.4% | 2273 |
| 2037 | - | 8/9/2023 | 87 | 16 | 23.3% | 101.5 | 100% | 20.2% | 2274 |
| 2049 | - | 8/9/2023 | 88 | 19 | 20.1% | 105.4 | 100% | 18.4% | 2275 |
| 2061 | - | 8/9/2023 | 89 | 16 | 23.2% | 101.7 | 100% | 20.2% | 2276 |
| 2073 | - | 8/9/2023 | 90 | 19 | 21.6% | 102.6 | 98% | 18.4% | 2277 |
| 2085 | - | 8/9/2023 | 91 | 19 | 19.0% | 101.9 | 97% | 18.4% | 2278 |
| 2091 | - | 8/10/2023 | 92 | 19 | 20.3% | 105.0 | 100% | 18.4% | 2279 |
| 2103 | - | 8/10/2023 | 93 | 16 | 24.1% | 100.9 | 99% | 20.2% | 2280 |
| 2115 | - | 8/10/2023 | 94 | 19 | 22.0% | 105.4 | 100% | 18.4% | 2281 |
| 2127 | - | 8/10/2023 | 95 | 19 | 21.6% | 104.4 | 99% | 18.4% | 2282 |
| 2139 | - | 8/10/2023 | 96 | 21 | 20.8% | 106.5 | 100% | 18.1% | 2283 |
| 2151 | - | 8/10/2023 | 97 | 19 | 22.2% | 104.3 | 99% | 18.4% | 2284 |
| 2163 | - | 8/11/2023 | 98 | 19 | 18.4% | 104.2 | 99% | 18.4% | 2285 |
| 2175 | - | 8/11/2023 | 99 | 21 | 20.5% | 106.7 | 100% | 18.1% | 2286 |
| 2187 | - | 8/11/2023 | 100 | 3 | 20.4% | 98.5 | 99% | 20.2% | 2287 |
| 2204 | - | 8/11/2023 | 101 | 21 | 19.6% | 107.6 | 101% | 18.1% | 2288 |
| 2205 | - | 8/11/2023 | 102 | 19 | 21.4% | 105.3 | 100% | 18.4% | 2289 |
| 2220 | - | 8/11/2023 | 103 | 21 | 21.0% | 108.0 | 102% | 18.1% | 2290 |
| 2233 | - | 8/11/2023 | 104 | 16 | 22.9% | 101.3 | 100% | 20.2% | 2291 |
| 2253 | - | 8/14/2023 | 105 | 21 | 20.4% | 106.1 | 100% | 18.1% | 2292 |
| 2254 | - | 8/14/2023 | 106 | 19 | 24.1% | 103.7 | 99% | 18.4% | 2293 |
| 2272 | - | 8/14/2023 | 107 | 16 | 22.0% | 101.7 | 100% | 20.2% | 2294 |
| 2285 | - | 8/14/2023 | 108 | 16 | 22.7% | 103.0 | 101% | 20.2% | 2295 |
| 2298 | - | 8/14/2023 | 109 | 16 | 22.7% | 100.9 | 99% | 20.2% | 2296 |
| 2311 | - | 8/14/2023 | 110 | 16 | 21.7% | 103.0 | 101% | 20.2% | 2297 |
| 2330 | - | 8/14/2023 | 111 | 16 | 23.6% | 100.9 | 99% | 20.2% | 2298 |
| 2485 | - | 8/17/2023 | 112 | 19 | 20.5% | 104.6 | 100% | 18.4% | 2299 |
| 2497 | - | 8/17/2023 | 113 | 1 | 22.7% | 100.8 | 100% | 19.4% | 2300 |
| 2509 | - | 8/17/2023 | 114 | 16 | 22.2% | 103.0 | 101% | 20.2% | 2301 |
| 2521 | - | 8/17/2023 | 115 | 3 | 22.7% | 99.3 | 100% | 20.2% | 2302 |
| 2533 | - | 8/17/2023 | 116 | 16 | 21.8% | 103.3 | 101% | 20.2% | 2303 |
| 2545 | - | 8/17/2023 | 117 | 16 | 22.9% | 101.1 | 99% | 20.2% | 2304 |
| 2556 | - | 8/17/2023 | 118 | 1 | 21.0% | 103.4 | 103% | 19.4% | 2305 |
| 2562 | - | 8/18/2023 | 119 | 16 | 23.7% | 101.4 | 100% | 20.2% | 2306 |
| 2573 | - | 8/18/2023 | 120 | 3 | 23.4% | 94.4 | 95% | 20.2% | 2307 |
| 2584 | - | 8/18/2023 | 121 | 16 | 22.8% | 103.0 | 101% | 20.2% | 2308 |
| 2595 | - | 8/18/2023 | 122 | 16 | 24.1% | 101.5 | 100% | 20.2% | 2309 |
| 2606 | - | 8/18/2023 | 123 | 16 | 21.7% | 103.4 | 102% | 20.2% | 2310 |
| 2617 | - | 8/18/2023 | 124 | 19 | 20.5% | 104.5 | 100% | 18.4% | 2311 |
| 2628 | - | 8/18/2023 | 125 | 16 | 22.8% | 101.7 | 100% | 20.2% | 2312 |
| 2639 | - | 8/19/2023 | 126 | 16 | 22.2% | 103.3 | 101% | 20.2% | 2313 |
| 2650 | - | 8/21/2023 | 127 | 21 | 20.5% | 106.7 | 100% | 18.1% | 2314 |
| 2661 | - | 8/21/2023 | 128 | 3 | 26.5% | 98.2 | 99% | 20.2% | 2315 |
| 2672 | - | 8/21/2023 | 129 | 3 | 25.4% | 95.9 | 97% | 20.2% | 2316 |
| 2683 | - | 8/21/2023 | 130 | 3 | 24.8% | 98.9 | 100% | 20.2% | 2317 |
| 2694 | - | 8/21/2023 | 131 | 1 | 24.3% | 99.9 | 99% | 19.4% | 2318 |
| 2703 | - | 8/22/2023 | 132 | 16 | 23.9% | 101.5 | 100% | 20.2% | 2319 |
| 2716 | - | 8/22/2023 | 133 | 16 | 22.1% | 101.0 | 99% | 20.2% | 2320 |

Clay Field Test Results Summary
Cell 5 Phase 1

| Test No. | Retest of | Date | Lift | Proctor Reference No. | In-Place Moisture Content (%) | In-Place Dry Denisty (pcf) | Percent Compaction | Optimum Moisture | Passing Test # (Overall) |
|---|---|---|---|---|---|---|---|---|---|
| 2722 | - | 8/22/2023 | 134 | 21 | 20.6% | 107.2 | 101% | 18.1% | 2321 |
| 2728 | - | 8/22/2023 | 135 | 16 | 23.5% | 102.5 | 101% | 20.2% | 2322 |
| 2734 | - | 8/22/2023 | 136 | 1 | 21.2% | 102.6 | 102% | 19.4% | 2323 |
| 2745 | - | 8/22/2023 | 137 | 16 | 23.6% | 99.0 | 97% | 20.2% | 2324 |
| 2751 | - | 8/22/2023 | 138 | 621 | 21.5% | 105.8 | 99% | 16.8% | 2325 |
| 2762 | - | 8/24/2023 | 139 | 19 | 21.3% | 104.9 | 100% | 18.4% | 2326 |
| 2768 | - | 8/24/2023 | 140 | 21 | 19.6% | 106.9 | 101% | 18.1% | 2327 |
| 2774 | - | 8/24/2023 | 141 | 3 | 23.8% | 98.4 | 99% | 20.2% | 2328 |
| 2780 | - | 8/24/2023 | 142 | 3 | 22.6% | 98.6 | 99% | 20.2% | 2329 |
| 2786 | - | 8/24/2023 | 143 | 3 | 25.3% | 97.4 | 98% | 20.2% | 2330 |
| 2796 | - | 8/25/2023 | 144 | 7 | 27.7% | 92.0 | 98% | 22.6% | 2331 |
| 2807 | - | 8/25/2023 | 145 | 3 | 25.1% | 97.0 | 98% | 20.2% | 2332 |
| Z-54 | | | | | | | | | |
| 1311 | - | 7/24/2023 | 1 | 3 | 23.7% | 99.4 | 100% | 20.2% | 2333 |
| 1316 | - | 7/24/2023 | 2 | 7 | 25.8% | 93.5 | 100% | 22.6% | 2334 |
| 1321 | - | 7/24/2023 | 3 | 3 | 22.3% | 97.8 | 98% | 20.2% | 2335 |
| 1326 | - | 7/24/2023 | 4 | 3 | 22.6% | 97.6 | 98% | 20.2% | 2336 |
| 1331 | - | 7/25/2023 | 5 | 3 | 24.1% | 99.4 | 100% | 20.2% | 2337 |
| 1336 | - | 7/25/2023 | 6 | 3 | 25.1% | 97.5 | 98% | 20.2% | 2338 |
| 1341 | - | 7/25/2023 | 7 | 16 | 24.0% | 101.1 | 99% | 20.2% | 2339 |
| 1346 | - | 7/25/2023 | 8 | 3 | 24.9% | 99.0 | 100% | 20.2% | 2340 |
| 1356 | - | 7/25/2023 | 9 | 19 | 18.9% | 100.6 | 96% | 18.4% | 2341 |
| 1361 | - | 7/25/2023 | 10 | 19 | 22.8% | 102.0 | 97% | 18.4% | 2342 |
| 1366 | - | 7/25/2023 | 11 | 19 | 22.7% | 101.7 | 97% | 18.4% | 2343 |
| 1371 | - | 7/25/2023 | 12 | 19 | 23.0% | 100.5 | 96% | 18.4% | 2344 |
| 1376 | - | 7/25/2023 | 13 | 3 | 24.7% | 96.3 | 97% | 20.2% | 2345 |
| 1382 | - | 7/25/2023 | 14 | 3 | 26.2% | 94.8 | 95% | 20.2% | 2346 |
| 1386 | - | 7/25/2023 | 15 | 19 | 23.1% | 101.5 | 97% | 18.4% | 2347 |
| 1391 | - | 7/26/2023 | 16 | 21 | 18.9% | 105.7 | 99% | 18.1% | 2348 |
| 1396 | - | 7/26/2023 | 17 | 3 | 23.1% | 99.2 | 100% | 20.2% | 2349 |
| 1401 | - | 7/26/2023 | 18 | 3 | 24.7% | 96.1 | 97% | 20.2% | 2350 |
| 1406 | - | 7/26/2023 | 19 | 3 | 22.9% | 97.0 | 98% | 20.2% | 2351 |
| 1412 | - | 7/26/2023 | 20 | 3 | 23.7% | 98.5 | 99% | 20.2% | 2352 |
| 1416 | - | 7/26/2023 | 21 | 19 | 23.3% | 100.1 | 95% | 18.4% | 2353 |
| 1421 | - | 7/26/2023 | 22 | 3 | 24.0% | 97.5 | 98% | 20.2% | 2354 |
| 1426 | - | 7/26/2023 | 23 | 19 | 19.8% | 101.5 | 97% | 18.4% | 2355 |
| 1431 | - | 7/26/2023 | 24 | 19 | 20.1% | 102.8 | 98% | 18.4% | 2356 |
| 1436 | - | 7/26/2023 | 25 | 19 | 20.3% | 104.3 | 99% | 18.4% | 2357 |
| 1441 | - | 7/26/2023 | 26 | 19 | 21.3% | 105.4 | 100% | 18.4% | 2358 |
| 1446 | - | 7/26/2023 | 27 | 19 | 21.0% | 103.6 | 99% | 18.4% | 2359 |
| 1451 | - | 7/26/2023 | 28 | 3 | 22.2% | 97.4 | 98% | 20.2% | 2360 |
| 1456 | - | 7/27/2023 | 29 | 19 | 20.7% | 103.9 | 99% | 18.4% | 2361 |
| 1461 | - | 7/27/2023 | 30 | 19 | 24.0% | 101.8 | 97% | 18.4% | 2362 |
| 1466 | - | 7/27/2023 | 31 | 3 | 23.4% | 98.2 | 99% | 20.2% | 2363 |
| 1471 | - | 7/27/2023 | 32 | 21 | 20.2% | 106.2 | 100% | 18.1% | 2364 |
| 1476 | - | 7/27/2023 | 33 | 3 | 24.1% | 96.8 | 97% | 20.2% | 2365 |
| 1481 | - | 7/27/2023 | 34 | 3 | 22.4% | 99.6 | 100% | 20.2% | 2366 |
| 1486 | - | 7/27/2023 | 35 | 19 | 21.3% | 104.4 | 99% | 18.4% | 2367 |

Clay Field Test Results Summary
Cell 5 Phase 1

| Test No. | Retest of | Date | Lift | Proctor Reference No. | In-Place Moisture Content (%) | In-Place Dry Denisty (pcf) | Percent Compaction | Optimum Moisture | Passing Test # (Overall) |
|---|---|---|---|---|---|---|---|---|---|
| 1491 | - | 7/27/2023 | 36 | 19 | 20.3% | 100.7 | 96% | 18.4% | 2368 |
| 1496 | - | 7/27/2023 | 37 | 19 | 21.3% | 102.5 | 98% | 18.4% | 2369 |
| 1501 | - | 7/27/2023 | 38 | 19 | 20.5% | 103.3 | 98% | 18.4% | 2370 |
| 1506 | - | 7/27/2023 | 39 | 7 | 27.8% | 90.6 | 97% | 22.6% | 2371 |
| 1511 | - | 7/27/2023 | 40 | 19 | 20.3% | 104.2 | 99% | 18.4% | 2372 |
| 1522 | - | 7/31/2023 | 41 | 19 | 23.2% | 101.2 | 96% | 18.4% | 2373 |
| 1533 | - | 7/31/2023 | 42 | 19 | 23.5% | 99.8 | 95% | 18.4% | 2374 |
| 1544 | - | 7/31/2023 | 43 | 3 | 25.8% | 94.6 | 95% | 20.2% | 2375 |
| 1555 | - | 7/31/2023 | 44 | 7 | 27.7% | 92.0 | 98% | 22.6% | 2376 |
| 1566 | - | 7/31/2023 | 45 | 3 | 20.8% | 95.5 | 96% | 20.2% | 2377 |
| 1577 | - | 7/31/2023 | 46 | 3 | 20.9% | 98.7 | 99% | 20.2% | 2378 |
| 1588 | - | 7/31/2023 | 47 | 3 | 22.4% | 98.4 | 99% | 20.2% | 2379 |
| 1589 | - | 7/31/2023 | 47 | 3 | 22.4% | 98.4 | 99% | 20.2% | 2380 |
| 1605 | - | 8/1/2023 | 48 | 19 | 21.3% | 105.1 | 100% | 18.4% | 2381 |
| 1606 | - | 8/1/2023 | 49 | 19 | 20.9% | 100.0 | 95% | 18.4% | 2382 |
| 1618 | - | 8/1/2023 | 50 | 19 | 22.1% | 102.5 | 98% | 18.4% | 2383 |
| 1619 | - | 8/1/2023 | 51 | 19 | 21.1% | 100.9 | 96% | 18.4% | 2384 |
| 1631 | - | 8/1/2023 | 52 | 19 | 19.5% | 103.8 | 99% | 18.4% | 2385 |
| 1632 | - | 8/1/2023 | 53 | 3 | 21.9% | 99.3 | 100% | 20.2% | 2386 |
| 1644 | - | 8/1/2023 | 54 | 19 | 21.4% | 102.9 | 98% | 18.4% | 2387 |
| 1645 | - | 8/1/2023 | 55 | 3 | 23.3% | 99.5 | 100% | 20.2% | 2388 |
| 1657 | - | 8/1/2023 | 56 | 7 | 29.3% | 91.9 | 98% | 22.6% | 2389 |
| 1658 | - | 8/1/2023 | 57 | 7 | 28.0% | 93.6 | 100% | 22.6% | 2390 |
| 1669 | - | 8/1/2023 | 58 | 19 | 21.4% | 101.8 | 97% | 18.4% | 2391 |
| 1680 | - | 8/1/2023 | 59 | 3 | 23.1% | 98.7 | 99% | 20.2% | 2392 |
| 1691 | - | 8/2/2023 | 60 | 19 | 20.0% | 103.9 | 99% | 18.4% | 2393 |
| 1702 | - | 8/2/2023 | 61 | 7 | 24.6% | 92.3 | 98% | 22.6% | 2394 |
| 1713 | - | 8/2/2023 | 62 | 19 | 22.0% | 104.3 | 99% | 18.4% | 2395 |
| 1724 | - | 8/2/2023 | 63 | 3 | 21.6% | 100.2 | 101% | 20.2% | 2396 |
| 1735 | - | 8/2/2023 | 64 | 3 | 20.9% | 100.1 | 101% | 20.2% | 2397 |
| 1752 | - | 8/3/2023 | 65 | 19 | 23.1% | 102.3 | 97% | 18.4% | 2398 |
| 1763 | - | 8/3/2023 | 66 | 3 | 26.5% | 97.1 | 98% | 20.2% | 2399 |
| 1774 | - | 8/3/2023 | 67 | 3 | 23.3% | 100.2 | 101% | 20.2% | 2400 |
| 1785 | - | 8/3/2023 | 68 | 3 | 25.8% | 95.5 | 96% | 20.2% | 2401 |
| 1796 | - | 8/3/2023 | 69 | 7 | 27.6% | 91.7 | 98% | 22.6% | 2402 |
| 1807 | - | 8/3/2023 | 70 | 3 | 22.9% | 99.2 | 100% | 20.2% | 2403 |
| 1829 | - | 8/7/2023 | 71 | 3 | 21.2% | 96.3 | 97% | 20.2% | 2404 |
| 1852 | - | 8/7/2023 | 72 | 19 | 21.5% | 102.3 | 97% | 18.4% | 2405 |
| 1869 | - | 8/7/2023 | 73 | 19 | 23.6% | 101.4 | 97% | 18.4% | 2406 |
| 1881 | - | 8/7/2023 | 74 | 19 | 21.8% | 100.2 | 95% | 18.4% | 2407 |
| 1893 | - | 8/7/2023 | 75 | 3 | 25.4% | 97.3 | 98% | 20.2% | 2408 |
| 1905 | - | 8/7/2023 | 76 | 19 | 21.9% | 101.2 | 96% | 18.4% | 2409 |
| 1918 | - | 8/8/2023 | 77 | 19 | 22.4% | 100.8 | 96% | 18.4% | 2410 |
| 1930 | - | 8/8/2023 | 78 | 19 | 20.4% | 102.9 | 98% | 18.4% | 2411 |
| 1942 | - | 8/8/2023 | 79 | 19 | 21.5% | 105.2 | 100% | 18.4% | 2412 |
| 1954 | - | 8/8/2023 | 80 | 19 | 19.7% | 104.6 | 100% | 18.4% | 2413 |
| 1966 | - | 8/8/2023 | 81 | 19 | 20.3% | 104.8 | 100% | 18.4% | 2414 |
| 1978 | - | 8/8/2023 | 82 | 19 | 22.1% | 104.3 | 99% | 18.4% | 2415 |

Clay Field Test Results Summary
Cell 5 Phase 1

| Test No. | Retest of | Date | Lift | Proctor Reference No. | In-Place Moisture Content (%) | In-Place Dry Denisty (pcf) | Percent Compaction | Optimum Moisture | Passing Test # (Overall) |
|---|---|---|---|---|---|---|---|---|---|
| 1990 | - | 8/8/2023 | 83 | 21 | 20.5% | 107.5 | 101% | 18.1% | 2416 |
| 2002 | - | 8/8/2023 | 84 | 3 | 21.4% | 97.0 | 98% | 20.2% | 2417 |
| 2014 | - | 8/9/2023 | 85 | 16 | 23.9% | 101.8 | 100% | 20.2% | 2418 |
| 2026 | - | 8/9/2023 | 86 | 16 | 24.8% | 100.8 | 99% | 20.2% | 2419 |
| 2038 | - | 8/9/2023 | 87 | 3 | 24.7% | 99.5 | 100% | 20.2% | 2420 |
| 2050 | - | 8/9/2023 | 88 | 19 | 21.4% | 104.9 | 100% | 18.4% | 2421 |
| 2062 | - | 8/9/2023 | 89 | 21 | 20.1% | 108.2 | 102% | 18.1% | 2422 |
| 2074 | - | 8/9/2023 | 90 | 19 | 21.2% | 101.0 | 96% | 18.4% | 2423 |
| 2086 | - | 8/9/2023 | 91 | 16 | 21.7% | 100.7 | 99% | 20.2% | 2424 |
| 2092 | - | 8/10/2023 | 92 | 21 | 20.9% | 106.7 | 100% | 18.1% | 2425 |
| 2104 | - | 8/10/2023 | 93 | 19 | 22.7% | 104.0 | 99% | 18.4% | 2426 |
| 2116 | - | 8/10/2023 | 94 | 21 | 20.3% | 106.1 | 100% | 18.1% | 2427 |
| 2128 | - | 8/10/2023 | 95 | 19 | 22.4% | 103.8 | 99% | 18.4% | 2428 |
| 2140 | - | 8/10/2023 | 96 | 3 | 23.8% | 98.3 | 99% | 20.2% | 2429 |
| 2152 | - | 8/10/2023 | 97 | 19 | 21.5% | 105.1 | 100% | 18.4% | 2430 |
| 2164 | - | 8/11/2023 | 98 | 21 | 20.7% | 108.9 | 102% | 18.1% | 2431 |
| 2176 | - | 8/11/2023 | 99 | 21 | 22.2% | 106.1 | 100% | 18.1% | 2432 |
| 2188 | - | 8/11/2023 | 100 | 19 | 21.9% | 104.6 | 100% | 18.4% | 2433 |
| 2206 | - | 8/11/2023 | 101 | 21 | 18.5% | 110.9 | 104% | 18.1% | 2434 |
| 2207 | - | 8/11/2023 | 102 | 21 | 20.4% | 107.6 | 101% | 18.1% | 2435 |
| 2221 | - | 8/11/2023 | 103 | 19 | 20.8% | 103.3 | 98% | 18.4% | 2436 |
| 2234 | - | 8/11/2023 | 104 | 19 | 20.6% | 105.0 | 100% | 18.4% | 2437 |
| 2255 | - | 8/14/2023 | 105 | 3 | 24.5% | 97.8 | 98% | 20.2% | 2438 |
| 2256 | - | 8/14/2023 | 106 | 16 | 24.7% | 101.4 | 100% | 20.2% | 2439 |
| 2273 | - | 8/14/2023 | 107 | 19 | 22.3% | 104.4 | 99% | 18.4% | 2440 |
| 2286 | - | 8/14/2023 | 108 | 3 | 22.6% | 99.3 | 100% | 20.2% | 2441 |
| 2299 | - | 8/14/2023 | 109 | 16 | 24.5% | 102.1 | 100% | 20.2% | 2442 |
| 2312 | - | 8/14/2023 | 110 | 16 | 23.7% | 101.5 | 100% | 20.2% | 2443 |
| 2331 | - | 8/14/2023 | 111 | 3 | 22.2% | 99.5 | 100% | 20.2% | 2444 |
| 2486 | - | 8/17/2023 | 112 | 1 | 20.8% | 102.4 | 102% | 19.4% | 2445 |
| 2498 | - | 8/17/2023 | 113 | 16 | 22.2% | 103.0 | 101% | 20.2% | 2446 |
| 2510 | - | 8/17/2023 | 114 | 19 | 18.8% | 105.1 | 100% | 18.4% | 2447 |
| 2522 | - | 8/17/2023 | 115 | 3 | 25.7% | 95.5 | 96% | 20.2% | 2448 |
| 2534 | - | 8/17/2023 | 116 | 16 | 21.3% | 104.1 | 102% | 20.2% | 2449 |
| 2546 | - | 8/17/2023 | 117 | 16 | 23.4% | 100.0 | 98% | 20.2% | 2450 |
| 2557 | - | 8/17/2023 | 118 | 16 | 22.1% | 104.3 | 102% | 20.2% | 2451 |
| 2563 | - | 8/18/2023 | 119 | 16 | 22.4% | 101.1 | 99% | 20.2% | 2452 |
| 2574 | - | 8/18/2023 | 120 | 16 | 22.1% | 103.3 | 101% | 20.2% | 2453 |
| 2585 | - | 8/18/2023 | 121 | 19 | 21.7% | 105.4 | 100% | 18.4% | 2454 |
| 2596 | - | 8/18/2023 | 122 | 16 | 22.9% | 102.9 | 101% | 20.2% | 2455 |
| 2607 | - | 8/18/2023 | 123 | 16 | 22.2% | 101.8 | 100% | 20.2% | 2456 |
| 2618 | - | 8/18/2023 | 124 | 3 | 24.4% | 94.8 | 95% | 20.2% | 2457 |
| 2629 | - | 8/18/2023 | 125 | 16 | 22.6% | 101.2 | 99% | 20.2% | 2458 |
| 2643 | - | 8/19/2023 | 126 | 16 | 22.2% | 103.3 | 101% | 20.2% | 2459 |
| 2651 | - | 8/21/2023 | 127 | 21 | 19.0% | 106.6 | 100% | 18.1% | 2460 |
| 2662 | - | 8/21/2023 | 128 | 1 | 25.7% | 100.1 | 99% | 19.4% | 2461 |
| 2673 | - | 8/21/2023 | 129 | 1 | 20.9% | 103.5 | 103% | 19.4% | 2462 |
| 2684 | - | 8/21/2023 | 130 | 19 | 21.8% | 104.9 | 100% | 18.4% | 2463 |

Clay Field Test Results Summary
Cell 5 Phase 1

| Test No. | Retest of | Date | Lift | Proctor Reference No. | In-Place Moisture Content (%) | In-Place Dry Denisty (pcf) | Percent Compaction | Optimum Moisture | Passing Test # (Overall) |
|---|---|---|---|---|---|---|---|---|---|
| 2695 | - | 8/21/2023 | 131 | 16 | 22.9% | 101.8 | 100% | 20.2% | 2464 |
| 2704 | - | 8/22/2023 | 132 | 16 | 23.4% | 100.9 | 99% | 20.2% | 2465 |
| 2717 | - | 8/22/2023 | 133 | 21 | 19.7% | 106.0 | 100% | 18.1% | 2466 |
| 2723 | - | 8/22/2023 | 134 | 3 | 28.4% | 95.1 | 96% | 20.2% | 2467 |
| 2729 | - | 8/22/2023 | 135 | 3 | 21.2% | 99.6 | 100% | 20.2% | 2468 |
| 2735 | - | 8/22/2023 | 136 | 16 | 22.9% | 104.1 | 102% | 20.2% | 2469 |
| 2746 | - | 8/22/2023 | 137 | 16 | 25.2% | 98.8 | 97% | 20.2% | 2470 |
| 2752 | - | 8/22/2023 | 138 | 16 | 23.9% | 101.4 | 100% | 20.2% | 2471 |
| 2763 | - | 8/24/2023 | 139 | 19 | 19.0% | 103.0 | 98% | 18.4% | 2472 |
| 2769 | - | 8/24/2023 | 140 | 16 | 22.7% | 101.3 | 100% | 20.2% | 2473 |
| 2775 | - | 8/24/2023 | 141 | 3 | 23.7% | 98.0 | 99% | 20.2% | 2474 |
| 2781 | - | 8/24/2023 | 142 | 16 | 22.0% | 103.2 | 101% | 20.2% | 2475 |
| 2787 | - | 8/24/2023 | 143 | 16 | 22.0% | 103.5 | 102% | 20.2% | 2476 |
| 2797 | - | 8/25/2023 | 144 | 19 | 19.1% | 105.5 | 100% | 18.4% | 2477 |
| 2808 | - | 8/25/2023 | 145 | 16 | 22.0% | 103.2 | 101% | 20.2% | 2478 |
| Z-55 | | | | | | | | | |
| 1312 | - | 7/24/2023 | 1 | 19 | 19.1% | 105.0 | 100% | 18.4% | 2479 |
| 1317 | - | 7/24/2023 | 2 | 14 | 28.0% | 90.4 | 98% | 27.2% | 2480 |
| 1322 | - | 7/24/2023 | 3 | 3 | 24.6% | 98.3 | 99% | 20.2% | 2481 |
| 1327 | - | 7/24/2023 | 4 | 5 | 28.0% | 93.1 | 97% | 24.5% | 2482 |
| 1332 | - | 7/25/2023 | 5 | 19 | 18.9% | 99.8 | 95% | 18.4% | 2483 |
| 1337 | - | 7/25/2023 | 6 | 3 | 26.1% | 97.7 | 98% | 20.2% | 2484 |
| 1342 | - | 7/25/2023 | 7 | 3 | 22.1% | 96.7 | 97% | 20.2% | 2485 |
| 1347 | - | 7/25/2023 | 8 | 3 | 24.9% | 96.5 | 97% | 20.2% | 2486 |
| 1357 | - | 7/25/2023 | 9 | 19 | 19.4% | 104.1 | 99% | 18.4% | 2487 |
| 1362 | - | 7/25/2023 | 10 | 3 | 24.3% | 96.2 | 97% | 20.2% | 2488 |
| 1367 | - | 7/25/2023 | 11 | 19 | 24.3% | 100.4 | 96% | 18.4% | 2489 |
| 1372 | - | 7/25/2023 | 12 | 19 | 22.8% | 102.3 | 97% | 18.4% | 2490 |
| 1377 | - | 7/25/2023 | 13 | 3 | 23.6% | 98.8 | 99% | 20.2% | 2491 |
| 1381 | - | 7/25/2023 | 14 | 19 | 18.7% | 104.5 | 100% | 18.4% | 2492 |
| 1387 | - | 7/25/2023 | 15 | 7 | 23.8% | 92.6 | 99% | 22.6% | 2493 |
| 1392 | - | 7/26/2023 | 16 | 21 | 22.0% | 101.4 | 95% | 18.1% | 2494 |
| 1397 | - | 7/26/2023 | 17 | 19 | 20.4% | 101.7 | 97% | 18.4% | 2495 |
| 1402 | - | 7/26/2023 | 18 | 7 | 26.1% | 91.7 | 98% | 22.6% | 2496 |
| 1407 | - | 7/26/2023 | 19 | 3 | 21.0% | 99.1 | 100% | 20.2% | 2497 |
| 1411 | - | 7/26/2023 | 20 | 19 | 20.1% | 100.1 | 95% | 18.4% | 2498 |
| 1417 | - | 7/26/2023 | 21 | 19 | 22.6% | 101.6 | 97% | 18.4% | 2499 |
| 1422 | - | 7/26/2023 | 22 | 3 | 24.2% | 98.0 | 99% | 20.2% | 2500 |
| 1427 | - | 7/26/2023 | 23 | 21 | 20.7% | 106.5 | 100% | 18.1% | 2501 |
| 1432 | - | 7/26/2023 | 24 | 3 | 24.5% | 95.2 | 96% | 20.2% | 2502 |
| 1437 | - | 7/26/2023 | 25 | 19 | 22.0% | 102.6 | 98% | 18.4% | 2503 |
| 1442 | - | 7/26/2023 | 26 | 21 | 19.9% | 106.3 | 100% | 18.1% | 2504 |
| 1447 | - | 7/26/2023 | 27 | 19 | 21.9% | 104.4 | 99% | 18.4% | 2505 |
| 1452 | - | 7/26/2023 | 28 | 19 | 21.3% | 103.0 | 98% | 18.4% | 2506 |
| 1457 | - | 7/27/2023 | 29 | 3 | 23.5% | 98.9 | 100% | 20.2% | 2507 |
| 1462 | - | 7/27/2023 | 30 | 19 | 20.5% | 104.3 | 99% | 18.4% | 2508 |
| 1467 | - | 7/27/2023 | 31 | 19 | 22.8% | 103.9 | 99% | 18.4% | 2509 |
| 1472 | - | 7/27/2023 | 32 | 21 | 20.7% | 106.2 | 100% | 18.1% | 2510 |

Clay Field Test Results Summary
Cell 5 Phase 1

| Test No. | Retest of | Date | Lift | Proctor Reference No. | In-Place Moisture Content (%) | In-Place Dry Denisty (pcf) | Percent Compaction | Optimum Moisture | Passing Test # (Overall) |
|---|---|---|---|---|---|---|---|---|---|
| 1477 | - | 7/27/2023 | 33 | 3 | 24.2% | 98.7 | 99% | 20.2% | 2511 |
| 1482 | - | 7/27/2023 | 34 | 19 | 22.6% | 100.4 | 96% | 18.4% | 2512 |
| 1487 | - | 7/27/2023 | 35 | 19 | 22.3% | 102.8 | 98% | 18.4% | 2513 |
| 1492 | - | 7/27/2023 | 36 | 21 | 22.7% | 104.1 | 98% | 18.1% | 2514 |
| 1497 | - | 7/27/2023 | 37 | 3 | 24.8% | 94.5 | 95% | 20.2% | 2515 |
| 1502 | - | 7/27/2023 | 38 | 3 | 24.3% | 98.4 | 99% | 20.2% | 2516 |
| 1507 | - | 7/27/2023 | 39 | 19 | 19.8% | 102.2 | 97% | 18.4% | 2517 |
| 1512 | - | 7/27/2023 | 40 | 19 | 21.4% | 102.0 | 97% | 18.4% | 2518 |
| 1523 | - | 7/31/2023 | 41 | 20 | 34.1% | 78.9 | 100% | 32.9% | 2519 |
| 1534 | - | 7/31/2023 | 42 | 7 | 25.8% | 93.3 | 99% | 22.6% | 2520 |
| 1545 | - | 7/31/2023 | 43 | 7 | 26.5% | 90.8 | 97% | 22.6% | 2521 |
| 1556 | - | 7/31/2023 | 44 | 3 | 24.5% | 97.8 | 98% | 20.2% | 2522 |
| 1567 | - | 7/31/2023 | 45 | 19 | 21.5% | 103.2 | 98% | 18.4% | 2523 |
| 1578 | - | 7/31/2023 | 46 | 19 | 20.8% | 101.1 | 96% | 18.4% | 2524 |
| 1590 | - | 7/31/2023 | 47 | 19 | 24.7% | 100.5 | 96% | 18.4% | 2525 |
| 1603 | - | 8/1/2023 | 48 | 14 | 28.2% | 87.8 | 95% | 27.2% | 2526 |
| 1604 | - | 8/1/2023 | 49 | 7 | 23.1% | 91.0 | 97% | 22.6% | 2527 |
| 1616 | - | 8/1/2023 | 50 | 19 | 20.8% | 102.6 | 98% | 18.4% | 2528 |
| 1617 | - | 8/1/2023 | 51 | 19 | 21.4% | 102.1 | 97% | 18.4% | 2529 |
| 1629 | - | 8/1/2023 | 52 | 19 | 19.8% | 102.7 | 98% | 18.4% | 2530 |
| 1630 | - | 8/1/2023 | 53 | 19 | 23.6% | 100.8 | 96% | 18.4% | 2531 |
| 1642 | - | 8/1/2023 | 54 | 19 | 24.2% | 101.1 | 96% | 18.4% | 2532 |
| 1643 | - | 8/1/2023 | 55 | 19 | 23.5% | 102.5 | 98% | 18.4% | 2533 |
| 1655 | - | 8/1/2023 | 56 | 7 | 27.2% | 90.5 | 96% | 22.6% | 2534 |
| 1656 | - | 8/1/2023 | 57 | 3 | 23.0% | 99.1 | 100% | 20.2% | 2535 |
| 1668 | - | 8/1/2023 | 58 | 7 | 26.8% | 93.6 | 100% | 22.6% | 2536 |
| 1679 | - | 8/1/2023 | 59 | 21 | 20.9% | 107.4 | 101% | 18.1% | 2537 |
| 1690 | - | 8/2/2023 | 60 | 19 | 21.0% | 100.4 | 96% | 18.4% | 2538 |
| 1701 | - | 8/2/2023 | 61 | 10 | 26.2% | 92.0 | 97% | 25.0% | 2539 |
| 1712 | - | 8/2/2023 | 62 | 19 | 21.2% | 100.2 | 95% | 18.4% | 2540 |
| 1723 | - | 8/2/2023 | 63 | 3 | 22.7% | 96.8 | 97% | 20.2% | 2541 |
| 1734 | - | 8/2/2023 | 64 | 3 | 22.7% | 99.5 | 100% | 20.2% | 2542 |
| 1751 | - | 8/3/2023 | 65 | 19 | 22.9% | 100.4 | 96% | 18.4% | 2543 |
| 1762 | - | 8/3/2023 | 66 | 3 | 25.6% | 98.7 | 99% | 20.2% | 2544 |
| 1773 | - | 8/3/2023 | 67 | 3 | 23.5% | 97.8 | 98% | 20.2% | 2545 |
| 1784 | - | 8/3/2023 | 68 | 3 | 24.2% | 97.9 | 99% | 20.2% | 2546 |
| 1795 | - | 8/3/2023 | 69 | 7 | 29.4% | 90.0 | 96% | 22.6% | 2547 |
| 1806 | - | 8/3/2023 | 70 | 7 | 22.7% | 92.8 | 99% | 22.6% | 2548 |
| 1830 | - | 8/7/2023 | 71 | 3 | 23.3% | 96.8 | 97% | 20.2% | 2549 |
| 1853 | - | 8/7/2023 | 72 | 3 | 22.5% | 97.7 | 98% | 20.2% | 2550 |
| 1870 | - | 8/7/2023 | 73 | 21 | 19.2% | 106.5 | 100% | 18.1% | 2551 |
| 1882 | - | 8/7/2023 | 74 | 19 | 22.1% | 102.3 | 97% | 18.4% | 2552 |
| 1894 | - | 8/7/2023 | 75 | 3 | 23.5% | 99.4 | 100% | 20.2% | 2553 |
| 1906 | - | 8/7/2023 | 76 | 19 | 20.2% | 104.2 | 99% | 18.4% | 2554 |
| 1919 | - | 8/8/2023 | 77 | 19 | 21.0% | 104.3 | 99% | 18.4% | 2555 |
| 1931 | - | 8/8/2023 | 78 | 19 | 22.5% | 103.9 | 99% | 18.4% | 2556 |
| 1943 | - | 8/8/2023 | 79 | 19 | 22.3% | 103.3 | 98% | 18.4% | 2557 |
| 1955 | - | 8/8/2023 | 80 | 19 | 20.6% | 104.5 | 100% | 18.4% | 2558 |

Clay Field Test Results Summary
Cell 5 Phase 1

| Test No. | Retest of | Date | Lift | Proctor Reference No. | In-Place Moisture Content (%) | In-Place Dry Denisty (pcf) | Percent Compaction | Optimum Moisture | Passing Test # (Overall) |
|---|---|---|---|---|---|---|---|---|---|
| 1967 | - | 8/8/2023 | 81 | 19 | 19.3% | 101.9 | 97% | 18.4% | 2559 |
| 1979 | - | 8/8/2023 | 82 | 19 | 22.0% | 104.1 | 99% | 18.4% | 2560 |
| 1991 | - | 8/8/2023 | 83 | 3 | 22.2% | 99.2 | 100% | 20.2% | 2561 |
| 2003 | - | 8/8/2023 | 84 | 21 | 20.6% | 106.4 | 100% | 18.1% | 2562 |
| 2015 | - | 8/9/2023 | 85 | 19 | 23.1% | 103.1 | 98% | 18.4% | 2563 |
| 2027 | - | 8/9/2023 | 86 | 3 | 20.5% | 99.4 | 100% | 20.2% | 2564 |
| 2039 | - | 8/9/2023 | 87 | 16 | 22.9% | 101.6 | 100% | 20.2% | 2565 |
| 2051 | - | 8/9/2023 | 88 | 19 | 22.3% | 102.5 | 98% | 18.4% | 2566 |
| 2063 | - | 8/9/2023 | 89 | 19 | 21.8% | 103.9 | 99% | 18.4% | 2567 |
| 2075 | - | 8/9/2023 | 90 | 19 | 21.5% | 103.1 | 98% | 18.4% | 2568 |
| 2087 | - | 8/9/2023 | 91 | 19 | 19.8% | 103.4 | 98% | 18.4% | 2569 |
| 2093 | - | 8/10/2023 | 92 | 19 | 21.9% | 104.5 | 100% | 18.4% | 2570 |
| 2105 | - | 8/10/2023 | 93 | 19 | 20.7% | 104.1 | 99% | 18.4% | 2571 |
| 2117 | - | 8/10/2023 | 94 | 19 | 20.4% | 104.4 | 99% | 18.4% | 2572 |
| 2129 | - | 8/10/2023 | 95 | 19 | 22.7% | 103.3 | 98% | 18.4% | 2573 |
| 2141 | - | 8/10/2023 | 96 | 19 | 21.1% | 105.2 | 100% | 18.4% | 2574 |
| 2153 | - | 8/10/2023 | 97 | 19 | 20.3% | 104.4 | 99% | 18.4% | 2575 |
| 2165 | - | 8/11/2023 | 98 | 19 | 21.1% | 105.0 | 100% | 18.4% | 2576 |
| 2177 | - | 8/11/2023 | 99 | 21 | 19.3% | 106.0 | 100% | 18.1% | 2577 |
| 2189 | - | 8/11/2023 | 100 | 21 | 20.1% | 106.8 | 100% | 18.1% | 2578 |
| 2208 | - | 8/11/2023 | 101 | 21 | 19.2% | 106.5 | 100% | 18.1% | 2579 |
| 2209 | - | 8/11/2023 | 102 | 21 | 19.3% | 106.6 | 100% | 18.1% | 2580 |
| 2222 | - | 8/11/2023 | 103 | 19 | 19.6% | 101.3 | 96% | 18.4% | 2581 |
| 2235 | - | 8/11/2023 | 104 | 21 | 19.6% | 108.8 | 102% | 18.1% | 2582 |
| 2244 | - | 8/11/2023 | 105 | 19 | 20.8% | 103.7 | 99% | 18.4% | 2583 |
| 2257 | - | 8/14/2023 | 106 | 19 | 21.9% | 103.5 | 99% | 18.4% | 2584 |
| 2274 | - | 8/14/2023 | 107 | 16 | 21.7% | 103.1 | 101% | 20.2% | 2585 |
| 2287 | - | 8/14/2023 | 108 | 16 | 21.9% | 102.2 | 100% | 20.2% | 2586 |
| 2300 | - | 8/14/2023 | 109 | 16 | 21.8% | 101.5 | 100% | 20.2% | 2587 |
| 2313 | - | 8/14/2023 | 110 | 21 | 18.9% | 109.3 | 103% | 18.1% | 2588 |
| 2332 | - | 8/14/2023 | 111 | 16 | 21.4% | 102.8 | 101% | 20.2% | 2589 |
| 2487 | - | 8/17/2023 | 112 | 3 | 22.7% | 99.2 | 100% | 20.2% | 2590 |
| 2499 | - | 8/17/2023 | 113 | 21 | 19.6% | 105.8 | 100% | 18.1% | 2591 |
| 2511 | - | 8/17/2023 | 114 | 1 | 22.0% | 100.9 | 100% | 19.4% | 2592 |
| 2523 | - | 8/17/2023 | 115 | 19 | 21.9% | 105.5 | 100% | 18.4% | 2593 |
| 2535 | - | 8/17/2023 | 116 | 16 | 22.8% | 101.5 | 100% | 20.2% | 2594 |
| 2798 | - | 8/25/2023 | 117 | 3 | 23.5% | 97.3 | 98% | 20.2% | 2595 |
| 2809 | - | 8/25/2023 | 118 | 3 | 24.4% | 96.6 | 97% | 20.2% | 2596 |
| 2966 | - | 8/28/2023 | 119 | 16 | 21.9% | 101.6 | 100% | 20.2% | 2597 |
| 2972 | - | 8/28/2023 | 120 | 16 | 23.5% | 102.0 | 100% | 20.2% | 2598 |
| 3030 | - | 8/30/2023 | 121 | 16 | 25.4% | 97.0 | 95% | 20.2% | 2599 |
| 3036 | - | 8/30/2023 | 122 | 16 | 24.6% | 98.3 | 97% | 20.2% | 2600 |
| 3042 | - | 8/30/2023 | 123 | 16 | 23.1% | 103.5 | 102% | 20.2% | 2601 |
| 3048 | - | 8/30/2023 | 124 | 16 | 23.5% | 100.8 | 99% | 20.2% | 2602 |
| 3054 | - | 8/30/2023 | 125 | 16 | 23.8% | 103.1 | 101% | 20.2% | 2603 |
| 3056 | - | 8/30/2023 | 126 | 16 | 23.4% | 100.1 | 98% | 20.2% | 2604 |
| 3066 | - | 8/30/2023 | 127 | 16 | 22.4% | 101.1 | 99% | 20.2% | 2605 |
| 3072 | - | 8/30/2023 | 128 | 16 | 21.3% | 103.5 | 102% | 20.2% | 2606 |

Clay Field Test Results Summary
Cell 5 Phase 1

| Test No. | Retest of | Date | Lift | Proctor Reference No. | In-Place Moisture Content (%) | In-Place Dry Denisty (pcf) | Percent Compaction | Optimum Moisture | Passing Test # (Overall) |
|---|---|---|---|---|---|---|---|---|---|
| 3078 | - | 8/30/2023 | 129 | 16 | 20.3% | 103.0 | 101% | 20.2% | 2607 |
| 3080 | - | 8/31/2023 | 130 | 9 | 25.4% | 96.6 | 98% | 23.9% | 2608 |
| 3086 | - | 8/31/2023 | 131 | 16 | 23.1% | 101.6 | 100% | 20.2% | 2609 |
| 3092 | - | 8/31/2023 | 132 | 16 | 22.1% | 101.7 | 100% | 20.2% | 2610 |
| 3098 | - | 8/31/2023 | 133 | 16 | 22.6% | 100.9 | 99% | 20.2% | 2611 |
| 3104 | - | 8/31/2023 | 134 | 1 | 20.9% | 97.0 | 96% | 19.4% | 2612 |
| 3110 | - | 8/31/2023 | 135 | 3 | 24.4% | 95.9 | 97% | 20.2% | 2613 |
| 3116 | - | 9/1/2023 | 136 | 16 | 23.4% | 102.0 | 100% | 20.2% | 2614 |
| Z-56 | | | | | | | | | |
| 1518 | - | 7/31/2023 | 1 | 7 | 27.2% | 90.9 | 97% | 22.6% | 2615 |
| 1529 | - | 7/31/2023 | 2 | 3 | 24.6% | 96.6 | 97% | 20.2% | 2616 |
| 1540 | - | 7/31/2023 | 3 | 3 | 23.5% | 96.7 | 97% | 20.2% | 2617 |
| 1551 | - | 7/31/2023 | 4 | 21 | 18.2% | 108.5 | 102% | 18.1% | 2618 |
| 1562 | - | 7/31/2023 | 5 | 19 | 19.4% | 104.8 | 100% | 18.4% | 2619 |
| 1573 | - | 7/31/2023 | 6 | 19 | 22.5% | 100.6 | 96% | 18.4% | 2620 |
| 1584 | - | 7/31/2023 | 7 | 3 | 24.5% | 99.4 | 100% | 20.2% | 2621 |
| 1596 | - | 7/31/2023 | 8 | 19 | 19.1% | 102.8 | 98% | 18.4% | 2622 |
| 1597 | - | 8/1/2023 | 9 | 3 | 23.2% | 96.4 | 97% | 20.2% | 2623 |
| 1610 | - | 8/1/2023 | 10 | 3 | 24.0% | 99.3 | 100% | 20.2% | 2624 |
| 1623 | - | 8/1/2023 | 11 | 19 | 23.4% | 101.1 | 96% | 18.4% | 2625 |
| 1636 | - | 8/1/2023 | 12 | 7 | 25.7% | 92.9 | 99% | 22.6% | 2626 |
| 1649 | - | 8/1/2023 | 13 | 3 | 22.3% | 97.6 | 98% | 20.2% | 2627 |
| 1662 | - | 8/1/2023 | 14 | 19 | 21.7% | 100.4 | 96% | 18.4% | 2628 |
| 1673 | - | 8/1/2023 | 15 | 21 | 18.3% | 105.1 | 99% | 18.1% | 2629 |
| 1684 | - | 8/2/2023 | 16 | 3 | 25.8% | 98.5 | 99% | 20.2% | 2630 |
| 1695 | - | 8/2/2023 | 17 | 3 | 25.9% | 95.3 | 96% | 20.2% | 2631 |
| 1706 | - | 8/2/2023 | 18 | 19 | 21.3% | 101.0 | 96% | 18.4% | 2632 |
| 1717 | - | 8/2/2023 | 19 | 3 | 26.5% | 94.5 | 95% | 20.2% | 2633 |
| 1728 | - | 8/2/2023 | 20 | 3 | 27.6% | 97.2 | 98% | 20.2% | 2634 |
| 1739 | - | 8/2/2023 | 21 | 19 | 19.6% | 102.5 | 98% | 18.4% | 2635 |
| 1745 | - | 8/3/2023 | 22 | 19 | 22.4% | 103.9 | 99% | 18.4% | 2636 |
| 1756 | - | 8/3/2023 | 23 | 19 | 20.2% | 102.0 | 97% | 18.4% | 2637 |
| 1767 | - | 8/3/2023 | 24 | 19 | 20.7% | 102.9 | 98% | 18.4% | 2638 |
| 1778 | - | 8/3/2023 | 25 | 3 | 26.8% | 95.9 | 97% | 20.2% | 2639 |
| 1789 | - | 8/3/2023 | 26 | 19 | 23.4% | 101.0 | 96% | 18.4% | 2640 |
| 1800 | - | 8/3/2023 | 27 | 3 | 26.0% | 95.5 | 96% | 20.2% | 2641 |
| 1811 | - | 8/3/2023 | 28 | 3 | 27.1% | 95.2 | 96% | 20.2% | 2642 |
| 1854 | - | 8/7/2023 | 29 | 19 | 21.4% | 101.1 | 96% | 18.4% | 2643 |
| 1871 | - | 8/7/2023 | 30 | 19 | 21.7% | 103.8 | 99% | 18.4% | 2644 |
| 1883 | - | 8/7/2023 | 31 | 19 | 21.7% | 104.3 | 99% | 18.4% | 2645 |
| 1900 | - | 8/7/2023 | 32 | 19 | 22.7% | 100.2 | 95% | 18.4% | 2646 |
| 1912 | - | 8/7/2023 | 33 | 19 | 22.9% | 101.2 | 96% | 18.4% | 2647 |
| 1925 | - | 8/8/2023 | 34 | 19 | 22.4% | 102.4 | 98% | 18.4% | 2648 |
| 1937 | - | 8/8/2023 | 35 | 19 | 20.5% | 103.3 | 98% | 18.4% | 2649 |
| 1944 | - | 8/8/2023 | 36 | 19 | 22.3% | 103.3 | 98% | 18.4% | 2650 |
| 1956 | - | 8/8/2023 | 37 | 3 | 22.8% | 99.2 | 100% | 20.2% | 2651 |
| 1968 | - | 8/8/2023 | 38 | 19 | 22.4% | 100.9 | 96% | 18.4% | 2652 |
| 1980 | - | 8/8/2023 | 39 | 19 | 19.1% | 100.7 | 96% | 18.4% | 2653 |

Clay Field Test Results Summary
Cell 5 Phase 1

| Test No. | Retest of | Date | Lift | Proctor Reference No. | In-Place Moisture Content (%) | In-Place Dry Denisty (pcf) | Percent Compaction | Optimum Moisture | Passing Test # (Overall) |
|---|---|---|---|---|---|---|---|---|---|
| 1992 | - | 8/8/2023 | 40 | 16 | 23.7% | 101.4 | 100% | 20.2% | 2654 |
| 2004 | - | 8/8/2023 | 41 | 19 | 19.6% | 102.3 | 97% | 18.4% | 2655 |
| 2016 | - | 8/9/2023 | 42 | 19 | 22.2% | 104.8 | 100% | 18.4% | 2656 |
| 2028 | - | 8/9/2023 | 43 | 16 | 22.9% | 101.6 | 100% | 20.2% | 2657 |
| 2040 | - | 8/9/2023 | 44 | 3 | 20.9% | 99.9 | 101% | 20.2% | 2658 |
| 2052 | - | 8/9/2023 | 45 | 19 | 22.4% | 104.1 | 99% | 18.4% | 2659 |
| 2064 | - | 8/9/2023 | 46 | 16 | 22.0% | 100.4 | 99% | 20.2% | 2660 |
| 2076 | - | 8/9/2023 | 47 | 19 | 21.1% | 100.2 | 95% | 18.4% | 2661 |
| 2094 | - | 8/10/2023 | 48 | 3 | 22.2% | 98.8 | 99% | 20.2% | 2662 |
| 2106 | - | 8/10/2023 | 49 | 21 | 21.3% | 107.3 | 101% | 18.1% | 2663 |
| 2118 | - | 8/10/2023 | 50 | 16 | 21.3% | 100.2 | 98% | 20.2% | 2664 |
| 2130 | - | 8/10/2023 | 51 | 21 | 20.3% | 106.6 | 100% | 18.1% | 2665 |
| 2142 | - | 8/10/2023 | 52 | 16 | 22.9% | 101.8 | 100% | 20.2% | 2666 |
| 2154 | - | 8/10/2023 | 53 | 19 | 22.2% | 103.6 | 99% | 18.4% | 2667 |
| 2166 | - | 8/11/2023 | 54 | 19 | 20.8% | 105.7 | 101% | 18.4% | 2668 |
| 2178 | - | 8/11/2023 | 55 | 21 | 21.8% | 105.5 | 99% | 18.1% | 2669 |
| 2190 | - | 8/11/2023 | 56 | 21 | 21.9% | 105.9 | 100% | 18.1% | 2670 |
| 2210 | - | 8/11/2023 | 57 | 21 | 19.5% | 106.6 | 100% | 18.1% | 2671 |
| 2223 | - | 8/11/2023 | 58 | 19 | 21.1% | 103.6 | 99% | 18.4% | 2672 |
| 2236 | - | 8/11/2023 | 59 | 3 | 21.6% | 97.9 | 99% | 20.2% | 2673 |
| 2242 | - | 8/11/2023 | 60 | 3 | 21.5% | 98.6 | 99% | 20.2% | 2674 |
| 2258 | - | 8/14/2023 | 61 | 19 | 24.2% | 101.9 | 97% | 18.4% | 2675 |
| 2275 | - | 8/14/2023 | 62 | 21 | 21.6% | 106.2 | 100% | 18.1% | 2676 |
| 2288 | - | 8/14/2023 | 63 | 16 | 22.3% | 102.0 | 100% | 20.2% | 2677 |
| 2301 | - | 8/14/2023 | 64 | 16 | 22.4% | 103.1 | 101% | 20.2% | 2678 |
| 2314 | - | 8/14/2023 | 65 | 16 | 22.5% | 102.3 | 100% | 20.2% | 2679 |
| 2320 | - | 8/14/2023 | 66 | 19 | 20.5% | 104.1 | 99% | 18.4% | 2680 |
| 2362 | - | 8/15/2023 | 67 | 3 | 23.4% | 95.1 | 96% | 20.2% | 2681 |
| 2364 | - | 8/15/2023 | 68 | 7 | 22.7% | 92.0 | 98% | 22.6% | 2682 |
| 2376 | - | 8/15/2023 | 69 | 3 | 24.3% | 98.7 | 99% | 20.2% | 2683 |
| 2378 | - | 8/15/2023 | 69 | 3 | 24.8% | 98.1 | 99% | 20.2% | 2684 |
| 2391 | - | 8/15/2023 | 71 | 19 | 20.7% | 103.0 | 98% | 18.4% | 2685 |
| 2403 | - | 8/15/2023 | 72 | 16 | 23.0% | 100.6 | 99% | 20.2% | 2686 |
| 2411 | - | 8/15/2023 | 73 | 1 | 20.9% | 102.9 | 102% | 19.4% | 2687 |
| 2423 | - | 8/16/2023 | 74 | 1 | 23.0% | 100.0 | 99% | 19.4% | 2688 |
| 2433 | - | 8/16/2023 | 75 | 21 | 19.9% | 106.0 | 100% | 18.1% | 2689 |
| 2441 | - | 8/16/2023 | 76 | 16 | 21.1% | 101.7 | 100% | 20.2% | 2690 |
| 2453 | - | 8/16/2023 | 77 | 19 | 20.8% | 104.9 | 100% | 18.4% | 2691 |
| 2460 | - | 8/16/2023 | 78 | 1 | 22.5% | 100.2 | 99% | 19.4% | 2692 |
| 2467 | - | 8/16/2023 | 79 | 16 | 22.2% | 102.9 | 101% | 20.2% | 2693 |
| 2474 | - | 8/16/2023 | 80 | 1 | 20.2% | 102.9 | 102% | 19.4% | 2694 |
| 2488 | - | 8/17/2023 | 81 | 16 | 22.4% | 101.7 | 100% | 20.2% | 2695 |
| 2500 | - | 8/17/2023 | 82 | 16 | 21.2% | 104.1 | 102% | 20.2% | 2696 |
| 2512 | - | 8/17/2023 | 83 | 16 | 23.2% | 102.6 | 101% | 20.2% | 2697 |
| 2524 | - | 8/17/2023 | 84 | 21 | 18.9% | 105.8 | 100% | 18.1% | 2698 |
| 2536 | - | 8/17/2023 | 85 | 19 | 20.9% | 104.4 | 99% | 18.4% | 2699 |
| 2547 | - | 8/17/2023 | 86 | 16 | 23.2% | 101.6 | 100% | 20.2% | 2700 |
| 2564 | - | 8/18/2023 | 87 | 3 | 24.5% | 98.9 | 100% | 20.2% | 2701 |

Clay Field Test Results Summary
Cell 5 Phase 1

| Test No. | Retest of | Date | Lift | Proctor Reference No. | In-Place Moisture Content (%) | In-Place Dry Denisty (pcf) | Percent Compaction | Optimum Moisture | Passing Test # (Overall) |
|---|---|---|---|---|---|---|---|---|---|
| 2575 | - | 8/18/2023 | 88 | 3 | 24.3% | 100.3 | 101% | 20.2% | 2702 |
| 2586 | - | 8/18/2023 | 89 | 16 | 22.0% | 101.0 | 99% | 20.2% | 2703 |
| 2597 | - | 8/18/2023 | 90 | 3 | 24.0% | 99.3 | 100% | 20.2% | 2704 |
| 2608 | - | 8/18/2023 | 91 | 16 | 21.3% | 102.8 | 101% | 20.2% | 2705 |
| 2619 | - | 8/18/2023 | 92 | 16 | 22.8% | 101.9 | 100% | 20.2% | 2706 |
| 2630 | - | 8/19/2023 | 93 | 3 | 21.4% | 96.3 | 97% | 20.2% | 2707 |
| 2640 | - | 8/19/2023 | 94 | 16 | 21.8% | 102.7 | 101% | 20.2% | 2708 |
| 2652 | - | 8/21/2023 | 95 | 21 | 20.4% | 107.8 | 101% | 18.1% | 2709 |
| 2663 | - | 8/21/2023 | 96 | 19 | 20.3% | 104.2 | 99% | 18.4% | 2710 |
| 2674 | - | 8/21/2023 | 97 | 19 | 21.9% | 105.5 | 100% | 18.4% | 2711 |
| 2685 | - | 8/21/2023 | 98 | 16 | 22.7% | 101.1 | 99% | 20.2% | 2712 |
| 2705 | - | 8/22/2023 | 99 | 16 | 22.7% | 104.9 | 103% | 20.2% | 2713 |
| 2706 | - | 8/22/2023 | 100 | 16 | 22.7% | 105.0 | 103% | 20.2% | 2714 |
| 2736 | - | 8/22/2023 | 101 | 16 | 23.2% | 99.9 | 98% | 20.2% | 2715 |
| 2753 | - | 8/22/2023 | 102 | 1 | 19.8% | 98.6 | 98% | 19.4% | 2716 |
| 2789 | - | 8/25/2023 | 103 | 19 | 20.2% | 104.5 | 100% | 18.4% | 2717 |
| 2799 | - | 8/25/2023 | 104 | 3 | 21.9% | 96.5 | 97% | 20.2% | 2718 |
| 2810 | - | 8/25/2023 | 105 | 16 | 22.4% | 102.3 | 100% | 20.2% | 2719 |
| 2814 | - | 8/25/2023 | 106 | 1 | 20.6% | 102.4 | 102% | 19.4% | 2720 |
| 2818 | - | 8/25/2023 | 107 | 1 | 21.0% | 102.4 | 102% | 19.4% | 2721 |
| 2826 | - | 8/26/2023 | 108 | 16 | 23.3% | 102.4 | 101% | 20.2% | 2722 |
| 2831 | - | 8/26/2023 | 109 | 3 | 23.7% | 98.4 | 99% | 20.2% | 2723 |
| 2836 | - | 8/26/2023 | 110 | 16 | 23.1% | 101.3 | 100% | 20.2% | 2724 |
| 2840 | - | 8/26/2023 | 111 | 16 | 23.6% | 101.7 | 100% | 20.2% | 2725 |
| 2845 | - | 8/26/2023 | 112 | 16 | 21.5% | 99.7 | 98% | 20.2% | 2726 |
| 2850 | - | 8/26/2023 | 113 | 16 | 24.4% | 100.7 | 99% | 20.2% | 2727 |
| 2855 | - | 8/26/2023 | 114 | 16 | 23.4% | 101.3 | 100% | 20.2% | 2728 |
| 2860 | - | 8/26/2023 | 115 | 7 | 30.0% | 88.9 | 95% | 22.6% | 2729 |
| 2865 | - | 8/26/2023 | 116 | 16 | 20.4% | 102.3 | 100% | 20.2% | 2730 |
| 2870 | - | 8/26/2023 | 117 | 16 | 22.3% | 100.6 | 99% | 20.2% | 2731 |
| 2875 | - | 8/26/2023 | 118 | 16 | 22.2% | 102.7 | 101% | 20.2% | 2732 |
| 2880 | - | 8/27/2023 | 119 | 16 | 23.1% | 102.9 | 101% | 20.2% | 2733 |
| 2885 | - | 8/27/2023 | 120 | 16 | 25.1% | 99.9 | 98% | 20.2% | 2734 |
| 2890 | - | 8/27/2023 | 121 | 16 | 22.9% | 102.2 | 100% | 20.2% | 2735 |
| 2895 | - | 8/27/2023 | 122 | 16 | 21.8% | 103.1 | 101% | 20.2% | 2736 |
| 2900 | - | 8/27/2023 | 123 | 16 | 23.6% | 99.9 | 98% | 20.2% | 2737 |
| 2905 | - | 8/27/2023 | 124 | 16 | 24.8% | 99.6 | 98% | 20.2% | 2738 |
| 2910 | - | 8/27/2023 | 125 | 16 | 21.7% | 101.2 | 99% | 20.2% | 2739 |
| 2915 | - | 8/27/2023 | 126 | 16 | 23.4% | 101.1 | 99% | 20.2% | 2740 |
| 2916 | - | 8/28/2023 | 127 | 16 | 21.7% | 104.1 | 102% | 20.2% | 2741 |
| 2921 | - | 8/28/2023 | 128 | 16 | 20.6% | 104.8 | 103% | 20.2% | 2742 |
| 2926 | - | 8/28/2023 | 129 | 16 | 20.9% | 103.3 | 101% | 20.2% | 2743 |
| 2931 | - | 8/28/2023 | 130 | 16 | 22.6% | 103.2 | 101% | 20.2% | 2744 |
| 2936 | - | 8/28/2023 | 131 | 16 | 20.3% | 103.4 | 102% | 20.2% | 2745 |
| 2941 | - | 8/28/2023 | 132 | 16 | 21.4% | 102.9 | 101% | 20.2% | 2746 |
| 2946 | - | 8/28/2023 | 133 | 15 | 27.2% | 95.6 | 97% | 24.1% | 2747 |
| 2951 | - | 8/28/2023 | 134 | 16 | 22.2% | 103.4 | 102% | 20.2% | 2748 |
| 2956 | - | 8/28/2023 | 135 | 16 | 22.5% | 98.9 | 97% | 20.2% | 2749 |

Clay Field Test Results Summary
Cell 5 Phase 1

| Test No. | Retest of | Date | Lift | Proctor Reference No. | In-Place Moisture Content (%) | In-Place Dry Denisty (pcf) | Percent Compaction | Optimum Moisture | Passing Test # (Overall) |
|---|---|---|---|---|---|---|---|---|---|
| 2961 | - | 8/28/2023 | 136 | 16 | 23.2% | 102.2 | 100% | 20.2% | 2750 |
| 2967 | - | 8/28/2023 | 137 | 16 | 23.6% | 100.4 | 99% | 20.2% | 2751 |
| 2973 | - | 8/28/2023 | 138 | 16 | 22.7% | 99.5 | 98% | 20.2% | 2752 |
| 3031 | - | 8/30/2023 | 139 | 16 | 23.0% | 101.0 | 99% | 20.2% | 2753 |
| 3037 | - | 8/30/2023 | 140 | 16 | 21.7% | 101.4 | 100% | 20.2% | 2754 |
| 3043 | - | 8/30/2023 | 141 | 16 | 22.1% | 102.7 | 101% | 20.2% | 2755 |
| 3049 | - | 8/30/2023 | 142 | 16 | 20.7% | 101.8 | 100% | 20.2% | 2756 |
| 3055 | - | 8/30/2023 | 143 | 16 | 23.2% | 101.5 | 100% | 20.2% | 2757 |
| 3057 | - | 8/30/2023 | 144 | 16 | 23.4% | 97.6 | 96% | 20.2% | 2758 |
| 3067 | - | 8/30/2023 | 145 | 16 | 23.1% | 98.9 | 97% | 20.2% | 2759 |
| 3073 | - | 8/30/2023 | 146 | 13 | 23.0% | 96.2 | 98% | 21.7% | 2760 |
| 3079 | - | 8/30/2023 | 147 | 16 | 22.1% | 103.1 | 101% | 20.2% | 2761 |
| 3081 | - | 8/31/2023 | 148 | 16 | 23.4% | 101.5 | 100% | 20.2% | 2762 |
| 3087 | - | 8/31/2023 | 149 | 16 | 21.7% | 98.2 | 96% | 20.2% | 2763 |
| 3093 | - | 8/31/2023 | 150 | 16 | 24.2% | 100.4 | 99% | 20.2% | 2764 |
| 3099 | - | 8/31/2023 | 151 | 16 | 24.3% | 101.0 | 99% | 20.2% | 2765 |
| 3105 | - | 8/31/2023 | 152 | 1 | 23.2% | 96.1 | 95% | 19.4% | 2766 |
| 3111 | - | 8/31/2023 | 153 | 1 | 22.8% | 100.6 | 100% | 19.4% | 2767 |
| 3117 | - | 9/1/2023 | 154 | 16 | 22.6% | 102.8 | 101% | 20.2% | 2768 |
| Z-57 | | | | | | | | | |
| 1517 | - | 7/31/2023 | 1 | 19 | 22.0% | 100.7 | 96% | 18.4% | 2769 |
| 1528 | - | 7/31/2023 | 2 | 3 | 24.8% | 97.5 | 98% | 20.2% | 2770 |
| 1539 | - | 7/31/2023 | 3 | 3 | 22.2% | 97.6 | 98% | 20.2% | 2771 |
| 1550 | - | 7/31/2023 | 4 | 3 | 21.3% | 96.8 | 97% | 20.2% | 2772 |
| 1561 | - | 7/31/2023 | 5 | 13 | 22.2% | 93.8 | 96% | 21.7% | 2773 |
| 1572 | - | 7/31/2023 | 6 | 7 | 25.3% | 93.8 | 100% | 22.6% | 2774 |
| 1583 | - | 7/31/2023 | 7 | 3 | 22.5% | 98.7 | 99% | 20.2% | 2775 |
| 1595 | - | 7/31/2023 | 8 | 19 | 20.5% | 100.2 | 95% | 18.4% | 2776 |
| 1598 | - | 8/1/2023 | 9 | 3 | 22.7% | 99.1 | 100% | 20.2% | 2777 |
| 1611 | - | 8/1/2023 | 10 | 3 | 25.8% | 96.6 | 97% | 20.2% | 2778 |
| 1624 | - | 8/1/2023 | 11 | 3 | 23.3% | 98.9 | 100% | 20.2% | 2779 |
| 1637 | - | 8/1/2023 | 12 | 3 | 21.8% | 99.4 | 100% | 20.2% | 2780 |
| 1650 | - | 8/1/2023 | 13 | 14 | 29.8% | 89.6 | 97% | 27.2% | 2781 |
| 1663 | - | 8/1/2023 | 14 | 3 | 22.7% | 98.4 | 99% | 20.2% | 2782 |
| 1674 | - | 8/1/2023 | 15 | 19 | 20.8% | 100.7 | 96% | 18.4% | 2783 |
| 1685 | - | 8/2/2023 | 16 | 3 | 25.0% | 99.1 | 100% | 20.2% | 2784 |
| 1696 | - | 8/2/2023 | 17 | 7 | 26.5% | 92.7 | 99% | 22.6% | 2785 |
| 1707 | - | 8/2/2023 | 18 | 19 | 19.2% | 100.9 | 96% | 18.4% | 2786 |
| 1718 | - | 8/2/2023 | 19 | 3 | 26.2% | 95.9 | 97% | 20.2% | 2787 |
| 1729 | - | 8/2/2023 | 20 | 3 | 25.1% | 98.6 | 99% | 20.2% | 2788 |
| 1740 | - | 8/2/2023 | 21 | 19 | 19.1% | 103.2 | 98% | 18.4% | 2789 |
| 1746 | - | 8/3/2023 | 22 | 19 | 21.8% | 102.2 | 97% | 18.4% | 2790 |
| 1757 | - | 8/3/2023 | 23 | 19 | 22.2% | 101.8 | 97% | 18.4% | 2791 |
| 1768 | - | 8/3/2023 | 24 | 19 | 20.8% | 100.1 | 95% | 18.4% | 2792 |
| 1779 | - | 8/3/2023 | 25 | 3 | 27.3% | 95.2 | 96% | 20.2% | 2793 |
| 1790 | - | 8/3/2023 | 26 | 3 | 21.9% | 99.7 | 100% | 20.2% | 2794 |
| 1801 | - | 8/3/2023 | 27 | 3 | 25.0% | 95.7 | 96% | 20.2% | 2795 |
| 1812 | - | 8/3/2023 | 28 | 19 | 23.0% | 99.9 | 95% | 18.4% | 2796 |

Clay Field Test Results Summary
Cell 5 Phase 1

| Test No. | Retest of | Date | Lift | Proctor Reference No. | In-Place Moisture Content (%) | In-Place Dry Denisty (pcf) | Percent Compaction | Optimum Moisture | Passing Test # (Overall) |
|---|---|---|---|---|---|---|---|---|---|
| 1855 | - | 8/7/2023 | 29 | 3 | 22.1% | 99.4 | 100% | 20.2% | 2797 |
| 1872 | - | 8/7/2023 | 30 | 3 | 24.4% | 95.6 | 96% | 20.2% | 2798 |
| 1884 | - | 8/7/2023 | 31 | 3 | 21.8% | 99.3 | 100% | 20.2% | 2799 |
| 1899 | - | 8/7/2023 | 32 | 19 | 22.5% | 103.5 | 99% | 18.4% | 2800 |
| 1911 | - | 8/7/2023 | 33 | 19 | 22.6% | 102.7 | 98% | 18.4% | 2801 |
| 1924 | - | 8/8/2023 | 34 | 19 | 23.4% | 100.0 | 95% | 18.4% | 2802 |
| 1936 | - | 8/8/2023 | 35 | 21 | 20.3% | 106.5 | 100% | 18.1% | 2803 |
| 1945 | - | 8/8/2023 | 36 | 19 | 18.9% | 102.8 | 98% | 18.4% | 2804 |
| 1957 | - | 8/8/2023 | 37 | 19 | 20.1% | 104.2 | 99% | 18.4% | 2805 |
| 1969 | - | 8/8/2023 | 38 | 19 | 21.0% | 100.9 | 96% | 18.4% | 2806 |
| 1981 | - | 8/8/2023 | 39 | 19 | 20.1% | 103.9 | 99% | 18.4% | 2807 |
| 1993 | - | 8/8/2023 | 40 | 19 | 22.7% | 103.0 | 98% | 18.4% | 2808 |
| 2005 | - | 8/8/2023 | 41 | 19 | 20.2% | 103.4 | 98% | 18.4% | 2809 |
| 2017 | - | 8/9/2023 | 42 | 21 | 22.0% | 105.9 | 100% | 18.1% | 2810 |
| 2029 | - | 8/9/2023 | 43 | 19 | 22.8% | 103.5 | 99% | 18.4% | 2811 |
| 2041 | - | 8/9/2023 | 44 | 19 | 20.5% | 101.9 | 97% | 18.4% | 2812 |
| 2053 | - | 8/9/2023 | 45 | 19 | 21.9% | 104.1 | 99% | 18.4% | 2813 |
| 2065 | - | 8/9/2023 | 46 | 19 | 22.6% | 102.7 | 98% | 18.4% | 2814 |
| 2077 | - | 8/9/2023 | 47 | 3 | 22.4% | 97.2 | 98% | 20.2% | 2815 |
| 2095 | - | 8/10/2023 | 48 | 21 | 20.4% | 106.8 | 100% | 18.1% | 2816 |
| 2107 | - | 8/10/2023 | 49 | 16 | 22.0% | 101.3 | 100% | 20.2% | 2817 |
| 2119 | - | 8/10/2023 | 50 | 16 | 22.6% | 101.6 | 100% | 20.2% | 2818 |
| 2131 | - | 8/10/2023 | 51 | 21 | 20.0% | 106.6 | 100% | 18.1% | 2819 |
| 2143 | - | 8/10/2023 | 52 | 19 | 23.7% | 103.1 | 98% | 18.4% | 2820 |
| 2155 | - | 8/10/2023 | 53 | 16 | 21.6% | 100.9 | 99% | 20.2% | 2821 |
| 2167 | - | 8/11/2023 | 54 | 19 | 22.1% | 105.1 | 100% | 18.4% | 2822 |
| 2179 | - | 8/11/2023 | 55 | 19 | 21.8% | 102.1 | 97% | 18.4% | 2823 |
| 2191 | - | 8/11/2023 | 56 | 21 | 21.5% | 107.1 | 101% | 18.1% | 2824 |
| 2211 | - | 8/11/2023 | 57 | 16 | 23.0% | 101.1 | 99% | 20.2% | 2825 |
| 2224 | - | 8/11/2023 | 58 | 21 | 20.7% | 105.9 | 100% | 18.1% | 2826 |
| 2237 | - | 8/11/2023 | 59 | 19 | 20.9% | 101.9 | 97% | 18.4% | 2827 |
| 2243 | - | 8/11/2023 | 60 | 19 | 20.4% | 102.1 | 97% | 18.4% | 2828 |
| 2259 | - | 8/14/2023 | 61 | 19 | 20.8% | 103.9 | 99% | 18.4% | 2829 |
| 2276 | - | 8/14/2023 | 62 | 19 | 21.0% | 103.1 | 98% | 18.4% | 2830 |
| 2289 | - | 8/14/2023 | 63 | 16 | 22.9% | 103.2 | 101% | 20.2% | 2831 |
| 2302 | - | 8/14/2023 | 64 | 16 | 22.2% | 104.0 | 102% | 20.2% | 2832 |
| 2315 | - | 8/14/2023 | 65 | 16 | 22.5% | 102.5 | 101% | 20.2% | 2833 |
| 2321 | - | 8/14/2023 | 66 | 16 | 22.2% | 103.2 | 101% | 20.2% | 2834 |
| 2363 | - | 8/15/2023 | 67 | 16 | 21.1% | 97.5 | 96% | 20.2% | 2835 |
| 2365 | - | 8/15/2023 | 68 | 19 | 19.9% | 100.8 | 96% | 18.4% | 2836 |
| 2377 | - | 8/15/2023 | 70 | 1 | 24.1% | 99.8 | 99% | 19.4% | 2837 |
| 2379 | - | 8/15/2023 | 70 | 3 | 24.1% | 98.3 | 99% | 20.2% | 2838 |
| 2392 | - | 8/15/2023 | 71 | 1 | 20.2% | 101.0 | 100% | 19.4% | 2839 |
| 2404 | - | 8/15/2023 | 72 | 16 | 23.3% | 100.3 | 99% | 20.2% | 2840 |
| 2412 | - | 8/15/2023 | 73 | 16 | 21.7% | 102.9 | 101% | 20.2% | 2841 |
| 2424 | - | 8/16/2023 | 74 | 3 | 24.8% | 99.0 | 100% | 20.2% | 2842 |
| 2434 | - | 8/16/2023 | 75 | 16 | 22.1% | 103.3 | 101% | 20.2% | 2843 |
| 2442 | - | 8/16/2023 | 76 | 16 | 22.6% | 102.8 | 101% | 20.2% | 2844 |

Clay Field Test Results Summary
Cell 5 Phase 1

| Test No. | Retest of | Date | Lift | Proctor Reference No. | In-Place Moisture Content (%) | In-Place Dry Denisty (pcf) | Percent Compaction | Optimum Moisture | Passing Test # (Overall) |
|---|---|---|---|---|---|---|---|---|---|
| 2454 | - | 8/16/2023 | 77 | 21 | 20.7% | 106.5 | 100% | 18.1% | 2845 |
| 2461 | - | 8/16/2023 | 78 | 1 | 19.8% | 103.0 | 102% | 19.4% | 2846 |
| 2468 | - | 8/16/2023 | 79 | 16 | 23.9% | 101.3 | 100% | 20.2% | 2847 |
| 2475 | - | 8/16/2023 | 80 | 1 | 20.7% | 103.4 | 103% | 19.4% | 2848 |
| 2489 | - | 8/17/2023 | 81 | 16 | 22.3% | 100.7 | 99% | 20.2% | 2849 |
| 2501 | - | 8/17/2023 | 82 | 1 | 23.7% | 100.6 | 100% | 19.4% | 2850 |
| 2513 | - | 8/17/2023 | 83 | 16 | 23.1% | 101.1 | 99% | 20.2% | 2851 |
| 2525 | - | 8/17/2023 | 84 | 19 | 18.8% | 105.4 | 100% | 18.4% | 2852 |
| 2537 | - | 8/17/2023 | 85 | 1 | 20.5% | 102.4 | 102% | 19.4% | 2853 |
| 2548 | - | 8/17/2023 | 86 | 7 | 24.1% | 92.1 | 98% | 22.6% | 2854 |
| 2565 | - | 8/18/2023 | 87 | 16 | 21.8% | 101.2 | 99% | 20.2% | 2855 |
| 2576 | - | 8/18/2023 | 88 | 16 | 23.0% | 101.4 | 100% | 20.2% | 2856 |
| 2587 | - | 8/18/2023 | 89 | 16 | 24.2% | 100.6 | 99% | 20.2% | 2857 |
| 2598 | - | 8/18/2023 | 90 | 16 | 21.6% | 101.2 | 99% | 20.2% | 2858 |
| 2609 | - | 8/18/2023 | 91 | 3 | 23.8% | 95.6 | 96% | 20.2% | 2859 |
| 2620 | - | 8/18/2023 | 92 | 3 | 25.3% | 95.8 | 96% | 20.2% | 2860 |
| 2631 | - | 8/19/2023 | 93 | 16 | 21.3% | 102.8 | 101% | 20.2% | 2861 |
| 2641 | - | 8/19/2023 | 94 | 1 | 20.2% | 101.6 | 101% | 19.4% | 2862 |
| 2653 | - | 8/21/2023 | 95 | 16 | 22.6% | 101.6 | 100% | 20.2% | 2863 |
| 2664 | - | 8/21/2023 | 96 | 21 | 21.6% | 106.6 | 100% | 18.1% | 2864 |
| 2675 | - | 8/21/2023 | 97 | 16 | 21.6% | 104.4 | 103% | 20.2% | 2865 |
| 2686 | - | 8/21/2023 | 98 | 1 | 21.9% | 100.3 | 100% | 19.4% | 2866 |
| 2707 | - | 8/22/2023 | 99 | 21 | 19.9% | 106.8 | 100% | 18.1% | 2867 |
| 2708 | - | 8/22/2023 | 100 | 21 | 19.6% | 107.3 | 101% | 18.1% | 2868 |
| 2737 | - | 8/22/2023 | 101 | 16 | 23.7% | 100.1 | 98% | 20.2% | 2869 |
| 2754 | - | 8/22/2023 | 102 | 3 | 23.9% | 99.5 | 100% | 20.2% | 2870 |
| 2788 | - | 8/25/2023 | 103 | 16 | 21.5% | 104.5 | 103% | 20.2% | 2871 |
| 2800 | - | 8/25/2023 | 104 | 3 | 25.1% | 94.5 | 95% | 20.2% | 2872 |
| 2811 | - | 8/25/2023 | 105 | 3 | 25.1% | 98.2 | 99% | 20.2% | 2873 |
| 2815 | - | 8/25/2023 | 106 | 16 | 21.2% | 102.8 | 101% | 20.2% | 2874 |
| 2819 | - | 8/25/2023 | 107 | 1 | 23.1% | 100.3 | 100% | 19.4% | 2875 |
| 2822 | - | 8/26/2023 | 108 | 16 | 24.2% | 100.8 | 99% | 20.2% | 2876 |
| 2827 | - | 8/26/2023 | 109 | 3 | 24.1% | 98.5 | 99% | 20.2% | 2877 |
| 2832 | - | 8/26/2023 | 110 | 16 | 22.7% | 102.1 | 100% | 20.2% | 2878 |
| 2837 | - | 8/26/2023 | 111 | 16 | 24.3% | 100.5 | 99% | 20.2% | 2879 |
| 2841 | - | 8/26/2023 | 112 | 16 | 23.2% | 102.9 | 101% | 20.2% | 2880 |
| 2846 | - | 8/26/2023 | 113 | 16 | 23.4% | 102.4 | 101% | 20.2% | 2881 |
| 2851 | - | 8/26/2023 | 114 | 16 | 24.5% | 96.9 | 95% | 20.2% | 2882 |
| 2856 | - | 8/26/2023 | 115 | 16 | 24.4% | 98.1 | 96% | 20.2% | 2883 |
| 2861 | - | 8/26/2023 | 116 | 16 | 21.1% | 100.1 | 98% | 20.2% | 2884 |
| 2866 | - | 8/26/2023 | 117 | 16 | 25.2% | 97.5 | 96% | 20.2% | 2885 |
| 2871 | - | 8/26/2023 | 118 | 16 | 23.3% | 100.4 | 99% | 20.2% | 2886 |
| 2876 | - | 8/26/2023 | 119 | 16 | 24.0% | 100.7 | 99% | 20.2% | 2887 |
| 2881 | - | 8/27/2023 | 120 | 16 | 24.3% | 101.9 | 100% | 20.2% | 2888 |
| 2886 | - | 8/27/2023 | 121 | 16 | 22.0% | 100.2 | 98% | 20.2% | 2889 |
| 2891 | - | 8/27/2023 | 122 | 16 | 25.4% | 97.6 | 96% | 20.2% | 2890 |
| 2896 | - | 8/27/2023 | 123 | 16 | 22.6% | 102.4 | 101% | 20.2% | 2891 |
| 2901 | - | 8/27/2023 | 124 | 16 | 23.9% | 99.5 | 98% | 20.2% | 2892 |

Clay Field Test Results Summary
Cell 5 Phase 1

| Test No. | Retest of | Date | Lift | Proctor Reference No. | In-Place Moisture Content (%) | In-Place Dry Denisty (pcf) | Percent Compaction | Optimum Moisture | Passing Test # (Overall) |
|---|---|---|---|---|---|---|---|---|---|
| 2906 | - | 8/27/2023 | 125 | 16 | 23.0% | 101.5 | 100% | 20.2% | 2893 |
| 2911 | - | 8/27/2023 | 126 | 16 | 24.2% | 98.7 | 97% | 20.2% | 2894 |
| 2917 | - | 8/28/2023 | 127 | 16 | 22.7% | 99.0 | 97% | 20.2% | 2895 |
| 2922 | - | 8/28/2023 | 128 | 16 | 23.8% | 99.2 | 97% | 20.2% | 2896 |
| 2927 | - | 8/28/2023 | 129 | 16 | 22.5% | 100.9 | 99% | 20.2% | 2897 |
| 2932 | - | 8/28/2023 | 130 | 16 | 22.8% | 100.7 | 99% | 20.2% | 2898 |
| 2937 | - | 8/28/2023 | 131 | 16 | 20.8% | 105.2 | 103% | 20.2% | 2899 |
| 2942 | - | 8/28/2023 | 132 | 16 | 23.7% | 101.1 | 99% | 20.2% | 2900 |
| 2947 | - | 8/28/2023 | 133 | 16 | 22.1% | 102.3 | 100% | 20.2% | 2901 |
| 2952 | - | 8/28/2023 | 134 | 16 | 22.4% | 98.3 | 97% | 20.2% | 2902 |
| 2957 | - | 8/28/2023 | 135 | 16 | 20.6% | 103.1 | 101% | 20.2% | 2903 |
| 2962 | - | 8/28/2023 | 136 | 16 | 21.4% | 101.2 | 99% | 20.2% | 2904 |
| 2968 | - | 8/28/2023 | 137 | 16 | 23.5% | 98.6 | 97% | 20.2% | 2905 |
| 3032 | - | 8/30/2023 | 138 | 16 | 23.1% | 102.4 | 101% | 20.2% | 2906 |
| 3038 | - | 8/30/2023 | 139 | 16 | 23.3% | 99.0 | 97% | 20.2% | 2907 |
| 3044 | - | 8/30/2023 | 140 | 16 | 20.7% | 102.6 | 101% | 20.2% | 2908 |
| 3050 | - | 8/30/2023 | 141 | 16 | 24.0% | 100.5 | 99% | 20.2% | 2909 |
| 3058 | - | 8/30/2023 | 142 | 13 | 25.6% | 93.3 | 95% | 21.7% | 2910 |
| 3062 | - | 8/30/2023 | 143 | 13 | 22.5% | 95.8 | 98% | 21.7% | 2911 |
| 3068 | - | 8/30/2023 | 144 | 16 | 23.4% | 100.0 | 98% | 20.2% | 2912 |
| 3074 | - | 8/30/2023 | 145 | 13 | 25.9% | 96.9 | 99% | 21.7% | 2913 |
| 3082 | - | 8/31/2023 | 146 | 3 | 20.6% | 95.2 | 96% | 20.2% | 2914 |
| 3088 | - | 8/31/2023 | 147 | 16 | 24.0% | 100.4 | 99% | 20.2% | 2915 |
| 3094 | - | 8/31/2023 | 148 | 16 | 23.0% | 101.9 | 100% | 20.2% | 2916 |
| 3100 | - | 8/31/2023 | 149 | 1 | 23.9% | 99.4 | 99% | 19.4% | 2917 |
| 3106 | - | 8/31/2023 | 150 | 3 | 25.0% | 95.5 | 96% | 20.2% | 2918 |
| 3112 | - | 8/31/2023 | 151 | 16 | 23.0% | 102.3 | 100% | 20.2% | 2919 |
| Z-58 | | | | | | | | | |
| 1516 | - | 7/31/2023 | 1 | 3 | 25.6% | 98.5 | 99% | 20.2% | 2920 |
| 1527 | - | 7/31/2023 | 2 | 3 | 22.0% | 97.7 | 98% | 20.2% | 2921 |
| 1538 | - | 7/31/2023 | 3 | 19 | 23.1% | 101.2 | 96% | 18.4% | 2922 |
| 1549 | - | 7/31/2023 | 4 | 19 | 19.2% | 103.5 | 99% | 18.4% | 2923 |
| 1560 | - | 7/31/2023 | 5 | 19 | 18.7% | 102.7 | 98% | 18.4% | 2924 |
| 1571 | - | 7/31/2023 | 6 | 19 | 19.7% | 104.5 | 100% | 18.4% | 2925 |
| 1582 | - | 7/31/2023 | 7 | 3 | 22.4% | 97.6 | 98% | 20.2% | 2926 |
| 1594 | - | 7/31/2023 | 8 | 19 | 18.8% | 100.8 | 96% | 18.4% | 2927 |
| 1599 | - | 8/1/2023 | 9 | 19 | 21.4% | 102.9 | 98% | 18.4% | 2928 |
| 1612 | - | 8/1/2023 | 10 | 19 | 23.6% | 102.2 | 97% | 18.4% | 2929 |
| 1625 | - | 8/1/2023 | 11 | 19 | 20.7% | 100.9 | 96% | 18.4% | 2930 |
| 1638 | - | 8/1/2023 | 12 | 3 | 24.0% | 97.7 | 98% | 20.2% | 2931 |
| 1651 | - | 8/1/2023 | 13 | 19 | 22.5% | 101.0 | 96% | 18.4% | 2932 |
| 1664 | - | 8/1/2023 | 14 | 19 | 22.4% | 101.2 | 96% | 18.4% | 2933 |
| 1675 | - | 8/1/2023 | 15 | 3 | 22.5% | 99.0 | 100% | 20.2% | 2934 |
| 1686 | - | 8/2/2023 | 16 | 19 | 22.6% | 100.5 | 96% | 18.4% | 2935 |
| 1697 | - | 8/2/2023 | 17 | 10 | 25.7% | 90.2 | 95% | 25.0% | 2936 |
| 1708 | - | 8/2/2023 | 18 | 3 | 24.6% | 97.0 | 98% | 20.2% | 2937 |
| 1719 | - | 8/2/2023 | 19 | 19 | 19.8% | 104.9 | 100% | 18.4% | 2938 |
| 1730 | - | 8/2/2023 | 20 | 19 | 21.1% | 102.0 | 97% | 18.4% | 2939 |

Clay Field Test Results Summary
Cell 5 Phase 1

| Test No. | Retest of | Date | Lift | Proctor Reference No. | In-Place Moisture Content (%) | In-Place Dry Denisty (pcf) | Percent Compaction | Optimum Moisture | Passing Test # (Overall) |
|---|---|---|---|---|---|---|---|---|---|
| 1741 | - | 8/2/2023 | 21 | 19 | 22.6% | 103.0 | 98% | 18.4% | 2940 |
| 1747 | - | 8/3/2023 | 22 | 19 | 24.3% | 102.0 | 97% | 18.4% | 2941 |
| 1758 | - | 8/3/2023 | 23 | 19 | 23.6% | 100.2 | 95% | 18.4% | 2942 |
| 1769 | - | 8/3/2023 | 24 | 3 | 22.1% | 98.7 | 99% | 20.2% | 2943 |
| 1780 | - | 8/3/2023 | 25 | 3 | 26.6% | 96.6 | 97% | 20.2% | 2944 |
| 1791 | - | 8/3/2023 | 26 | 19 | 20.8% | 101.2 | 96% | 18.4% | 2945 |
| 1802 | - | 8/3/2023 | 27 | 19 | 20.6% | 102.2 | 97% | 18.4% | 2946 |
| 1813 | - | 8/3/2023 | 28 | 19 | 20.8% | 103.3 | 98% | 18.4% | 2947 |
| 1860 | - | 8/7/2023 | 29 | 7 | 28.9% | 91.1 | 97% | 22.6% | 2948 |
| 1873 | - | 8/7/2023 | 30 | 19 | 23.2% | 101.0 | 96% | 18.4% | 2949 |
| 1888 | - | 8/7/2023 | 31 | 19 | 20.9% | 103.4 | 98% | 18.4% | 2950 |
| 1898 | - | 8/7/2023 | 32 | 3 | 22.7% | 99.0 | 100% | 20.2% | 2951 |
| 1910 | - | 8/7/2023 | 33 | 19 | 21.2% | 103.6 | 99% | 18.4% | 2952 |
| 1923 | - | 8/8/2023 | 34 | 19 | 22.2% | 105.0 | 100% | 18.4% | 2953 |
| 1935 | - | 8/8/2023 | 35 | 3 | 21.0% | 94.4 | 95% | 20.2% | 2954 |
| 1946 | - | 8/8/2023 | 36 | 16 | 22.3% | 101.8 | 100% | 20.2% | 2955 |
| 1958 | - | 8/8/2023 | 37 | 19 | 20.4% | 104.3 | 99% | 18.4% | 2956 |
| 1970 | - | 8/8/2023 | 38 | 19 | 20.3% | 101.0 | 96% | 18.4% | 2957 |
| 1982 | - | 8/8/2023 | 39 | 19 | 21.4% | 104.7 | 100% | 18.4% | 2958 |
| 1994 | - | 8/8/2023 | 40 | 19 | 23.6% | 103.2 | 98% | 18.4% | 2959 |
| 2006 | - | 8/8/2023 | 41 | 19 | 22.7% | 103.1 | 98% | 18.4% | 2960 |
| 2018 | - | 8/9/2023 | 42 | 3 | 25.0% | 98.1 | 99% | 20.2% | 2961 |
| 2030 | - | 8/9/2023 | 43 | 3 | 24.3% | 94.4 | 95% | 20.2% | 2962 |
| 2042 | - | 8/9/2023 | 44 | 19 | 21.6% | 102.8 | 98% | 18.4% | 2963 |
| 2054 | - | 8/9/2023 | 45 | 21 | 20.6% | 106.4 | 100% | 18.1% | 2964 |
| 2066 | - | 8/9/2023 | 46 | 19 | 19.8% | 105.3 | 100% | 18.4% | 2965 |
| 2078 | - | 8/9/2023 | 47 | 19 | 21.8% | 102.0 | 97% | 18.4% | 2966 |
| 2096 | - | 8/10/2023 | 48 | 19 | 21.0% | 104.6 | 100% | 18.4% | 2967 |
| 2108 | - | 8/10/2023 | 49 | 16 | 22.0% | 102.1 | 100% | 20.2% | 2968 |
| 2120 | - | 8/10/2023 | 50 | 19 | 20.8% | 105.1 | 100% | 18.4% | 2969 |
| 2132 | - | 8/10/2023 | 51 | 21 | 21.2% | 105.9 | 100% | 18.1% | 2970 |
| 2144 | - | 8/10/2023 | 52 | 21 | 21.4% | 106.3 | 100% | 18.1% | 2971 |
| 2156 | - | 8/10/2023 | 53 | 19 | 21.9% | 103.7 | 99% | 18.4% | 2972 |
| 2168 | - | 8/11/2023 | 54 | 21 | 20.8% | 106.8 | 100% | 18.1% | 2973 |
| 2180 | - | 8/11/2023 | 55 | 1 | 21.5% | 100.0 | 99% | 19.4% | 2974 |
| 2192 | - | 8/11/2023 | 56 | 19 | 18.8% | 105.2 | 100% | 18.4% | 2975 |
| 2212 | - | 8/11/2023 | 57 | 19 | 18.9% | 104.8 | 100% | 18.4% | 2976 |
| 2225 | - | 8/11/2023 | 58 | 19 | 19.8% | 105.4 | 100% | 18.4% | 2977 |
| 2238 | - | 8/11/2023 | 59 | 21 | 20.0% | 107.5 | 101% | 18.1% | 2978 |
| 2260 | - | 8/14/2023 | 60 | 16 | 22.6% | 101.2 | 99% | 20.2% | 2979 |
| 2261 | - | 8/14/2023 | 61 | 16 | 22.2% | 102.1 | 100% | 20.2% | 2980 |
| 2277 | - | 8/14/2023 | 62 | 21 | 20.9% | 108.5 | 102% | 18.1% | 2981 |
| 2290 | - | 8/14/2023 | 63 | 19 | 20.4% | 102.7 | 98% | 18.4% | 2982 |
| 2303 | - | 8/14/2023 | 64 | 1 | 20.3% | 101.9 | 101% | 19.4% | 2983 |
| 2316 | - | 8/14/2023 | 65 | 3 | 22.9% | 98.7 | 99% | 20.2% | 2984 |
| 2322 | - | 8/14/2023 | 66 | 16 | 21.3% | 103.4 | 102% | 20.2% | 2985 |
| 2339 | - | 8/15/2023 | 67 | 21 | 21.6% | 106.1 | 100% | 18.1% | 2986 |
| 2352 | - | 8/15/2023 | 68 | 16 | 23.6% | 102.0 | 100% | 20.2% | 2987 |

Clay Field Test Results Summary
Cell 5 Phase 1

| Test No. | Retest of | Date | Lift | Proctor Reference No. | In-Place Moisture Content (%) | In-Place Dry Denisty (pcf) | Percent Compaction | Optimum Moisture | Passing Test # (Overall) |
|---|---|---|---|---|---|---|---|---|---|
| 2366 | - | 8/15/2023 | 69 | 16 | 21.8% | 103.9 | 102% | 20.2% | 2988 |
| 2380 | - | 8/15/2023 | 70 | 16 | 22.0% | 101.1 | 99% | 20.2% | 2989 |
| 2393 | - | 8/15/2023 | 71 | 3 | 23.5% | 95.5 | 96% | 20.2% | 2990 |
| 2405 | - | 8/15/2023 | 72 | 16 | 21.9% | 102.3 | 100% | 20.2% | 2991 |
| 2413 | - | 8/15/2023 | 73 | 1 | 21.0% | 102.8 | 102% | 19.4% | 2992 |
| 2425 | - | 8/16/2023 | 74 | 16 | 22.7% | 101.7 | 100% | 20.2% | 2993 |
| 2435 | - | 8/16/2023 | 75 | 16 | 22.7% | 102.0 | 100% | 20.2% | 2994 |
| 2445 | - | 8/16/2023 | 76 | 16 | 22.5% | 104.0 | 102% | 20.2% | 2995 |
| 2455 | - | 8/16/2023 | 77 | 3 | 21.2% | 99.0 | 100% | 20.2% | 2996 |
| 2462 | - | 8/16/2023 | 78 | 16 | 22.9% | 102.1 | 100% | 20.2% | 2997 |
| 2469 | - | 8/16/2023 | 79 | 16 | 20.5% | 103.8 | 102% | 20.2% | 2998 |
| 2476 | - | 8/16/2023 | 80 | 1 | 23.4% | 100.9 | 100% | 19.4% | 2999 |
| 2490 | - | 8/17/2023 | 81 | 1 | 19.6% | 98.9 | 98% | 19.4% | 3000 |
| 2502 | - | 8/17/2023 | 82 | 16 | 22.8% | 102.5 | 101% | 20.2% | 3001 |
| 2514 | - | 8/17/2023 | 83 | 16 | 22.7% | 104.8 | 103% | 20.2% | 3002 |
| 2526 | - | 8/17/2023 | 84 | 1 | 20.4% | 99.6 | 99% | 19.4% | 3003 |
| 2538 | - | 8/17/2023 | 85 | 3 | 25.0% | 96.5 | 97% | 20.2% | 3004 |
| 2549 | - | 8/17/2023 | 86 | 3 | 23.0% | 99.5 | 100% | 20.2% | 3005 |
| 2566 | - | 8/18/2023 | 87 | 19 | 20.2% | 104.0 | 99% | 18.4% | 3006 |
| 2577 | - | 8/18/2023 | 88 | 16 | 22.6% | 102.3 | 100% | 20.2% | 3007 |
| 2588 | - | 8/18/2023 | 89 | 16 | 22.3% | 102.8 | 101% | 20.2% | 3008 |
| 2599 | - | 8/18/2023 | 90 | 16 | 23.9% | 101.3 | 100% | 20.2% | 3009 |
| 2610 | - | 8/18/2023 | 91 | 16 | 23.3% | 101.4 | 100% | 20.2% | 3010 |
| 2621 | - | 8/18/2023 | 92 | 3 | 26.1% | 97.1 | 98% | 20.2% | 3011 |
| 2632 | - | 8/19/2023 | 93 | 16 | 23.5% | 100.6 | 99% | 20.2% | 3012 |
| 2642 | - | 8/19/2023 | 94 | 21 | 20.7% | 106.6 | 100% | 18.1% | 3013 |
| 2654 | - | 8/21/2023 | 95 | 21 | 20.3% | 106.7 | 100% | 18.1% | 3014 |
| 2665 | - | 8/21/2023 | 96 | 16 | 24.7% | 101.1 | 99% | 20.2% | 3015 |
| 2676 | - | 8/21/2023 | 97 | 1 | 20.3% | 102.8 | 102% | 19.4% | 3016 |
| 2687 | - | 8/21/2023 | 98 | 1 | 24.2% | 100.9 | 100% | 19.4% | 3017 |
| 2696 | - | 8/21/2023 | 99 | 1 | 20.6% | 101.7 | 101% | 19.4% | 3018 |
| 2709 | - | 8/22/2023 | 100 | 16 | 22.5% | 103.2 | 101% | 20.2% | 3019 |
| 2738 | - | 8/22/2023 | 101 | 16 | 23.7% | 100.1 | 98% | 20.2% | 3020 |
| 2755 | - | 8/22/2023 | 102 | 21 | 20.7% | 107.5 | 101% | 18.1% | 3021 |
| 2790 | - | 8/25/2023 | 103 | 16 | 24.2% | 101.7 | 100% | 20.2% | 3022 |
| 2801 | - | 8/25/2023 | 104 | 1 | 24.3% | 100.0 | 99% | 19.4% | 3023 |
| 2812 | - | 8/25/2023 | 105 | 3 | 25.4% | 97.3 | 98% | 20.2% | 3024 |
| 2816 | - | 8/25/2023 | 106 | 21 | 21.3% | 105.7 | 99% | 18.1% | 3025 |
| 2820 | - | 8/25/2023 | 107 | 3 | 25.5% | 99.5 | 100% | 20.2% | 3026 |
| 2823 | - | 8/26/2023 | 108 | 16 | 22.7% | 103.3 | 101% | 20.2% | 3027 |
| 2828 | - | 8/26/2023 | 109 | 3 | 24.4% | 95.0 | 96% | 20.2% | 3028 |
| 2833 | - | 8/26/2023 | 110 | 16 | 24.7% | 98.8 | 97% | 20.2% | 3029 |
| 2838 | - | 8/26/2023 | 111 | 16 | 26.3% | 96.4 | 95% | 20.2% | 3030 |
| 2842 | - | 8/26/2023 | 112 | 16 | 24.0% | 100.2 | 98% | 20.2% | 3031 |
| 2847 | - | 8/26/2023 | 113 | 16 | 22.2% | 102.0 | 100% | 20.2% | 3032 |
| 2852 | - | 8/26/2023 | 114 | 16 | 22.5% | 102.3 | 100% | 20.2% | 3033 |
| 2857 | - | 8/26/2023 | 115 | 16 | 24.2% | 99.9 | 98% | 20.2% | 3034 |
| 2862 | - | 8/26/2023 | 116 | 16 | 22.2% | 100.7 | 99% | 20.2% | 3035 |

Clay Field Test Results Summary
Cell 5 Phase 1

| Test No. | Retest of | Date | Lift | Proctor Reference No. | In-Place Moisture Content (%) | In-Place Dry Denisty (pcf) | Percent Compaction | Optimum Moisture | Passing Test # (Overall) |
|---|---|---|---|---|---|---|---|---|---|
| 2867 | - | 8/26/2023 | 117 | 16 | 24.9% | 99.5 | 98% | 20.2% | 3036 |
| 2872 | - | 8/26/2023 | 118 | 16 | 22.5% | 99.2 | 97% | 20.2% | 3037 |
| 2877 | - | 8/26/2023 | 119 | 16 | 23.2% | 98.6 | 97% | 20.2% | 3038 |
| 2882 | - | 8/27/2023 | 120 | 16 | 22.1% | 99.1 | 97% | 20.2% | 3039 |
| 2887 | - | 8/27/2023 | 121 | 16 | 23.0% | 99.7 | 98% | 20.2% | 3040 |
| 2892 | - | 8/27/2023 | 122 | 16 | 23.2% | 103.2 | 101% | 20.2% | 3041 |
| 2897 | - | 8/27/2023 | 123 | 16 | 26.0% | 96.5 | 95% | 20.2% | 3042 |
| 2902 | - | 8/27/2023 | 124 | 16 | 25.0% | 99.3 | 98% | 20.2% | 3043 |
| 2907 | - | 8/27/2023 | 125 | 16 | 22.1% | 99.6 | 98% | 20.2% | 3044 |
| 2912 | - | 8/27/2023 | 126 | 16 | 24.4% | 100.0 | 98% | 20.2% | 3045 |
| 2918 | - | 8/28/2023 | 127 | 16 | 22.1% | 101.8 | 100% | 20.2% | 3046 |
| 2923 | - | 8/28/2023 | 128 | 16 | 22.8% | 102.3 | 100% | 20.2% | 3047 |
| 2928 | - | 8/28/2023 | 129 | 16 | 23.3% | 100.2 | 98% | 20.2% | 3048 |
| 2933 | - | 8/28/2023 | 130 | 13 | 22.3% | 95.0 | 97% | 21.7% | 3049 |
| 2938 | - | 8/28/2023 | 131 | 16 | 23.3% | 101.4 | 100% | 20.2% | 3050 |
| 2943 | - | 8/28/2023 | 132 | 16 | 20.8% | 100.6 | 99% | 20.2% | 3051 |
| 2948 | - | 8/28/2023 | 133 | 16 | 22.3% | 101.5 | 100% | 20.2% | 3052 |
| 2953 | - | 8/28/2023 | 134 | 16 | 20.3% | 104.0 | 102% | 20.2% | 3053 |
| 2958 | - | 8/28/2023 | 135 | 16 | 24.4% | 96.9 | 95% | 20.2% | 3054 |
| 2963 | - | 8/28/2023 | 136 | 15 | 25.3% | 93.9 | 95% | 24.1% | 3055 |
| 2969 | - | 8/28/2023 | 137 | 15 | 25.9% | 95.5 | 97% | 24.1% | 3056 |
| 3033 | - | 8/30/2023 | 138 | 16 | 22.2% | 102.5 | 101% | 20.2% | 3057 |
| 3039 | - | 8/30/2023 | 139 | 16 | 23.5% | 99.8 | 98% | 20.2% | 3058 |
| 3045 | - | 8/30/2023 | 140 | 16 | 24.1% | 99.3 | 98% | 20.2% | 3059 |
| 3051 | - | 8/30/2023 | 141 | 16 | 22.6% | 100.9 | 99% | 20.2% | 3060 |
| 3059 | - | 8/30/2023 | 142 | 16 | 23.2% | 99.3 | 98% | 20.2% | 3061 |
| 3063 | - | 8/30/2023 | 143 | 13 | 26.6% | 94.3 | 96% | 21.7% | 3062 |
| 3069 | - | 8/30/2023 | 144 | 16 | 23.0% | 100.1 | 98% | 20.2% | 3063 |
| 3075 | - | 8/30/2023 | 145 | 16 | 23.6% | 100.4 | 99% | 20.2% | 3064 |
| 3083 | - | 8/31/2023 | 146 | 16 | 21.5% | 102.7 | 101% | 20.2% | 3065 |
| 3089 | - | 8/31/2023 | 147 | 16 | 21.6% | 100.7 | 99% | 20.2% | 3066 |
| 3095 | - | 8/31/2023 | 148 | 16 | 21.7% | 100.6 | 99% | 20.2% | 3067 |
| 3101 | - | 8/31/2023 | 149 | 3 | 26.1% | 95.7 | 96% | 20.2% | 3068 |
| 3107 | - | 8/31/2023 | 150 | 3 | 25.1% | 96.5 | 97% | 20.2% | 3069 |
| 3113 | - | 8/31/2023 | 151 | 16 | 20.9% | 102.5 | 101% | 20.2% | 3070 |
| Z-59 | | | | | | | | | |
| 1515 | - | 7/31/2023 | 1 | 3 | 23.6% | 94.5 | 95% | 20.2% | 3071 |
| 1526 | - | 7/31/2023 | 2 | 14 | 27.3% | 88.6 | 96% | 27.2% | 3072 |
| 1537 | - | 7/31/2023 | 3 | 3 | 23.6% | 98.6 | 99% | 20.2% | 3073 |
| 1548 | - | 7/31/2023 | 4 | 19 | 21.6% | 100.6 | 96% | 18.4% | 3074 |
| 1559 | - | 7/31/2023 | 5 | 19 | 19.2% | 101.4 | 97% | 18.4% | 3075 |
| 1570 | - | 7/31/2023 | 6 | 3 | 22.6% | 98.9 | 100% | 20.2% | 3076 |
| 1581 | - | 7/31/2023 | 7 | 19 | 19.4% | 100.3 | 96% | 18.4% | 3077 |
| 1593 | - | 7/31/2023 | 8 | 19 | 21.2% | 101.5 | 97% | 18.4% | 3078 |
| 1600 | - | 8/1/2023 | 9 | 21 | 20.5% | 105.9 | 100% | 18.1% | 3079 |
| 1613 | - | 8/1/2023 | 10 | 19 | 19.5% | 101.8 | 97% | 18.4% | 3080 |
| 1626 | - | 8/1/2023 | 11 | 19 | 21.7% | 100.0 | 95% | 18.4% | 3081 |
| 1639 | - | 8/1/2023 | 12 | 19 | 22.0% | 100.4 | 96% | 18.4% | 3082 |

Clay Field Test Results Summary
Cell 5 Phase 1

| Test No. | Retest of | Date | Lift | Proctor Reference No. | In-Place Moisture Content (%) | In-Place Dry Denisty (pcf) | Percent Compaction | Optimum Moisture | Passing Test # (Overall) |
|---|---|---|---|---|---|---|---|---|---|
| 1652 | - | 8/1/2023 | 13 | 3 | 25.1% | 98.0 | 99% | 20.2% | 3083 |
| 1665 | - | 8/1/2023 | 14 | 7 | 26.4% | 92.3 | 98% | 22.6% | 3084 |
| 1676 | - | 8/1/2023 | 15 | 19 | 21.4% | 104.5 | 100% | 18.4% | 3085 |
| 1687 | - | 8/2/2023 | 16 | 3 | 25.7% | 94.9 | 96% | 20.2% | 3086 |
| 1698 | - | 8/2/2023 | 17 | 3 | 24.2% | 95.1 | 96% | 20.2% | 3087 |
| 1709 | - | 8/2/2023 | 18 | 7 | 26.7% | 89.5 | 95% | 22.6% | 3088 |
| 1720 | - | 8/2/2023 | 19 | 3 | 24.6% | 97.8 | 98% | 20.2% | 3089 |
| 1731 | - | 8/2/2023 | 20 | 19 | 21.1% | 102.6 | 98% | 18.4% | 3090 |
| 1742 | - | 8/2/2023 | 21 | 3 | 25.8% | 94.7 | 95% | 20.2% | 3091 |
| 1748 | - | 8/3/2023 | 22 | 19 | 22.5% | 102.9 | 98% | 18.4% | 3092 |
| 1759 | - | 8/3/2023 | 23 | 19 | 24.1% | 99.9 | 95% | 18.4% | 3093 |
| 1770 | - | 8/3/2023 | 24 | 3 | 23.3% | 99.9 | 101% | 20.2% | 3094 |
| 1781 | - | 8/3/2023 | 25 | 3 | 24.0% | 100.2 | 101% | 20.2% | 3095 |
| 1792 | - | 8/3/2023 | 26 | 7 | 25.8% | 93.0 | 99% | 22.6% | 3096 |
| 1803 | - | 8/3/2023 | 27 | 3 | 25.6% | 96.1 | 97% | 20.2% | 3097 |
| 1814 | - | 8/3/2023 | 28 | 3 | 22.5% | 97.6 | 98% | 20.2% | 3098 |
| 1861 | - | 8/7/2023 | 29 | 3 | 21.2% | 96.6 | 97% | 20.2% | 3099 |
| 1874 | - | 8/7/2023 | 30 | 19 | 23.6% | 100.6 | 96% | 18.4% | 3100 |
| 1887 | - | 8/7/2023 | 31 | 3 | 23.1% | 98.2 | 99% | 20.2% | 3101 |
| 1897 | - | 8/7/2023 | 32 | 19 | 21.1% | 103.1 | 98% | 18.4% | 3102 |
| 1909 | - | 8/7/2023 | 33 | 19 | 22.0% | 102.7 | 98% | 18.4% | 3103 |
| 1922 | - | 8/8/2023 | 34 | 19 | 20.1% | 101.8 | 97% | 18.4% | 3104 |
| 1934 | - | 8/8/2023 | 35 | 3 | 22.6% | 98.1 | 99% | 20.2% | 3105 |
| 1947 | - | 8/8/2023 | 36 | 19 | 21.4% | 103.5 | 99% | 18.4% | 3106 |
| 1959 | - | 8/8/2023 | 37 | 21 | 20.5% | 106.1 | 100% | 18.1% | 3107 |
| 1971 | - | 8/8/2023 | 38 | 19 | 20.9% | 102.0 | 97% | 18.4% | 3108 |
| 1983 | - | 8/8/2023 | 39 | 3 | 22.7% | 98.8 | 99% | 20.2% | 3109 |
| 1995 | - | 8/8/2023 | 40 | 19 | 22.6% | 102.4 | 98% | 18.4% | 3110 |
| 2007 | - | 8/8/2023 | 41 | 21 | 21.0% | 109.5 | 103% | 18.1% | 3111 |
| 2019 | - | 8/9/2023 | 42 | 19 | 22.4% | 102.1 | 97% | 18.4% | 3112 |
| 2031 | - | 8/9/2023 | 43 | 19 | 21.8% | 103.6 | 99% | 18.4% | 3113 |
| 2043 | - | 8/9/2023 | 44 | 19 | 21.9% | 104.9 | 100% | 18.4% | 3114 |
| 2055 | - | 8/9/2023 | 45 | 16 | 22.2% | 101.8 | 100% | 20.2% | 3115 |
| 2067 | - | 8/9/2023 | 46 | 19 | 21.6% | 103.3 | 98% | 18.4% | 3116 |
| 2079 | - | 8/9/2023 | 47 | 19 | 20.9% | 101.5 | 97% | 18.4% | 3117 |
| 2097 | - | 8/10/2023 | 48 | 19 | 21.7% | 104.4 | 99% | 18.4% | 3118 |
| 2109 | - | 8/10/2023 | 49 | 21 | 20.6% | 106.4 | 100% | 18.1% | 3119 |
| 2121 | - | 8/10/2023 | 50 | 21 | 21.4% | 106.1 | 100% | 18.1% | 3120 |
| 2133 | - | 8/10/2023 | 51 | 21 | 20.7% | 106.2 | 100% | 18.1% | 3121 |
| 2145 | - | 8/10/2023 | 52 | 16 | 22.6% | 101.3 | 100% | 20.2% | 3122 |
| 2157 | - | 8/10/2023 | 53 | 19 | 21.7% | 104.4 | 99% | 18.4% | 3123 |
| 2169 | - | 8/11/2023 | 54 | 19 | 20.5% | 105.2 | 100% | 18.4% | 3124 |
| 2181 | - | 8/11/2023 | 55 | 21 | 21.2% | 106.2 | 100% | 18.1% | 3125 |
| 2193 | - | 8/11/2023 | 56 | 21 | 19.0% | 106.2 | 100% | 18.1% | 3126 |
| 2213 | - | 8/11/2023 | 57 | 21 | 20.2% | 107.0 | 101% | 18.1% | 3127 |
| 2226 | - | 8/11/2023 | 58 | 3 | 21.1% | 97.0 | 98% | 20.2% | 3128 |
| 2239 | - | 8/11/2023 | 59 | 3 | 23.1% | 95.0 | 96% | 20.2% | 3129 |
| 2262 | - | 8/14/2023 | 60 | 16 | 22.0% | 101.9 | 100% | 20.2% | 3130 |

Clay Field Test Results Summary
Cell 5 Phase 1

| Test No. | Retest of | Date | Lift | Proctor Reference No. | In-Place Moisture Content (%) | In-Place Dry Denisty (pcf) | Percent Compaction | Optimum Moisture | Passing Test # (Overall) |
|---|---|---|---|---|---|---|---|---|---|
| 2263 | - | 8/14/2023 | 61 | 16 | 21.5% | 102.2 | 100% | 20.2% | 3131 |
| 2278 | - | 8/14/2023 | 62 | 16 | 22.4% | 103.3 | 101% | 20.2% | 3132 |
| 2291 | - | 8/14/2023 | 63 | 19 | 21.0% | 102.8 | 98% | 18.4% | 3133 |
| 2304 | - | 8/14/2023 | 64 | 21 | 21.5% | 105.7 | 99% | 18.1% | 3134 |
| 2317 | - | 8/14/2023 | 65 | 3 | 24.9% | 99.0 | 100% | 20.2% | 3135 |
| 2323 | - | 8/14/2023 | 66 | 3 | 21.9% | 99.3 | 100% | 20.2% | 3136 |
| 2340 | - | 8/15/2023 | 67 | 21 | 20.6% | 109.6 | 103% | 18.1% | 3137 |
| 2353 | - | 8/15/2023 | 68 | 19 | 19.1% | 105.5 | 100% | 18.4% | 3138 |
| 2367 | - | 8/15/2023 | 69 | 3 | 25.5% | 95.6 | 96% | 20.2% | 3139 |
| 2381 | - | 8/15/2023 | 70 | 16 | 23.5% | 102.7 | 101% | 20.2% | 3140 |
| 2394 | - | 8/15/2023 | 71 | 21 | 20.7% | 105.9 | 100% | 18.1% | 3141 |
| 2406 | - | 8/15/2023 | 72 | 16 | 24.5% | 102.1 | 100% | 20.2% | 3142 |
| 2414 | - | 8/15/2023 | 73 | 19 | 22.2% | 105.6 | 101% | 18.4% | 3143 |
| 2426 | - | 8/16/2023 | 74 | 16 | 22.7% | 103.6 | 102% | 20.2% | 3144 |
| 2436 | - | 8/16/2023 | 75 | 19 | 20.8% | 104.4 | 99% | 18.4% | 3145 |
| 2446 | - | 8/16/2023 | 76 | 16 | 21.7% | 103.0 | 101% | 20.2% | 3146 |
| 2456 | - | 8/16/2023 | 77 | 16 | 22.4% | 103.5 | 102% | 20.2% | 3147 |
| 2463 | - | 8/16/2023 | 78 | 21 | 21.5% | 106.0 | 100% | 18.1% | 3148 |
| 2470 | - | 8/16/2023 | 79 | 16 | 23.4% | 103.4 | 102% | 20.2% | 3149 |
| 2477 | - | 8/16/2023 | 80 | 16 | 22.5% | 103.1 | 101% | 20.2% | 3150 |
| 2491 | - | 8/17/2023 | 81 | 16 | 22.6% | 103.8 | 102% | 20.2% | 3151 |
| 2503 | - | 8/17/2023 | 82 | 19 | 19.5% | 105.2 | 100% | 18.4% | 3152 |
| 2515 | - | 8/17/2023 | 83 | 16 | 21.2% | 104.4 | 103% | 20.2% | 3153 |
| 2527 | - | 8/17/2023 | 84 | 3 | 23.4% | 98.8 | 99% | 20.2% | 3154 |
| 2539 | - | 8/17/2023 | 85 | 16 | 22.5% | 104.2 | 102% | 20.2% | 3155 |
| 2550 | - | 8/17/2023 | 86 | 16 | 21.2% | 104.3 | 102% | 20.2% | 3156 |
| 2567 | - | 8/18/2023 | 87 | 1 | 20.4% | 101.6 | 101% | 19.4% | 3157 |
| 2578 | - | 8/18/2023 | 88 | 16 | 23.9% | 100.3 | 99% | 20.2% | 3158 |
| 2589 | - | 8/18/2023 | 89 | 16 | 22.5% | 101.2 | 99% | 20.2% | 3159 |
| 2600 | - | 8/18/2023 | 90 | 16 | 21.9% | 101.0 | 99% | 20.2% | 3160 |
| 2611 | - | 8/18/2023 | 91 | 16 | 22.9% | 104.0 | 102% | 20.2% | 3161 |
| 2622 | - | 8/18/2023 | 92 | 16 | 21.5% | 101.3 | 100% | 20.2% | 3162 |
| 2633 | - | 8/19/2023 | 93 | 21 | 18.4% | 109.8 | 103% | 18.1% | 3163 |
| 2644 | - | 8/19/2023 | 94 | 1 | 21.0% | 101.7 | 101% | 19.4% | 3164 |
| 2655 | - | 8/21/2023 | 95 | 21 | 20.9% | 107.1 | 101% | 18.1% | 3165 |
| 2666 | - | 8/21/2023 | 96 | 16 | 21.5% | 103.5 | 102% | 20.2% | 3166 |
| 2677 | - | 8/21/2023 | 97 | 16 | 23.1% | 103.2 | 101% | 20.2% | 3167 |
| 2688 | - | 8/21/2023 | 98 | 16 | 23.5% | 102.3 | 100% | 20.2% | 3168 |
| 2697 | - | 8/21/2023 | 99 | 16 | 21.3% | 105.0 | 103% | 20.2% | 3169 |
| 2710 | - | 8/22/2023 | 100 | 16 | 21.6% | 103.7 | 102% | 20.2% | 3170 |
| 2739 | - | 8/22/2023 | 101 | 19 | 20.1% | 104.8 | 100% | 18.4% | 3171 |
| 2756 | - | 8/22/2023 | 102 | 19 | 20.2% | 104.7 | 100% | 18.4% | 3172 |
| 2791 | - | 8/25/2023 | 103 | 3 | 25.1% | 95.9 | 97% | 20.2% | 3173 |
| 2802 | - | 8/25/2023 | 104 | 16 | 21.4% | 101.8 | 100% | 20.2% | 3174 |
| 2813 | - | 8/25/2023 | 105 | 16 | 23.2% | 102.0 | 100% | 20.2% | 3175 |
| 2817 | - | 8/25/2023 | 106 | 3 | 23.8% | 96.8 | 97% | 20.2% | 3176 |
| 2821 | - | 8/26/2023 | 107 | 21 | 19.3% | 106.7 | 100% | 18.1% | 3177 |
| 2824 | - | 8/26/2023 | 108 | 16 | 22.9% | 102.4 | 101% | 20.2% | 3178 |

Clay Field Test Results Summary
Cell 5 Phase 1

| Test No. | Retest of | Date | Lift | Proctor Reference No. | In-Place Moisture Content (%) | In-Place Dry Denisty (pcf) | Percent Compaction | Optimum Moisture | Passing Test # (Overall) |
|---|---|---|---|---|---|---|---|---|---|
| 2829 | - | 8/26/2023 | 109 | 3 | 23.7% | 95.3 | 96% | 20.2% | 3179 |
| 2834 | - | 8/26/2023 | 110 | 16 | 24.5% | 99.5 | 98% | 20.2% | 3180 |
| 2839 | - | 8/26/2023 | 111 | 16 | 23.1% | 102.8 | 101% | 20.2% | 3181 |
| 2843 | - | 8/26/2023 | 112 | 16 | 23.4% | 98.8 | 97% | 20.2% | 3182 |
| 2848 | - | 8/26/2023 | 113 | 16 | 21.7% | 100.9 | 99% | 20.2% | 3183 |
| 2853 | - | 8/26/2023 | 114 | 16 | 21.8% | 102.5 | 101% | 20.2% | 3184 |
| 2858 | - | 8/26/2023 | 115 | 7 | 26.0% | 93.5 | 100% | 22.6% | 3185 |
| 2863 | - | 8/26/2023 | 116 | 3 | 25.9% | 94.6 | 95% | 20.2% | 3186 |
| 2868 | - | 8/26/2023 | 117 | 16 | 23.2% | 96.3 | 95% | 20.2% | 3187 |
| 2873 | - | 8/26/2023 | 118 | 16 | 24.0% | 100.7 | 99% | 20.2% | 3188 |
| 2878 | - | 8/26/2023 | 119 | 16 | 21.4% | 99.8 | 98% | 20.2% | 3189 |
| 2883 | - | 8/27/2023 | 120 | 16 | 21.9% | 102.4 | 101% | 20.2% | 3190 |
| 2888 | - | 8/27/2023 | 121 | 16 | 22.3% | 102.3 | 100% | 20.2% | 3191 |
| 2893 | - | 8/27/2023 | 122 | 16 | 23.2% | 103.1 | 101% | 20.2% | 3192 |
| 2898 | - | 8/27/2023 | 123 | 16 | 23.2% | 100.9 | 99% | 20.2% | 3193 |
| 2903 | - | 8/27/2023 | 124 | 16 | 23.6% | 99.0 | 97% | 20.2% | 3194 |
| 2908 | - | 8/27/2023 | 125 | 16 | 22.4% | 102.9 | 101% | 20.2% | 3195 |
| 2913 | - | 8/27/2023 | 126 | 16 | 25.0% | 98.0 | 96% | 20.2% | 3196 |
| 2919 | - | 8/28/2023 | 127 | 16 | 23.1% | 102.7 | 101% | 20.2% | 3197 |
| 2924 | - | 8/28/2023 | 128 | 16 | 23.4% | 100.2 | 98% | 20.2% | 3198 |
| 2929 | - | 8/28/2023 | 129 | 16 | 22.2% | 101.3 | 100% | 20.2% | 3199 |
| 2934 | - | 8/28/2023 | 130 | 13 | 26.7% | 94.0 | 96% | 21.7% | 3200 |
| 2939 | - | 8/28/2023 | 131 | 16 | 21.2% | 104.3 | 102% | 20.2% | 3201 |
| 2944 | - | 8/28/2023 | 132 | 16 | 23.1% | 99.0 | 97% | 20.2% | 3202 |
| 2949 | - | 8/28/2023 | 133 | 16 | 21.5% | 102.4 | 101% | 20.2% | 3203 |
| 2954 | - | 8/28/2023 | 134 | 16 | 22.2% | 101.3 | 100% | 20.2% | 3204 |
| 2959 | - | 8/28/2023 | 135 | 16 | 21.4% | 103.0 | 101% | 20.2% | 3205 |
| 2964 | - | 8/28/2023 | 136 | 16 | 23.3% | 101.3 | 100% | 20.2% | 3206 |
| 2970 | - | 8/28/2023 | 137 | 16 | 22.8% | 101.0 | 99% | 20.2% | 3207 |
| 3034 | - | 8/30/2023 | 138 | 16 | 22.1% | 101.9 | 100% | 20.2% | 3208 |
| 3040 | - | 8/30/2023 | 139 | 16 | 23.1% | 101.9 | 100% | 20.2% | 3209 |
| 3046 | - | 8/30/2023 | 140 | 16 | 23.8% | 100.0 | 98% | 20.2% | 3210 |
| 3052 | - | 8/30/2023 | 141 | 16 | 22.2% | 102.3 | 100% | 20.2% | 3211 |
| 3060 | - | 8/30/2023 | 142 | 16 | 20.6% | 102.0 | 100% | 20.2% | 3212 |
| 3064 | - | 8/30/2023 | 143 | 16 | 20.5% | 102.9 | 101% | 20.2% | 3213 |
| 3070 | - | 8/30/2023 | 144 | 16 | 21.5% | 102.3 | 100% | 20.2% | 3214 |
| 3076 | - | 8/30/2023 | 145 | 12 | 27.7% | 93.2 | 96% | 23.6% | 3215 |
| 3084 | - | 8/31/2023 | 146 | 16 | 21.4% | 101.2 | 99% | 20.2% | 3216 |
| 3090 | - | 8/31/2023 | 147 | 12 | 25.3% | 95.3 | 98% | 23.6% | 3217 |
| 3096 | - | 8/31/2023 | 148 | 16 | 23.3% | 100.8 | 99% | 20.2% | 3218 |
| 3102 | - | 8/31/2023 | 149 | 3 | 24.1% | 95.9 | 97% | 20.2% | 3219 |
| 3108 | - | 8/31/2023 | 150 | 1 | 23.4% | 100.9 | 100% | 19.4% | 3220 |
| 3114 | - | 8/31/2023 | 151 | 16 | 21.8% | 100.8 | 99% | 20.2% | 3221 |
| Z-60 | | | | | | | | | |
| 1514 | - | 7/31/2023 | 1 | 3 | 24.0% | 97.6 | 98% | 20.2% | 3222 |
| 1525 | - | 7/31/2023 | 2 | 3 | 24.6% | 95.0 | 96% | 20.2% | 3223 |
| 1536 | - | 7/31/2023 | 3 | 3 | 24.4% | 95.5 | 96% | 20.2% | 3224 |
| 1547 | - | 7/31/2023 | 4 | 3 | 23.9% | 97.6 | 98% | 20.2% | 3225 |

Clay Field Test Results Summary
Cell 5 Phase 1

| Test No. | Retest of | Date | Lift | Proctor Reference No. | In-Place Moisture Content (%) | In-Place Dry Denisty (pcf) | Percent Compaction | Optimum Moisture | Passing Test # (Overall) |
|---|---|---|---|---|---|---|---|---|---|
| 1558 | - | 7/31/2023 | 5 | 3 | 21.3% | 97.5 | 98% | 20.2% | 3226 |
| 1569 | - | 7/31/2023 | 6 | 7 | 26.1% | 93.8 | 100% | 22.6% | 3227 |
| 1580 | - | 7/31/2023 | 7 | 7 | 26.9% | 92.1 | 98% | 22.6% | 3228 |
| 1592 | - | 7/31/2023 | 8 | 3 | 23.4% | 99.6 | 100% | 20.2% | 3229 |
| 1601 | - | 8/1/2023 | 9 | 21 | 20.7% | 101.0 | 95% | 18.1% | 3230 |
| 1614 | - | 8/1/2023 | 10 | 3 | 22.2% | 98.4 | 99% | 20.2% | 3231 |
| 1627 | - | 8/1/2023 | 11 | 7 | 28.7% | 93.1 | 99% | 22.6% | 3232 |
| 1640 | - | 8/1/2023 | 12 | 7 | 28.0% | 91.8 | 98% | 22.6% | 3233 |
| 1653 | - | 8/1/2023 | 13 | 7 | 26.9% | 91.6 | 98% | 22.6% | 3234 |
| 1666 | - | 8/1/2023 | 14 | 7 | 27.7% | 92.0 | 98% | 22.6% | 3235 |
| 1677 | - | 8/1/2023 | 15 | 19 | 21.4% | 102.1 | 97% | 18.4% | 3236 |
| 1688 | - | 8/2/2023 | 16 | 14 | 31.8% | 89.2 | 97% | 27.2% | 3237 |
| 1699 | - | 8/2/2023 | 17 | 19 | 19.9% | 101.0 | 96% | 18.4% | 3238 |
| 1710 | - | 8/2/2023 | 18 | 19 | 18.4% | 104.2 | 99% | 18.4% | 3239 |
| 1721 | - | 8/2/2023 | 19 | 3 | 22.6% | 98.1 | 99% | 20.2% | 3240 |
| 1732 | - | 8/2/2023 | 20 | 14 | 27.4% | 88.8 | 96% | 27.2% | 3241 |
| 1743 | - | 8/2/2023 | 21 | 3 | 23.8% | 98.4 | 99% | 20.2% | 3242 |
| 1749 | - | 8/3/2023 | 22 | 3 | 22.4% | 99.4 | 100% | 20.2% | 3243 |
| 1760 | - | 8/3/2023 | 23 | 3 | 24.4% | 98.4 | 99% | 20.2% | 3244 |
| 1771 | - | 8/3/2023 | 24 | 3 | 23.7% | 99.9 | 101% | 20.2% | 3245 |
| 1782 | - | 8/3/2023 | 25 | 3 | 25.0% | 97.3 | 98% | 20.2% | 3246 |
| 1793 | - | 8/3/2023 | 26 | 3 | 24.3% | 95.3 | 96% | 20.2% | 3247 |
| 1804 | - | 8/3/2023 | 27 | 19 | 22.2% | 100.2 | 95% | 18.4% | 3248 |
| 1815 | - | 8/3/2023 | 28 | 3 | 25.4% | 98.6 | 99% | 20.2% | 3249 |
| 1862 | - | 8/7/2023 | 29 | 19 | 21.5% | 103.2 | 98% | 18.4% | 3250 |
| 1875 | - | 8/7/2023 | 30 | 3 | 22.5% | 98.9 | 100% | 20.2% | 3251 |
| 1886 | - | 8/7/2023 | 31 | 3 | 24.4% | 95.4 | 96% | 20.2% | 3252 |
| 1896 | - | 8/7/2023 | 32 | 19 | 21.2% | 103.8 | 99% | 18.4% | 3253 |
| 1908 | - | 8/7/2023 | 33 | 19 | 23.0% | 101.0 | 96% | 18.4% | 3254 |
| 1921 | - | 8/8/2023 | 34 | 19 | 20.8% | 104.4 | 99% | 18.4% | 3255 |
| 1933 | - | 8/8/2023 | 35 | 19 | 19.6% | 102.8 | 98% | 18.4% | 3256 |
| 1948 | - | 8/8/2023 | 36 | 19 | 18.6% | 100.3 | 96% | 18.4% | 3257 |
| 1960 | - | 8/8/2023 | 37 | 19 | 21.2% | 105.5 | 100% | 18.4% | 3258 |
| 1972 | - | 8/8/2023 | 38 | 19 | 19.6% | 102.7 | 98% | 18.4% | 3259 |
| 1984 | - | 8/8/2023 | 39 | 19 | 22.5% | 103.4 | 98% | 18.4% | 3260 |
| 1996 | - | 8/8/2023 | 40 | 19 | 22.5% | 102.6 | 98% | 18.4% | 3261 |
| 2008 | - | 8/8/2023 | 41 | 16 | 22.9% | 101.7 | 100% | 20.2% | 3262 |
| 2020 | - | 8/9/2023 | 42 | 19 | 21.0% | 103.6 | 99% | 18.4% | 3263 |
| 2032 | - | 8/9/2023 | 43 | 19 | 22.0% | 104.6 | 100% | 18.4% | 3264 |
| 2044 | - | 8/9/2023 | 44 | 21 | 21.4% | 105.8 | 100% | 18.1% | 3265 |
| 2056 | - | 8/9/2023 | 45 | 19 | 22.5% | 102.0 | 97% | 18.4% | 3266 |
| 2068 | - | 8/9/2023 | 46 | 19 | 21.1% | 105.1 | 100% | 18.4% | 3267 |
| 2080 | - | 8/9/2023 | 47 | 19 | 22.0% | 104.0 | 99% | 18.4% | 3268 |
| 2098 | - | 8/10/2023 | 48 | 19 | 21.3% | 103.3 | 98% | 18.4% | 3269 |
| 2110 | - | 8/10/2023 | 49 | 19 | 22.4% | 103.6 | 99% | 18.4% | 3270 |
| 2122 | - | 8/10/2023 | 50 | 19 | 20.8% | 102.3 | 97% | 18.4% | 3271 |
| 2134 | - | 8/10/2023 | 51 | 19 | 22.8% | 103.7 | 99% | 18.4% | 3272 |
| 2146 | - | 8/10/2023 | 52 | 19 | 21.4% | 103.9 | 99% | 18.4% | 3273 |

Clay Field Test Results Summary
Cell 5 Phase 1

| Test No. | Retest of | Date | Lift | Proctor Reference No. | In-Place Moisture Content (%) | In-Place Dry Denisty (pcf) | Percent Compaction | Optimum Moisture | Passing Test # (Overall) |
|---|---|---|---|---|---|---|---|---|---|
| 2158 | - | 8/10/2023 | 53 | 16 | 22.0% | 100.9 | 99% | 20.2% | 3274 |
| 2170 | - | 8/11/2023 | 54 | 19 | 20.3% | 103.7 | 99% | 18.4% | 3275 |
| 2182 | - | 8/11/2023 | 55 | 19 | 21.1% | 102.4 | 98% | 18.4% | 3276 |
| 2194 | - | 8/11/2023 | 56 | 19 | 21.9% | 105.0 | 100% | 18.4% | 3277 |
| 2214 | - | 8/11/2023 | 57 | 21 | 20.1% | 106.9 | 101% | 18.1% | 3278 |
| 2227 | - | 8/11/2023 | 58 | 1 | 19.7% | 100.6 | 100% | 19.4% | 3279 |
| 2240 | - | 8/11/2023 | 59 | 19 | 22.2% | 102.4 | 98% | 18.4% | 3280 |
| 2264 | - | 8/14/2023 | 60 | 3 | 23.1% | 96.9 | 98% | 20.2% | 3281 |
| 2265 | - | 8/14/2023 | 61 | 3 | 22.6% | 96.1 | 97% | 20.2% | 3282 |
| 2279 | - | 8/14/2023 | 62 | 21 | 19.9% | 109.9 | 103% | 18.1% | 3283 |
| 2292 | - | 8/14/2023 | 63 | 21 | 21.3% | 106.2 | 100% | 18.1% | 3284 |
| 2305 | - | 8/14/2023 | 64 | 16 | 22.7% | 104.7 | 103% | 20.2% | 3285 |
| 2318 | - | 8/14/2023 | 65 | 16 | 22.7% | 103.9 | 102% | 20.2% | 3286 |
| 2324 | - | 8/14/2023 | 66 | 3 | 23.1% | 99.3 | 100% | 20.2% | 3287 |
| 2341 | - | 8/15/2023 | 67 | 19 | 20.6% | 105.5 | 100% | 18.4% | 3288 |
| 2354 | - | 8/15/2023 | 68 | 21 | 19.6% | 107.9 | 102% | 18.1% | 3289 |
| 2368 | - | 8/15/2023 | 69 | 19 | 20.7% | 105.7 | 101% | 18.4% | 3290 |
| 2382 | - | 8/15/2023 | 70 | 16 | 22.8% | 102.6 | 101% | 20.2% | 3291 |
| 2395 | - | 8/15/2023 | 71 | 1 | 20.7% | 102.9 | 102% | 19.4% | 3292 |
| 2407 | - | 8/15/2023 | 72 | 21 | 20.6% | 107.7 | 101% | 18.1% | 3293 |
| 2415 | - | 8/15/2023 | 73 | 19 | 21.5% | 103.6 | 99% | 18.4% | 3294 |
| 2427 | - | 8/16/2023 | 74 | 21 | 19.0% | 109.1 | 103% | 18.1% | 3295 |
| 2437 | - | 8/16/2023 | 75 | 1 | 20.7% | 103.8 | 103% | 19.4% | 3296 |
| 2447 | - | 8/16/2023 | 76 | 19 | 21.3% | 105.3 | 100% | 18.4% | 3297 |
| 2457 | - | 8/16/2023 | 77 | 16 | 22.3% | 102.7 | 101% | 20.2% | 3298 |
| 2464 | - | 8/16/2023 | 78 | 1 | 21.5% | 100.1 | 99% | 19.4% | 3299 |
| 2471 | - | 8/16/2023 | 79 | 21 | 21.5% | 105.6 | 99% | 18.1% | 3300 |
| 2478 | - | 8/16/2023 | 80 | 3 | 22.5% | 95.4 | 96% | 20.2% | 3301 |
| 2492 | - | 8/17/2023 | 81 | 21 | 21.2% | 105.5 | 99% | 18.1% | 3302 |
| 2504 | - | 8/17/2023 | 82 | 19 | 21.0% | 105.6 | 101% | 18.4% | 3303 |
| 2516 | - | 8/17/2023 | 83 | 21 | 21.1% | 106.0 | 100% | 18.1% | 3304 |
| 2528 | - | 8/17/2023 | 84 | 16 | 23.7% | 101.5 | 100% | 20.2% | 3305 |
| 2540 | - | 8/17/2023 | 85 | 19 | 21.1% | 105.2 | 100% | 18.4% | 3306 |
| 2551 | - | 8/17/2023 | 86 | 16 | 23.8% | 102.1 | 100% | 20.2% | 3307 |
| 2568 | - | 8/18/2023 | 87 | 16 | 22.8% | 103.1 | 101% | 20.2% | 3308 |
| 2579 | - | 8/18/2023 | 88 | 16 | 21.3% | 104.0 | 102% | 20.2% | 3309 |
| 2590 | - | 8/18/2023 | 89 | 16 | 22.1% | 101.5 | 100% | 20.2% | 3310 |
| 2601 | - | 8/18/2023 | 90 | 3 | 21.7% | 99.3 | 100% | 20.2% | 3311 |
| 2612 | - | 8/18/2023 | 91 | 1 | 23.9% | 100.0 | 99% | 19.4% | 3312 |
| 2623 | - | 8/18/2023 | 92 | 1 | 20.3% | 104.2 | 103% | 19.4% | 3313 |
| 2634 | - | 8/19/2023 | 93 | 21 | 18.6% | 108.7 | 102% | 18.1% | 3314 |
| 2645 | - | 8/19/2023 | 94 | 16 | 21.9% | 102.3 | 100% | 20.2% | 3315 |
| 2656 | - | 8/21/2023 | 95 | 19 | 18.9% | 104.9 | 100% | 18.4% | 3316 |
| 2667 | - | 8/21/2023 | 96 | 3 | 25.3% | 98.8 | 99% | 20.2% | 3317 |
| 2678 | - | 8/21/2023 | 97 | 19 | 21.1% | 104.9 | 100% | 18.4% | 3318 |
| 2689 | - | 8/21/2023 | 98 | 16 | 22.5% | 102.7 | 101% | 20.2% | 3319 |
| 2698 | - | 8/21/2023 | 99 | 16 | 23.8% | 102.4 | 101% | 20.2% | 3320 |
| 2711 | - | 8/22/2023 | 100 | 16 | 21.7% | 102.6 | 101% | 20.2% | 3321 |

Clay Field Test Results Summary
Cell 5 Phase 1

| Test No. | Retest of | Date | Lift | Proctor Reference No. | In-Place Moisture Content (%) | In-Place Dry Denisty (pcf) | Percent Compaction | Optimum Moisture | Passing Test # (Overall) |
|---|---|---|---|---|---|---|---|---|---|
| 2740 | - | 8/22/2023 | 101 | 16 | 23.2% | 104.1 | 102% | 20.2% | 3322 |
| 2757 | - | 8/22/2023 | 102 | 16 | 22.8% | 102.6 | 101% | 20.2% | 3323 |
| 2825 | - | 8/26/2023 | 103 | 3 | 26.0% | 95.1 | 96% | 20.2% | 3324 |
| 2830 | - | 8/26/2023 | 104 | 3 | 24.2% | 98.9 | 100% | 20.2% | 3325 |
| 2835 | - | 8/26/2023 | 105 | 16 | 22.4% | 104.1 | 102% | 20.2% | 3326 |
| 2844 | - | 8/26/2023 | 106 | 16 | 22.9% | 102.7 | 101% | 20.2% | 3327 |
| 2849 | - | 8/26/2023 | 107 | 16 | 22.4% | 103.7 | 102% | 20.2% | 3328 |
| 2854 | - | 8/26/2023 | 108 | 16 | 24.4% | 100.6 | 99% | 20.2% | 3329 |
| 2859 | - | 8/26/2023 | 109 | 7 | 28.1% | 92.6 | 99% | 22.6% | 3330 |
| 2864 | - | 8/26/2023 | 110 | 16 | 22.0% | 103.2 | 101% | 20.2% | 3331 |
| 2869 | - | 8/26/2023 | 111 | 16 | 20.9% | 103.3 | 101% | 20.2% | 3332 |
| 2874 | - | 8/26/2023 | 112 | 16 | 22.4% | 102.3 | 100% | 20.2% | 3333 |
| 2879 | - | 8/26/2023 | 113 | 16 | 22.1% | 96.5 | 95% | 20.2% | 3334 |
| 2884 | - | 8/27/2023 | 114 | 16 | 23.1% | 100.6 | 99% | 20.2% | 3335 |
| 2889 | - | 8/27/2023 | 115 | 16 | 21.2% | 101.1 | 99% | 20.2% | 3336 |
| 2894 | - | 8/27/2023 | 116 | 16 | 22.6% | 101.6 | 100% | 20.2% | 3337 |
| 2899 | - | 8/27/2023 | 117 | 16 | 25.4% | 98.3 | 97% | 20.2% | 3338 |
| 2904 | - | 8/27/2023 | 118 | 16 | 23.3% | 101.1 | 99% | 20.2% | 3339 |
| 2909 | - | 8/27/2023 | 119 | 16 | 25.2% | 96.9 | 95% | 20.2% | 3340 |
| 2914 | - | 8/27/2023 | 120 | 16 | 25.6% | 97.1 | 95% | 20.2% | 3341 |
| 2920 | - | 8/28/2023 | 121 | 3 | 23.9% | 95.9 | 97% | 20.2% | 3342 |
| 2925 | - | 8/28/2023 | 122 | 16 | 22.9% | 100.6 | 99% | 20.2% | 3343 |
| 2930 | - | 8/28/2023 | 123 | 16 | 23.3% | 101.2 | 99% | 20.2% | 3344 |
| 2935 | - | 8/28/2023 | 124 | 16 | 22.1% | 102.8 | 101% | 20.2% | 3345 |
| 2940 | - | 8/28/2023 | 125 | 16 | 21.6% | 98.6 | 97% | 20.2% | 3346 |
| 2945 | - | 8/28/2023 | 126 | 16 | 21.0% | 97.6 | 96% | 20.2% | 3347 |
| 2950 | - | 8/28/2023 | 127 | 16 | 20.7% | 99.2 | 97% | 20.2% | 3348 |
| 2955 | - | 8/28/2023 | 128 | 16 | 23.1% | 99.6 | 98% | 20.2% | 3349 |
| 2960 | - | 8/28/2023 | 129 | 16 | 22.6% | 101.9 | 100% | 20.2% | 3350 |
| 2965 | - | 8/28/2023 | 130 | 16 | 22.3% | 102.7 | 101% | 20.2% | 3351 |
| 2971 | - | 8/28/2023 | 131 | 16 | 21.1% | 102.3 | 100% | 20.2% | 3352 |
| 3035 | - | 8/30/2023 | 132 | 16 | 22.0% | 102.2 | 100% | 20.2% | 3353 |
| 3041 | - | 8/30/2023 | 133 | 16 | 22.7% | 102.1 | 100% | 20.2% | 3354 |
| 3047 | - | 8/30/2023 | 134 | 16 | 23.0% | 97.6 | 96% | 20.2% | 3355 |
| 3053 | - | 8/30/2023 | 135 | 16 | 22.3% | 103.0 | 101% | 20.2% | 3356 |
| 3061 | - | 8/30/2023 | 136 | 16 | 22.5% | 99.6 | 98% | 20.2% | 3357 |
| 3065 | - | 8/30/2023 | 137 | 13 | 23.4% | 95.1 | 97% | 21.7% | 3358 |
| 3071 | - | 8/30/2023 | 138 | 16 | 22.9% | 101.3 | 100% | 20.2% | 3359 |
| 3077 | - | 8/30/2023 | 139 | 12 | 24.9% | 93.1 | 96% | 23.6% | 3360 |
| 3085 | - | 8/31/2023 | 140 | 16 | 22.3% | 98.6 | 97% | 20.2% | 3361 |
| 3091 | - | 8/31/2023 | 141 | 16 | 23.2% | 102.8 | 101% | 20.2% | 3362 |
| 3097 | - | 8/31/2023 | 142 | 16 | 21.8% | 101.4 | 100% | 20.2% | 3363 |
| 3103 | - | 8/31/2023 | 143 | 16 | 21.9% | 101.9 | 100% | 20.2% | 3364 |
| 3109 | - | 8/31/2023 | 144 | 16 | 22.0% | 101.9 | 100% | 20.2% | 3365 |
| 3115 | - | 8/31/2023 | 145 | 16 | 18.5% | 108.1 | 106% | 20.2% | - |
| 3118 | 3115 | 9/1/2023 | 145 | 16 | 23.3% | 101.9 | 100% | 20.2% | 3366 |
| 3375 | - | 9/12/2023 | 146 | 1 | 22.7% | 96.0 | 95% | 19.4% | 3367 |
| 3377 | - | 9/12/2023 | 147 | 1 | 23.4% | 100.6 | 100% | 19.4% | 3368 |

Clay Field Test Results Summary
Cell 5 Phase 1

| Test No. | Retest of | Date | Lift | Proctor Reference No. | In-Place Moisture Content (%) | In-Place Dry Denisty (pcf) | Percent Compaction | Optimum Moisture | Passing Test # (Overall) |
|---|---|---|---|---|---|---|---|---|---|
| 3380 | - | 9/12/2023 | 148 | 16 | 23.2% | 101.2 | 99% | 20.2% | 3369 |
| 3383 | - | 9/12/2023 | 149 | 10 | 27.2% | 92.7 | 98% | 25.0% | 3370 |
| 3386 | - | 9/12/2023 | 150 | 1 | 22.9% | 98.1 | 97% | 19.4% | 3371 |
| 3389 | - | 9/13/2023 | 151 | 16 | 21.5% | 102.5 | 101% | 20.2% | 3372 |
| 3392 | - | 9/13/2023 | 152 | 3 | 24.2% | 97.8 | 98% | 20.2% | 3373 |
| 3395 | - | 9/13/2023 | 153 | 3 | 23.4% | 99.3 | 100% | 20.2% | 3374 |
| 3398 | - | 9/13/2023 | 154 | 3 | 25.3% | 97.1 | 98% | 20.2% | 3375 |
| 3401 | - | 9/13/2023 | 155 | 1 | 22.6% | 101.3 | 100% | 19.4% | 3376 |
| 3404 | - | 9/13/2023 | 156 | 3 | 23.9% | 97.9 | 99% | 20.2% | 3377 |
| 3407 | - | 9/13/2023 | 157 | 3 | 23.7% | 98.4 | 99% | 20.2% | 3378 |
| 3410 | - | 9/13/2023 | 158 | 7 | 24.3% | 90.6 | 97% | 22.6% | 3379 |

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 05/08/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | 05/01/23 | P-16 | | CH | 20.2 | 101.8 | 23.7 | 101.9 | 126.0 | 6 | 100 | 95 | 0 / 10 | A |
| 2 | | 05/01/23 | P-16 | | CH | 20.2 | 101.8 | 23.8 | 100.8 | 124.8 | 6 | 99 | 95 | 0 / 10 | A |
| 3 | | 05/01/23 | P-19 | | CH | 18.4 | 105.0 | 22.9 | 102.9 | 126.5 | 6 | 98 | 95 | 0 / 10 | A |
| 4 | | 05/01/23 | P-19 | | CH | 18.4 | 105.0 | 22.7 | 105.5 | 129.5 | 6 | 100 | 95 | 0 / 10 | A |
| 5 | | 05/01/23 | P-19 | | CH | 18.4 | 105.0 | 20.9 | 105.1 | 127.1 | 6 | 100 | 95 | 0 / 10 | A |
| 6 | | 05/01/23 | P-19 | | CH | 18.4 | 105.0 | 22.4 | 103.8 | 127.0 | 6 | 99 | 95 | 0 / 10 | A |
| 7 | | 05/01/23 | P-16 | | CH | 20.2 | 101.8 | 22.2 | 100.3 | 122.6 | 6 | 99 | 95 | 0 / 10 | A |
| 8 | | 05/01/23 | P-16 | | CH | 20.2 | 101.8 | 19.1 | 96.3 | 114.7 | 6 | 95 | 95 | 0 / 10 | B |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1 | Select Clay: Trench, Zone 5, 1st Lift | | | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 2 | Select Clay: Trench, Zone 10, 1st Lift | | | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3 | Select Clay: Trench, Zone 15, 1st Lift | | | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 4 | Select Clay: Trench, Zone 14, 1st Lift | | | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 5 | Select Clay: Trench, Zone 13, 1st Lift | | | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 6 | Select Clay: Trench, Zone 12, 1st Lift | | | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 7 | Select Clay: Trench, Zone 11, 1st Lift | | | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 8 | Select Clay: Trench, Zone 6, 1st Lift | | | InstroTek / 3500 / 1908 / | Wenko, Steve |

### Remarks

**A:** Test results comply with specifications

**B:** Test results do not comply with specifications

### Comments

Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency.

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 05/08/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9 | 8 | 05/01/23 | P-19 | | CH | 18.4 | 105.0 | 22.1 | 103.7 | 126.6 | 6 | 99 | 95 | 0 / 10 | A |
| 10 | | 05/01/23 | P-16 | | CH | 20.2 | 101.8 | 24.7 | 98.3 | 122.6 | 6 | 97 | 95 | 0 / 10 | A |
| 11 | | 05/01/23 | P-16 | | CH | 20.2 | 101.8 | 22.9 | 101.2 | 124.4 | 6 | 99 | 95 | 0 / 10 | A |
| 12 | | 05/01/23 | P-16 | | CH | 20.2 | 101.8 | 24.0 | 98.5 | 122.1 | 6 | 97 | 95 | 0 / 10 | A |
| 13 | | 05/01/23 | P-19 | | CH | 18.4 | 105.0 | 22.3 | 104.3 | 127.6 | 6 | 99 | 95 | 0 / 10 | A |
| 14 | | 05/01/23 | P-19 | | CH | 18.4 | 105.0 | 19.6 | 105.9 | 126.7 | 6 | 101 | 95 | 0 / 10 | A |
| 15 | | 05/01/23 | P-19 | | CH | 18.4 | 105.0 | 21.8 | 104.2 | 126.9 | 6 | 99 | 95 | 0 / 10 | A |
| 16 | | 05/01/23 | P-19 | | CH | 18.4 | 105.0 | 23.1 | 102.1 | 125.7 | 6 | 97 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 9 | Select Clay: Trench, Zone 6, 1st Lift | | | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 10 | Select Clay: Trench, Zone 1, 1st Lift | | | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 11 | Select Clay: Trench, Zone 2, 1st Lift | | | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 12 | Select Clay: Trench, Zone 3, 1st Lift | | | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 13 | Select Clay: Trench, Zone 4, 1st Lift | | | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 14 | Select Clay: Trench, Zone 5, 2nd Lift | | | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 15 | Select Clay: Trench, Zone 10, 2nd Lift | | | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 16 | Select Clay: Trench, Zone 15, 2nd Lift | | | InstroTek / 3500 / 1908 / | Wenko, Steve |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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# Field Compaction Report

**Report Date:** 05/08/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 17 | | 05/01/23 | P-19 | | CH | 18.4 | 105.0 | 19.6 | 103.3 | 123.5 | 6 | 98 | 95 | 0 / 10 | A |
| 18 | | 05/01/23 | P-19 | | CH | 18.4 | 105.0 | 20.1 | 106.9 | 128.4 | 6 | 102 | 95 | 0 / 10 | A |
| 19 | | 05/01/23 | P-19 | | CH | 18.4 | 105.0 | 20.6 | 102.6 | 123.7 | 6 | 98 | 95 | 0 / 10 | A |
| 20 | | 05/01/23 | P-16 | | CH | 20.2 | 101.8 | 22.1 | 100.3 | 122.5 | 6 | 99 | 95 | 0 / 10 | A |
| 21 | | 05/01/23 | P-16 | | CH | 20.2 | 101.8 | 21.9 | 101.6 | 123.8 | 6 | 100 | 95 | 0 / 10 | A |
| 22 | | 05/01/23 | P-19 | | CH | 18.4 | 105.0 | 23.1 | 102.1 | 125.7 | 6 | 97 | 95 | 0 / 10 | A |
| 23 | | 05/01/23 | P-19 | | CH | 18.4 | 105.0 | 19.9 | 105.9 | 127.0 | 6 | 101 | 95 | 0 / 10 | A |
| 24 | | 05/01/23 | P-16 | | CH | 20.2 | 101.8 | 22.6 | 99.9 | 122.5 | 6 | 98 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 17 | Select Clay: Trench, Zone 14, 2nd Lift | | | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 18 | Select Clay: Trench, Zone 13, 2nd Lift | | | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 19 | Select Clay: Trench, Zone 12, 2nd Lift | | | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 20 | Select Clay: Trench, Zone 11, 2nd Lift | | | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 21 | Select Clay: Trench, Zone 2, 2nd Lift | | | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 22 | Select Clay: Trench, Zone 3, 2nd Lift | | | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 23 | Select Clay: Trench, Zone 4, 2nd Lift | | | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 24 | Select Clay: Trench, Zone 5, 3rd Lift | | | InstroTek / 3500 / 1908 / | Wenko, Steve |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 05/08/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25 | | 05/01/23 | P-16 | | CH | 20.2 | 101.8 | 23.3 | 96.9 | 119.5 | 6 | 95 | 95 | 0 / 10 | A |
| 26 | | 05/01/23 | P-19 | | CH | 18.4 | 105.0 | 21.9 | 105.2 | 128.2 | 6 | 100 | 95 | 0 / 10 | A |
| 27 | | 05/01/23 | P-19 | | CH | 18.4 | 105.0 | 19.0 | 105.8 | 125.9 | 6 | 101 | 95 | 0 / 10 | A |
| 28 | | 05/01/23 | P-15 | | CH | 24.1 | 98.6 | 24.3 | 96.1 | 119.5 | 6 | 97 | 95 | 0 / 10 | A |
| 29 | | 05/01/23 | P-16 | | CH | 20.2 | 101.8 | 23.3 | 101.7 | 125.4 | 6 | 100 | 95 | 0 / 10 | A |
| 30 | | 05/01/23 | P-16 | | CH | 20.2 | 101.8 | 23.1 | 100.3 | 123.5 | 6 | 99 | 95 | 0 / 10 | A |
| 31 | | 05/01/23 | P-15 | | CH | 24.1 | 98.6 | 25.6 | 98.2 | 123.3 | 6 | 100 | 95 | 0 / 10 | A |
| 32 | | 05/01/23 | P-15 | | CH | 24.1 | 98.6 | 24.6 | 97.7 | 121.7 | 6 | 99 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 25 | Select Clay: Trench, Zone 5, 4th Lift | | | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 26 | Select Clay: Trench, Zone 5, 5th Lift | | | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 27 | Select Clay: Trench, Zone 10, 3rd Lift | | | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 28 | Select Clay: Trench, Zone 10, 4th Lift | | | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 29 | Select Clay: Trench, Zone 10, 5th Lift | | | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 30 | Select Clay: Trench, Zone 15, 3rd Lift | | | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 31 | Select Clay: Trench, Zone 15, 4th Lift | | | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 32 | Select Clay: Trench, Zone 15, 5th Lift | | | InstroTek / 3500 / 1908 / | Wenko, Steve |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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Bismarck, ND 58504
Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 05/08/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 33 | | 05/01/23 | P-19 | | CH | 18.4 | 105.0 | 22.5 | 102.4 | 125.4 | 6 | 98 | 95 | 0 / 10 | A |
| 34 | | 05/01/23 | P-19 | | CH | 18.4 | 105.0 | 19.6 | 106.5 | 127.4 | 6 | 101 | 95 | 0 / 10 | A |
| 35 | | 05/01/23 | P-16 | | CH | 20.2 | 101.8 | 22.4 | 101.1 | 123.7 | 6 | 99 | 95 | 0 / 10 | A |
| 36 | | 05/01/23 | P-16 | | CH | 20.2 | 101.8 | 23.7 | 99.8 | 123.5 | 6 | 98 | 95 | 0 / 10 | A |
| 37 | | 05/01/23 | P-16 | | CH | 20.2 | 101.8 | 21.8 | 100.5 | 122.4 | 6 | 99 | 95 | 0 / 10 | A |
| 38 | | 05/01/23 | P-16 | | CH | 20.2 | 101.8 | 24.5 | 100.9 | 125.6 | 6 | 99 | 95 | 0 / 10 | A |
| 39 | | 05/01/23 | P-19 | | CH | 18.4 | 105.0 | 21.0 | 103.8 | 125.6 | 6 | 99 | 95 | 0 / 10 | A |
| 40 | | 05/01/23 | P-19 | | CH | 18.4 | 105.0 | 21.0 | 103.9 | 125.7 | 6 | 99 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 33 | Select Clay: Trench, Zone 14, 3rd Lift | | | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 34 | Select Clay: Trench, Zone 14, 4th Lift | | | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 35 | Select Clay: Trench, Zone 14, 5th Lift | | | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 36 | Select Clay: Trench, Zone 13, 3rd Lift | | | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 37 | Select Clay: Trench, Zone 13, 4th Lift | | | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 38 | Select Clay: Trench, Zone 13, 5th Lift | | | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 39 | Select Clay: Trench, Zone 12, 3rd Lift | | | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 40 | Select Clay: Trench, Zone 12, 4th Lift | | | InstroTek / 3500 / 1908 / | Wenko, Steve |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 05/08/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 41 | | 05/01/23 | P-15 | | CH | 24.1 | 98.6 | 25.1 | 96.9 | 121.2 | 6 | 98 | 95 | 0 / 10 | A |
| 42 | | 05/01/23 | P-16 | | CH | 20.2 | 101.8 | 22.7 | 101.1 | 124.1 | 6 | 99 | 95 | 0 / 10 | A |
| 43 | | 05/01/23 | P-16 | | CH | 20.2 | 101.8 | 23.0 | 99.8 | 122.8 | 6 | 98 | 95 | 0 / 10 | A |
| 44 | | 05/01/23 | P-16 | | CH | 20.2 | 101.8 | 24.2 | 97.4 | 121.0 | 6 | 96 | 95 | 0 / 10 | A |
| 45 | | 05/01/23 | P-15 | | CH | 24.1 | 98.6 | 24.5 | 95.0 | 118.3 | 6 | 96 | 95 | 0 / 10 | A |
| 46 | | 05/01/23 | P-19 | | CH | 18.4 | 105.0 | 19.7 | 104.0 | 124.5 | 6 | 99 | 95 | 0 / 10 | A |
| 47 | | 05/01/23 | P-16 | | CH | 20.2 | 101.8 | 23.1 | 96.3 | 118.5 | 6 | 95 | 95 | 0 / 10 | A |
| 48 | | 05/01/23 | P-16 | | CH | 20.2 | 101.8 | 23.6 | 98.4 | 121.6 | 6 | 97 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 41 | Select Clay: Trench, Zone 12, 5th Lift | | | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 42 | Select Clay: Trench, Zone 11, 3rd Lift | | | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 43 | Select Clay: Trench, Zone 11, 4th Lift | | | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 44 | Select Clay: Trench, Zone 11, 5th Lift | | | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 45 | Select Clay: Trench, Zone 6, 2nd Lift | | | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 46 | Select Clay: Trench, Zone 6, 3rd Lift | | | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 47 | Select Clay: Trench, Zone 6, 4th Lift | | | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 48 | Select Clay: Trench, Zone 6, 5th Lift | | | InstroTek / 3500 / 1908 / | Wenko, Steve |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 05/08/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 49 | | 05/01/23 | P-16 | | CH | 20.2 | 101.8 | 22.1 | 97.9 | 119.5 | 6 | 96 | 95 | 0 / 10 | A |
| 50 | | 05/01/23 | P-19 | | CH | 18.4 | 105.0 | 20.9 | 103.4 | 125.0 | 6 | 98 | 95 | 0 / 10 | A |
| 51 | | 05/01/23 | P-16 | | CH | 20.2 | 101.8 | 22.0 | 101.2 | 123.5 | 6 | 99 | 95 | 0 / 10 | A |
| 52 | | 05/01/23 | P-07 | | CH | 22.6 | 93.8 | 23.8 | 92.2 | 114.1 | 6 | 98 | 95 | 0 / 10 | A |
| 53 | | 05/01/23 | P-19 | | CH | 18.4 | 105.0 | 18.0 | 106.9 | 126.1 | 6 | 102 | 95 | 0 / 10 | B |
| 54 | 53 | 05/01/23 | P-19 | | CH | 18.4 | 105.0 | 20.9 | 105.4 | 127.4 | 6 | 100 | 95 | 0 / 10 | A |
| 55 | | 05/01/23 | P-19 | | CH | 18.4 | 105.0 | 20.4 | 105.7 | 127.3 | 6 | 101 | 95 | 0 / 10 | A |
| 56 | | 05/01/23 | P-16 | | CH | 20.2 | 101.8 | 22.4 | 101.0 | 123.6 | 6 | 99 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 49 | Select Clay: Trench, Zone 1, 2nd Lift | | | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 50 | Select Clay: Trench, Zone 1, 3rd Lift | | | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 51 | Select Clay: Trench, Zone 1, 4th Lift | | | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 52 | Select Clay: Trench, Zone 1, 5th Lift | | | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 53 | Select Clay: Trench, Zone 2, 3rd Lift | | | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 54 | Select Clay: Trench, Zone 2, 3rd Lift | | | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 55 | Select Clay: Trench, Zone 2, 4th Lift | | | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 56 | Select Clay: Trench, Zone 2, 5th Lift | | | InstroTek / 3500 / 1908 / | Wenko, Steve |

### Remarks

**A:** Test results comply with specifications

**B:** Test results do not comply with specifications

### Comments

Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency.

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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The Science You Build On.

2908 Morrison Ave.
Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 05/08/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 57 | | 05/01/23 | P-19 | | CH | 18.4 | 105.0 | 20.2 | 105.3 | 126.6 | 6 | 100 | 95 | 0 / 10 | A |
| 58 | | 05/01/23 | P-16 | | CH | 20.2 | 101.8 | 22.6 | 101.3 | 124.2 | 6 | 100 | 95 | 0 / 10 | A |
| 59 | | 05/01/23 | P-16 | | CH | 20.2 | 101.8 | 23.6 | 98.9 | 122.2 | 6 | 97 | 95 | 0 / 10 | A |
| 60 | | 05/01/23 | P-19 | | CH | 18.4 | 105.0 | 22.1 | 102.5 | 125.2 | 6 | 98 | 95 | 0 / 10 | A |
| 61 | | 05/01/23 | P-19 | | CH | 18.4 | 105.0 | 21.3 | 104.3 | 126.5 | 6 | 99 | 95 | 0 / 10 | A |
| 62 | | 05/01/23 | P-15 | | CH | 24.1 | 98.6 | 26.1 | 96.0 | 121.1 | 6 | 97 | 95 | 0 / 10 | A |
| 63 | | 05/02/23 | P-16 | | CH | 20.2 | 101.8 | 22.5 | 100.1 | 122.6 | 6 | 98 | 95 | 0 / 10 | A |
| 64 | | 05/02/23 | P-14 | | CH | 27.2 | 92.4 | 30.4 | 91.3 | 119.1 | 6 | 99 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 57 | Select Clay: Trench, Zone 3, 3rd Lift | | | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 58 | Select Clay: Trench, Zone 3, 4th Lift | | | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 59 | Select Clay: Trench, Zone 3, 5th Lift | | | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 60 | Select Clay: Trench, Zone 4, 3rd Lift | | | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 61 | Select Clay: Trench, Zone 4, 4th Lift | | | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 62 | Select Clay: Trench, Zone 4, 5th Lift | | | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 63 | Select Clay: Trench, Zone 5, 6th Lift | | | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 64 | Select Clay: Trench, Zone 5, 7th Lift | | | InstroTek / 3500 / 1908 / | Wenko, Steve |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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2908 Morrison Ave.
Suite 3
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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 05/08/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 65 | | 05/02/23 | P-14 | | CH | 27.2 | 92.4 | 31.1 | 87.8 | 115.1 | 6 | 95 | 95 | 0 / 10 | A |
| 66 | | 05/02/23 | P-14 | | CH | 27.2 | 92.4 | 31.0 | 89.3 | 117.0 | 6 | 97 | 95 | 0 / 10 | A |
| 67 | | 05/02/23 | P-14 | | CH | 27.2 | 92.4 | 36.4 | 83.3 | 113.6 | 6 | 90 | 95 | 0 / 10 | B |
| 68 | 67 | 05/02/23 | P-14 | | CH | 27.2 | 92.4 | 34.5 | 87.5 | 117.7 | 6 | 95 | 95 | 0 / 10 | A |
| 69 | | 05/02/23 | P-14 | | CH | 27.2 | 92.4 | 31.4 | 88.3 | 116.0 | 6 | 96 | 95 | 0 / 10 | A |
| 70 | | 05/02/23 | P-15 | | CH | 24.1 | 98.6 | 26.9 | 97.1 | 123.2 | 6 | 98 | 95 | 0 / 10 | A |
| 71 | | 05/02/23 | P-18 | | CH | 25.7 | 94.5 | 28.3 | 92.3 | 118.4 | 6 | 98 | 95 | 0 / 10 | A |
| 72 | | 05/02/23 | P-14 | | CH | 27.2 | 92.4 | 30.8 | 87.8 | 114.8 | 6 | 95 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 65 | Select Clay: Trench, Zone 5, 8th Lift | | | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 66 | Select Clay: Trench, Zone 10, 6th Lift | | | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 67 | Select Clay: Trench, Zone 10, 7th Lift | | | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 68 | Select Clay: Trench, Zone 10, 7th Lift | | | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 69 | Select Clay: Trench, Zone 10, 8th Lift | | | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 70 | Select Clay: Trench, Zone 15, 6th Lift | | | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 71 | Select Clay: Trench, Zone 15, 7th Lift | | | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 72 | Select Clay: Trench, Zone 15, 8th Lift | | | InstroTek / 3500 / 1908 / | Wenko, Steve |

### Remarks

**A:** Test results comply with specifications

**B:** Test results do not comply with specifications

### Comments

Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency.

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 05/08/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 73 | | 05/02/23 | P-14 | | CH | 27.2 | 92.4 | 30.8 | 92.6 | 121.1 | 6 | 100 | 95 | 0 / 10 | A |
| 74 | | 05/02/23 | P-14 | | CH | 27.2 | 92.4 | 30.5 | 91.0 | 118.8 | 6 | 98 | 95 | 0 / 10 | A |
| 75 | | 05/02/23 | P-14 | | CH | 27.2 | 92.4 | 34.8 | 86.1 | 116.1 | 6 | 93 | 95 | 0 / 10 | B |
| 76 | 75 | 05/02/23 | P-14 | | CH | 27.2 | 92.4 | 31.9 | 88.2 | 116.3 | 6 | 95 | 95 | 0 / 10 | A |
| 77 | | 05/02/23 | P-14 | | CH | 27.2 | 92.4 | 31.6 | 87.6 | 115.3 | 6 | 95 | 95 | 0 / 10 | A |
| 78 | | 05/02/23 | P-14 | | CH | 27.2 | 92.4 | 32.1 | 87.8 | 116.0 | 6 | 95 | 95 | 0 / 10 | A |
| 79 | | 05/02/23 | P-14 | | CH | 27.2 | 92.4 | 33.1 | 85.8 | 114.2 | 6 | 93 | 95 | 0 / 10 | B |
| 80 | 79 | 05/02/23 | P-14 | | CH | 27.2 | 92.4 | 29.7 | 87.8 | 113.9 | 6 | 95 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 73 | Select Clay: Trench, Zone 14, 6th Lift | | | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 74 | Select Clay: Trench, Zone 14, 7th Lift | | | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 75 | Select Clay: Trench, Zone 14, 8th Lift | | | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 76 | Select Clay: Trench, Zone 14, 8th Lift | | | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 77 | Select Clay: Trench, Zone 13, 6th Lift | | | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 78 | Select Clay: Trench, Zone 13, 7th Lift | | | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 79 | Select Clay: Trench, Zone 13, 8th Lift | | | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 80 | Select Clay: Trench, Zone 13, 8th Lift | | | InstroTek / 3500 / 1908 / | Wenko, Steve |

### Remarks

**A:** Test results comply with specifications

**B:** Test results do not comply with specifications

### Comments

Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency.

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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# Field Compaction Report

**Report Date:** 05/08/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 81 | | 05/02/23 | P-14 | | CH | 27.2 | 92.4 | 30.1 | 88.1 | 114.6 | 6 | 95 | 95 | 0 / 10 | A |
| 82 | | 05/02/23 | P-14 | | CH | 27.2 | 92.4 | 30.9 | 91.2 | 119.4 | 6 | 99 | 95 | 0 / 10 | A |
| 83 | | 05/02/23 | P-14 | | CH | 27.2 | 92.4 | 29.8 | 91.6 | 118.9 | 6 | 99 | 95 | 0 / 10 | A |
| 84 | | 05/02/23 | P-14 | | CH | 27.2 | 92.4 | 31.1 | 88.3 | 115.8 | 6 | 96 | 95 | 0 / 10 | A |
| 85 | | 05/02/23 | P-14 | | CH | 27.2 | 92.4 | 30.2 | 89.6 | 116.7 | 6 | 97 | 95 | 0 / 10 | A |
| 86 | | 05/02/23 | P-15 | | CH | 24.1 | 98.6 | 25.7 | 96.4 | 121.2 | 6 | 98 | 95 | 0 / 10 | A |
| 87 | | 05/02/23 | P-15 | | CH | 24.1 | 98.6 | 25.1 | 97.5 | 122.0 | 6 | 99 | 95 | 0 / 10 | A |
| 88 | | 05/02/23 | P-14 | | CH | 27.2 | 92.4 | 30.9 | 89.7 | 117.4 | 6 | 97 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 81 | Select Clay: Trench, Zone 12, 6th Lift | | | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 82 | Select Clay: Trench, Zone 12, 7th Lift | | | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 83 | Select Clay: Trench, Zone 12, 8th Lift | | | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 84 | Select Clay: Trench, Zone 11, 6th Lift | | | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 85 | Select Clay: Trench, Zone 11, 7th Lift | | | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 86 | Select Clay: Trench, Zone 11, 8th Lift | | | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 87 | Select Clay: Trench, Zone 6, 6th Lift | | | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 88 | Select Clay: Trench, Zone 6, 7th Lift | | | InstroTek / 3500 / 1908 / | Wenko, Steve |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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Bismarck, ND 58504
Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 05/08/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 89 | | 05/02/23 | P-14 | | CH | 27.2 | 92.4 | 29.4 | 91.2 | 118.0 | 6 | 99 | 95 | 0 / 10 | A |
| 90 | | 05/02/23 | P-18 | | CH | 25.7 | 94.5 | 29.9 | 92.6 | 120.3 | 6 | 98 | 95 | 0 / 10 | A |
| 91 | | 05/02/23 | P-14 | | CH | 27.2 | 92.4 | 34.1 | 88.1 | 118.1 | 6 | 95 | 95 | 0 / 10 | A |
| 92 | | 05/02/23 | P-14 | | CH | 27.2 | 92.4 | 31.3 | 88.5 | 116.2 | 6 | 96 | 95 | 0 / 10 | A |
| 93 | | 05/02/23 | P-18 | | CH | 25.7 | 94.5 | 28.9 | 93.9 | 121.0 | 6 | 99 | 95 | 0 / 10 | A |
| 94 | | 05/02/23 | P-14 | | CH | 27.2 | 92.4 | 31.3 | 89.5 | 117.5 | 6 | 97 | 95 | 0 / 10 | A |
| 95 | | 05/02/23 | P-16 | | CH | 20.2 | 101.8 | 24.4 | 98.8 | 122.9 | 6 | 97 | 95 | 0 / 10 | A |
| 96 | | 05/02/23 | P-14 | | CH | 27.2 | 92.4 | 28.7 | 90.1 | 116.0 | 6 | 98 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 89 | Select Clay: Trench, Zone 6, 8th Lift | | | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 90 | Select Clay: Trench, Zone 1, 6th Lift | | | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 91 | Select Clay: Trench, Zone 1, 7th Lift | | | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 92 | Select Clay: Trench, Zone 1, 8th Lift | | | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 93 | Select Clay: Trench, Zone 2, 6th Lift | | | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 94 | Select Clay: Trench, Zone 2, 7th Lift | | | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 95 | Select Clay: Trench, Zone 3, 6th Lift | | | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 96 | Select Clay: Trench, Zone 3, 7th Lift | | | InstroTek / 3500 / 1908 / | Wenko, Steve |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 05/08/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 97 | | 05/02/23 | P-15 | | CH | 24.1 | 98.6 | 34.4 | 85.7 | 115.2 | 6 | 87 | 95 | 0 / 10 | B |
| 98 | 97 | 05/02/23 | P-15 | | CH | 24.1 | 98.6 | 25.0 | 95.7 | 119.6 | 6 | 97 | 95 | 0 / 10 | A |
| 99 | | 05/02/23 | P-16 | | CH | 20.2 | 101.8 | 22.5 | 100.1 | 122.6 | 6 | 98 | 95 | 0 / 10 | A |
| 100 | | 05/02/23 | P-14 | | CH | 27.2 | 92.4 | 31.4 | 87.7 | 115.2 | 6 | 95 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 97 | Select Clay: Trench, Zone 3, 8th Lift | | | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 98 | Select Clay: Trench, Zone 3, 8th Lift | | | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 99 | Select Clay: Trench, Zone 4, 6th Lift | | | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 100 | Select Clay: Trench, Zone 4, 7th Lift | | | InstroTek / 3500 / 1908 / | Wenko, Steve |

### Remarks

**B:** Test results do not comply with specifications

**A:** Test results comply with specifications

### Comments

Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency.

Kurt Kuechle
05/08/2023

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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# Field Compaction Report

**Report Date:** 05/08/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 101 | | 05/02/23 | P-14 | | CH | 27.2 | 92.4 | 34.6 | 84.0 | 113.1 | 6 | 91 | 95 | 0 / 10 | B |
| 102 | 101 | 05/02/23 | P-14 | | CH | 27.2 | 92.4 | 30.8 | 90.2 | 118.0 | 6 | 98 | 95 | 0 / 10 | A |
| 103 | | 05/02/23 | P-19 | | CH | 18.4 | 105.0 | 30.9 | 86.6 | 113.4 | 6 | 82 | 95 | 0 / 10 | B |
| 104 | 103 | 05/02/23 | P-18 | | CH | 25.7 | 94.5 | 29.8 | 91.6 | 118.9 | 6 | 97 | 95 | 0 / 10 | A |
| 105 | | 05/02/23 | P-15 | | CH | 24.1 | 98.6 | 26.4 | 93.2 | 117.8 | 6 | 95 | 95 | 0 / 10 | A |
| 106 | | 05/02/23 | P-19 | | CH | 18.4 | 105.0 | 20.7 | 101.0 | 121.9 | 6 | 96 | 95 | 0 / 10 | A |
| 107 | | 05/02/23 | P-14 | | CH | 27.2 | 92.4 | 30.5 | 87.6 | 114.3 | 6 | 95 | 95 | 0 / 10 | A |
| 108 | | 05/02/23 | P-14 | | CH | 27.2 | 92.4 | 27.3 | 86.5 | 110.1 | 6 | 94 | 95 | 0 / 10 | B |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 101 | Select Clay: Trench, Zone 4, 8th Lift | | | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 102 | Select Clay: Trench, Zone 4, 8th Lift | | | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 103 | Select Clay: Wall, Zone 16 | 1.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 104 | Select Clay: Wall, Zone 16 | 1.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 105 | Select Clay: Wall, Zone 16 | 2.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 106 | Select Clay: Wall, Zone 16 | 3.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 107 | Select Clay: Wall, Zone 17 | 1.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 108 | Select Clay: Wall, Zone 17 | 2.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |

### Remarks

**B:** Test results do not comply with specifications

**A:** Test results comply with specifications

### Comments

Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency.

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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The Science You Build On.

2908 Morrison Ave.
Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 05/08/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 109 | 108 | 05/02/23 | P-14 | | CH | 27.2 | 92.4 | 27.2 | 91.1 | 115.9 | 6 | 99 | 95 | 0 / 10 | A |
| 110 | | 05/02/23 | P-19 | | CH | 18.4 | 105.0 | 22.4 | 102.9 | 126.0 | 6 | 98 | 95 | 0 / 10 | A |
| 111 | | 05/02/23 | P-15 | | CH | 24.1 | 98.6 | 25.2 | 95.6 | 119.7 | 6 | 97 | 95 | 0 / 10 | A |
| 112 | | 05/02/23 | P-14 | | CH | 27.2 | 92.4 | 27.3 | 83.4 | 106.2 | 6 | 90 | 95 | 0 / 10 | B |
| 113 | 112 | 05/02/23 | P-14 | | CH | 27.2 | 92.4 | 28.8 | 87.4 | 112.6 | 6 | 95 | 95 | 0 / 10 | A |
| 114 | | 05/02/23 | P-15 | | CH | 24.1 | 98.6 | 26.5 | 95.1 | 120.3 | 6 | 96 | 95 | 0 / 10 | A |
| 115 | | 05/02/23 | P-14 | | CH | 27.2 | 92.4 | 27.9 | 92.2 | 117.9 | 6 | 100 | 95 | 0 / 10 | A |
| 116 | | 05/02/23 | P-17 | | CH | 25.6 | 95.9 | 28.6 | 92.1 | 118.4 | 6 | 96 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 109 | Select Clay: Wall, Zone 17 | 2.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 110 | Select Clay: Wall, Zone 17 | 3.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 111 | Select Clay: Wall, Zone 18 | 1.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 112 | Select Clay: Wall, Zone 18 | 2.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 113 | Select Clay: Wall, Zone 18 | 2.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 114 | Select Clay: Wall, Zone 18 | 3.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 115 | Select Clay: Wall, Zone 22 | 1.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 116 | Select Clay: Wall, Zone 22 | 2.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |

### Remarks

**A:** Test results comply with specifications

**B:** Test results do not comply with specifications

### Comments

Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency.

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 05/08/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 117 | | 05/02/23 | P-14 | | CH | 27.2 | 92.4 | 29.2 | 91.7 | 118.5 | 6 | 99 | 95 | 0 / 10 | A |
| 118 | | 05/02/23 | P-19 | | CH | 18.4 | 105.0 | 20.5 | 106.1 | 127.9 | 6 | 101 | 95 | 0 / 10 | A |
| 119 | | 05/02/23 | P-17 | | CH | 25.6 | 95.9 | 27.5 | 94.9 | 121.0 | 6 | 99 | 95 | 0 / 10 | A |
| 120 | | 05/02/23 | P-16 | | CH | 20.2 | 101.8 | 23.4 | 100.7 | 124.3 | 6 | 99 | 95 | 0 / 10 | A |
| 121 | | 05/02/23 | P-10 | | CH | 25.0 | 94.6 | 25.5 | 93.8 | 117.7 | 6 | 99 | 95 | 0 / 10 | A |
| 122 | | 05/02/23 | P-19 | | CH | 18.4 | 105.0 | 19.8 | 106.3 | 127.3 | 6 | 101 | 95 | 0 / 10 | A |
| 123 | | 05/02/23 | P-14 | | CH | 27.2 | 92.4 | 32.1 | 86.2 | 113.9 | 6 | 93 | 95 | 0 / 10 | B |
| 124 | 123 | 05/02/23 | P-14 | | CH | 27.2 | 92.4 | 30.9 | 89.7 | 117.4 | 6 | 97 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 117 | Select Clay: Wall, Zone 22 | 3.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 118 | Select Clay: Wall, Zone 22 | 4.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 119 | Select Clay: Wall, Zone 23 | 1.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 120 | Select Clay: Wall, Zone 23 | 2.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 121 | Select Clay: Wall, Zone 23 | 3.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 122 | Select Clay: Wall, Zone 23 | 4.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 123 | Select Clay: Wall, Zone 24 | 1.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 124 | Select Clay: Wall, Zone 24 | 1.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |

## Remarks

**A:** Test results comply with specifications

**B:** Test results do not comply with specifications

## Comments

Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency.

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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# Field Compaction Report

**Report Date:** 05/08/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 125 | | 05/02/23 | P-15 | | CH | 24.1 | 98.6 | 25.9 | 95.6 | 120.4 | 6 | 97 | 95 | 0 / 10 | A |
| 126 | | 05/02/23 | P-10 | | CH | 25.0 | 94.6 | 25.2 | 90.2 | 112.9 | 6 | 95 | 95 | 0 / 10 | A |
| 127 | | 05/02/23 | P-19 | | CH | 18.4 | 105.0 | 21.0 | 103.9 | 125.7 | 6 | 99 | 95 | 0 / 10 | A |
| 128 | | 05/02/23 | P-14 | | CH | 27.2 | 92.4 | 30.6 | 88.3 | 115.3 | 6 | 96 | 95 | 0 / 10 | A |
| 129 | | 05/02/23 | P-15 | | CH | 24.1 | 98.6 | 25.4 | 94.2 | 118.1 | 6 | 96 | 95 | 0 / 10 | A |
| 130 | | 05/02/23 | P-14 | | CH | 27.2 | 92.4 | 26.6 | 88.3 | 111.8 | 6 | 96 | 95 | 0 / 10 | B |
| 131 | 130 | 05/02/23 | P-14 | | CH | 27.2 | 92.4 | 27.9 | 90.1 | 115.2 | 6 | 98 | 95 | 0 / 10 | A |
| 132 | | 05/02/23 | P-14 | | CH | 27.2 | 92.4 | 33.0 | 81.8 | 108.8 | 6 | 89 | 95 | 0 / 10 | B |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 125 | Select Clay: Wall, Zone 24 | 2.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 126 | Select Clay: Wall, Zone 24 | 3.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 127 | Select Clay: Wall, Zone 24 | 4.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 128 | Select Clay: Wall, Zone 25 | 1.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 129 | Select Clay: Wall, Zone 25 | 2.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 130 | Select Clay: Wall, Zone 25 | 3.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 131 | Select Clay: Wall, Zone 25 | 3.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 132 | Select Clay: Wall, Zone 26 | 1.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |

### Remarks

**A:** Test results comply with specifications

**B:** Test results do not comply with specifications

### Comments

Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency.

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 05/08/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 133 | 132 | 05/02/23 | P-14 | | CH | 27.2 | 92.4 | 29.6 | 87.7 | 113.7 | 6 | 95 | 95 | 0 / 10 | A |
| 134 | | 05/02/23 | P-17 | | CH | 25.6 | 95.9 | 26.5 | 91.3 | 115.5 | 6 | 95 | 95 | 0 / 10 | A |
| 135 | | 05/02/23 | P-14 | | CH | 27.2 | 92.4 | 34.3 | 79.9 | 107.3 | 6 | 86 | 95 | 0 / 10 | B |
| 136 | 135 | 05/02/23 | P-14 | | CH | 27.2 | 92.4 | 27.8 | 88.2 | 112.7 | 6 | 95 | 95 | 0 / 10 | A |
| 137 | | 05/02/23 | P-10 | | CH | 25.0 | 94.6 | 27.7 | 91.2 | 116.5 | 6 | 96 | 95 | 0 / 10 | A |
| 138 | | 05/02/23 | P-14 | | CH | 27.2 | 92.4 | 27.9 | 87.8 | 112.3 | 6 | 95 | 95 | 0 / 10 | A |
| 139 | | 05/02/23 | P-16 | | CH | 20.2 | 101.8 | 28.7 | 84.1 | 108.2 | 6 | 83 | 95 | 0 / 10 | B |
| 140 | 139 | 05/02/23 | P-16 | | CH | 20.2 | 101.8 | 24.1 | 99.8 | 123.9 | 6 | 98 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 133 | Select Clay: Wall, Zone 26 | 1.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 134 | Select Clay: Wall, Zone 26 | 2.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 135 | Select Clay: Wall, Zone 26 | 3.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 136 | Select Clay: Wall, Zone 26 | 3.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 137 | Select Clay: Wall, Zone 27 | 1.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 138 | Select Clay: Wall, Zone 27 | 2.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 139 | Select Clay: Wall, Zone 27 | 3.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 140 | Select Clay: Wall, Zone 27 | 3.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |

### Remarks

**A:** Test results comply with specifications

**B:** Test results do not comply with specifications

### Comments

Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency.

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 05/08/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 141 | | 05/03/23 | P-07 | | CH | 22.6 | 93.8 | 26.2 | 92.6 | 116.9 | 6 | 99 | 95 | 0 / 10 | A |
| 142 | | 05/03/23 | P-15 | | CH | 24.1 | 98.6 | 28.0 | 94.3 | 120.7 | 6 | 96 | 95 | 0 / 10 | A |
| 143 | | 05/03/23 | P-07 | | CH | 22.6 | 93.8 | 25.2 | 92.6 | 115.9 | 6 | 99 | 95 | 0 / 10 | A |
| 144 | | 05/03/23 | P-03 | | CH | 20.2 | 99.3 | 21.4 | 96.0 | 116.5 | 6 | 97 | 95 | 0 / 10 | A |
| 145 | | 05/03/23 | P-16 | | CH | 20.2 | 101.8 | 21.6 | 98.9 | 120.3 | 6 | 97 | 95 | 0 / 10 | A |
| 146 | | 05/03/23 | P-16 | | CH | 20.2 | 101.8 | 21.4 | 99.4 | 120.7 | 6 | 98 | 95 | 0 / 10 | A |
| 147 | | 05/03/23 | P-14 | | CH | 27.2 | 92.4 | 27.9 | 89.6 | 114.6 | 6 | 97 | 95 | 0 / 10 | A |
| 148 | | 05/03/23 | P-07 | | CH | 22.6 | 93.8 | 26.0 | 94.1 | 118.6 | 6 | 100 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 141 | Select Clay: Wall, Zone 22 | 5.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 142 | Select Clay: Wall, Zone 23 | 5.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 143 | Select Clay: Wall, Zone 24 | 5.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 144 | Select Clay: Wall, Zone 25 | 4.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 145 | Select Clay: Wall, Zone 26 | 4.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 146 | Select Clay: Wall, Zone 27 | 4.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 147 | Select Clay: Wall, Zone 16 | 4.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 148 | Select Clay: Wall, Zone 16 | 5.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 05/08/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 149 | | 05/03/23 | P-17 | | CH | 25.6 | 95.9 | 26.8 | 92.0 | 116.7 | 6 | 96 | 95 | 0 / 10 | A |
| 150 | | 05/03/23 | P-14 | | CH | 27.2 | 92.4 | 28.5 | 87.7 | 112.7 | 6 | 95 | 95 | 0 / 10 | A |
| 151 | | 05/03/23 | P-12 | | CH | 23.6 | 97.4 | 24.6 | 92.1 | 114.8 | 6 | 95 | 95 | 0 / 10 | A |
| 152 | | 05/03/23 | P-19 | | CH | 18.4 | 105.0 | 19.4 | 105.5 | 126.0 | 6 | 100 | 95 | 0 / 10 | A |
| 153 | | 05/03/23 | P-16 | | CH | 20.2 | 101.8 | 21.9 | 97.1 | 118.4 | 6 | 95 | 95 | 0 / 10 | A |
| 154 | | 05/03/23 | P-15 | | CH | 24.1 | 98.6 | 25.5 | 98.1 | 123.1 | 6 | 99 | 95 | 0 / 10 | A |
| 155 | | 05/03/23 | P-07 | | CH | 22.6 | 93.8 | 27.1 | 89.9 | 114.3 | 6 | 96 | 95 | 0 / 10 | A |
| 156 | | 05/03/23 | P-07 | | CH | 22.6 | 93.8 | 25.1 | 91.4 | 114.3 | 6 | 97 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 149 | Select Clay: Wall, Zone 16 | 6.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 150 | Select Clay: Wall, Zone 16 | 7.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 151 | Select Clay: Wall, Zone 16 | 8.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 152 | Select Clay: Wall, Zone 17 | 4.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 153 | Select Clay: Wall, Zone 17 | 5.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 154 | Select Clay: Wall, Zone 17 | 6.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 155 | Select Clay: Wall, Zone 17 | 7.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 156 | Select Clay: Wall, Zone 17 | 8.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 05/08/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 157 | | 05/03/23 | P-14 | | CH | 27.2 | 92.4 | 29.5 | 91.1 | 118.0 | 6 | 99 | 95 | 0 / 10 | A |
| 158 | | 05/03/23 | P-03 | | CH | 20.2 | 99.3 | 17.7 | 102.6 | 120.8 | 6 | 103 | 95 | 0 / 10 | B |
| 159 | 158 | 05/03/23 | P-03 | | CH | 20.2 | 99.3 | 22.6 | 96.7 | 118.6 | 6 | 97 | 95 | 0 / 10 | A |
| 160 | | 05/03/23 | P-17 | | CH | 25.6 | 95.9 | 28.6 | 92.3 | 118.7 | 6 | 96 | 95 | 0 / 10 | A |
| 161 | | 05/03/23 | P-14 | | CH | 27.2 | 92.4 | 29.5 | 91.9 | 119.0 | 6 | 99 | 95 | 0 / 10 | A |
| 162 | | 05/03/23 | P-14 | | CH | 27.2 | 92.4 | 27.9 | 87.5 | 111.9 | 6 | 95 | 95 | 0 / 10 | A |
| 163 | | 05/03/23 | P-19 | | CH | 18.4 | 105.0 | 20.8 | 102.0 | 123.2 | 6 | 97 | 95 | 0 / 10 | A |
| 164 | | 05/03/23 | P-19 | | CH | 18.4 | 105.0 | 18.4 | 105.7 | 125.2 | 6 | 101 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 157 | Select Clay: Wall, Zone 18 | 4.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 158 | Select Clay: Wall, Zone 18 | 5.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 159 | Select Clay: Wall, Zone 18 | 5.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 160 | Select Clay: Wall, Zone 18 | 6.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 161 | Select Clay: Wall, Zone 18 | 7.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 162 | Select Clay: Wall, Zone 18 | 8.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 163 | Select Clay: Wall, Zone 22 | 6.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 164 | Select Clay: Wall, Zone 22 | 7.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |

### Remarks

**A:** Test results comply with specifications

**B:** Test results do not comply with specifications

### Comments

Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency.

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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The Science You Build On.

2908 Morrison Ave.
Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 05/08/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 165 | | 05/03/23 | P-13 | | CH | 21.7 | 97.9 | 24.8 | 93.8 | 117.1 | 6 | 96 | 95 | 0 / 10 | A |
| 166 | | 05/03/23 | P-19 | | CH | 18.4 | 105.0 | 21.7 | 104.3 | 126.9 | 6 | 99 | 95 | 0 / 10 | A |
| 167 | | 05/03/23 | P-07 | | CH | 22.6 | 93.8 | 25.4 | 92.3 | 115.7 | 6 | 98 | 95 | 0 / 10 | A |
| 168 | | 05/03/23 | P-19 | | CH | 18.4 | 105.0 | 18.9 | 103.9 | 123.5 | 6 | 99 | 95 | 0 / 10 | A |
| 169 | | 05/03/23 | P-15 | | CH | 24.1 | 98.6 | 25.9 | 94.0 | 118.3 | 6 | 95 | 95 | 0 / 10 | A |
| 170 | | 05/03/23 | P-01 | | CH | 19.4 | 100.8 | 19.8 | 99.9 | 119.7 | 6 | 99 | 95 | 0 / 10 | A |
| 171 | | 05/03/23 | P-17 | | CH | 25.6 | 95.9 | 26.7 | 95.5 | 121.0 | 6 | 100 | 95 | 0 / 10 | A |
| 172 | | 05/03/23 | P-16 | | CH | 20.2 | 101.8 | 22.3 | 98.0 | 119.9 | 6 | 96 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 165 | Select Clay: Wall, Zone 22 | 8.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 166 | Select Clay: Wall, Zone 22 | 9.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 167 | Select Clay: Wall, Zone 23 | 6.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 168 | Select Clay: Wall, Zone 23 | 7.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 169 | Select Clay: Wall, Zone 23 | 8.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 170 | Select Clay: Wall, Zone 23 | 9.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 171 | Select Clay: Wall, Zone 23 | 10.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 172 | Select Clay: Wall, Zone 24 | 6.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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2908 Morrison Ave.
Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 05/08/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 173 | | 05/03/23 | P-15 | | CH | 24.1 | 98.6 | 27.5 | 94.5 | 120.5 | 6 | 96 | 95 | 0 / 10 | A |
| 174 | | 05/03/23 | P-04 | | CH | 20.2 | 99.3 | 23.0 | 98.6 | 121.3 | 6 | 99 | 95 | 0 / 10 | A |
| 175 | | 05/03/23 | P-19 | | CH | 18.4 | 105.0 | 19.3 | 102.8 | 122.6 | 6 | 98 | 95 | 0 / 10 | A |
| 176 | | 05/03/23 | P-19 | | CH | 18.4 | 105.0 | 19.1 | 103.8 | 123.6 | 6 | 99 | 95 | 0 / 10 | A |
| 177 | | 05/03/23 | P-15 | | CH | 24.1 | 98.6 | 25.4 | 97.4 | 122.1 | 6 | 99 | 95 | 0 / 10 | A |
| 178 | | 05/03/23 | P-03 | | CH | 20.2 | 99.3 | 22.1 | 98.3 | 120.0 | 6 | 99 | 95 | 0 / 10 | A |
| 179 | | 05/03/23 | P-16 | | CH | 20.2 | 101.8 | 20.6 | 99.9 | 120.5 | 6 | 98 | 95 | 0 / 10 | A |
| 180 | | 05/03/23 | P-15 | | CH | 24.1 | 98.6 | 27.2 | 94.4 | 120.1 | 6 | 96 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 173 | Select Clay: Wall, Zone 24 | 7.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 174 | Select Clay: Wall, Zone 24 | 8.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 175 | Select Clay: Wall, Zone 24 | 9.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 176 | Select Clay: Wall, Zone 24 | 10.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 177 | Select Clay: Wall, Zone 24 | 11.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 178 | Select Clay: Wall, Zone 24 | 12.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 179 | Select Clay: Wall, Zone 25 | 5.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 180 | Select Clay: Wall, Zone 25 | 6.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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Bismarck, ND 58504
Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 05/08/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 181 | | 05/03/23 | P-15 | | CH | 24.1 | 98.6 | 26.3 | 93.8 | 118.5 | 6 | 95 | 95 | 0 / 10 | A |
| 182 | | 05/03/23 | P-13 | | CH | 21.7 | 97.9 | 21.9 | 93.4 | 113.9 | 6 | 95 | 95 | 0 / 10 | A |
| 183 | | 05/03/23 | P-16 | | CH | 20.2 | 101.8 | 23.1 | 99.0 | 121.9 | 6 | 97 | 95 | 0 / 10 | A |
| 184 | | 05/03/23 | P-19 | | CH | 18.4 | 105.0 | 21.6 | 101.5 | 123.4 | 6 | 97 | 95 | 0 / 10 | A |
| 185 | | 05/03/23 | P-03 | | CH | 20.2 | 99.3 | 20.9 | 98.9 | 119.6 | 6 | 100 | 95 | 0 / 10 | A |
| 186 | | 05/03/23 | P-01 | | CH | 19.4 | 100.8 | 20.6 | 98.7 | 119.0 | 6 | 98 | 95 | 0 / 10 | A |
| 187 | | 05/03/23 | P-01 | | CH | 19.4 | 100.8 | 15.2 | 106.3 | 122.5 | 6 | 105 | 95 | 0 / 10 | B |
| 188 | 187 | 05/03/23 | P-01 | | CH | 19.4 | 100.8 | 20.8 | 97.7 | 118.0 | 6 | 97 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 181 | Select Clay: Wall, Zone 25 | 7.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 182 | Select Clay: Wall, Zone 25 | 8.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 183 | Select Clay: Wall, Zone 25 | 9.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 184 | Select Clay: Wall, Zone 25 | 10.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 185 | Select Clay: Wall, Zone 25 | 11.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 186 | Select Clay: Wall, Zone 25 | 12.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 187 | Select Clay: Wall, Zone 25 | 13.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 188 | Select Clay: Wall, Zone 25 | 13.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |

### Remarks

**A:** Test results comply with specifications

**B:** Test results do not comply with specifications

### Comments

Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency.

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 05/08/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 189 | | 05/03/23 | P-19 | | CH | 18.4 | 105.0 | 21.5 | 103.8 | 126.1 | 6 | 99 | 95 | 0 / 10 | A |
| 190 | | 05/03/23 | P-15 | | CH | 24.1 | 98.6 | 25.9 | 94.3 | 118.7 | 6 | 96 | 95 | 0 / 10 | A |
| 191 | | 05/03/23 | P-15 | | CH | 24.1 | 98.6 | 27.0 | 94.5 | 120.0 | 6 | 96 | 95 | 0 / 10 | A |
| 192 | | 05/03/23 | P-09 | | CH | 23.9 | 98.6 | 28.6 | 93.4 | 120.1 | 6 | 95 | 95 | 0 / 10 | A |
| 193 | | 05/03/23 | P-16 | | CH | 20.2 | 101.8 | 22.1 | 101.5 | 123.9 | 6 | 100 | 95 | 0 / 10 | A |
| 194 | | 05/03/23 | P-16 | | CH | 20.2 | 101.8 | 22.1 | 97.9 | 119.5 | 6 | 96 | 95 | 0 / 10 | A |
| 195 | | 05/03/23 | P-19 | | CH | 18.4 | 105.0 | 19.8 | 104.8 | 125.5 | 6 | 100 | 95 | 0 / 10 | A |
| 196 | | 05/03/23 | P-19 | | CH | 18.4 | 105.0 | 19.8 | 105.2 | 126.0 | 6 | 100 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 189 | Select Clay: Wall, Zone 25 | 14.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 190 | Select Clay: Wall, Zone 26 | 5.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 191 | Select Clay: Wall, Zone 26 | 6.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 192 | Select Clay: Wall, Zone 26 | 7.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 193 | Select Clay: Wall, Zone 26 | 8.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 194 | Select Clay: Wall, Zone 26 | 9.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 195 | Select Clay: Wall, Zone 26 | 10.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 196 | Select Clay: Wall, Zone 26 | 11.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 05/08/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 197 | | 05/03/23 | P-12 | | CH | 23.6 | 97.4 | 26.2 | 95.3 | 120.3 | 6 | 98 | 95 | 0 / 10 | A |
| 198 | | 05/03/23 | P-16 | | CH | 20.2 | 101.8 | 22.2 | 100.4 | 122.7 | 6 | 99 | 95 | 0 / 10 | A |
| 199 | | 05/03/23 | P-19 | | CH | 18.4 | 105.0 | 22.3 | 102.5 | 125.4 | 6 | 98 | 95 | 0 / 10 | A |
| 200 | | 05/03/23 | P-14 | | CH | 27.2 | 92.4 | 30.4 | 84.0 | 109.5 | 6 | 91 | 95 | 0 / 10 | B |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 197 | Select Clay: Wall, Zone 26 | 12.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 198 | Select Clay: Wall, Zone 26 | 13.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 199 | Select Clay: Wall, Zone 26 | 14.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 200 | Select Clay: Wall, Zone 27 | 5.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |

### Remarks

**A:** Test results comply with specifications

**B:** Test results do not comply with specifications

### Comments

Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency.

Kurt Kuechle
05/08/2023

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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# Field Compaction Report

**Report Date:** 05/12/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 201 | 200 | 05/03/23 | P-14 | | CH | 27.2 | 92.4 | 28.6 | 87.4 | 112.4 | 6 | 95 | 95 | 0 / 10 | A |
| 202 | | 05/03/23 | P-15 | | CH | 24.1 | 98.6 | 25.4 | 94.7 | 118.8 | 6 | 96 | 95 | 0 / 10 | A |
| 203 | | 05/03/23 | P-05 | | CH | 24.5 | 96.2 | 27.8 | 91.4 | 116.8 | 6 | 95 | 95 | 0 / 10 | A |
| 204 | | 05/03/23 | P-15 | | CH | 24.1 | 98.6 | 28.0 | 95.7 | 122.5 | 6 | 97 | 95 | 0 / 10 | A |
| 205 | | 05/03/23 | P-16 | | CH | 20.2 | 101.8 | 23.4 | 98.3 | 121.3 | 6 | 97 | 95 | 0 / 10 | A |
| 206 | | 05/03/23 | P-19 | | CH | 18.4 | 105.0 | 19.2 | 102.9 | 122.7 | 6 | 98 | 95 | 0 / 10 | A |
| 207 | | 05/03/23 | P-19 | | CH | 18.4 | 105.0 | 18.5 | 104.4 | 123.7 | 6 | 99 | 95 | 0 / 10 | A |
| 208 | | 05/03/23 | P-19 | | CH | 18.4 | 105.0 | 20.1 | 102.1 | 122.6 | 6 | 97 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 201 | Select Clay: Wall, Zone 27 | 5.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 202 | Select Clay: Wall, Zone 27 | 6.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 203 | Select Clay: Wall, Zone 27 | 7.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 204 | Select Clay: Wall, Zone 27 | 8.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 205 | Select Clay: Wall, Zone 27 | 9.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 206 | Select Clay: Wall, Zone 27 | 10.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 207 | Select Clay: Wall, Zone 27 | 11.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 208 | Select Clay: Wall, Zone 27 | 12.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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Bismarck, ND 58504
Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 05/12/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 209 | | 05/03/23 | P-16 | | CH | 20.2 | 101.8 | 22.1 | 101.1 | 123.4 | 6 | 99 | 95 | 0 / 10 | A |
| 210 | | 05/03/23 | P-19 | | CH | 18.4 | 105.0 | 22.3 | 100.3 | 122.7 | 6 | 96 | 95 | 0 / 10 | A |
| 211 | | 05/03/23 | P-06 | | CH | 24.5 | 97.3 | 25.9 | 95.2 | 119.9 | 6 | 98 | 95 | 0 / 10 | A |
| 212 | | 05/03/23 | P-16 | | CH | 20.2 | 101.8 | 21.3 | 98.2 | 119.1 | 6 | 96 | 95 | 0 / 10 | A |
| 213 | | 05/03/23 | P-19 | | CH | 18.4 | 105.0 | 18.4 | 104.1 | 123.3 | 6 | 99 | 95 | 0 / 10 | A |
| 214 | | 05/03/23 | P-01 | | CH | 19.4 | 100.8 | 21.1 | 99.4 | 120.4 | 6 | 99 | 95 | 0 / 10 | A |
| 215 | | 05/03/23 | P-19 | | CH | 18.4 | 105.0 | 19.5 | 104.3 | 124.6 | 6 | 99 | 95 | 0 / 10 | A |
| 216 | | 05/03/23 | P-16 | | CH | 20.2 | 101.8 | 22.9 | 99.8 | 122.7 | 6 | 98 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 209 | Select Clay: Wall, Zone 27 | 13.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 210 | Select Clay: Wall, Zone 27 | 14.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 211 | Select Clay: Wall, Zone 16 | 9.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 212 | Select Clay: Wall, Zone 16 | 10.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 213 | Select Clay: Wall, Zone 16 | 11.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 214 | Select Clay: Wall, Zone 16 | 12.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 215 | Select Clay: Wall, Zone 16 | 13.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 216 | Select Clay: Wall, Zone 16 | 14.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

BRAUN INTERTEC
The Science You Build On.

2908 Morrison Ave.
Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 05/12/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 217 | | 05/03/23 | P-19 | | CH | 18.4 | 105.0 | 17.1 | 102.3 | 119.8 | 6 | 97 | 95 | 0 / 10 | B |
| 218 | | 05/03/23 | P-13 | | CH | 21.7 | 97.9 | 23.2 | 94.7 | 116.7 | 6 | 97 | 95 | 0 / 10 | A |
| 219 | | 05/03/23 | P-01 | | CH | 19.4 | 100.8 | 17.8 | 102.8 | 121.1 | 6 | 102 | 95 | 0 / 10 | B |
| 220 | 219 | 05/03/23 | P-01 | | CH | 19.4 | 100.8 | 20.0 | 99.7 | 119.6 | 6 | 99 | 95 | 0 / 10 | A |
| 221 | | 05/03/23 | P-19 | | CH | 18.4 | 105.0 | 18.4 | 100.4 | 118.9 | 6 | 96 | 95 | 0 / 10 | A |
| 222 | | 05/03/23 | P-01 | | CH | 19.4 | 100.8 | 16.8 | 103.7 | 121.1 | 6 | 103 | 95 | 0 / 10 | B |
| 223 | 222 | 05/03/23 | P-01 | | CH | 19.4 | 100.8 | 19.5 | 98.5 | 117.7 | 6 | 98 | 95 | 0 / 10 | A |
| 224 | | 05/03/23 | P-16 | | CH | 20.2 | 101.8 | 22.5 | 99.6 | 122.0 | 6 | 98 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 217 | Select Clay: Wall, Zone 16 | 15.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 218 | Select Clay: Wall, Zone 17 | 9.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 219 | Select Clay: Wall, Zone 17 | 10.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 220 | Select Clay: Wall, Zone 17 | 10.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 221 | Select Clay: Wall, Zone 17 | 11.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 222 | Select Clay: Wall, Zone 17 | 12.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 223 | Select Clay: Wall, Zone 17 | 12.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 224 | Select Clay: Wall, Zone 17 | 13.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |

| Remarks | Comments |
|---|---|
| **B:** Test results do not comply with specifications<br><br>**A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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# Field Compaction Report

**Report Date:** 05/12/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 225 | | 05/03/23 | P-13 | | CH | 21.7 | 97.9 | 21.6 | 93.8 | 114.1 | 6 | 96 | 95 | 0 / 10 | B |
| 226 | 225 | 05/03/23 | P-13 | | CH | 21.7 | 97.9 | 21.7 | 93.7 | 114.0 | 6 | 96 | 95 | 0 / 10 | A |
| 227 | | 05/03/23 | P-19 | | CH | 18.4 | 105.0 | 21.3 | 101.2 | 122.8 | 6 | 96 | 95 | 0 / 10 | A |
| 228 | | 05/03/23 | P-12 | | CH | 23.6 | 97.4 | 26.0 | 95.5 | 120.3 | 6 | 98 | 95 | 0 / 10 | A |
| 229 | | 05/03/23 | P-19 | | CH | 18.4 | 105.0 | 21.3 | 102.9 | 124.8 | 6 | 98 | 95 | 0 / 10 | A |
| 230 | | 05/03/23 | P-19 | | CH | 18.4 | 105.0 | 19.1 | 99.4 | 118.4 | 6 | 95 | 95 | 0 / 10 | A |
| 231 | | 05/03/23 | P-12 | | CH | 23.6 | 97.4 | 24.9 | 94.9 | 118.5 | 6 | 97 | 95 | 0 / 10 | A |
| 232 | | 05/03/23 | P-19 | | CH | 18.4 | 105.0 | 19.5 | 104.9 | 125.4 | 6 | 100 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 225 | Select Clay: Wall, Zone 17 | 14.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 226 | Select Clay: Wall, Zone 17 | 14.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 227 | Select Clay: Wall, Zone 17 | 15.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 228 | Select Clay: Wall, Zone 18 | 9.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 229 | Select Clay: Wall, Zone 18 | 10.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 230 | Select Clay: Wall, Zone 18 | 11.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 231 | Select Clay: Wall, Zone 18 | 12.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 232 | Select Clay: Wall, Zone 18 | 13.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |

| Remarks | Comments |
|---|---|
| **B:** Test results do not comply with specifications<br><br>**A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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# Field Compaction Report

**Report Date:** 05/12/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 233 | | 05/03/23 | P-19 | | CH | 18.4 | 105.0 | 20.7 | 104.2 | 125.8 | 6 | 99 | 95 | 0 / 10 | A |
| 234 | | 05/03/23 | P-19 | | CH | 18.4 | 105.0 | 20.3 | 100.9 | 121.4 | 6 | 96 | 95 | 0 / 10 | A |
| 235 | | 05/03/23 | P-19 | | CH | 18.4 | 105.0 | 22.2 | 102.0 | 124.6 | 6 | 97 | 95 | 0 / 10 | A |
| 236 | | 05/03/23 | P-13 | | CH | 21.7 | 97.9 | 24.5 | 92.7 | 115.4 | 6 | 95 | 95 | 0 / 10 | A |
| 237 | | 05/03/23 | P-13 | | CH | 21.7 | 97.9 | 24.6 | 96.4 | 120.1 | 6 | 98 | 95 | 0 / 10 | A |
| 238 | | 05/03/23 | P-19 | | CH | 18.4 | 105.0 | 21.0 | 104.9 | 126.9 | 6 | 100 | 95 | 0 / 10 | A |
| 239 | | 05/03/23 | P-14 | | CH | 27.2 | 92.4 | 28.4 | 91.4 | 117.4 | 6 | 99 | 95 | 0 / 10 | A |
| 240 | | 05/03/23 | P-14 | | CH | 27.2 | 92.4 | 29.2 | 90.6 | 117.1 | 6 | 98 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 233 | Select Clay: Wall, Zone 18 | 14.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 234 | Select Clay: Wall, Zone 18 | 15.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 235 | Select Clay: Wall, Zone 22 | 10.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 236 | Select Clay: Wall, Zone 22 | 11.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 237 | Select Clay: Wall, Zone 22 | 12.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 238 | Select Clay: Wall, Zone 22 | 13.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 239 | Select Clay: Wall, Zone 22 | 14.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 240 | Select Clay: Wall, Zone 22 | 15.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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# Field Compaction Report

**Report Date:** 05/12/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 241 | | 05/03/23 | P-15 | | CH | 24.1 | 98.6 | 25.1 | 94.6 | 118.3 | 6 | 96 | 95 | 0 / 10 | A |
| 242 | | 05/03/23 | P-13 | | CH | 21.7 | 97.9 | 24.4 | 96.7 | 120.3 | 6 | 99 | 95 | 0 / 10 | A |
| 243 | | 05/03/23 | P-19 | | CH | 18.4 | 105.0 | 18.5 | 105.2 | 124.7 | 6 | 100 | 95 | 0 / 10 | A |
| 244 | | 05/03/23 | P-19 | | CH | 18.4 | 105.0 | 20.4 | 104.5 | 125.8 | 6 | 100 | 95 | 0 / 10 | A |
| 245 | | 05/03/23 | P-19 | | CH | 18.4 | 105.0 | 19.6 | 101.6 | 121.5 | 6 | 97 | 95 | 0 / 10 | A |
| 246 | | 05/03/23 | P-19 | | CH | 18.4 | 105.0 | 21.7 | 101.1 | 123.0 | 6 | 96 | 95 | 0 / 10 | A |
| 247 | | 05/03/23 | P-19 | | CH | 18.4 | 105.0 | 15.7 | 107.7 | 124.6 | 6 | 103 | 95 | 0 / 10 | B |
| 248 | 247 | 05/03/23 | P-19 | | CH | 18.4 | 105.0 | 21.4 | 103.3 | 125.4 | 6 | 98 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 241 | Select Clay: Wall, Zone 23 | 11.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 242 | Select Clay: Wall, Zone 23 | 12.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 243 | Select Clay: Wall, Zone 23 | 13.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 244 | Select Clay: Wall, Zone 23 | 14.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 245 | Select Clay: Wall, Zone 23 | 15.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 246 | Select Clay: Wall, Zone 24 | 13.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 247 | Select Clay: Wall, Zone 24 | 14.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 248 | Select Clay: Wall, Zone 24 | 14.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |

## Remarks

**A:** Test results comply with specifications

**B:** Test results do not comply with specifications

## Comments

Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency.

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# Field Compaction Report

**Report Date:** 05/12/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 249 | | 05/03/23 | P-16 | | CH | 20.2 | 101.8 | 22.7 | 100.0 | 122.7 | 6 | 98 | 95 | 0 / 10 | A |
| 250 | 217 | 05/04/23 | P-16 | | CH | 20.2 | 101.8 | 24.2 | 98.3 | 122.1 | 6 | 97 | 95 | 0 / 10 | A |
| 251 | | 05/04/23 | P-19 | | CH | 18.4 | 105.0 | 20.7 | 100.2 | 120.9 | 6 | 95 | 95 | 0 / 10 | A |
| 252 | | 05/04/23 | P-19 | | CH | 18.4 | 105.0 | 18.6 | 105.6 | 125.2 | 6 | 101 | 95 | 0 / 10 | A |
| 253 | | 05/04/23 | P-19 | | CH | 18.4 | 105.0 | 19.4 | 104.0 | 124.2 | 6 | 99 | 95 | 0 / 10 | A |
| 254 | | 05/04/23 | P-19 | | CH | 18.4 | 105.0 | 18.9 | 100.2 | 119.1 | 6 | 95 | 95 | 0 / 10 | A |
| 255 | | 05/04/23 | P-19 | | CH | 18.4 | 105.0 | 19.2 | 103.7 | 123.6 | 6 | 99 | 95 | 0 / 10 | A |
| 256 | | 05/04/23 | P-16 | | CH | 20.2 | 101.8 | 20.7 | 98.7 | 119.1 | 6 | 97 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 249 | Select Clay: Wall, Zone 24 | 15.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 250 | Select Clay: Wall, Zone 16 | 15.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 251 | Select Clay: Wall, Zone 22 | 16.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 252 | Select Clay: Wall, Zone 23 | 16.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 253 | Select Clay: Wall, Zone 24 | 16.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 254 | Select Clay: Wall, Zone 25 | 15.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 255 | Select Clay: Wall, Zone 26 | 15.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 256 | Select Clay: Wall, Zone 27 | 15.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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# Field Compaction Report

**Report Date:** 05/12/2023
**Test Method:** ASTM D6938

**Client:**
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5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 257 | | 05/04/23 | P-16 | | CH | 20.2 | 101.8 | 23.4 | 97.1 | 119.8 | 6 | 95 | 95 | 0 / 10 | A |
| 258 | | 05/04/23 | P-16 | | CH | 20.2 | 101.8 | 20.6 | 99.8 | 120.4 | 6 | 98 | 95 | 0 / 10 | A |
| 259 | | 05/04/23 | P-16 | | CH | 20.2 | 101.8 | 21.7 | 98.7 | 120.1 | 6 | 97 | 95 | 0 / 10 | A |
| 260 | | 05/04/23 | P-19 | | CH | 18.4 | 105.0 | 23.0 | 101.8 | 125.2 | 6 | 97 | 95 | 0 / 10 | A |
| 261 | | 05/04/23 | P-19 | | CH | 18.4 | 105.0 | 21.3 | 102.2 | 124.0 | 6 | 97 | 95 | 0 / 10 | A |
| 262 | | 05/04/23 | P-16 | | CH | 20.2 | 101.8 | 24.3 | 97.1 | 120.7 | 6 | 95 | 95 | 0 / 10 | A |
| 263 | | 05/04/23 | P-16 | | CH | 20.2 | 101.8 | 21.6 | 98.5 | 119.8 | 6 | 97 | 95 | 0 / 10 | A |
| 264 | | 05/04/23 | P-19 | | CH | 18.4 | 105.0 | 21.6 | 103.8 | 126.2 | 6 | 99 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 257 | Select Clay: Wall, Zone 16 | 16.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 258 | Select Clay: Wall, Zone 17 | 16.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 259 | Select Clay: Wall, Zone 18 | 16.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 260 | Select Clay: Wall, Zone 22 | 17.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 261 | Select Clay: Wall, Zone 23 | 17.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 262 | Select Clay: Wall, Zone 24 | 17.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 263 | Select Clay: Wall, Zone 25 | 16.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 264 | Select Clay: Wall, Zone 26 | 16.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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# Field Compaction Report

**Report Date:** 05/12/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
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**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 265 | | 05/04/23 | P-01 | | CH | 19.4 | 100.8 | 19.5 | 96.4 | 115.2 | 6 | 96 | 95 | 0 / 10 | A |
| 266 | | 05/04/23 | P-19 | | CH | 18.4 | 105.0 | 20.6 | 101.8 | 122.8 | 6 | 97 | 95 | 0 / 10 | A |
| 267 | | 05/04/23 | P-19 | | CH | 18.4 | 105.0 | 20.5 | 103.0 | 124.1 | 6 | 98 | 95 | 0 / 10 | A |
| 268 | | 05/04/23 | P-19 | | CH | 18.4 | 105.0 | 20.5 | 102.9 | 124.0 | 6 | 98 | 95 | 0 / 10 | A |
| 269 | | 05/04/23 | P-19 | | CH | 18.4 | 105.0 | 22.1 | 102.0 | 124.5 | 6 | 97 | 95 | 0 / 10 | A |
| 270 | | 05/04/23 | P-16 | | CH | 20.2 | 101.8 | 23.0 | 99.7 | 122.6 | 6 | 98 | 95 | 0 / 10 | A |
| 271 | | 05/04/23 | P-16 | | CH | 20.2 | 101.8 | 25.5 | 97.8 | 122.7 | 6 | 96 | 95 | 0 / 10 | A |
| 272 | | 05/04/23 | P-17 | | CH | 25.6 | 95.9 | 28.4 | 92.5 | 118.8 | 6 | 96 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 265 | Select Clay: Wall, Zone 27 | 16.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 266 | Select Clay: Wall, Zone 18 | 17.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 267 | Select Clay: Wall, Zone 17 | 17.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 268 | Select Clay: Wall, Zone 16 | 17.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 269 | Select Clay: Wall, Zone 22 | 18.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 270 | Select Clay: Wall, Zone 23 | 18.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 271 | Select Clay: Wall, Zone 24 | 18.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 272 | Select Clay: Wall, Zone 25 | 17.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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The Science You Build On.

2908 Morrison Ave.
Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 05/12/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 273 | | 05/04/23 | P-19 | | CH | 18.4 | 105.0 | 20.8 | 100.5 | 121.4 | 6 | 96 | 95 | 0 / 10 | A |
| 274 | | 05/04/23 | P-06 | | CH | 24.5 | 97.3 | 26.3 | 94.4 | 119.2 | 6 | 97 | 95 | 0 / 10 | A |
| 275 | | 05/04/23 | P-19 | | CH | 18.4 | 105.0 | 21.4 | 101.2 | 122.9 | 6 | 96 | 95 | 0 / 10 | A |
| 276 | | 05/04/23 | P-19 | | CH | 18.4 | 105.0 | 21.0 | 103.1 | 124.8 | 6 | 98 | 95 | 0 / 10 | A |
| 277 | | 05/04/23 | P-19 | | CH | 18.4 | 105.0 | 19.6 | 101.8 | 121.8 | 6 | 97 | 95 | 0 / 10 | A |
| 278 | | 05/04/23 | P-19 | | CH | 18.4 | 105.0 | 22.3 | 101.1 | 123.6 | 6 | 96 | 95 | 0 / 10 | A |
| 279 | | 05/04/23 | P-19 | | CH | 18.4 | 105.0 | 21.2 | 102.6 | 124.4 | 6 | 98 | 95 | 0 / 10 | A |
| 280 | | 05/04/23 | P-16 | | CH | 20.2 | 101.8 | 23.6 | 99.6 | 123.1 | 6 | 98 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 273 | Select Clay: Wall, Zone 26 | 17.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 274 | Select Clay: Wall, Zone 27 | 17.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 275 | Select Clay: Wall, Zone 18 | 18.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 276 | Select Clay: Wall, Zone 17 | 18.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 277 | Select Clay: Wall, Zone 16 | 18.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 278 | Select Clay: Wall, Zone 22 | 19.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 279 | Select Clay: Wall, Zone 23 | 19.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 280 | Select Clay: Wall, Zone 24 | 19.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 05/12/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 281 | | 05/04/23 | P-04 | | CH | 20.2 | 99.3 | 23.0 | 96.2 | 118.3 | 6 | 97 | 95 | 0 / 10 | A |
| 282 | | 05/04/23 | P-16 | | CH | 20.2 | 101.8 | 23.6 | 96.8 | 119.6 | 6 | 95 | 95 | 0 / 10 | A |
| 283 | | 05/04/23 | P-07 | | CH | 22.6 | 93.8 | 24.4 | 91.4 | 113.7 | 6 | 97 | 95 | 0 / 10 | A |
| 284 | | 05/04/23 | P-19 | | CH | 18.4 | 105.0 | 19.0 | 104.8 | 124.7 | 6 | 100 | 95 | 0 / 10 | A |
| 285 | | 05/04/23 | P-19 | | CH | 18.4 | 105.0 | 21.7 | 101.3 | 123.3 | 6 | 96 | 95 | 0 / 10 | A |
| 286 | | 05/04/23 | P-19 | | CH | 18.4 | 105.0 | 19.8 | 104.0 | 124.6 | 6 | 99 | 95 | 0 / 10 | A |
| 287 | | 05/04/23 | P-19 | | CH | 18.4 | 105.0 | 21.8 | 103.1 | 125.6 | 6 | 98 | 95 | 0 / 10 | A |
| 288 | | 05/04/23 | P-19 | | CH | 18.4 | 105.0 | 20.7 | 104.4 | 126.0 | 6 | 99 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 281 | Select Clay: Wall, Zone 25 | 18.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 282 | Select Clay: Wall, Zone 26 | 18.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 283 | Select Clay: Wall, Zone 27 | 18.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 284 | Select Clay: Wall, Zone 18 | 19.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 285 | Select Clay: Wall, Zone 17 | 19.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 286 | Select Clay: Wall, Zone 16 | 19.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 287 | Select Clay: Wall, Zone 22 | 20.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 288 | Select Clay: Wall, Zone 23 | 20.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 05/12/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 289 | | 05/04/23 | P-16 | | CH | 20.2 | 101.8 | 24.0 | 98.3 | 121.9 | 6 | 97 | 95 | 0 / 10 | A |
| 290 | | 05/04/23 | P-19 | | CH | 18.4 | 105.0 | 20.4 | 102.5 | 123.4 | 6 | 98 | 95 | 0 / 10 | A |
| 291 | | 05/04/23 | P-19 | | CH | 18.4 | 105.0 | 19.7 | 102.3 | 122.5 | 6 | 97 | 95 | 0 / 10 | A |
| 292 | | 05/04/23 | P-19 | | CH | 18.4 | 105.0 | 19.7 | 103.8 | 124.2 | 6 | 99 | 95 | 0 / 10 | A |
| 293 | | 05/04/23 | P-19 | | CH | 18.4 | 105.0 | 22.1 | 103.4 | 126.3 | 6 | 98 | 95 | 0 / 10 | A |
| 294 | | 05/04/23 | P-19 | | CH | 18.4 | 105.0 | 20.4 | 104.2 | 125.5 | 6 | 99 | 95 | 0 / 10 | A |
| 295 | | 05/04/23 | P-19 | | CH | 18.4 | 105.0 | 20.3 | 101.5 | 122.1 | 6 | 97 | 95 | 0 / 10 | A |
| 296 | | 05/04/23 | P-19 | | CH | 18.4 | 105.0 | 20.9 | 104.0 | 125.7 | 6 | 99 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 289 | Select Clay: Wall, Zone 24 | 20.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 290 | Select Clay: Wall, Zone 25 | 19.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 291 | Select Clay: Wall, Zone 26 | 19.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 292 | Select Clay: Wall, Zone 27 | 19.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 293 | Select Clay: Wall, Zone 18 | 20.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 294 | Select Clay: Wall, Zone 17 | 20.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 295 | Select Clay: Wall, Zone 16 | 20.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 296 | Select Clay: Wall, Zone 22 | 21.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 05/12/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 297 | | 05/04/23 | P-19 | | CH | 18.4 | 105.0 | 21.0 | 103.5 | 125.2 | 6 | 99 | 95 | 0 / 10 | A |
| 298 | | 05/04/23 | P-19 | | CH | 18.4 | 105.0 | 18.6 | 105.3 | 124.9 | 6 | 100 | 95 | 0 / 10 | A |
| 299 | | 05/04/23 | P-19 | | CH | 18.4 | 105.0 | 21.6 | 102.4 | 124.5 | 6 | 98 | 95 | 0 / 10 | A |
| 300 | | 05/04/23 | P-19 | | CH | 18.4 | 105.0 | 23.4 | 100.1 | 123.5 | 6 | 95 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 297 | Select Clay: Wall, Zone 23 | 21.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 298 | Select Clay: Wall, Zone 24 | 21.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 299 | Select Clay: Wall, Zone 25 | 20.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 300 | Select Clay: Wall, Zone 26 | 20.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Kurt Kuechle
05/12/2023

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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# Field Compaction Report

**Report Date:** 05/12/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 301 | | 05/04/23 | P-19 | | CH | 18.4 | 105.0 | 20.4 | 103.6 | 124.7 | 6 | 99 | 95 | 0 / 10 | A |
| 302 | | 05/04/23 | P-16 | | CH | 20.2 | 101.8 | 21.2 | 99.7 | 120.8 | 6 | 98 | 95 | 0 / 10 | A |
| 303 | | 05/04/23 | P-19 | | CH | 18.4 | 105.0 | 17.5 | 103.6 | 121.7 | 6 | 99 | 95 | 0 / 10 | B |
| 304 | | 05/04/23 | P-19 | | CH | 18.4 | 105.0 | 21.2 | 102.5 | 124.2 | 6 | 98 | 95 | 0 / 10 | A |
| 305 | 303 | 05/04/23 | P-19 | | CH | 18.4 | 105.0 | 18.7 | 104.6 | 124.2 | 6 | 100 | 95 | 0 / 10 | A |
| 306 | | 05/04/23 | P-19 | | CH | 18.4 | 105.0 | 18.9 | 103.7 | 123.3 | 6 | 99 | 95 | 0 / 10 | A |
| 307 | | 05/04/23 | P-19 | | CH | 18.4 | 105.0 | 22.4 | 99.8 | 122.2 | 6 | 95 | 95 | 0 / 10 | A |
| 308 | | 05/04/23 | P-19 | | CH | 18.4 | 105.0 | 20.9 | 103.2 | 124.8 | 6 | 98 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 301 | Select Clay: Wall, Zone 27 | 20.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 302 | Select Clay: Wall, Zone 16 | 21.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 303 | Select Clay: Wall, Zone 17 | 21.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 304 | Select Clay: Wall, Zone 18 | 21.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 305 | Select Clay: Wall, Zone 17 | 21.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 306 | Select Clay: Wall, Zone 22 | 22.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 307 | Select Clay: Wall, Zone 23 | 22.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 308 | Select Clay: Wall, Zone 24 | 22.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |

## Remarks

**A:** Test results comply with specifications

**B:** Test results do not comply with specifications

## Comments

Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency.

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 05/12/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 309 | | 05/04/23 | P-19 | | CH | 18.4 | 105.0 | 21.1 | 104.1 | 126.1 | 6 | 99 | 95 | 0 / 10 | A |
| 310 | | 05/04/23 | P-19 | | CH | 18.4 | 105.0 | 19.9 | 105.1 | 126.0 | 6 | 100 | 95 | 0 / 10 | A |
| 311 | | 05/04/23 | P-01 | | CH | 19.4 | 100.8 | 19.8 | 98.7 | 118.2 | 6 | 98 | 95 | 0 / 10 | A |
| 312 | | 05/04/23 | P-19 | | CH | 18.4 | 105.0 | 21.5 | 101.3 | 123.1 | 6 | 96 | 95 | 0 / 10 | A |
| 313 | | 05/04/23 | P-19 | | CH | 18.4 | 105.0 | 17.4 | 104.4 | 122.6 | 6 | 99 | 95 | 0 / 10 | B |
| 314 | | 05/04/23 | P-19 | | CH | 18.4 | 105.0 | 20.0 | 100.8 | 121.0 | 6 | 96 | 95 | 0 / 10 | A |
| 315 | 313 | 05/04/23 | P-19 | | CH | 18.4 | 105.0 | 19.3 | 106.5 | 127.1 | 6 | 101 | 95 | 0 / 10 | A |
| 316 | | 05/04/23 | P-03 | | CH | 20.2 | 99.3 | 23.6 | 96.2 | 118.9 | 6 | 97 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 309 | Select Clay: Wall, Zone 25 | 21.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 310 | Select Clay: Wall, Zone 26 | 21.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 311 | Select Clay: Wall, Zone 27 | 21.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 312 | Select Clay: Wall, Zone 16 | 22.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 313 | Select Clay: Wall, Zone 17 | 22.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 314 | Select Clay: Wall, Zone 18 | 22.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 315 | Select Clay: Wall, Zone 17 | 22.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 316 | Select Clay: Wall, Zone 22 | 23.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications<br><br>**B:** Test results do not comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 05/12/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 317 | | 05/04/23 | P-19 | | CH | 18.4 | 105.0 | 19.1 | 101.9 | 121.4 | 6 | 97 | 95 | 0 / 10 | A |
| 318 | | 05/04/23 | P-19 | | CH | 18.4 | 105.0 | 19.2 | 102.4 | 122.1 | 6 | 98 | 95 | 0 / 10 | A |
| 319 | | 05/04/23 | P-19 | | CH | 18.4 | 105.0 | 21.7 | 102.8 | 125.1 | 6 | 98 | 95 | 0 / 10 | A |
| 320 | | 05/04/23 | P-19 | | CH | 18.4 | 105.0 | 21.2 | 102.3 | 124.0 | 6 | 97 | 95 | 0 / 10 | A |
| 321 | | 05/04/23 | P-19 | | CH | 18.4 | 105.0 | 19.9 | 102.3 | 122.7 | 6 | 97 | 95 | 0 / 10 | A |
| 322 | | 05/04/23 | P-19 | | CH | 18.4 | 105.0 | 20.1 | 105.0 | 126.1 | 6 | 100 | 95 | 0 / 10 | A |
| 323 | | 05/04/23 | P-19 | | CH | 18.4 | 105.0 | 22.0 | 100.4 | 122.5 | 6 | 96 | 95 | 0 / 10 | A |
| 324 | | 05/04/23 | P-19 | | CH | 18.4 | 105.0 | 21.4 | 101.6 | 123.3 | 6 | 97 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 317 | Select Clay: Wall, Zone 23 | 23.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 318 | Select Clay: Wall, Zone 24 | 23.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 319 | Select Clay: Wall, Zone 25 | 22.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 320 | Select Clay: Wall, Zone 26 | 22.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 321 | Select Clay: Wall, Zone 27 | 22.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 322 | Select Clay: Wall, Zone 16 | 23.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 323 | Select Clay: Wall, Zone 17 | 23.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 324 | Select Clay: Wall, Zone 18 | 23.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 05/12/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 325 | | 05/04/23 | P-19 | | CH | 18.4 | 105.0 | 19.7 | 105.0 | 125.7 | 6 | 100 | 95 | 0 / 10 | A |
| 326 | | 05/04/23 | P-19 | | CH | 18.4 | 105.0 | 19.4 | 105.4 | 125.8 | 6 | 100 | 95 | 0 / 10 | A |
| 327 | | 05/04/23 | P-19 | | CH | 18.4 | 105.0 | 22.4 | 103.0 | 126.1 | 6 | 98 | 95 | 0 / 10 | A |
| 328 | | 05/04/23 | P-19 | | CH | 18.4 | 105.0 | 18.7 | 104.9 | 124.5 | 6 | 100 | 95 | 0 / 10 | A |
| 329 | | 05/04/23 | P-16 | | CH | 20.2 | 101.8 | 24.4 | 97.6 | 121.4 | 6 | 96 | 95 | 0 / 10 | A |
| 330 | | 05/04/23 | P-01 | | CH | 19.4 | 100.8 | 19.5 | 98.5 | 117.7 | 6 | 98 | 95 | 0 / 10 | A |
| 331 | | 05/04/23 | P-19 | | CH | 18.4 | 105.0 | 20.0 | 102.1 | 122.5 | 6 | 97 | 95 | 0 / 10 | A |
| 332 | | 05/04/23 | P-19 | | CH | 18.4 | 105.0 | 22.2 | 101.2 | 123.7 | 6 | 96 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 325 | Select Clay: Wall, Zone 22 | 24.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 326 | Select Clay: Wall, Zone 23 | 24.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 327 | Select Clay: Wall, Zone 24 | 24.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 328 | Select Clay: Wall, Zone 25 | 23.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 329 | Select Clay: Wall, Zone 26 | 23.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 330 | Select Clay: Wall, Zone 27 | 23.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 331 | Select Clay: Wall, Zone 16 | 24.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 332 | Select Clay: Wall, Zone 17 | 24.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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2908 Morrison Ave.
Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 05/12/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 333 | | 05/04/23 | P-19 | | CH | 18.4 | 105.0 | 20.1 | 105.1 | 126.2 | 6 | 100 | 95 | 0 / 10 | A |
| 334 | | 05/04/23 | P-01 | | CH | 19.4 | 100.8 | 19.7 | 99.3 | 118.9 | 6 | 99 | 95 | 0 / 10 | A |
| 335 | | 05/04/23 | P-16 | | CH | 20.2 | 101.8 | 21.7 | 98.1 | 119.4 | 6 | 96 | 95 | 0 / 10 | A |
| 336 | | 05/04/23 | P-19 | | CH | 18.4 | 105.0 | 22.6 | 102.1 | 125.2 | 6 | 97 | 95 | 0 / 10 | A |
| 337 | | 05/04/23 | P-16 | | CH | 20.2 | 101.8 | 21.0 | 101.3 | 122.6 | 6 | 100 | 95 | 0 / 10 | A |
| 338 | | 05/04/23 | P-19 | | CH | 18.4 | 105.0 | 22.2 | 100.9 | 123.3 | 6 | 96 | 95 | 0 / 10 | A |
| 339 | | 05/04/23 | P-16 | | CH | 20.2 | 101.8 | 23.9 | 96.8 | 119.9 | 6 | 95 | 95 | 0 / 10 | A |
| 340 | | 05/04/23 | P-19 | | CH | 18.4 | 105.0 | 22.4 | 101.5 | 124.2 | 6 | 97 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 333 | Select Clay: Wall, Zone 18 | 24.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 334 | Select Clay: Wall, Zone 22 | 25.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 335 | Select Clay: Wall, Zone 23 | 25.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 336 | Select Clay: Wall, Zone 24 | 25.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 337 | Select Clay: Wall, Zone 25 | 24.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 338 | Select Clay: Wall, Zone 26 | 24.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 339 | Select Clay: Wall, Zone 27 | 24.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 340 | Select Clay: Wall, Zone 16 | 25.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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2908 Morrison Ave.
Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 05/12/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 341 | | 05/04/23 | P-19 | | CH | 18.4 | 105.0 | 20.5 | 103.9 | 125.2 | 6 | 99 | 95 | 0 / 10 | A |
| 342 | | 05/04/23 | P-16 | | CH | 20.2 | 101.8 | 23.6 | 97.7 | 120.8 | 6 | 96 | 95 | 0 / 10 | A |
| 343 | | 05/05/23 | P-19 | | CH | 18.4 | 105.0 | 19.6 | 103.9 | 124.3 | 6 | 99 | 95 | 0 / 10 | A |
| 344 | | 05/05/23 | P-19 | | CH | 18.4 | 105.0 | 22.1 | 100.4 | 122.6 | 6 | 96 | 95 | 0 / 10 | A |
| 345 | | 05/05/23 | P-16 | | CH | 20.2 | 101.8 | 23.5 | 98.8 | 122.0 | 6 | 97 | 95 | 0 / 10 | A |
| 346 | | 05/05/23 | P-19 | | CH | 18.4 | 105.0 | 20.9 | 103.9 | 125.6 | 6 | 99 | 95 | 0 / 10 | A |
| 347 | | 05/05/23 | P-16 | | CH | 20.2 | 101.8 | 22.9 | 98.3 | 120.8 | 6 | 97 | 95 | 0 / 10 | A |
| 348 | | 05/05/23 | P-19 | | CH | 18.4 | 105.0 | 21.0 | 102.1 | 123.5 | 6 | 97 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 341 | Select Clay: Wall, Zone 17 | 25.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 342 | Select Clay: Wall, Zone 18 | 25.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 343 | Select Clay: Wall, Zone 22 | 26.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 344 | Select Clay: Wall, Zone 23 | 26.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 345 | Select Clay: Wall, Zone 24 | 26.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 346 | Select Clay: Wall, Zone 25 | 25.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 347 | Select Clay: Wall, Zone 26 | 25.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 348 | Select Clay: Wall, Zone 27 | 25.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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Bismarck, ND 58504
Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 05/12/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 349 | | 05/05/23 | P-19 | | CH | 18.4 | 105.0 | 20.8 | 103.1 | 124.5 | 6 | 98 | 95 | 0 / 10 | A |
| 350 | | 05/05/23 | P-19 | | CH | 18.4 | 105.0 | 23.9 | 100.8 | 124.9 | 6 | 96 | 95 | 0 / 10 | A |
| 351 | | 05/05/23 | P-01 | | CH | 19.4 | 100.8 | 21.1 | 98.1 | 118.8 | 6 | 97 | 95 | 0 / 10 | A |
| 352 | | 05/05/23 | P-16 | | CH | 20.2 | 101.8 | 22.6 | 97.0 | 118.9 | 6 | 95 | 95 | 0 / 10 | A |
| 353 | | 05/05/23 | P-16 | | CH | 20.2 | 101.8 | 25.2 | 99.1 | 124.1 | 6 | 97 | 95 | 0 / 10 | A |
| 354 | | 05/05/23 | P-16 | | CH | 20.2 | 101.8 | 24.7 | 97.3 | 121.3 | 6 | 96 | 95 | 0 / 10 | A |
| 355 | | 05/05/23 | P-19 | | CH | 18.4 | 105.0 | 23.0 | 102.2 | 125.7 | 6 | 97 | 95 | 0 / 10 | A |
| 356 | | 05/05/23 | P-19 | | CH | 18.4 | 105.0 | 22.0 | 99.6 | 121.5 | 6 | 95 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 349 | Select Clay: Wall, Zone 16 | 26.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 350 | Select Clay: Wall, Zone 17 | 26.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 351 | Select Clay: Wall, Zone 18 | 26.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 352 | Select Clay: Wall, Zone 22 | 27.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 353 | Select Clay: Wall, Zone 23 | 27.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 354 | Select Clay: Wall, Zone 24 | 27.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 355 | Select Clay: Wall, Zone 25 | 26.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 356 | Select Clay: Wall, Zone 26 | 26.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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Bismarck, ND 58504
Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 05/12/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 357 | | 05/05/23 | P-19 | | CH | 18.4 | 105.0 | 19.6 | 101.2 | 121.0 | 6 | 96 | 95 | 0 / 10 | A |
| 358 | | 05/05/23 | P-19 | | CH | 18.4 | 105.0 | 21.1 | 101.9 | 123.4 | 6 | 97 | 95 | 0 / 10 | A |
| 359 | | 05/05/23 | P-19 | | CH | 18.4 | 105.0 | 21.7 | 101.1 | 123.0 | 6 | 96 | 95 | 0 / 10 | A |
| 360 | | 05/05/23 | P-03 | | CH | 20.2 | 99.3 | 24.4 | 94.6 | 117.7 | 6 | 95 | 95 | 0 / 10 | A |
| 361 | | 05/05/23 | P-03 | | CH | 20.2 | 99.3 | 23.0 | 95.2 | 117.1 | 6 | 96 | 95 | 0 / 10 | A |
| 362 | | 05/05/23 | P-03 | | CH | 20.2 | 99.3 | 26.2 | 95.6 | 120.6 | 6 | 96 | 95 | 0 / 10 | A |
| 363 | | 05/05/23 | P-14 | | CH | 27.2 | 92.4 | 29.1 | 89.2 | 115.2 | 6 | 97 | 95 | 0 / 10 | A |
| 364 | | 05/05/23 | P-19 | | CH | 18.4 | 105.0 | 20.9 | 103.0 | 124.5 | 6 | 98 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 357 | Select Clay: Wall, Zone 27 | 26.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 358 | Select Clay: Wall, Zone 16 | 27.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 359 | Select Clay: Wall, Zone 17 | 27.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 360 | Select Clay: Wall, Zone 18 | 27.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 361 | Select Clay: Wall, Zone 22 | 28.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 362 | Select Clay: Wall, Zone 23 | 28.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 363 | Select Clay: Wall, Zone 24 | 28.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 364 | Select Clay: Wall, Zone 25 | 27.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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Bismarck, ND 58504
Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 05/12/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 365 | | 05/05/23 | P-13 | | CH | 21.7 | 97.9 | 26.6 | 96.4 | 122.0 | 6 | 98 | 95 | 0 / 10 | A |
| 366 | | 05/05/23 | P-16 | | CH | 20.2 | 101.8 | 22.9 | 100.0 | 122.9 | 6 | 98 | 95 | 0 / 10 | A |
| 367 | | 05/05/23 | P-16 | | CH | 20.2 | 101.8 | 23.3 | 99.9 | 123.2 | 6 | 98 | 95 | 0 / 10 | A |
| 368 | | 05/05/23 | P-09 | | CH | 23.9 | 98.6 | 25.9 | 94.8 | 119.4 | 6 | 96 | 95 | 0 / 10 | A |
| 369 | | 05/05/23 | P-09 | | CH | 23.9 | 98.6 | 24.9 | 97.4 | 121.7 | 6 | 99 | 95 | 0 / 10 | A |
| 370 | | 05/05/23 | P-03 | | CH | 20.2 | 99.3 | 24.3 | 95.2 | 118.3 | 6 | 96 | 95 | 0 / 10 | A |
| 371 | | 05/05/23 | P-03 | | CH | 20.2 | 99.3 | 24.6 | 97.3 | 121.2 | 6 | 98 | 95 | 0 / 10 | A |
| 372 | | 05/05/23 | P-16 | | CH | 20.2 | 101.8 | 23.3 | 97.8 | 120.6 | 6 | 96 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 365 | Select Clay: Wall, Zone 26 | 27.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 366 | Select Clay: Wall, Zone 27 | 27.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 367 | Select Clay: Wall, Zone 16 | 28.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 368 | Select Clay: Wall, Zone 17 | 28.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 369 | Select Clay: Wall, Zone 18 | 28.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 370 | Select Clay: Wall, Zone 22 | 29.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 371 | Select Clay: Wall, Zone 23 | 29.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 372 | Select Clay: Wall, Zone 24 | 29.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 05/12/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 373 | | 05/05/23 | P-03 | | CH | 20.2 | 99.3 | 24.6 | 96.9 | 120.7 | 6 | 98 | 95 | 0 / 10 | A |
| 374 | | 05/05/23 | P-02 | | CH | 22.6 | 97.7 | 26.5 | 94.1 | 119.0 | 6 | 96 | 95 | 0 / 10 | A |
| 375 | | 05/05/23 | P-03 | | CH | 20.2 | 99.3 | 22.9 | 95.3 | 117.1 | 6 | 96 | 95 | 0 / 10 | A |
| 376 | | 05/05/23 | P-13 | | CH | 21.7 | 97.9 | 26.2 | 92.8 | 117.1 | 6 | 95 | 95 | 0 / 10 | A |
| 377 | | 05/05/23 | P-03 | | CH | 20.2 | 99.3 | 25.5 | 96.1 | 120.6 | 6 | 97 | 95 | 0 / 10 | A |
| 378 | | 05/05/23 | P-01 | | CH | 19.4 | 100.8 | 20.2 | 95.6 | 114.9 | 6 | 95 | 95 | 0 / 10 | A |
| 379 | | 05/05/23 | P-02 | | CH | 22.6 | 97.7 | 27.3 | 94.0 | 119.7 | 6 | 96 | 95 | 0 / 10 | A |
| 380 | | 05/05/23 | P-07 | | CH | 22.6 | 93.8 | 24.6 | 92.5 | 115.3 | 6 | 99 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 373 | Select Clay: Wall, Zone 25 | 28.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 374 | Select Clay: Wall, Zone 26 | 28.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 375 | Select Clay: Wall, Zone 27 | 28.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 376 | Select Clay: Wall, Zone 16 | 29.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 377 | Select Clay: Wall, Zone 17 | 29.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 378 | Select Clay: Wall, Zone 18 | 29.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 379 | Select Clay: Wall, Zone 22 | 30.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 380 | Select Clay: Wall, Zone 23 | 30.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 05/12/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 381 | | 05/05/23 | P-03 | | CH | 20.2 | 99.3 | 26.3 | 96.3 | 121.6 | 6 | 97 | 95 | 0 / 10 | A |
| 382 | | 05/05/23 | P-19 | | CH | 18.4 | 105.0 | 22.4 | 101.8 | 124.6 | 6 | 97 | 95 | 0 / 10 | A |
| 383 | | 05/05/23 | P-16 | | CH | 20.2 | 101.8 | 22.0 | 100.3 | 122.4 | 6 | 99 | 95 | 0 / 10 | A |
| 384 | | 05/05/23 | P-01 | | CH | 19.4 | 100.8 | 21.4 | 98.6 | 119.7 | 6 | 98 | 95 | 0 / 10 | A |
| 385 | | 05/08/23 | P-19 | | CH | 18.4 | 105.0 | 19.2 | 103.7 | 123.6 | 6 | 99 | 95 | 0 / 10 | A |
| 386 | | 05/08/23 | P-16 | | CH | 20.2 | 101.8 | 24.4 | 96.3 | 119.8 | 6 | 95 | 95 | 0 / 10 | A |
| 387 | | 05/08/23 | P-16 | | CH | 20.2 | 101.8 | 22.1 | 99.4 | 121.4 | 6 | 98 | 95 | 0 / 10 | A |
| 388 | | 05/08/23 | P-16 | | CH | 20.2 | 101.8 | 25.1 | 98.0 | 122.6 | 6 | 96 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 381 | Select Clay: Wall, Zone 24 | 30.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 382 | Select Clay: Wall, Zone 25 | 29.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 383 | Select Clay: Wall, Zone 26 | 29.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 384 | Select Clay: Wall, Zone 27 | 29.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 385 | Select Clay: Wall, Zone 16 | 30.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 386 | Select Clay: Wall, Zone 17 | 30.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 387 | Select Clay: Wall, Zone 18 | 30.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 388 | Select Clay: Wall, Zone 22 | 31.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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The Science You Build On.

2908 Morrison Ave.
Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 05/12/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 389 | | 05/08/23 | P-16 | | CH | 20.2 | 101.8 | 24.3 | 99.6 | 123.8 | 6 | 98 | 95 | 0 / 10 | A |
| 390 | | 05/08/23 | P-03 | | CH | 20.2 | 99.3 | 24.5 | 96.7 | 120.4 | 6 | 97 | 95 | 0 / 10 | A |
| 391 | | 05/08/23 | P-19 | | CH | 18.4 | 105.0 | 20.0 | 103.5 | 124.2 | 6 | 99 | 95 | 0 / 10 | A |
| 392 | | 05/08/23 | P-19 | | CH | 18.4 | 105.0 | 21.0 | 105.0 | 127.1 | 6 | 100 | 95 | 0 / 10 | A |
| 393 | | 05/08/23 | P-16 | | CH | 20.2 | 101.8 | 24.5 | 98.4 | 122.5 | 6 | 97 | 95 | 0 / 10 | A |
| 394 | | 05/08/23 | P-19 | | CH | 18.4 | 105.0 | 24.9 | 99.5 | 124.3 | 6 | 95 | 95 | 0 / 10 | A |
| 395 | | 05/08/23 | P-03 | | CH | 20.2 | 99.3 | 22.4 | 95.4 | 116.8 | 6 | 96 | 95 | 0 / 10 | A |
| 396 | | 05/08/23 | P-03 | | CH | 20.2 | 99.3 | 26.0 | 95.7 | 120.6 | 6 | 96 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 389 | Select Clay: Wall, Zone 23 | 31.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 390 | Select Clay: Wall, Zone 24 | 31.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 391 | Select Clay: Wall, Zone 25 | 30.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 392 | Select Clay: Wall, Zone 26 | 30.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 393 | Select Clay: Wall, Zone 27 | 30.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 394 | Select Clay: Wall, Zone 16 | 31.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 395 | Select Clay: Wall, Zone 17 | 31.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 396 | Select Clay: Wall, Zone 18 | 31.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 05/12/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 397 | | 05/08/23 | P-19 | | CH | 18.4 | 105.0 | 20.7 | 103.6 | 125.0 | 6 | 99 | 95 | 0 / 10 | A |
| 398 | | 05/08/23 | P-19 | | CH | 18.4 | 105.0 | 19.2 | 100.1 | 119.3 | 6 | 95 | 95 | 0 / 10 | A |
| 399 | | 05/08/23 | P-03 | | CH | 20.2 | 99.3 | 24.0 | 94.5 | 117.2 | 6 | 95 | 95 | 0 / 10 | A |
| 400 | | 05/08/23 | P-19 | | CH | 18.4 | 105.0 | 23.2 | 100.2 | 123.4 | 6 | 95 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 397 | Select Clay: Wall, Zone 22 | 32.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 398 | Select Clay: Wall, Zone 23 | 32.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 399 | Select Clay: Wall, Zone 24 | 32.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 400 | Select Clay: Wall, Zone 25 | 31.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Kurt Kuechle
05/12/2023

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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# Field Compaction Report

**Report Date:** 05/12/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 401 | | 05/08/23 | P-19 | | CH | 18.4 | 105.0 | 21.5 | 102.3 | 124.3 | 6 | 97 | 95 | 0 / 10 | A |
| 402 | | 05/08/23 | P-19 | | CH | 18.4 | 105.0 | 20.1 | 106.0 | 127.3 | 6 | 101 | 95 | 0 / 10 | A |
| 403 | | 05/08/23 | P-16 | | CH | 20.2 | 101.8 | 24.2 | 97.2 | 120.7 | 6 | 95 | 95 | 0 / 10 | A |
| 404 | | 05/08/23 | P-06 | | CH | 24.5 | 97.3 | 27.4 | 93.1 | 118.6 | 6 | 96 | 95 | 0 / 10 | A |
| 405 | | 05/08/23 | P-09 | | CH | 23.9 | 98.6 | 26.0 | 97.2 | 122.5 | 6 | 99 | 95 | 0 / 10 | A |
| 406 | | 05/08/23 | P-03 | | CH | 20.2 | 99.3 | 24.2 | 97.8 | 121.5 | 6 | 98 | 95 | 0 / 10 | A |
| 407 | | 05/08/23 | P-03 | | CH | 20.2 | 99.3 | 24.0 | 98.6 | 122.3 | 6 | 99 | 95 | 0 / 10 | A |
| 408 | | 05/08/23 | P-03 | | CH | 20.2 | 99.3 | 24.6 | 98.0 | 122.1 | 6 | 99 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 401 | Select Clay: Wall, Zone 26 | 31.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 402 | Select Clay: Wall, Zone 27 | 31.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 403 | Select Clay: Wall, Zone 16 | 32.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 404 | Select Clay: Wall, Zone 17 | 32.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 405 | Select Clay: Wall, Zone 18 | 32.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 406 | Select Clay: Wall, Zone 22 | 33.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 407 | Select Clay: Wall, Zone 23 | 33.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 408 | Select Clay: Wall, Zone 24 | 33.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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# Field Compaction Report

**Report Date:** 05/12/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 409 | | 05/08/23 | P-06 | | CH | 24.5 | 97.3 | 26.1 | 96.2 | 121.3 | 6 | 99 | 95 | 0 / 10 | A |
| 410 | | 05/08/23 | P-03 | | CH | 20.2 | 99.3 | 24.4 | 98.8 | 122.9 | 6 | 99 | 95 | 0 / 10 | A |
| 411 | | 05/08/23 | P-16 | | CH | 20.2 | 101.8 | 23.1 | 98.5 | 121.3 | 6 | 97 | 95 | 0 / 10 | A |
| 412 | | 05/08/23 | P-19 | | CH | 18.4 | 105.0 | 22.7 | 101.5 | 124.5 | 6 | 97 | 95 | 0 / 10 | A |
| 413 | | 05/08/23 | P-16 | | CH | 20.2 | 101.8 | 24.7 | 97.5 | 121.6 | 6 | 96 | 95 | 0 / 10 | A |
| 414 | | 05/08/23 | P-16 | | CH | 20.2 | 101.8 | 22.9 | 99.0 | 121.7 | 6 | 97 | 95 | 0 / 10 | A |
| 415 | | 05/08/23 | P-16 | | CH | 20.2 | 101.8 | 23.3 | 99.5 | 122.7 | 10 | 98 | 95 | 0 / 10 | A |
| 416 | | 05/08/23 | P-19 | | CH | 18.4 | 105.0 | 20.2 | 102.5 | 123.2 | 10 | 98 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 409 | Select Clay: Wall, Zone 25 | 32.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 410 | Select Clay: Wall, Zone 26 | 32.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 411 | Select Clay: Wall, Zone 27 | 32.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 412 | Select Clay: Wall, Zone 16 | 33.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 413 | Select Clay: Wall, Zone 17 | 33.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 414 | Select Clay: Wall, Zone 18 | 33.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 415 | Select Clay: Pipe Ditch, Zone 15 | 2.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 416 | Select Clay: Pipe Ditch, Zone 14 | 2.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 05/12/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 417 | | 05/08/23 | P-19 | | CH | 18.4 | 105.0 | 20.4 | 101.0 | 121.6 | 10 | 96 | 95 | 0 / 10 | A |
| 418 | | 05/08/23 | P-19 | | CH | 18.4 | 105.0 | 22.3 | 104.0 | 127.2 | 10 | 99 | 95 | 0 / 10 | A |
| 419 | | 05/08/23 | P-16 | | CH | 20.2 | 101.8 | 25.1 | 97.9 | 122.5 | 10 | 96 | 95 | 0 / 10 | A |
| 420 | | 05/08/23 | P-16 | | CH | 20.2 | 101.8 | 24.3 | 97.5 | 121.2 | 10 | 96 | 95 | 0 / 10 | A |
| 421 | | 05/08/23 | P-16 | | CH | 20.2 | 101.8 | 24.0 | 96.8 | 120.0 | 6 | 95 | 95 | 0 / 10 | A |
| 422 | | 05/08/23 | P-09 | | CH | 23.9 | 98.6 | 27.9 | 95.0 | 121.5 | 6 | 96 | 95 | 0 / 10 | A |
| 423 | | 05/08/23 | P-13 | | CH | 21.7 | 97.9 | 27.9 | 92.6 | 118.4 | 6 | 95 | 95 | 0 / 10 | A |
| 424 | | 05/08/23 | P-06 | | CH | 24.5 | 97.3 | 28.8 | 93.3 | 120.2 | 6 | 96 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 417 | Select Clay: Pipe Ditch, Zone 8 | 2.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 418 | Select Clay: Pipe Ditch, Zone 7 | 2.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 419 | Select Clay: Pipe Ditch, Zone 1 | 2.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 420 | Select Clay: Cell Floor, Zone 15 | 1.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 421 | Select Clay: Cell Floor, Zone 14 | 1.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 422 | Select Clay: Cell Floor, Zone 13 | 1.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 423 | Select Clay: Cell Floor, Zone 12 | 1.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 424 | Select Clay: Cell Floor, Zone 7 | 1.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 05/12/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 425 | | 05/08/23 | P-17 | | CH | 25.6 | 95.9 | 28.7 | 91.5 | 117.8 | 6 | 95 | 95 | 0 / 10 | A |
| 426 | | 05/08/23 | P-15 | | CH | 24.1 | 98.6 | 26.7 | 96.0 | 121.6 | 6 | 97 | 95 | 0 / 10 | A |
| 427 | | 05/08/23 | P-09 | | CH | 23.9 | 98.6 | 28.7 | 94.2 | 121.2 | 6 | 96 | 95 | 0 / 10 | A |
| 428 | | 05/08/23 | P-09 | | CH | 23.9 | 98.6 | 27.6 | 94.0 | 119.9 | 6 | 95 | 95 | 0 / 10 | A |
| 429 | | 05/08/23 | P-11 | | CH | 24.8 | 95.9 | 28.9 | 92.2 | 118.8 | 6 | 96 | 95 | 0 / 10 | A |
| 430 | | 05/08/23 | P-11 | | CH | 24.8 | 95.9 | 27.0 | 95.8 | 121.7 | 6 | 100 | 95 | 0 / 10 | A |
| 431 | | 05/08/23 | P-11 | | CH | 24.8 | 95.9 | 27.8 | 95.8 | 122.4 | 6 | 100 | 95 | 0 / 10 | A |
| 432 | | 05/08/23 | P-09 | | CH | 23.9 | 98.6 | 25.4 | 97.9 | 122.8 | 6 | 99 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 425 | Select Clay: Cell Floor, Zone 11 | 1.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 426 | Select Clay: Cell Floor, Zone 6 | 1.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 427 | Select Clay: Cell Floor, Zone 15 | 2.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 428 | Select Clay: Cell Floor, Zone 14 | 2.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 429 | Select Clay: Cell Floor, Zone 13 | 2.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 430 | Select Clay: Cell Floor, Zone 12 | 2.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 431 | Select Clay: Cell Floor, Zone 11 | 2.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 432 | Select Clay: Cell Floor, Zone 6 | 2.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 05/12/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 433 | | 05/08/23 | P-16 | | CH | 20.2 | 101.8 | 24.6 | 99.0 | 123.4 | 6 | 97 | 95 | 0 / 10 | A |
| 434 | | 05/08/23 | P-09 | | CH | 23.9 | 98.6 | 27.4 | 94.3 | 120.1 | 6 | 96 | 95 | 0 / 10 | A |
| 435 | | 05/08/23 | P-09 | | CH | 23.9 | 98.6 | 26.4 | 95.1 | 120.2 | 6 | 96 | 95 | 0 / 10 | A |
| 436 | | 05/08/23 | P-11 | | CH | 24.8 | 95.9 | 27.4 | 92.3 | 117.6 | 6 | 96 | 95 | 0 / 10 | A |
| 437 | | 05/08/23 | P-11 | | CH | 24.8 | 95.9 | 27.7 | 91.4 | 116.7 | 6 | 95 | 95 | 0 / 10 | A |
| 438 | | 05/08/23 | P-09 | | CH | 23.9 | 98.6 | 25.9 | 97.0 | 122.1 | 6 | 98 | 95 | 0 / 10 | A |
| 439 | | 05/09/23 | P-03 | | CH | 20.2 | 99.3 | 23.1 | 97.6 | 120.1 | 6 | 98 | 95 | 0 / 10 | A |
| 440 | | 05/09/23 | P-11 | | CH | 24.8 | 95.9 | 26.1 | 94.7 | 119.4 | 6 | 99 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 433 | Select Clay: Cell Floor, Zone 7 | 2.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 434 | Select Clay: Cell Floor, Zone 15 | 3.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 435 | Select Clay: Cell Floor, Zone 14 | 3.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 436 | Select Clay: Cell Floor, Zone 13 | 3.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 437 | Select Clay: Cell Floor, Zone 12 | 3.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 438 | Select Clay: Cell Floor, Zone 11 | 3.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 439 | Select Clay: Cell Floor, Zone 7 | 3.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 440 | Select Clay: Cell Floor, Zone 6 | 3.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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2908 Morrison Ave.
Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 05/12/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 441 | | 05/09/23 | P-07 | | CH | 22.6 | 93.8 | 23.3 | 91.0 | 112.2 | 6 | 97 | 95 | 0 / 10 | A |
| 442 | | 05/09/23 | P-07 | | CH | 22.6 | 93.8 | 26.3 | 92.0 | 116.2 | 6 | 98 | 95 | 0 / 10 | A |
| 443 | | 05/09/23 | P-03 | | CH | 20.2 | 99.3 | 23.3 | 98.4 | 121.3 | 6 | 99 | 95 | 0 / 10 | A |
| 444 | | 05/09/23 | P-15 | | CH | 24.1 | 98.6 | 25.2 | 100.5 | 125.8 | 6 | 102 | 95 | 0 / 10 | A |
| 445 | | 05/09/23 | P-07 | | CH | 22.6 | 93.8 | 27.2 | 92.9 | 118.2 | 6 | 99 | 95 | 0 / 10 | A |
| 446 | | 05/09/23 | P-16 | | CH | 20.2 | 101.8 | 25.0 | 100.2 | 125.3 | 6 | 98 | 95 | 0 / 10 | A |
| 447 | | 05/09/23 | P-01 | | CH | 19.4 | 100.8 | 22.3 | 97.2 | 118.9 | 6 | 96 | 95 | 0 / 10 | A |
| 448 | | 05/09/23 | P-10 | | CH | 25.0 | 94.6 | 27.8 | 92.4 | 118.1 | 6 | 98 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 441 | Select Clay: Cell Floor, Zone 14 | 4.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 442 | Select Clay: Cell Floor, Zone 13 | 4.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 443 | Select Clay: Cell Floor, Zone 12 | 4.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 444 | Select Clay: Cell Floor, Zone 11 | 4.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 445 | Select Clay: Cell Floor, Zone 7 | 4.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 446 | Select Clay: Cell Floor, Zone 6 | 4.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 447 | Select Clay: Cell Floor, Zone 14 | 5.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 448 | Select Clay: Cell Floor, Zone 13 | 5.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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2908 Morrison Ave.
Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 05/12/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 449 | | 05/09/23 | P-12 | | CH | 23.6 | 97.4 | 26.7 | 95.9 | 121.5 | 6 | 98 | 95 | 0 / 10 | A |
| 450 | | 05/09/23 | P-12 | | CH | 23.6 | 97.4 | 27.2 | 94.7 | 120.5 | 6 | 97 | 95 | 0 / 10 | A |
| 451 | | 05/09/23 | P-01 | | CH | 19.4 | 100.8 | 23.8 | 99.2 | 122.8 | 6 | 98 | 95 | 0 / 10 | A |
| 452 | | 05/09/23 | P-19 | | CH | 18.4 | 105.0 | 21.1 | 101.9 | 123.4 | 6 | 97 | 95 | 0 / 10 | A |
| 453 | | 05/09/23 | P-12 | | CH | 23.6 | 97.4 | 24.3 | 96.8 | 120.3 | 6 | 99 | 95 | 0 / 10 | A |
| 454 | | 05/09/23 | P-01 | | CH | 19.4 | 100.8 | 22.8 | 98.9 | 121.4 | 6 | 98 | 95 | 0 / 10 | A |
| 455 | | 05/09/23 | P-07 | | CH | 22.6 | 93.8 | 25.6 | 93.1 | 116.9 | 6 | 99 | 95 | 0 / 10 | A |
| 456 | | 05/09/23 | P-02 | | CH | 22.6 | 97.7 | 23.1 | 96.1 | 118.3 | 6 | 98 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 449 | Select Clay: Cell Floor, Zone 12 | 5.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 450 | Select Clay: Cell Floor, Zone 11 | 5.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 451 | Select Clay: Cell Floor, Zone 6 | 5.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 452 | Select Clay: Cell Floor, Zone 7 | 5.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 453 | Select Clay: Cell Floor, Zone 14 | 6.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 454 | Select Clay: Cell Floor, Zone 13 | 6.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 455 | Select Clay: Cell Floor, Zone 12 | 6.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 456 | Select Clay: Cell Floor, Zone 11 | 6.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 05/12/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 457 | | 05/09/23 | P-01 | | CH | 19.4 | 100.8 | 24.3 | 99.5 | 123.7 | 6 | 99 | 95 | 0 / 10 | A |
| 458 | | 05/09/23 | P-03 | | CH | 20.2 | 99.3 | 22.4 | 97.3 | 119.1 | 6 | 98 | 95 | 0 / 10 | A |
| 459 | | 05/09/23 | P-18 | | CH | 25.7 | 94.5 | 27.3 | 89.8 | 114.3 | 6 | 95 | 95 | 0 / 10 | A |
| 460 | | 05/09/23 | P-01 | | CH | 19.4 | 100.8 | 24.3 | 98.7 | 122.7 | 6 | 98 | 95 | 0 / 10 | A |
| 461 | | 05/09/23 | P-19 | | CH | 18.4 | 105.0 | 21.8 | 103.5 | 126.1 | 6 | 99 | 95 | 0 / 10 | A |
| 462 | | 05/09/23 | P-03 | | CH | 20.2 | 99.3 | 22.4 | 96.0 | 117.5 | 6 | 97 | 95 | 0 / 10 | A |
| 463 | | 05/09/23 | P-06 | | CH | 24.5 | 97.3 | 25.6 | 97.3 | 122.2 | 6 | 100 | 95 | 0 / 10 | A |
| 464 | | 05/09/23 | P-07 | | CH | 22.6 | 93.8 | 25.8 | 93.1 | 117.1 | 6 | 99 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 457 | Select Clay: Cell Floor, Zone 6 | 6.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 458 | Select Clay: Cell Floor, Zone 7 | 6.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 459 | Select Clay: Cell Floor, Zone 14 | 7.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 460 | Select Clay: Cell Floor, Zone 13 | 7.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 461 | Select Clay: Cell Floor, Zone 12 | 7.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 462 | Select Clay: Cell Floor, Zone 11 | 7.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 463 | Select Clay: Cell Floor, Zone 6 | 7.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 464 | Select Clay: Cell Floor, Zone 7 | 7.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 05/12/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 465 | | 05/09/23 | P-08 | | CH | 24.4 | 97.0 | 25.4 | 97.0 | 121.6 | 6 | 100 | 95 | 0 / 10 | A |
| 466 | | 05/09/23 | P-10 | | CH | 25.0 | 94.6 | 27.2 | 93.4 | 118.8 | 6 | 99 | 95 | 0 / 10 | A |
| 467 | | 05/09/23 | P-01 | | CH | 19.4 | 100.8 | 23.7 | 100.8 | 124.7 | 6 | 100 | 95 | 0 / 10 | A |
| 468 | | 05/09/23 | P-16 | | CH | 20.2 | 101.8 | 21.4 | 99.8 | 121.2 | 6 | 98 | 95 | 0 / 10 | A |
| 469 | | 05/09/23 | P-12 | | CH | 23.6 | 97.4 | 25.4 | 95.3 | 119.5 | 6 | 98 | 95 | 0 / 10 | A |
| 470 | | 05/09/23 | P-13 | | CH | 21.7 | 97.9 | 22.1 | 96.9 | 118.3 | 6 | 99 | 95 | 0 / 10 | A |
| 471 | | 05/09/23 | P-01 | | CH | 19.4 | 100.8 | 22.6 | 99.4 | 121.9 | 6 | 99 | 95 | 0 / 10 | A |
| 472 | | 05/09/23 | P-16 | | CH | 20.2 | 101.8 | 21.9 | 101.0 | 123.1 | 6 | 99 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 465 | Select Clay: Cell Floor, Zone 14 | 8.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 466 | Select Clay: Cell Floor, Zone 13 | 8.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 467 | Select Clay: Cell Floor, Zone 12 | 8.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 468 | Select Clay: Cell Floor, Zone 11 | 8.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 469 | Select Clay: Cell Floor, Zone 6 | 8.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 470 | Select Clay: Cell Floor, Zone 7 | 8.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 471 | Select Clay: Cell Floor, Zone 14 | 9.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 472 | Select Clay: Cell Floor, Zone 13 | 9.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Bismarck, ND 58504
Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 05/12/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 473 | | 05/09/23 | P-01 | | CH | 19.4 | 100.8 | 23.6 | 99.7 | 123.2 | 6 | 99 | 95 | 0 / 10 | A |
| 474 | | 05/09/23 | P-19 | | CH | 18.4 | 105.0 | 22.3 | 103.8 | 126.9 | 6 | 99 | 95 | 0 / 10 | A |
| 475 | | 05/09/23 | P-03 | | CH | 20.2 | 99.3 | 24.1 | 98.6 | 122.4 | 6 | 99 | 95 | 0 / 10 | A |
| 476 | | 05/09/23 | P-18 | | CH | 25.7 | 94.5 | 27.1 | 90.7 | 115.3 | 6 | 96 | 95 | 0 / 10 | A |
| 477 | | 05/10/23 | P-16 | | CH | 20.2 | 101.8 | 22.6 | 100.3 | 123.0 | 6 | 99 | 95 | 0 / 10 | A |
| 478 | | 05/10/23 | P-19 | | CH | 18.4 | 105.0 | 20.0 | 105.9 | 127.1 | 6 | 101 | 95 | 0 / 10 | A |
| 479 | | 05/10/23 | P-01 | | CH | 19.4 | 100.8 | 20.3 | 99.4 | 119.6 | 6 | 99 | 95 | 0 / 10 | A |
| 480 | | 05/10/23 | P-16 | | CH | 20.2 | 101.8 | 21.1 | 100.5 | 121.7 | 6 | 99 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 473 | Select Clay: Cell Floor, Zone 12 | 9.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 474 | Select Clay: Cell Floor, Zone 11 | 9.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 475 | Select Clay: Cell Floor, Zone 6 | 9.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 476 | Select Clay: Cell Floor, Zone 7 | 9.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 477 | Select Clay: Wall, Zone 25 | 33.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 478 | Select Clay: Wall, Zone 26 | 33.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 479 | Select Clay: Wall, Zone 27 | 33.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 480 | Select Clay: Wall, Zone 16 | 34.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 05/12/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 481 | | 05/10/23 | P-19 | | CH | 18.4 | 105.0 | 19.4 | 105.8 | 126.3 | 6 | 101 | 95 | 0 / 10 | A |
| 482 | | 05/10/23 | P-08 | | CH | 24.4 | 97.0 | 26.0 | 95.1 | 119.8 | 6 | 98 | 95 | 0 / 10 | A |
| 483 | | 05/10/23 | P-13 | | CH | 21.7 | 97.9 | 25.6 | 93.8 | 117.8 | 6 | 96 | 95 | 0 / 10 | A |
| 484 | | 05/10/23 | P-16 | | CH | 20.2 | 101.8 | 22.3 | 97.5 | 119.2 | 6 | 96 | 95 | 0 / 10 | A |
| 485 | | 05/10/23 | P-13 | | CH | 21.7 | 97.9 | 26.1 | 96.1 | 121.2 | 6 | 98 | 95 | 0 / 10 | A |
| 486 | | 05/10/23 | P-16 | | CH | 20.2 | 101.8 | 23.8 | 101.4 | 125.5 | 6 | 100 | 95 | 0 / 10 | A |
| 487 | | 05/10/23 | P-16 | | CH | 20.2 | 101.8 | 22.9 | 101.0 | 124.1 | 6 | 99 | 95 | 0 / 10 | A |
| 488 | | 05/10/23 | P-03 | | CH | 20.2 | 99.3 | 24.4 | 96.6 | 120.2 | 6 | 97 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 481 | Select Clay: Wall, Zone 17 | 34.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 482 | Select Clay: Wall, Zone 18 | 34.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 483 | Select Clay: Wall, Zone 22 | 34.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 484 | Select Clay: Wall, Zone 23 | 34.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 485 | Select Clay: Wall, Zone 24 | 34.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 486 | Select Clay: Wall, Zone 25 | 34.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 487 | Select Clay: Wall, Zone 26 | 34.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 488 | Select Clay: Wall, Zone 27 | 34.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 05/12/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 489 | | 05/10/23 | P-16 | | CH | 20.2 | 101.8 | 23.9 | 99.6 | 123.4 | 6 | 98 | 95 | 0 / 10 | A |
| 490 | | 05/10/23 | P-16 | | CH | 20.2 | 101.8 | 25.7 | 97.8 | 122.9 | 6 | 96 | 95 | 0 / 10 | A |
| 491 | | 05/10/23 | P-11 | | CH | 24.8 | 95.9 | 27.2 | 92.5 | 117.7 | 6 | 96 | 95 | 0 / 10 | A |
| 492 | | 05/10/23 | P-11 | | CH | 24.8 | 95.9 | 27.5 | 92.2 | 117.6 | 6 | 96 | 95 | 0 / 10 | A |
| 493 | | 05/10/23 | P-16 | | CH | 20.2 | 101.8 | 22.3 | 97.1 | 118.8 | 6 | 95 | 95 | 0 / 10 | A |
| 494 | | 05/10/23 | P-16 | | CH | 20.2 | 101.8 | 20.9 | 99.4 | 120.2 | 6 | 98 | 95 | 0 / 10 | A |
| 495 | | 05/10/23 | P-11 | | CH | 24.8 | 95.9 | 28.4 | 95.0 | 122.0 | 6 | 99 | 95 | 0 / 10 | A |
| 496 | | 05/10/23 | P-09 | | CH | 23.9 | 98.6 | 26.0 | 96.7 | 121.8 | 6 | 98 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 489 | Select Clay: Wall, Zone 16 | 35.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 490 | Select Clay: Wall, Zone 17 | 35.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 491 | Select Clay: Wall, Zone 18 | 35.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 492 | Select Clay: Wall, Zone 22 | 35.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 493 | Select Clay: Wall, Zone 23 | 35.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 494 | Select Clay: Wall, Zone 24 | 35.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 495 | Select Clay: Wall, Zone 25 | 35.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 496 | Select Clay: Wall, Zone 26 | 35.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

BRAUN INTERTEC
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2908 Morrison Ave.
Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 05/12/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 497 | | 05/10/23 | P-11 | | CH | 24.8 | 95.9 | 25.7 | 92.6 | 116.4 | 6 | 97 | 95 | 0 / 10 | A |
| 498 | | 05/10/23 | P-16 | | CH | 20.2 | 101.8 | 24.2 | 99.4 | 123.5 | 6 | 98 | 95 | 0 / 10 | A |
| 499 | | 05/10/23 | P-07 | | CH | 22.6 | 93.8 | 25.9 | 91.4 | 115.1 | 6 | 97 | 95 | 0 / 10 | A |
| 500 | | 05/10/23 | P-07 | | CH | 22.6 | 93.8 | 24.6 | 90.9 | 113.3 | 6 | 97 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 497 | Select Clay: Wall, Zone 27 | 35.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 498 | Select Clay: Wall, Zone 16 | 36.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 499 | Select Clay: Wall, Zone 17 | 36.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 500 | Select Clay: Wall, Zone 18 | 36.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Kurt Kuechle
05/12/2023

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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Bismarck, ND 58504
Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 06/21/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 501 | | 05/10/23 | P-01 | | CH | 19.4 | 100.8 | 20.3 | 100.4 | 120.8 | 6 | 100 | 95 | 0 / 10 | A |
| 502 | | 05/10/23 | P-09 | | CH | 23.9 | 98.6 | 26.4 | 94.7 | 119.7 | 6 | 96 | 95 | 0 / 10 | A |
| 503 | | 05/10/23 | P-16 | | CH | 20.2 | 101.8 | 21.4 | 101.4 | 123.1 | 6 | 100 | 95 | 0 / 10 | A |
| 504 | | 05/10/23 | P-15 | | CH | 24.1 | 98.6 | 26.7 | 96.0 | 121.6 | 6 | 97 | 95 | 0 / 10 | A |
| 505 | | 05/10/23 | P-15 | | CH | 24.1 | 98.6 | 24.9 | 97.5 | 121.8 | 6 | 99 | 95 | 0 / 10 | A |
| 506 | | 05/10/23 | P-09 | | CH | 23.9 | 98.6 | 25.2 | 98.1 | 122.8 | 6 | 99 | 95 | 0 / 10 | A |
| 507 | | 05/10/23 | P-03 | | CH | 20.2 | 99.3 | 24.4 | 95.9 | 119.3 | 6 | 97 | 95 | 0 / 10 | A |
| 508 | | 05/10/23 | P-16 | | CH | 20.2 | 101.8 | 21.3 | 101.6 | 123.2 | 6 | 100 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 501 | Select Clay: Wall, Zone 22 | 36.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 502 | Select Clay: Wall, Zone 23 | 36.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 503 | Select Clay: Wall, Zone 24 | 36.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 504 | Select Clay: Wall, Zone 25 | 36.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 505 | Select Clay: Wall, Zone 26 | 36.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 506 | Select Clay: Wall, Zone 27 | 36.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 507 | Select Clay: Wall, Zone 16 | 37.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 508 | Select Clay: Wall, Zone 17 | 37.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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# Field Compaction Report

**Report Date:** 06/21/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 509 | | 05/10/23 | P-19 | | CH | 18.4 | 105.0 | 20.4 | 100.2 | 120.6 | 6 | 95 | 95 | 0 / 10 | A |
| 510 | | 05/10/23 | P-13 | | CH | 21.7 | 97.9 | 24.1 | 96.8 | 120.1 | 6 | 99 | 95 | 0 / 10 | A |
| 511 | | 05/10/23 | P-16 | | CH | 20.2 | 101.8 | 21.8 | 100.4 | 122.3 | 6 | 99 | 95 | 0 / 10 | A |
| 512 | | 05/10/23 | P-13 | | CH | 21.7 | 97.9 | 22.6 | 96.1 | 117.8 | 6 | 98 | 95 | 0 / 10 | A |
| 513 | | 05/10/23 | P-09 | | CH | 23.9 | 98.6 | 25.4 | 97.6 | 122.4 | 6 | 99 | 95 | 0 / 10 | A |
| 514 | | 05/10/23 | P-09 | | CH | 23.9 | 98.6 | 26.8 | 94.0 | 119.2 | 6 | 95 | 95 | 0 / 10 | A |
| 515 | | 05/10/23 | P-09 | | CH | 23.9 | 98.6 | 24.5 | 97.2 | 121.0 | 6 | 99 | 95 | 0 / 10 | A |
| 516 | | 05/10/23 | P-16 | | CH | 20.2 | 101.8 | 21.6 | 101.8 | 123.8 | 6 | 100 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 509 | Select Clay: Wall, Zone 18 | 37.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 510 | Select Clay: Wall, Zone 22 | 37.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 511 | Select Clay: Wall, Zone 23 | 37.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 512 | Select Clay: Wall, Zone 24 | 37.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 513 | Select Clay: Wall, Zone 25 | 37.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 514 | Select Clay: Wall, Zone 26 | 37.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 515 | Select Clay: Wall, Zone 27 | 37.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 516 | Select Clay: Wall, Zone 16 | 38.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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# Field Compaction Report

**Report Date:** 06/21/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 517 | | 05/10/23 | P-19 | | CH | 18.4 | 105.0 | 20.2 | 103.4 | 124.3 | 6 | 98 | 95 | 0 / 10 | A |
| 518 | | 05/10/23 | P-16 | | CH | 20.2 | 101.8 | 21.2 | 99.1 | 120.1 | 6 | 97 | 95 | 0 / 10 | A |
| 519 | | 05/10/23 | P-07 | | CH | 22.6 | 93.8 | 28.7 | 89.2 | 114.8 | 6 | 95 | 95 | 0 / 10 | A |
| 520 | | 05/10/23 | P-13 | | CH | 21.7 | 97.9 | 24.1 | 95.5 | 118.5 | 6 | 98 | 95 | 0 / 10 | A |
| 521 | | 05/10/23 | P-13 | | CH | 21.7 | 97.9 | 26.6 | 94.5 | 119.6 | 6 | 97 | 95 | 0 / 10 | A |
| 522 | | 05/10/23 | P-19 | | CH | 18.4 | 105.0 | 21.9 | 104.8 | 127.8 | 6 | 100 | 95 | 0 / 10 | A |
| 523 | | 05/10/23 | P-16 | | CH | 20.2 | 101.8 | 23.5 | 98.0 | 121.0 | 6 | 96 | 95 | 0 / 10 | A |
| 524 | | 05/10/23 | P-16 | | CH | 20.2 | 101.8 | 25.5 | 97.9 | 122.9 | 6 | 96 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 517 | Select Clay: Wall, Zone 17 | 38.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 518 | Select Clay: Wall, Zone 18 | 38.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 519 | Select Clay: Wall, Zone 22 | 38.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 520 | Select Clay: Wall, Zone 23 | 38.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 521 | Select Clay: Wall, Zone 24 | 38.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 522 | Select Clay: Wall, Zone 25 | 38.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 523 | Select Clay: Wall, Zone 26 | 38.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 524 | Select Clay: Wall, Zone 27 | 38.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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Bismarck, ND 58504
Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 06/21/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 525 | | 05/10/23 | P-07 | | CH | 22.6 | 93.8 | 25.9 | 91.4 | 115.1 | 6 | 97 | 95 | 0 / 10 | A |
| 526 | | 05/10/23 | P-19 | | CH | 18.4 | 105.0 | 22.6 | 102.9 | 126.2 | 6 | 98 | 95 | 0 / 10 | A |
| 527 | | 05/10/23 | P-13 | | CH | 21.7 | 97.9 | 25.2 | 94.3 | 118.1 | 6 | 96 | 95 | 0 / 10 | A |
| 528 | | 05/10/23 | P-13 | | CH | 21.7 | 97.9 | 22.3 | 96.2 | 117.7 | 6 | 98 | 95 | 0 / 10 | A |
| 529 | | 05/10/23 | P-16 | | CH | 20.2 | 101.8 | 21.2 | 101.2 | 122.7 | 6 | 99 | 95 | 0 / 10 | A |
| 530 | | 05/10/23 | P-16 | | CH | 20.2 | 101.8 | 22.9 | 102.2 | 125.6 | 6 | 100 | 95 | 0 / 10 | A |
| 531 | | 05/10/23 | P-16 | | CH | 20.2 | 101.8 | 20.8 | 101.7 | 122.9 | 6 | 100 | 95 | 0 / 10 | A |
| 532 | | 05/10/23 | P-19 | | CH | 18.4 | 105.0 | 22.9 | 104.0 | 127.8 | 6 | 99 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 525 | Select Clay: Wall, Zone 16 | 39.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 526 | Select Clay: Wall, Zone 17 | 39.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 527 | Select Clay: Wall, Zone 18 | 39.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 528 | Select Clay: Wall, Zone 22 | 39.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 529 | Select Clay: Wall, Zone 23 | 39.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 530 | Select Clay: Wall, Zone 24 | 39.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 531 | Select Clay: Wall, Zone 25 | 39.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 532 | Select Clay: Wall, Zone 26 | 39.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 06/21/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 533 | | 05/10/23 | P-16 | | CH | 20.2 | 101.8 | 24.6 | 99.6 | 124.1 | 6 | 98 | 95 | 0 / 10 | A |
| 534 | | 05/10/23 | P-16 | | CH | 20.2 | 101.8 | 23.5 | 101.3 | 125.1 | 6 | 100 | 95 | 0 / 10 | A |
| 535 | | 05/10/23 | P-16 | | CH | 20.2 | 101.8 | 24.1 | 101.3 | 125.7 | 6 | 100 | 95 | 0 / 10 | A |
| 536 | | 05/10/23 | P-16 | | CH | 20.2 | 101.8 | 21.7 | 100.0 | 121.7 | 6 | 98 | 95 | 0 / 10 | A |
| 537 | | 05/10/23 | P-16 | | CH | 20.2 | 101.8 | 23.1 | 85.9 | 105.7 | 6 | 84 | 95 | 0 / 10 | B |
| 538 | | 05/10/23 | P-01 | | CH | 19.4 | 100.8 | 22.1 | 99.1 | 121.0 | 6 | 98 | 95 | 0 / 10 | A |
| 539 | | 05/10/23 | P-19 | | CH | 18.4 | 105.0 | 20.1 | 103.9 | 124.8 | 6 | 99 | 95 | 0 / 10 | A |
| 540 | 537 | 05/10/23 | P-16 | | CH | 20.2 | 101.8 | 23.6 | 97.5 | 120.5 | 6 | 96 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 533 | Select Clay: Wall, Zone 27 | 39.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 534 | Select Clay: Wall, Zone 16 | 40.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 535 | Select Clay: Wall, Zone 17 | 40.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 536 | Select Clay: Wall, Zone 18 | 40.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 537 | Select Clay: Wall, Zone 22 | 40.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 538 | Select Clay: Wall, Zone 23 | 40.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 539 | Select Clay: Wall, Zone 24 | 40.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 540 | Select Clay: Wall, Zone 22 | 40.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |

## Remarks

**A:** Test results comply with specifications

**B:** Test results do not comply with specifications

## Comments

Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency.

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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# Field Compaction Report

**Report Date:** 06/21/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 541 | | 05/10/23 | P-16 | | CH | 20.2 | 101.8 | 22.4 | 102.3 | 125.2 | 6 | 100 | 95 | 0 / 10 | A |
| 542 | | 05/10/23 | P-16 | | CH | 20.2 | 101.8 | 24.2 | 99.0 | 123.0 | 6 | 97 | 95 | 0 / 10 | A |
| 543 | | 05/10/23 | P-16 | | CH | 20.2 | 101.8 | 22.8 | 97.4 | 119.6 | 6 | 96 | 95 | 0 / 10 | A |
| 544 | | 05/10/23 | P-19 | | CH | 18.4 | 105.0 | 19.6 | 105.2 | 125.8 | 6 | 100 | 95 | 0 / 10 | A |
| 545 | | 05/10/23 | P-16 | | CH | 20.2 | 101.8 | 23.2 | 100.6 | 123.9 | 6 | 99 | 95 | 0 / 10 | A |
| 546 | | 05/10/23 | P-16 | | CH | 20.2 | 101.8 | 25.0 | 97.1 | 121.4 | 6 | 95 | 95 | 0 / 10 | A |
| 547 | | 05/11/23 | P-07 | | CH | 22.6 | 93.8 | 30.1 | 91.0 | 118.4 | 6 | 97 | 95 | 0 / 10 | A |
| 548 | | 05/11/23 | P-16 | | CH | 20.2 | 101.8 | 23.5 | 99.6 | 123.0 | 6 | 98 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 541 | Select Clay: Wall, Zone 25 | 40.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 542 | Select Clay: Wall, Zone 26 | 40.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 543 | Select Clay: Wall, Zone 27 | 40.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 544 | Select Clay: Wall, Zone 16 | 41.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 545 | Select Clay: Wall, Zone 17 | 41.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 546 | Select Clay: Wall, Zone 18 | 41.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 547 | Select Clay: Cell Floor, Zone 9 | 1.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 548 | Select Clay: Cell Floor, Zone 8 | 1.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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2908 Morrison Ave.
Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 06/21/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 549 | | 05/11/23 | P-07 | | CH | 22.6 | 93.8 | 27.1 | 91.4 | 116.2 | 6 | 97 | 95 | 0 / 10 | A |
| 550 | | 05/11/23 | P-13 | | CH | 21.7 | 97.9 | 25.7 | 96.2 | 120.9 | 6 | 98 | 95 | 0 / 10 | A |
| 551 | | 05/11/23 | P-19 | | CH | 18.4 | 105.0 | 19.1 | 103.0 | 122.7 | 6 | 98 | 95 | 0 / 10 | A |
| 552 | | 05/11/23 | P-07 | | CH | 22.6 | 93.8 | 27.4 | 90.3 | 115.0 | 6 | 96 | 95 | 0 / 10 | A |
| 553 | | 05/11/23 | P-05 | | CH | 24.5 | 96.2 | 26.9 | 94.8 | 120.3 | 6 | 99 | 95 | 0 / 10 | A |
| 554 | | 05/11/23 | P-13 | | CH | 21.7 | 97.9 | 24.5 | 97.2 | 121.0 | 6 | 99 | 95 | 0 / 10 | A |
| 555 | | 05/11/23 | P-16 | | CH | 20.2 | 101.8 | 17.9 | 101.4 | 119.5 | 6 | 100 | 95 | 0 / 10 | B |
| 556 | | 05/11/23 | P-16 | | CH | 20.2 | 101.8 | 20.9 | 100.4 | 121.4 | 6 | 99 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 549 | Select Clay: Cell Floor, Zone 2 | 1.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 550 | Select Clay: Cell Floor, Zone 3 | 1.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 551 | Select Clay: Cell Floor, Zone 4 | 1.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 552 | Select Clay: Cell Floor, Zone 5 | 1.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 553 | Select Clay: Cell Floor, Zone 10 | 1.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 554 | Select Clay: Cell Floor, Zone 5 | 2.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 555 | Select Clay: Cell Floor, Zone 4 | 2.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 556 | Select Clay: Cell Floor, Zone 3 | 2.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |

## Remarks

**A:** Test results comply with specifications

**B:** Test results do not comply with specifications

## Comments

Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency.

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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# Field Compaction Report

**Report Date:** 06/21/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 557 | | 05/11/23 | P-16 | | CH | 20.2 | 101.8 | 22.6 | 100.8 | 123.6 | 6 | 99 | 95 | 0 / 10 | A |
| 558 | 555 | 05/11/23 | P-16 | | CH | 20.2 | 101.8 | 21.2 | 100.9 | 122.3 | 6 | 99 | 95 | 0 / 10 | A |
| 559 | | 05/11/23 | P-16 | | CH | 20.2 | 101.8 | 22.2 | 101.5 | 124.0 | 6 | 100 | 95 | 0 / 10 | A |
| 560 | | 05/11/23 | P-09 | | CH | 23.9 | 98.6 | 26.4 | 93.6 | 118.3 | 6 | 95 | 95 | 0 / 10 | A |
| 561 | | 05/11/23 | P-09 | | CH | 23.9 | 98.6 | 26.4 | 95.6 | 120.8 | 6 | 97 | 95 | 0 / 10 | A |
| 562 | | 05/11/23 | P-13 | | CH | 21.7 | 97.9 | 24.4 | 97.1 | 120.8 | 6 | 99 | 95 | 0 / 10 | A |
| 563 | | 05/11/23 | P-19 | | CH | 18.4 | 105.0 | 19.1 | 106.8 | 127.2 | 6 | 102 | 95 | 0 / 10 | A |
| 564 | | 05/11/23 | P-16 | | CH | 20.2 | 101.8 | 23.5 | 100.9 | 124.6 | 6 | 99 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 557 | Select Clay: Cell Floor, Zone 2 | 2.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 558 | Select Clay: Cell Floor, Zone 4 | 2.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 559 | Select Clay: Cell Floor, Zone 10 | 2.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 560 | Select Clay: Cell Floor, Zone 9 | 2.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 561 | Select Clay: Cell Floor, Zone 8 | 2.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 562 | Select Clay: Cell Floor, Zone 9 | 3.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 563 | Select Clay: Cell Floor, Zone 8 | 3.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 564 | Select Clay: Cell Floor, Zone 2 | 3.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 06/21/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 565 | | 05/11/23 | P-16 | | CH | 20.2 | 101.8 | 24.1 | 98.7 | 122.5 | 6 | 97 | 95 | 0 / 10 | A |
| 566 | | 05/11/23 | P-16 | | CH | 20.2 | 101.8 | 22.5 | 99.6 | 122.0 | 6 | 98 | 95 | 0 / 10 | A |
| 567 | | 05/11/23 | P-16 | | CH | 20.2 | 101.8 | 20.9 | 99.0 | 119.7 | 6 | 97 | 95 | 0 / 10 | A |
| 568 | | 05/11/23 | P-16 | | CH | 20.2 | 101.8 | 23.6 | 101.0 | 124.8 | 6 | 99 | 95 | 0 / 10 | A |
| 569 | | 06/12/23 | P-19 | | CH | 18.4 | 105.0 | 20.2 | 103.5 | 124.4 | 12 | 99 | 95 | 0 / 10 | A |
| 570 | | 06/12/23 | P-19 | | CH | 18.4 | 105.0 | 18.8 | 106.0 | 125.9 | 12 | 101 | 95 | 0 / 10 | A |
| 571 | | 06/12/23 | P-19 | | CH | 18.4 | 105.0 | 20.2 | 104.2 | 125.3 | 12 | 99 | 95 | 0 / 10 | A |
| 572 | | 06/12/23 | P-16 | | CH | 20.2 | 101.8 | 21.8 | 101.5 | 123.6 | 12 | 100 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 565 | Select Clay: Cell Floor, Zone 4 | 3.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 566 | Select Clay: Cell Floor, Zone 3 | 3.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 567 | Select Clay: Cell Floor, Zone 5 | 3.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 568 | Select Clay: Cell Floor, Zone 10 | 3.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 569 | Select Clay: Cell Floor, Zone 15 | 6.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 570 | Select Clay: Cell Floor, Zone 9 | 4.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 571 | Select Clay: Cell Floor, Zone 8 | 4.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 572 | Select Clay: Cell Floor, Zone 2 | 6.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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# Field Compaction Report

**Report Date:** 06/21/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 573 | | 06/12/23 | P-19 | | CH | 18.4 | 105.0 | 18.7 | 103.4 | 122.7 | 12 | 98 | 95 | 0 / 10 | A |
| 574 | | 06/12/23 | P-19 | | CH | 18.4 | 105.0 | 18.5 | 102.6 | 121.6 | 12 | 98 | 95 | 0 / 10 | A |
| 575 | | 06/12/23 | P-19 | | CH | 18.4 | 105.0 | 18.6 | 103.4 | 122.6 | 12 | 98 | 95 | 0 / 10 | A |
| 576 | | 06/12/23 | P-19 | | CH | 18.4 | 105.0 | 20.2 | 103.7 | 124.6 | 12 | 99 | 95 | 0 / 10 | A |
| 577 | | 06/12/23 | P-19 | | CH | 18.4 | 105.0 | 21.5 | 102.3 | 124.3 | 12 | 97 | 95 | 0 / 10 | A |
| 578 | | 06/12/23 | P-19 | | CH | 18.4 | 105.0 | 20.4 | 104.5 | 125.8 | 12 | 100 | 95 | 0 / 10 | A |
| 579 | | 06/12/23 | P-16 | | CH | 20.2 | 101.8 | 23.6 | 99.9 | 123.5 | 12 | 98 | 95 | 0 / 10 | A |
| 580 | | 06/12/23 | P-16 | | CH | 20.2 | 101.8 | 22.7 | 97.3 | 119.4 | 12 | 96 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 573 | Select Clay: Cell Floor, Zone 3 | 6.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 574 | Select Clay: Cell Floor, Zone 5 | 6.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 575 | Select Clay: Cell Floor, Zone 4 | 6.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 576 | Select Clay: Cell Floor, Zone 10 | 6.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 577 | Select Clay: Cell Floor, Zone 15 | 7.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 578 | Select Clay: Cell Floor, Zone 9 | 5.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 579 | Select Clay: Cell Floor, Zone 8 | 5.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 580 | Select Clay: Cell Floor, Zone 2 | 7.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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# Field Compaction Report

**Report Date:** 06/21/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 581 | | 06/12/23 | P-16 | | CH | 20.2 | 101.8 | 23.9 | 98.1 | 121.5 | 12 | 96 | 95 | 0 / 10 | A |
| 582 | | 06/12/23 | P-16 | | CH | 20.2 | 101.8 | 23.6 | 99.2 | 122.6 | 12 | 97 | 95 | 0 / 10 | A |
| 583 | | 06/12/23 | P-13 | | CH | 21.7 | 97.9 | 23.6 | 93.6 | 115.7 | 12 | 96 | 95 | 0 / 10 | A |
| 584 | | 06/12/23 | P-19 | | CH | 18.4 | 105.0 | 19.9 | 105.1 | 126.0 | 12 | 100 | 95 | 0 / 10 | A |
| 585 | | 06/12/23 | P-16 | | CH | 20.2 | 101.8 | 22.8 | 98.7 | 121.2 | 12 | 97 | 95 | 0 / 10 | A |
| 586 | | 06/12/23 | P-16 | | CH | 20.2 | 101.8 | 20.4 | 99.6 | 119.9 | 12 | 98 | 95 | 0 / 10 | A |
| 587 | | 06/12/23 | P-13 | | CH | 21.7 | 97.9 | 21.9 | 95.9 | 116.9 | 12 | 98 | 95 | 0 / 10 | A |
| 588 | | 06/12/23 | P-19 | | CH | 18.4 | 105.0 | 20.8 | 101.5 | 122.6 | 12 | 97 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 581 | Select Clay: Cell Floor, Zone 4 | 7.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 582 | Select Clay: Cell Floor, Zone 3 | 7.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 583 | Select Clay: Cell Floor, Zone 5 | 7.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 584 | Select Clay: Cell Floor, Zone 10 | 7.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 585 | Select Clay: Cell Floor, Zone 15 | 8.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 586 | Select Clay: Cell Floor, Zone 9 | 6.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 587 | Select Clay: Cell Floor, Zone 8 | 6.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 588 | Select Clay: Cell Floor, Zone 8 | 7.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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# Field Compaction Report

**Report Date:** 06/21/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 589 | | 06/12/23 | P-16 | | CH | 20.2 | 101.8 | 23.5 | 98.1 | 121.2 | 12 | 96 | 95 | 0 / 10 | A |
| 590 | | 06/12/23 | P-16 | | CH | 20.2 | 101.8 | 22.9 | 96.8 | 119.0 | 12 | 95 | 95 | 0 / 10 | A |
| 591 | | 06/12/23 | P-02 | | CH | 22.6 | 97.7 | 25.6 | 96.1 | 120.7 | 12 | 98 | 95 | 0 / 10 | A |
| 592 | | 06/12/23 | P-16 | | CH | 20.2 | 101.8 | 23.5 | 98.3 | 121.4 | 12 | 97 | 95 | 0 / 10 | A |
| 593 | | 06/12/23 | P-19 | | CH | 18.4 | 105.0 | 21.0 | 103.9 | 125.7 | 12 | 99 | 95 | 0 / 10 | A |
| 594 | | 06/12/23 | P-16 | | CH | 20.2 | 101.8 | 21.9 | 100.5 | 122.5 | 12 | 99 | 95 | 0 / 10 | A |
| 595 | | 06/12/23 | P-19 | | CH | 18.4 | 105.0 | 19.6 | 105.2 | 125.8 | 12 | 100 | 95 | 0 / 10 | A |
| 596 | | 06/12/23 | P-16 | | CH | 20.2 | 101.8 | 23.0 | 97.9 | 120.4 | 12 | 96 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 589 | Select Clay: Cell Floor, Zone 4 | 8.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 590 | Select Clay: Cell Floor, Zone 3 | 8.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 591 | Select Clay: Cell Floor, Zone 5 | 8.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 592 | Select Clay: Cell Floor, Zone 10 | 8.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 593 | Select Clay: Cell Wall, Zone 23 | 41.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 594 | Select Clay: Cell Wall, Zone 24 | 41.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 595 | Select Clay: Cell Wall, Zone 25 | 41.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 596 | Select Clay: Cell Wall, Zone 26 | 41.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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# Field Compaction Report

**Report Date:** 06/21/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 597 | | 06/12/23 | P-19 | | CH | 18.4 | 105.0 | 20.0 | 104.3 | 125.2 | 12 | 99 | 95 | 0 / 10 | A |
| 598 | | 06/12/23 | P-19 | | CH | 18.4 | 105.0 | 20.3 | 105.0 | 126.3 | 12 | 100 | 95 | 0 / 10 | A |
| 599 | | 06/12/23 | P-19 | | CH | 18.4 | 105.0 | 21.0 | 103.3 | 125.0 | 12 | 98 | 95 | 0 / 10 | A |
| 600 | | 06/12/23 | P-19 | | CH | 18.4 | 105.0 | 22.0 | 100.9 | 123.1 | 12 | 96 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 597 | Select Clay: Cell Wall, Zone 27 | 41.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 598 | Select Clay: Cell Wall, Zone 16 | 42.0 | Lift Number | InstroTek / 3500 / 1907 / | Schwarz, Jordan |
| 599 | Select Clay: Cell Wall, Zone 17 | 42.0 | Lift Number | InstroTek / 3500 / 1907 / | Schwarz, Jordan |
| 600 | Select Clay: Cell Wall, Zone 18 | 42.0 | Lift Number | InstroTek / 3500 / 1907 / | Schwarz, Jordan |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Kurt Kuechle
06/21/2023

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# Field Compaction Report

**Report Date:** 06/21/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 601 | | 06/13/23 | P-16 | | CH | 20.2 | 101.8 | 23.1 | 101.4 | 124.8 | 12 | 100 | 95 | 0 / 10 | A |
| 602 | | 06/13/23 | P-16 | | CH | 20.2 | 101.8 | 22.0 | 99.2 | 121.0 | 12 | 97 | 95 | 0 / 10 | A |
| 603 | | 06/13/23 | P-19 | | CH | 18.4 | 105.0 | 22.6 | 102.8 | 126.0 | 12 | 98 | 95 | 0 / 10 | A |
| 604 | | 06/13/23 | P-09 | | CH | 23.9 | 98.6 | 24.9 | 96.2 | 120.2 | 12 | 98 | 95 | 0 / 10 | A |
| 605 | | 06/13/23 | P-09 | | CH | 23.9 | 98.6 | 24.9 | 96.2 | 120.2 | 12 | 98 | 95 | 0 / 10 | A |
| 606 | | 06/13/23 | P-16 | | CH | 20.2 | 101.8 | 23.8 | 100.9 | 124.9 | 12 | 99 | 95 | 0 / 10 | A |
| 607 | | 06/13/23 | P-16 | | CH | 20.2 | 101.8 | 22.7 | 100.4 | 123.2 | 12 | 99 | 95 | 0 / 10 | A |
| 608 | | 06/13/23 | P-19 | | CH | 18.4 | 105.0 | 23.6 | 102.5 | 126.7 | 12 | 98 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 601 | Select Clay: Wall Zone 23 | 42.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 602 | Select Clay: Wall Zone 24 | 42.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 603 | Select Clay: Wall Zone 25 | 42.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 604 | Select Clay: Wall Zone 26 | 42.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 605 | Select Clay: Wall Zone 27 | 42.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 606 | Select Clay: Wall Zone 16 | 43.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 607 | Select Clay: Wall Zone 17 | 43.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 608 | Select Clay: Wall Zone 18 | 43.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

BRAUN INTERTEC
The Science You Build On.

2908 Morrison Ave.
Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

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| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 609 | | 06/13/23 | P-19 | | CH | 18.4 | 105.0 | 24.5 | 100.1 | 124.6 | 12 | 95 | 95 | 0 / 10 | A |
| 610 | | 06/13/23 | P-19 | | CH | 18.4 | 105.0 | 21.8 | 104.5 | 127.3 | 12 | 100 | 95 | 0 / 10 | A |
| 611 | | 06/13/23 | P-19 | | CH | 18.4 | 105.0 | 21.5 | 102.9 | 125.0 | 12 | 98 | 95 | 0 / 10 | A |
| 612 | | 06/13/23 | P-16 | | CH | 20.2 | 101.8 | 23.3 | 101.3 | 124.9 | 12 | 100 | 95 | 0 / 10 | A |
| 613 | | 06/13/23 | P-16 | | CH | 20.2 | 101.8 | 23.3 | 101.3 | 124.9 | 12 | 100 | 95 | 0 / 10 | A |
| 614 | | 06/13/23 | P-19 | | CH | 18.4 | 105.0 | 21.9 | 101.2 | 123.4 | 12 | 96 | 95 | 0 / 10 | A |
| 615 | | 06/13/23 | P-19 | | CH | 18.4 | 105.0 | 22.4 | 103.3 | 126.4 | 12 | 98 | 95 | 0 / 10 | A |
| 616 | | 06/13/23 | P-16 | | CH | 20.2 | 101.8 | 23.0 | 100.5 | 123.6 | 12 | 99 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 609 | Select Clay: Wall Zone 23 | 43.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 610 | Select Clay: Wall Zone 24 | 43.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 611 | Select Clay: Wall Zone 25 | 43.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 612 | Select Clay: Wall Zone 26 | 43.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 613 | Select Clay: Wall Zone 27 | 43.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 614 | Select Clay: Wall Zone 16 | 44.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 615 | Select Clay: Wall Zone 17 | 44.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 616 | Select Clay: Wall Zone 18 | 44.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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**Project:**
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Minnkota Cell 5
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Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 617 | | 06/13/23 | P-16 | | CH | 20.2 | 101.8 | 22.3 | 100.6 | 123.0 | 12 | 99 | 95 | 0 / 10 | A |
| 618 | | 06/13/23 | P-19 | | CH | 18.4 | 105.0 | 21.3 | 104.3 | 126.5 | 12 | 99 | 95 | 0 / 10 | A |
| 619 | | 06/13/23 | P-16 | | CH | 20.2 | 101.8 | 22.5 | 100.7 | 123.4 | 12 | 99 | 95 | 0 / 10 | A |
| 620 | | 06/13/23 | P-16 | | CH | 20.2 | 101.8 | 23.0 | 100.5 | 123.6 | 12 | 99 | 95 | 0 / 10 | A |
| 621 | | 06/13/23 | P-16 | | CH | 20.2 | 101.8 | 22.6 | 101.2 | 124.1 | 12 | 99 | 95 | 0 / 10 | A |
| 622 | | 06/13/23 | P-19 | | CH | 18.4 | 105.0 | 21.7 | 103.0 | 125.4 | 12 | 98 | 95 | 0 / 10 | A |
| 623 | | 06/13/23 | P-19 | | CH | 18.4 | 105.0 | 21.2 | 102.8 | 124.6 | 12 | 98 | 95 | 0 / 10 | A |
| 624 | | 06/13/23 | P-16 | | CH | 20.2 | 101.8 | 22.1 | 101.4 | 123.8 | 12 | 100 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 617 | Select Clay: Wall Zone 23 | 44.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 618 | Select Clay: Wall Zone 24 | 44.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 619 | Select Clay: Wall Zone 25 | 44.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 620 | Select Clay: Wall Zone ~~25~~ 26 | 44.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 621 | Select Clay: Wall Zone 27 | 44.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 622 | Select Clay: Wall Zone 16 | 45.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 623 | Select Clay: Wall Zone 17 | 45.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 624 | Select Clay: Wall Zone 18 | 45.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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**Project:**
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| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 625 | | 06/13/23 | P-19 | | CH | 18.4 | 105.0 | 21.1 | 103.4 | 125.2 | 12 | 98 | 95 | 0 / 10 | A |
| 626 | | 06/13/23 | P-19 | | CH | 18.4 | 105.0 | 21.4 | 103.5 | 125.7 | 12 | 99 | 95 | 0 / 10 | A |
| 627 | | 06/13/23 | P-16 | | CH | 20.2 | 101.8 | 22.3 | 100.4 | 122.8 | 12 | 99 | 95 | 0 / 10 | A |
| 628 | | 06/13/23 | P-16 | | CH | 20.2 | 101.8 | 24.1 | 99.4 | 123.4 | 12 | 98 | 95 | 0 / 10 | A |
| 629 | | 06/13/23 | P-16 | | CH | 20.2 | 101.8 | 23.6 | 100.8 | 124.6 | 10 | 99 | 95 | 0 / 10 | A |
| 630 | | 06/13/23 | P-19 | | CH | 18.4 | 105.0 | 20.2 | 104.2 | 125.2 | 12 | 99 | 95 | 0 / 10 | A |
| 631 | | 06/13/23 | P-19 | | CH | 18.4 | 105.0 | 20.3 | 105.7 | 127.2 | 12 | 101 | 95 | 0 / 10 | A |
| 632 | | 06/13/23 | P-19 | | CH | 18.4 | 105.0 | 20.2 | 103.7 | 124.6 | 12 | 99 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 625 | Select Clay: Wall Zone 23 | 45.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 626 | Select Clay: Wall Zone 24 | 45.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 627 | Select Clay: Wall Zone 25 | 45.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 628 | Select Clay: Wall Zone 26 | 45.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 629 | Select Clay: Wall Zone 27 | 45.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 630 | Select Clay: Wall Zone 16 | 46.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 631 | Select Clay: Wall Zone 17 | 46.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 632 | Select Clay: Wall Zone 18 | 46.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 633 | | 06/13/23 | P-16 | | CH | 20.2 | 101.8 | 21.8 | 100.2 | 122.0 | 12 | 98 | 95 | 0 / 10 | A |
| 634 | | 06/13/23 | P-16 | | CH | 20.2 | 101.8 | 22.0 | 100.9 | 123.1 | 12 | 99 | 95 | 0 / 10 | A |
| 635 | | 06/13/23 | P-16 | | CH | 20.2 | 101.8 | 23.5 | 100.5 | 124.1 | 12 | 99 | 95 | 0 / 10 | A |
| 636 | | 06/13/23 | P-19 | | CH | 18.4 | 105.0 | 21.5 | 102.5 | 124.5 | 10 | 98 | 95 | 0 / 10 | A |
| 637 | | 06/13/23 | P-19 | | CH | 18.4 | 105.0 | 23.0 | 102.1 | 125.6 | 12 | 97 | 95 | 0 / 10 | A |
| 638 | | 06/13/23 | P-19 | | CH | 18.4 | 105.0 | 22.0 | 102.3 | 124.8 | 12 | 97 | 95 | 0 / 10 | A |
| 639 | | 06/13/23 | P-19 | | CH | 18.4 | 105.0 | 25.4 | 100.7 | 126.3 | 12 | 96 | 95 | 0 / 10 | A |
| 640 | | 06/13/23 | P-19 | | CH | 18.4 | 105.0 | 21.4 | 103.5 | 125.6 | 12 | 99 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 633 | Select Clay: Wall Zone 23 | 46.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 634 | Select Clay: Wall Zone 24 | 46.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 635 | Select Clay: Wall Zone 25 | 46.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 636 | Select Clay: Wall Zone 26 | 46.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 637 | Select Clay: Wall Zone 27 | 46.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 638 | Select Clay: Wall Zone 16 | 47.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 639 | Select Clay: Wall Zone 17 | 47.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 640 | Select Clay: Wall Zone 18 | 47.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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**Project:**
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## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 641 | | 06/13/23 | P-19 | | CH | 18.4 | 105.0 | 23.0 | 102.7 | 126.3 | 10 | 98 | 95 | 0 / 10 | A |
| 642 | | 06/13/23 | P-19 | | CH | 18.4 | 105.0 | 24.0 | 101.2 | 125.5 | 12 | 96 | 95 | 0 / 10 | A |
| 643 | | 06/13/23 | P-19 | | CH | 18.4 | 105.0 | 22.1 | 102.5 | 125.2 | 12 | 98 | 95 | 0 / 10 | A |
| 644 | | 06/13/23 | P-19 | | CH | 18.4 | 105.0 | 22.1 | 102.9 | 125.6 | 12 | 98 | 95 | 0 / 10 | A |
| 645 | | 06/13/23 | P-19 | | CH | 18.4 | 105.0 | 23.0 | 102.4 | 126.0 | 12 | 98 | 95 | 0 / 10 | A |
| 646 | | 06/13/23 | P-19 | | CH | 18.4 | 105.0 | 23.1 | 101.2 | 124.6 | 12 | 96 | 95 | 0 / 10 | A |
| 647 | | 06/13/23 | P-19 | | CH | 18.4 | 105.0 | 23.3 | 103.1 | 127.1 | 12 | 98 | 95 | 0 / 10 | A |
| 648 | | 06/13/23 | P-16 | | CH | 20.2 | 101.8 | 21.8 | 101.3 | 123.4 | 12 | 100 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 641 | Select Clay: Wall Zone 23 | 47.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 642 | Select Clay: Wall Zone 24 | 47.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 643 | Select Clay: Wall Zone 25 | 47.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 644 | Select Clay: Wall Zone 26 | 47.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 645 | Select Clay: Wall Zone 27 | 47.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 646 | Select Clay: Wall Zone 16 | 48.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 647 | Select Clay: Wall Zone 17 | 48.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 648 | Select Clay: Wall Zone 18 | 48.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 649 | | 06/13/23 | P-16 | | CH | 20.2 | 101.8 | 22.7 | 100.2 | 122.9 | 12 | 98 | 95 | 0 / 10 | A |
| 650 | | 06/13/23 | P-16 | | CH | 20.2 | 101.8 | 22.5 | 100.2 | 122.7 | 10 | 98 | 95 | 0 / 10 | A |
| 651 | | 06/13/23 | P-16 | | CH | 20.2 | 101.8 | 23.0 | 101.7 | 125.1 | 12 | 100 | 95 | 0 / 10 | A |
| 652 | | 06/13/23 | P-16 | | CH | 20.2 | 101.8 | 23.0 | 101.7 | 125.1 | 12 | 100 | 95 | 0 / 10 | A |
| 653 | | 06/13/23 | P-19 | | CH | 18.4 | 105.0 | 21.9 | 104.3 | 127.1 | 12 | 99 | 95 | 0 / 10 | A |
| 654 | | 06/13/23 | P-16 | | CH | 20.2 | 101.8 | 24.0 | 100.8 | 125.0 | 12 | 99 | 95 | 0 / 10 | A |
| 655 | | 06/13/23 | P-16 | | CH | 20.2 | 101.8 | 20.2 | 100.8 | 121.2 | 12 | 99 | 95 | 0 / 10 | A |
| 656 | | 06/13/23 | P-19 | | CH | 18.4 | 105.0 | 23.4 | 102.6 | 126.6 | 12 | 98 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 649 | Select Clay: Wall Zone 23 | 48.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 650 | Select Clay: Wall Zone 24 | 48.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 651 | Select Clay: Wall Zone 25 | 48.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 652 | Select Clay: Wall Zone 26 | 48.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 653 | Select Clay: Wall Zone 27 | 48.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 654 | Select Clay: Wall Zone 16 | 49.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 655 | Select Clay: Wall Zone 17 | 49.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 656 | Select Clay: Wall Zone 18 | 49.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
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Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 657 | | 06/14/23 | P-16 | | CH | 20.2 | 101.8 | 22.8 | 100.8 | 123.8 | 12 | 99 | 95 | 0 / 10 | A |
| 658 | | 06/14/23 | P-19 | | CH | 18.4 | 105.0 | 21.3 | 104.9 | 127.2 | 12 | 100 | 95 | 0 / 10 | A |
| 659 | | 06/14/23 | P-19 | | CH | 18.4 | 105.0 | 22.4 | 103.8 | 127.1 | 12 | 99 | 95 | 0 / 10 | A |
| 660 | | 06/14/23 | P-19 | | CH | 18.4 | 105.0 | 22.0 | 103.8 | 126.6 | 12 | 99 | 95 | 0 / 10 | A |
| 661 | | 06/14/23 | P-16 | | CH | 20.2 | 101.8 | 22.0 | 100.1 | 122.1 | 12 | 98 | 95 | 0 / 10 | A |
| 662 | | 06/14/23 | P-16 | | CH | 20.2 | 101.8 | 22.8 | 100.8 | 123.8 | 12 | 99 | 95 | 0 / 10 | A |
| 663 | | 06/14/23 | P-16 | | CH | 20.2 | 101.8 | 23.4 | 101.3 | 125.0 | 12 | 100 | 95 | 0 / 10 | A |
| 664 | | 06/14/23 | P-16 | | CH | 20.2 | 101.8 | 23.9 | 99.3 | 123.0 | 12 | 98 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 657 | Select Clay: Wall Zone 23 | 49.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 658 | Select Clay: Wall Zone 24 | 49.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 659 | Select Clay: Wall Zone 25 | 49.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 660 | Select Clay: Wall Zone 26 | 49.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 661 | Select Clay: Wall Zone 27 | 49.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 662 | Select Clay: Wall Zone ~~23~~ 27 | 50.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 663 | Select Clay: Wall Zone 16 | 50.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 664 | Select Clay: Wall Zone 17 | 50.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

BRAUN INTERTEC
The Science You Build On.

2908 Morrison Ave.
Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 06/21/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 665 | | 06/14/23 | P-19 | | CH | 18.4 | 105.0 | 22.4 | 100.9 | 123.5 | 12 | 96 | 95 | 0 / 10 | A |
| 666 | | 06/14/23 | P-16 | | CH | 20.2 | 101.8 | 24.7 | 101.7 | 126.8 | 10 | 100 | 95 | 0 / 10 | A |
| 667 | | 06/14/23 | P-16 | | CH | 20.2 | 101.8 | 22.4 | 100.9 | 123.5 | 12 | 99 | 95 | 0 / 10 | A |
| 668 | | 06/14/23 | P-19 | | CH | 18.4 | 105.0 | 21.8 | 104.6 | 127.4 | 12 | 100 | 95 | 0 / 10 | A |
| 669 | | 06/14/23 | P-19 | | CH | 18.4 | 105.0 | 21.8 | 104.6 | 127.4 | 12 | 100 | 95 | 0 / 10 | A |
| 670 | | 06/14/23 | P-16 | | CH | 20.2 | 101.8 | 22.1 | 99.7 | 121.7 | 12 | 98 | 95 | 0 / 10 | A |
| 671 | | 06/14/23 | P-19 | | CH | 18.4 | 105.0 | 19.9 | 105.2 | 126.1 | 12 | 100 | 95 | 0 / 10 | A |
| 672 | | 06/14/23 | P-19 | | CH | 18.4 | 105.0 | 21.4 | 102.3 | 124.2 | 12 | 97 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 665 | Select Clay: Wall Zone 18 | 50.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 666 | Select Clay: Wall Zone 23 | 50.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 667 | Select Clay: Wall Zone 24 | 50.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 668 | Select Clay: Wall Zone 25 | 50.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 669 | Select Clay: Wall Zone 26 | 50.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 670 | Select Clay: Wall Zone 27 | 51.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 671 | Select Clay: Wall Zone 16 | 51.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 672 | Select Clay: Wall Zone 17 | 51.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 06/21/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 673 | | 06/14/23 | P-16 | | CH | 20.2 | 101.8 | 21.7 | 99.5 | 121.1 | 12 | 98 | 95 | 0 / 10 | A |
| 674 | | 06/14/23 | P-16 | | CH | 20.2 | 101.8 | 24.6 | 99.2 | 123.6 | 12 | 97 | 95 | 0 / 10 | A |
| 675 | | 06/14/23 | P-16 | | CH | 20.2 | 101.8 | 24.2 | 99.0 | 123.0 | 12 | 97 | 95 | 0 / 10 | A |
| 676 | | 06/14/23 | P-16 | | CH | 20.2 | 101.8 | 24.2 | 99.0 | 123.0 | 12 | 97 | 95 | 0 / 10 | A |
| 677 | | 06/14/23 | P-19 | | CH | 18.4 | 105.0 | 20.3 | 104.9 | 126.2 | 12 | 100 | 95 | 0 / 10 | A |
| 678 | | 06/14/23 | P-16 | | CH | 20.2 | 101.8 | 24.9 | 98.3 | 122.8 | 12 | 97 | 95 | 0 / 10 | A |
| 679 | | 06/14/23 | P-19 | | CH | 18.4 | 105.0 | 18.8 | 103.6 | 123.1 | 12 | 99 | 95 | 0 / 10 | A |
| 680 | | 06/14/23 | P-16 | | CH | 20.2 | 101.8 | 24.6 | 99.0 | 123.4 | 12 | 97 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 673 | Select Clay: Wall Zone 18 | 51.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 674 | Select Clay: Wall Zone 23 | 51.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 675 | Select Clay: Wall Zone 24 | 51.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 676 | Select Clay: Wall Zone 25 | 51.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 677 | Select Clay: Wall Zone 26 | 51.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 678 | Select Clay: Wall Zone 27 | 52.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 679 | Select Clay: Wall Zone 16 | 52.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 680 | Select Clay: Wall Zone 17 | 52.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 06/21/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 681 | | 06/14/23 | P-16 | | CH | 20.2 | 101.8 | 21.8 | 97.8 | 119.1 | 12 | 96 | 95 | 0 / 10 | A |
| 682 | | 06/14/23 | P-16 | | CH | 20.2 | 101.8 | 22.9 | 100.4 | 123.4 | 12 | 99 | 95 | 0 / 10 | A |
| 683 | | 06/14/23 | P-19 | | CH | 18.4 | 105.0 | 21.0 | 102.7 | 124.3 | 10 | 98 | 95 | 0 / 10 | A |
| 684 | | 06/14/23 | P-16 | | CH | 20.2 | 101.8 | 23.0 | 101.1 | 124.4 | 12 | 99 | 95 | 0 / 10 | A |
| 685 | | 06/14/23 | P-16 | | CH | 20.2 | 101.8 | 24.4 | 97.6 | 121.4 | 12 | 96 | 95 | 0 / 10 | A |
| 686 | | 06/14/23 | P-16 | | CH | 20.2 | 101.8 | 22.9 | 99.5 | 122.3 | 12 | 98 | 95 | 0 / 10 | A |
| 687 | | 06/14/23 | P-16 | | CH | 20.2 | 101.8 | 22.6 | 101.1 | 123.9 | 12 | 99 | 95 | 0 / 10 | A |
| 688 | | 06/14/23 | P-16 | | CH | 20.2 | 101.8 | 23.5 | 99.2 | 122.5 | 12 | 97 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 681 | Select Clay: Wall Zone 18 | 52.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 682 | Select Clay: Wall Zone 23 | 52.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 683 | Select Clay: Wall Zone 24 | 52.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 684 | Select Clay: Wall Zone 25 | 52.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 685 | Select Clay: Wall Zone 26 | 52.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 686 | Select Clay: Wall Zone 27 | 53.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 687 | Select Clay: Wall Zone 16 | 53.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 688 | Select Clay: Wall Zone 17 | 53.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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# Field Compaction Report

**Report Date:** 06/21/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 689 | | 06/14/23 | P-19 | | CH | 18.4 | 105.0 | 19.0 | 102.9 | 122.4 | 12 | 98 | 95 | 0 / 10 | A |
| 690 | | 06/14/23 | P-16 | | CH | 20.2 | 101.8 | 22.6 | 101.1 | 123.9 | 12 | 99 | 95 | 0 / 10 | A |
| 691 | | 06/14/23 | P-16 | | CH | 20.2 | 101.8 | 22.7 | 101.5 | 124.5 | 6 | 100 | 95 | 0 / 10 | A |
| 692 | | 06/14/23 | P-19 | | CH | 18.4 | 105.0 | 18.8 | 106.0 | 125.9 | 6 | 101 | 95 | 0 / 10 | A |
| 693 | | 06/14/23 | P-19 | | CH | 18.4 | 105.0 | 19.7 | 103.1 | 123.4 | 6 | 98 | 95 | 0 / 10 | A |
| 694 | | 06/14/23 | P-19 | | CH | 18.4 | 105.0 | 20.7 | 104.2 | 125.8 | 12 | 99 | 95 | 0 / 10 | A |
| 695 | | 06/14/23 | P-16 | | CH | 20.2 | 101.8 | 22.4 | 101.8 | 124.6 | 12 | 100 | 95 | 0 / 10 | A |
| 696 | | 06/14/23 | P-16 | | CH | 20.2 | 101.8 | 22.6 | 98.2 | 120.4 | 12 | 96 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 689 | Select Clay: Wall Zone 18 | 53.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 690 | Select Clay: Floor Zone 9 | 7.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 691 | Select Clay: Floor Zone 9 | 8.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 692 | Select Clay: Floor Zone 8 | 8.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 693 | Select Clay: Floor Zone 2 | 8.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 694 | Select Clay: Wall Zone 23 | 53.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 695 | Select Clay: Wall Zone 24 | 53.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 696 | Select Clay: Wall Zone 25 | 53.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Suite 3
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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 06/21/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 697 | | 06/14/23 | P-16 | | CH | 20.2 | 101.8 | 24.0 | 100.3 | 124.4 | 12 | 99 | 95 | 0 / 10 | A |
| 698 | | 06/14/23 | P-19 | | CH | 18.4 | 105.0 | 22.2 | 102.2 | 124.9 | 12 | 97 | 95 | 0 / 10 | A |
| 699 | | 06/14/23 | P-16 | | CH | 20.2 | 101.8 | 21.4 | 101.3 | 123.0 | 12 | 100 | 95 | 0 / 10 | A |
| 700 | | 06/14/23 | P-19 | | CH | 18.4 | 105.0 | 19.6 | 104.8 | 125.3 | 12 | 100 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 697 | Select Clay: Wall Zone 26 | 53.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 698 | Select Clay: Wall Zone 27 | 53.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 699 | Select Clay: Wall Zone 16 | 54.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 700 | Select Clay: Wall Zone 17 | 54.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Kurt Kuechle
06/21/2023

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# Field Compaction Report

**Report Date:** 06/21/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 701 | | 06/14/23 | P-19 | | CH | 18.4 | 105.0 | 22.0 | 102.5 | 125.1 | 12 | 98 | 95 | 0 / 10 | A |
| 702 | | 06/14/23 | P-19 | | CH | 18.4 | 105.0 | 19.6 | 104.8 | 125.3 | 12 | 100 | 95 | 0 / 10 | A |
| 703 | | 06/14/23 | P-19 | | CH | 18.4 | 105.0 | 21.8 | 104.0 | 126.7 | 12 | 99 | 95 | 0 / 10 | A |
| 704 | | 06/14/23 | P-19 | | CH | 18.4 | 105.0 | 21.0 | 104.2 | 126.1 | 12 | 99 | 95 | 0 / 10 | A |
| 705 | | 06/14/23 | P-19 | | CH | 18.4 | 105.0 | 21.0 | 104.1 | 126.0 | 12 | 99 | 95 | 0 / 10 | A |
| 706 | | 06/14/23 | P-19 | | CH | 18.4 | 105.0 | 21.0 | 104.2 | 126.1 | 12 | 99 | 95 | 0 / 10 | A |
| 707 | | 06/14/23 | P-19 | | CH | 18.4 | 105.0 | 20.8 | 103.7 | 125.3 | 12 | 99 | 95 | 0 / 10 | A |
| 708 | | 06/14/23 | P-16 | | CH | 20.2 | 101.8 | 25.3 | 99.0 | 124.0 | 12 | 97 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 701 | Select Clay: Wall Zone 18 | 54.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 702 | Select Clay: Wall Zone 23 | 54.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 703 | Select Clay: Wall Zone 24 | 54.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 704 | Select Clay: Wall Zone 25 | 54.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 705 | Select Clay: Wall Zone 26 | 54.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 706 | Select Clay: Wall Zone 27 | 54.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 707 | Select Clay: Wall Zone 16 | 55.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 708 | Select Clay: Wall Zone 17 | 55.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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# Field Compaction Report

**Report Date:** 06/21/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 709 | | 06/14/23 | P-16 | | CH | 20.2 | 101.8 | 22.5 | 100.6 | 123.2 | 12 | 99 | 95 | 0 / 10 | A |
| 710 | | 06/14/23 | P-19 | | CH | 18.4 | 105.0 | 21.2 | 103.9 | 125.9 | 12 | 99 | 95 | 0 / 10 | A |
| 711 | | 06/14/23 | P-19 | | CH | 18.4 | 105.0 | 19.1 | 109.9 | 130.9 | 12 | 105 | 95 | 0 / 10 | A |
| 712 | | 06/14/23 | P-16 | | CH | 20.2 | 101.8 | 24.5 | 98.5 | 122.6 | 12 | 97 | 95 | 0 / 10 | A |
| 713 | | 06/14/23 | P-19 | | CH | 18.4 | 105.0 | 20.1 | 101.2 | 121.5 | 12 | 96 | 95 | 0 / 10 | A |
| 714 | | 06/14/23 | P-19 | | CH | 18.4 | 105.0 | 19.4 | 104.1 | 124.3 | 12 | 99 | 95 | 0 / 10 | A |
| 715 | | 06/14/23 | P-19 | | CH | 18.4 | 105.0 | 21.0 | 104.1 | 126.0 | 12 | 99 | 95 | 0 / 10 | A |
| 716 | | 06/14/23 | P-16 | | CH | 20.2 | 101.8 | 20.8 | 99.7 | 120.4 | 12 | 98 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 709 | Select Clay: Wall Zone 18 | 55.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 710 | Select Clay: Wall Zone 23 | 56.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 711 | Select Clay: Wall Zone 23 | 55.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 712 | Select Clay: Wall Zone 24 | 56.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 713 | Select Clay: Wall Zone 24 | 55.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 714 | Select Clay: Wall Zone 25 | 56.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 715 | Select Clay: Wall Zone 25 | 55.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 716 | Select Clay: Wall Zone 26 | 56.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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The Science You Build On.

2908 Morrison Ave.
Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 06/21/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 717 | | 06/14/23 | P-19 | | CH | 18.4 | 105.0 | 19.1 | 107.6 | 128.2 | 12 | 102 | 95 | 0 / 10 | A |
| 718 | | 06/14/23 | P-19 | | CH | 18.4 | 105.0 | 21.3 | 105.2 | 127.6 | 12 | 100 | 95 | 0 / 10 | A |
| 719 | | 06/14/23 | P-19 | | CH | 18.4 | 105.0 | 21.1 | 105.6 | 127.9 | 12 | 101 | 95 | 0 / 10 | A |
| 720 | | 06/14/23 | P-19 | | CH | 18.4 | 105.0 | 18.4 | 103.2 | 122.2 | 12 | 98 | 95 | 0 / 10 | A |
| 721 | | 06/14/23 | P-19 | | CH | 18.4 | 105.0 | 22.6 | 103.2 | 126.5 | 12 | 98 | 95 | 0 / 10 | A |
| 722 | | 06/14/23 | P-19 | | CH | 18.4 | 105.0 | 20.6 | 103.4 | 124.7 | 12 | 98 | 95 | 0 / 10 | A |
| 723 | | 06/14/23 | P-19 | | CH | 18.4 | 105.0 | 22.5 | 102.7 | 125.8 | 12 | 98 | 95 | 0 / 10 | A |
| 724 | | 06/14/23 | P-19 | | CH | 18.4 | 105.0 | 19.3 | 102.3 | 122.0 | 12 | 97 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 717 | Select Clay: Wall Zone 26 | 55.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 718 | Select Clay: Wall Zone 27 | 56.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 719 | Select Clay: Wall Zone 27 | 55.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 720 | Select Clay: Wall Zone 16 | 57.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 721 | Select Clay: Wall Zone 16 | 56.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 722 | Select Clay: Wall Zone 17 | 57.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 723 | Select Clay: Wall Zone 17 | 56.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 724 | Select Clay: Wall Zone 18 | 57.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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2908 Morrison Ave.
Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 06/21/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 725 | | 06/14/23 | P-19 | | CH | 18.4 | 105.0 | 22.6 | 102.1 | 125.2 | 12 | 97 | 95 | 0 / 10 | A |
| 726 | | 06/15/23 | P-16 | | CH | 20.2 | 101.8 | 22.7 | 98.3 | 120.6 | 12 | 97 | 95 | 0 / 10 | A |
| 727 | | 06/15/23 | P-16 | | CH | 20.2 | 101.8 | 25.1 | 100.0 | 125.1 | 6 | 98 | 95 | 0 / 10 | A |
| 728 | | 06/15/23 | P-16 | | CH | 20.2 | 101.8 | 22.6 | 97.9 | 120.0 | 6 | 96 | 95 | 0 / 10 | A |
| 729 | | 06/15/23 | P-19 | | CH | 18.4 | 105.0 | 23.6 | 100.9 | 124.7 | 6 | 96 | 95 | 0 / 10 | A |
| 730 | | 06/15/23 | P-19 | | CH | 18.4 | 105.0 | 19.3 | 106.2 | 126.7 | 6 | 101 | 95 | 0 / 10 | A |
| 731 | | 06/15/23 | P-16 | | CH | 20.2 | 101.8 | 21.8 | 102.7 | 125.1 | 6 | 101 | 95 | 0 / 10 | A |
| 732 | | 06/15/23 | P-16 | | CH | 20.2 | 101.8 | 23.0 | 99.1 | 121.9 | 6 | 97 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 725 | Select Clay: Wall Zone 18 | 57.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 726 | Select Clay: Wall Zone 23 | 57.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 727 | Select Clay: Wall Zone 24 | 57.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 728 | Select Clay: Wall Zone 25 | 57.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 729 | Select Clay: Wall Zone 26 | 57.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 730 | Select Clay: Wall Zone 27 | 57.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 731 | Select Clay: Wall Zone 16 | 58.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 732 | Select Clay: Wall Zone 17 | 58.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 06/21/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 733 | | 06/15/23 | P-16 | | CH | 20.2 | 101.8 | 20.2 | 101.9 | 122.5 | 6 | 100 | 95 | 0 / 10 | A |
| 734 | | 06/15/23 | P-16 | | CH | 20.2 | 101.8 | 22.4 | 101.5 | 124.2 | 6 | 100 | 95 | 0 / 10 | A |
| 735 | | 06/15/23 | P-19 | | CH | 18.4 | 105.0 | 21.7 | 101.5 | 123.5 | 6 | 97 | 95 | 0 / 10 | A |
| 736 | | 06/15/23 | P-16 | | CH | 20.2 | 101.8 | 20.4 | 102.9 | 123.9 | 6 | 101 | 95 | 0 / 10 | A |
| 737 | | 06/15/23 | P-03 | | CH | 20.2 | 99.3 | 24.2 | 100.9 | 125.3 | 6 | 102 | 95 | 0 / 10 | A |
| 738 | | 06/15/23 | P-03 | | CH | 20.2 | 99.3 | 23.2 | 96.7 | 119.1 | 6 | 97 | 95 | 0 / 10 | A |
| 739 | | 06/15/23 | P-03 | | CH | 20.2 | 99.3 | 24.9 | 94.8 | 118.4 | 6 | 95 | 95 | 0 / 10 | A |
| 740 | | 06/15/23 | P-19 | | CH | 18.4 | 105.0 | 23.7 | 100.4 | 124.2 | 6 | 96 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 733 | Select Clay: Wall Zone 18 | 58.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 734 | Select Clay: Wall Zone 23 | 58.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 735 | Select Clay: Wall Zone 24 | 58.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 736 | Select Clay: Wall Zone 25 | 58.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 737 | Select Clay: Wall Zone 26 | 58.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 738 | Select Clay: Wall Zone 27 | 58.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 739 | Select Clay: Wall Zone 16 | 59.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 740 | Select Clay: Wall Zone 17 | 59.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 06/21/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 741 | | 06/15/23 | P-03 | | CH | 20.2 | 99.3 | 22.6 | 102.3 | 125.4 | 6 | 103 | 95 | 0 / 10 | A |
| 742 | | 06/15/23 | P-03 | | CH | 20.2 | 99.3 | 24.2 | 98.1 | 121.8 | 6 | 99 | 95 | 0 / 10 | A |
| 743 | | 06/15/23 | P-16 | | CH | 20.2 | 101.8 | 22.0 | 96.4 | 117.6 | 6 | 95 | 95 | 0 / 10 | A |
| 744 | | 06/15/23 | P-03 | | CH | 20.2 | 99.3 | 21.9 | 100.1 | 122.0 | 6 | 101 | 95 | 0 / 10 | A |
| 745 | | 06/15/23 | P-03 | | CH | 20.2 | 99.3 | 26.2 | 94.7 | 119.5 | 6 | 95 | 95 | 0 / 10 | A |
| 746 | | 06/15/23 | P-03 | | CH | 20.2 | 99.3 | 22.3 | 102.0 | 124.7 | 6 | 103 | 95 | 0 / 10 | A |
| 747 | | 06/15/23 | P-03 | | CH | 20.2 | 99.3 | 21.1 | 97.4 | 118.0 | 6 | 98 | 95 | 0 / 10 | A |
| 748 | | 06/15/23 | P-16 | | CH | 20.2 | 101.8 | 20.5 | 103.5 | 124.7 | 6 | 102 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 741 | Select Clay: Wall Zone 18 | 59.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 742 | Select Clay: Wall Zone 23 | 59.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 743 | Select Clay: Wall Zone 24 | 59.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 744 | Select Clay: Wall Zone 25 | 59.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 745 | Select Clay: Wall Zone 26 | 59.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 746 | Select Clay: Wall Zone 27 | 59.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 747 | Select Clay: Wall Zone 16 | 60.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 748 | Select Clay: Wall Zone 17 | 60.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 06/21/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 749 | | 06/15/23 | P-02 | | CH | 22.6 | 97.7 | 24.3 | 99.0 | 123.1 | 6 | 101 | 95 | 0 / 10 | A |
| 750 | | 06/15/23 | P-03 | | CH | 20.2 | 99.3 | 23.6 | 95.9 | 118.5 | 6 | 97 | 95 | 0 / 10 | A |
| 751 | | 06/15/23 | P-16 | | CH | 20.2 | 101.8 | 25.4 | 99.1 | 124.3 | 6 | 97 | 95 | 0 / 10 | A |
| 752 | | 06/15/23 | P-03 | | CH | 20.2 | 99.3 | 24.6 | 99.3 | 123.7 | 6 | 100 | 95 | 0 / 10 | A |
| 753 | | 06/15/23 | P-03 | | CH | 20.2 | 99.3 | 22.3 | 96.0 | 117.4 | 6 | 97 | 95 | 0 / 10 | A |
| 754 | | 06/15/23 | P-03 | | CH | 20.2 | 99.3 | 21.9 | 102.0 | 124.3 | 6 | 103 | 95 | 0 / 10 | A |
| 755 | | 06/15/23 | P-16 | | CH | 20.2 | 101.8 | 23.2 | 97.3 | 119.9 | 6 | 96 | 95 | 0 / 10 | A |
| 756 | | 06/15/23 | P-16 | | CH | 20.2 | 101.8 | 24.6 | 99.0 | 123.4 | 6 | 97 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 749 | Select Clay: Wall Zone 18 | 60.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 750 | Select Clay: Wall Zone 23 | 60.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 751 | Select Clay: Wall Zone 24 | 60.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 752 | Select Clay: Wall Zone 25 | 60.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 753 | Select Clay: Wall Zone 26 | 60.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 754 | Select Clay: Wall Zone 27 | 60.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 755 | Select Clay: Wall Zone 16 | 61.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 756 | Select Clay: Wall Zone 17 | 61.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Suite 3
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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 06/21/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 757 | | 06/15/23 | P-03 | | CH | 20.2 | 99.3 | 22.7 | 99.7 | 122.3 | 6 | 100 | 95 | 0 / 10 | A |
| 758 | | 06/15/23 | P-03 | | CH | 20.2 | 99.3 | 25.8 | 96.2 | 121.0 | 6 | 97 | 95 | 0 / 10 | A |
| 759 | | 06/15/23 | P-03 | | CH | 20.2 | 99.3 | 26.2 | 98.4 | 124.2 | 6 | 99 | 95 | 0 / 10 | A |
| 760 | | 06/15/23 | P-16 | | CH | 20.2 | 101.8 | 22.6 | 102.1 | 125.2 | 6 | 100 | 95 | 0 / 10 | A |
| 761 | | 06/15/23 | P-13 | | CH | 21.7 | 97.9 | 22.9 | 98.9 | 121.5 | 6 | 101 | 95 | 0 / 10 | A |
| 762 | | 06/15/23 | P-15 | | CH | 24.1 | 98.6 | 26.9 | 96.2 | 122.1 | 6 | 98 | 95 | 0 / 10 | A |
| 763 | | 06/15/23 | P-03 | | CH | 20.2 | 99.3 | 24.2 | 95.0 | 118.0 | 6 | 96 | 95 | 0 / 10 | A |
| 764 | | 06/15/23 | P-16 | | CH | 20.2 | 101.8 | 24.5 | 100.0 | 124.5 | 6 | 98 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 757 | Select Clay: Wall Zone 18 | 61.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 758 | Select Clay: Wall Zone 23 | 61.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 759 | Select Clay: Wall Zone 24 | 61.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 760 | Select Clay: Wall Zone 25 | 61.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 761 | Select Clay: Wall Zone 26 | 61.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 762 | Select Clay: Wall Zone 27 | 61.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 763 | Select Clay: Wall Zone 16 | 62.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 764 | Select Clay: Wall Zone 17 | 62.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 06/21/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 765 | | 06/15/23 | P-16 | | CH | 20.2 | 101.8 | 24.3 | 100.5 | 124.9 | 6 | 99 | 95 | 0 / 10 | A |
| 766 | | 06/15/23 | P-19 | | CH | 18.4 | 105.0 | 23.8 | 99.7 | 123.4 | 6 | 95 | 95 | 0 / 10 | A |
| 767 | | 06/15/23 | P-16 | | CH | 20.2 | 101.8 | 21.9 | 103.3 | 125.9 | 6 | 101 | 95 | 0 / 10 | A |
| 768 | | 06/15/23 | P-16 | | CH | 20.2 | 101.8 | 21.3 | 100.1 | 121.4 | 6 | 98 | 95 | 0 / 10 | A |
| 769 | | 06/15/23 | P-19 | | CH | 18.4 | 105.0 | 20.3 | 101.5 | 122.1 | 6 | 97 | 95 | 0 / 10 | A |
| 770 | | 06/15/23 | P-19 | | CH | 18.4 | 105.0 | 21.0 | 102.7 | 124.3 | 6 | 98 | 95 | 0 / 10 | A |
| 771 | | 06/15/23 | P-16 | | CH | 20.2 | 101.8 | 21.9 | 102.4 | 124.8 | 6 | 101 | 95 | 0 / 10 | A |
| 772 | | 06/15/23 | P-03 | | CH | 20.2 | 99.3 | 21.6 | 98.7 | 120.0 | 6 | 99 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 765 | Select Clay: Wall Zone 18 | 62.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 766 | Select Clay: Wall Zone 23 | 62.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 767 | Select Clay: Wall Zone 24 | 62.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 768 | Select Clay: Wall Zone 25 | 62.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 769 | Select Clay: Wall Zone 26 | 62.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 770 | Select Clay: Wall Zone 27 | 62.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 771 | Select Clay: Wall Zone 16 | 63.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 772 | Select Clay: Wall Zone 17 | 63.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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The Science You Build On.

2908 Morrison Ave.
Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 06/21/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 773 | | 06/15/23 | P-03 | | CH | 20.2 | 99.3 | 25.4 | 96.4 | 120.9 | 6 | 97 | 95 | 0 / 10 | A |
| 774 | | 06/15/23 | P-16 | | CH | 20.2 | 101.8 | 21.3 | 103.9 | 126.0 | 6 | 102 | 95 | 0 / 10 | A |
| 775 | | 06/15/23 | P-03 | | CH | 20.2 | 99.3 | 24.1 | 98.4 | 122.1 | 6 | 99 | 95 | 0 / 10 | A |
| 776 | | 06/15/23 | P-16 | | CH | 20.2 | 101.8 | 21.5 | 104.1 | 126.5 | 6 | 102 | 95 | 0 / 10 | A |
| 777 | | 06/15/23 | P-19 | | CH | 18.4 | 105.0 | 21.3 | 101.9 | 123.6 | 6 | 97 | 95 | 0 / 10 | A |
| 778 | | 06/15/23 | P-16 | | CH | 20.2 | 101.8 | 20.7 | 105.0 | 126.7 | 6 | 103 | 95 | 0 / 10 | A |
| 779 | | 06/15/23 | P-19 | | CH | 18.4 | 105.0 | 24.2 | 100.4 | 124.7 | 6 | 96 | 95 | 0 / 10 | A |
| 780 | | 06/15/23 | P-19 | | CH | 18.4 | 105.0 | 23.5 | 102.4 | 126.5 | 6 | 98 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 773 | Select Clay: Wall Zone 18 | 64.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 774 | Select Clay: Wall Zone 23 | 63.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 775 | Select Clay: Wall Zone 23 | 64.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 776 | Select Clay: Wall Zone 24 | 63.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 777 | Select Clay: Wall Zone 24 | 64.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 778 | Select Clay: Wall Zone 25 | 63.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 779 | Select Clay: Wall Zone 25 | 64.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 780 | Select Clay: Wall Zone 26 | 63.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Suite 3
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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 06/21/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 781 | | 06/15/23 | P-16 | | CH | 20.2 | 101.8 | 24.5 | 98.3 | 122.4 | 6 | 97 | 95 | 0 / 10 | A |
| 782 | | 06/15/23 | P-19 | | CH | 18.4 | 105.0 | 19.8 | 102.7 | 123.0 | 6 | 98 | 95 | 0 / 10 | A |
| 783 | | 06/15/23 | P-16 | | CH | 20.2 | 101.8 | 23.3 | 101.7 | 125.4 | 6 | 100 | 95 | 0 / 10 | A |
| 784 | | 06/15/23 | P-19 | | CH | 18.4 | 105.0 | 18.7 | 102.5 | 121.7 | 6 | 98 | 95 | 0 / 10 | A |
| 785 | | 06/15/23 | P-19 | | CH | 18.4 | 105.0 | 22.3 | 103.6 | 126.7 | 6 | 99 | 95 | 0 / 10 | A |
| 786 | | 06/15/23 | P-19 | | CH | 18.4 | 105.0 | 22.9 | 102.3 | 125.7 | 6 | 97 | 95 | 0 / 10 | A |
| 787 | | 06/15/23 | P-16 | | CH | 20.2 | 101.8 | 23.6 | 98.6 | 121.9 | 6 | 97 | 95 | 0 / 10 | A |
| 788 | | 06/15/23 | P-19 | | CH | 18.4 | 105.0 | 20.1 | 100.7 | 120.9 | 6 | 96 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 781 | Select Clay: Wall Zone 26 | 64.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 782 | Select Clay: Wall Zone 27 | 63.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 783 | Select Clay: Wall Zone 27 | 64.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 784 | Select Clay: Wall Zone 16 | 64.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 785 | Select Clay: Wall Zone 16 | 65.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 786 | Select Clay: Wall Zone 17 | 64.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 787 | Select Clay: Wall Zone 17 | 65.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 788 | Select Clay: Wall Zone 18 | 64.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 06/21/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 789 | | 06/15/23 | P-19 | | CH | 18.4 | 105.0 | 20.8 | 102.2 | 123.5 | 6 | 97 | 95 | 0 / 10 | A |
| 790 | | 06/19/23 | P-16 | | CH | 20.2 | 101.8 | 21.6 | 101.7 | 123.7 | 6 | 100 | 95 | 0 / 10 | A |
| 791 | | 06/19/23 | P-16 | | CH | 20.2 | 101.8 | 22.7 | 101.5 | 124.5 | 6 | 100 | 95 | 0 / 10 | A |
| 792 | | 06/19/23 | P-02 | | CH | 22.6 | 97.7 | 22.9 | 96.6 | 118.7 | 6 | 99 | 95 | 0 / 10 | A |
| 793 | | 06/19/23 | P-02 | | CH | 22.6 | 97.7 | 24.3 | 97.5 | 121.2 | 6 | 100 | 95 | 0 / 10 | A |
| 794 | | 06/19/23 | P-03 | | CH | 20.2 | 99.3 | 22.0 | 96.8 | 118.1 | 6 | 97 | 95 | 0 / 10 | A |
| 795 | | 06/19/23 | P-16 | | CH | 20.2 | 101.8 | 23.4 | 99.1 | 122.3 | 6 | 97 | 95 | 0 / 10 | A |
| 796 | | 06/19/23 | P-16 | | CH | 20.2 | 101.8 | 22.8 | 101.4 | 124.5 | 6 | 100 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 789 | Select Clay: Wall Zone 18 | 65.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 790 | Select Clay: Wall Zone 23 | 65.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 791 | Select Clay: Wall Zone 24 | 65.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 792 | Select Clay: Wall Zone 25 | 65.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 793 | Select Clay: Wall Zone 26 | 65.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 794 | Select Clay: Wall Zone 27 | 65.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 795 | Select Clay: Wall Zone 16 | 66.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 796 | Select Clay: Wall Zone 17 | 66.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 06/21/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 797 | | 06/19/23 | P-03 | | CH | 20.2 | 99.3 | 24.4 | 98.7 | 122.8 | 6 | 99 | 95 | 0 / 10 | A |
| 798 | | 06/19/23 | P-03 | | CH | 20.2 | 99.3 | 24.2 | 98.9 | 122.8 | 6 | 100 | 95 | 0 / 10 | A |
| 799 | | 06/19/23 | P-16 | | CH | 20.2 | 101.8 | 24.2 | 99.8 | 124.0 | 6 | 98 | 95 | 0 / 10 | A |
| 800 | | 06/19/23 | P-02 | | CH | 22.6 | 97.7 | 24.0 | 97.7 | 121.1 | 6 | 100 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 797 | Select Clay: Wall Zone 18 | 66.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 798 | Select Clay: Wall Zone 23 | 66.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 799 | Select Clay: Wall Zone 24 | 66.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 800 | Select Clay: Wall Zone 25 | 66.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Kurt Kuechle
06/21/2023

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 06/21/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 801 | | 06/19/23 | P-11 | | CH | 24.8 | 95.9 | 24.9 | 92.8 | 115.9 | 6 | 97 | 95 | 0 / 10 | A |
| 802 | | 06/19/23 | P-02 | | CH | 22.6 | 97.7 | 25.6 | 96.3 | 121.0 | 6 | 99 | 95 | 0 / 10 | A |
| 803 | | 06/19/23 | P-05 | | CH | 24.5 | 96.2 | 26.9 | 92.5 | 117.4 | 6 | 96 | 95 | 0 / 10 | A |
| 804 | | 06/19/23 | P-16 | | CH | 20.2 | 101.8 | 23.3 | 98.9 | 121.9 | 6 | 97 | 95 | 0 / 10 | A |
| 805 | | 06/19/23 | P-03 | | CH | 20.2 | 99.3 | 22.4 | 97.0 | 118.7 | 6 | 98 | 95 | 0 / 10 | A |
| 806 | | 06/19/23 | P-19 | | CH | 18.4 | 105.0 | 21.9 | 103.6 | 126.3 | 6 | 99 | 95 | 0 / 10 | A |
| 807 | | 06/19/23 | P-16 | | CH | 20.2 | 101.8 | 22.3 | 99.3 | 121.4 | 6 | 98 | 95 | 0 / 10 | A |
| 808 | | 06/19/23 | P-16 | | CH | 20.2 | 101.8 | 23.9 | 98.3 | 121.8 | 6 | 97 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 801 | Select Clay: Wall Zone 26 | 66.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 802 | Select Clay: Wall Zone 27 | 66.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 803 | Select Clay: Wall Zone 16 | 67.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 804 | Select Clay: Wall Zone 17 | 67.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 805 | Select Clay: Wall Zone 18 | 67.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 806 | Select Clay: Wall Zone 23 | 67.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 807 | Select Clay: Wall Zone 24 | 67.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 808 | Select Clay: Wall Zone 25 | 67.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 06/21/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 809 | | 06/19/23 | P-19 | | CH | 18.4 | 105.0 | 21.1 | 104.5 | 126.6 | 6 | 100 | 95 | 0 / 10 | A |
| 810 | | 06/19/23 | P-03 | | CH | 20.2 | 99.3 | 24.0 | 98.7 | 122.4 | 6 | 99 | 95 | 0 / 10 | A |
| 811 | | 06/19/23 | P-14 | | CH | 27.2 | 92.4 | 27.5 | 91.4 | 116.5 | 6 | 99 | 95 | 0 / 10 | A |
| 812 | | 06/19/23 | P-16 | | CH | 20.2 | 101.8 | 22.4 | 101.4 | 124.1 | 6 | 100 | 95 | 0 / 10 | A |
| 813 | | 06/19/23 | P-02 | | CH | 22.6 | 97.7 | 25.4 | 97.1 | 121.8 | 6 | 99 | 95 | 0 / 10 | A |
| 814 | | 06/19/23 | P-03 | | CH | 20.2 | 99.3 | 23.4 | 98.7 | 121.8 | 6 | 99 | 95 | 0 / 10 | A |
| 815 | | 06/19/23 | P-16 | | CH | 20.2 | 101.8 | 22.4 | 101.9 | 124.7 | 6 | 100 | 95 | 0 / 10 | A |
| 816 | | 06/19/23 | P-19 | | CH | 18.4 | 105.0 | 20.7 | 104.7 | 126.4 | 6 | 100 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 809 | Select Clay: Wall Zone 26 | 67.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 810 | Select Clay: Wall Zone 27 | 67.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 811 | Select Clay: Wall Zone 16 | 68.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 812 | Select Clay: Wall Zone 17 | 68.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 813 | Select Clay: Wall Zone 18 | 68.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 814 | Select Clay: Wall Zone 23 | 68.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 815 | Select Clay: Wall Zone 24 | 68.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 816 | Select Clay: Wall Zone 25 | 68.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 06/21/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 817 | | 06/19/23 | P-19 | | CH | 18.4 | 105.0 | 21.1 | 104.2 | 126.2 | 6 | 99 | 95 | 0 / 10 | A |
| 818 | | 06/19/23 | P-19 | | CH | 18.4 | 105.0 | 21.2 | 102.8 | 124.6 | 6 | 98 | 95 | 0 / 10 | A |
| 819 | | 06/19/23 | P-16 | | CH | 20.2 | 101.8 | 23.9 | 99.7 | 123.5 | 6 | 98 | 95 | 0 / 10 | A |
| 820 | | 06/19/23 | P-19 | | CH | 18.4 | 105.0 | 20.0 | 103.4 | 124.1 | 6 | 98 | 95 | 0 / 10 | A |
| 821 | | 06/19/23 | P-03 | | CH | 20.2 | 99.3 | 24.9 | 98.4 | 122.9 | 6 | 99 | 95 | 0 / 10 | A |
| 822 | | 06/19/23 | P-19 | | CH | 18.4 | 105.0 | 22.0 | 102.0 | 124.4 | 6 | 97 | 95 | 0 / 10 | A |
| 823 | | 06/19/23 | P-19 | | CH | 18.4 | 105.0 | 20.9 | 103.0 | 124.5 | 6 | 98 | 95 | 0 / 10 | A |
| 824 | | 06/19/23 | P-19 | | CH | 18.4 | 105.0 | 22.3 | 103.2 | 126.2 | 6 | 98 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 817 | Select Clay: Wall Zone 26 | 68.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 818 | Select Clay: Wall Zone 27 | 68.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 819 | Select Clay: Wall Zone 16 | 69.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 820 | Select Clay: Wall Zone 17 | 69.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 821 | Select Clay: Wall Zone 18 | 69.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 822 | Select Clay: Wall Zone 23 | 69.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 823 | Select Clay: Wall Zone 24 | 69.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 824 | Select Clay: Wall Zone 25 | 69.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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The Science You Build On.

2908 Morrison Ave.
Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 06/21/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 825 | | 06/19/23 | P-16 | | CH | 20.2 | 101.8 | 24.2 | 99.7 | 123.8 | 6 | 98 | 95 | 0 / 10 | A |
| 826 | | 06/19/23 | P-19 | | CH | 18.4 | 105.0 | 18.9 | 107.6 | 127.9 | 6 | 102 | 95 | 0 / 10 | A |
| 827 | | 06/19/23 | P-19 | | CH | 18.4 | 105.0 | 22.6 | 102.2 | 125.3 | 6 | 97 | 95 | 0 / 10 | A |
| 828 | | 06/19/23 | P-19 | | CH | 18.4 | 105.0 | 20.6 | 104.1 | 125.5 | 6 | 99 | 95 | 0 / 10 | A |
| 829 | | 06/19/23 | P-02 | | CH | 22.6 | 97.7 | 25.6 | 95.3 | 119.7 | 6 | 98 | 95 | 0 / 10 | A |
| 830 | | 06/19/23 | P-16 | | CH | 20.2 | 101.8 | 21.4 | 100.0 | 121.4 | 6 | 98 | 95 | 0 / 10 | A |
| 831 | | 06/19/23 | P-16 | | CH | 20.2 | 101.8 | 21.7 | 99.7 | 121.3 | 6 | 98 | 95 | 0 / 10 | A |
| 832 | | 06/19/23 | P-02 | | CH | 22.6 | 97.7 | 25.1 | 97.5 | 122.0 | 6 | 100 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 825 | Select Clay: Wall Zone 26 | 69.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 826 | Select Clay: Wall Zone 27 | 69.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 827 | Select Clay: Wall Zone 16 | 70.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 828 | Select Clay: Wall Zone 17 | 70.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 829 | Select Clay: Wall Zone 18 | 70.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 830 | Select Clay: Wall Zone 23 | 70.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 831 | Select Clay: Wall Zone 24 | 70.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 832 | Select Clay: Wall Zone 25 | 70.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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# Field Compaction Report

**Report Date:** 06/21/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 833 | | 06/19/23 | P-03 | | CH | 20.2 | 99.3 | 21.7 | 98.8 | 120.2 | 6 | 99 | 95 | 0 / 10 | A |
| 834 | | 06/19/23 | P-02 | | CH | 22.6 | 97.7 | 23.1 | 97.5 | 120.0 | 6 | 100 | 95 | 0 / 10 | A |
| 835 | | 06/19/23 | P-03 | | CH | 20.2 | 99.3 | 20.5 | 98.8 | 119.1 | 6 | 99 | 95 | 0 / 10 | A |
| 836 | | 06/19/23 | P-03 | | CH | 20.2 | 99.3 | 22.4 | 98.0 | 120.0 | 6 | 99 | 95 | 0 / 10 | A |
| 837 | | 06/19/23 | P-19 | | CH | 18.4 | 105.0 | 21.4 | 101.3 | 123.0 | 6 | 96 | 95 | 0 / 10 | A |
| 838 | | 06/19/23 | P-19 | | CH | 18.4 | 105.0 | 20.5 | 104.1 | 125.4 | 6 | 99 | 95 | 0 / 10 | A |
| 839 | | 06/19/23 | P-16 | | CH | 20.2 | 101.8 | 21.1 | 101.3 | 122.7 | 12 | 100 | 95 | 0 / 10 | A |
| 840 | | 06/19/23 | P-03 | | CH | 20.2 | 99.3 | 23.1 | 97.5 | 120.0 | 6 | 98 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 833 | Select Clay: Wall Zone 26 | 70.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 834 | Select Clay: Wall Zone 27 | 70.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 835 | Select Clay: Wall Zone 16 | 71.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 836 | Select Clay: Wall Zone 17 | 71.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 837 | Select Clay: Wall Zone 18 | 71.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 838 | Select Clay: Wall zone 23 | 72.0 | lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 839 | Select Clay: Wall zone 23 | 71.0 | lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 840 | Select Clay: Wall zone 24 | 72.0 | lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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# Field Compaction Report

**Report Date:** 06/21/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 841 | | 06/19/23 | P-13 | | CH | 21.7 | 97.9 | 22.4 | 95.8 | 117.3 | 6 | 98 | 95 | 0 / 10 | A |
| 842 | | 06/19/23 | P-08 | | CH | 24.4 | 97.0 | 25.4 | 92.7 | 116.2 | 6 | 96 | 95 | 0 / 10 | A |
| 843 | | 06/19/23 | P-13 | | CH | 21.7 | 97.9 | 22.5 | 97.1 | 118.9 | 6 | 99 | 95 | 0 / 10 | A |
| 844 | | 06/19/23 | P-13 | | CH | 21.7 | 97.9 | 21.8 | 97.6 | 118.9 | 6 | 100 | 95 | 0 / 10 | A |
| 845 | | 06/19/23 | P-16 | | CH | 20.2 | 101.8 | 21.8 | 99.8 | 121.6 | 6 | 98 | 95 | 0 / 10 | A |
| 846 | | 06/19/23 | P-16 | | CH | 20.2 | 101.8 | 22.0 | 99.0 | 120.8 | 6 | 97 | 95 | 0 / 10 | A |
| 847 | | 06/19/23 | P-10 | | CH | 25.0 | 94.6 | 25.6 | 94.7 | 118.9 | 6 | 100 | 95 | 0 / 10 | A |
| 848 | | 06/19/23 | P-16 | | CH | 20.2 | 101.8 | 22.1 | 100.3 | 122.5 | 6 | 99 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 841 | Select Clay: Wall zone 24 | 71.0 | lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 842 | Select Clay: Wall zone 25 | 72.0 | lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 843 | Select Clay: Wall zone 25 | 71.0 | lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 844 | Select Clay: Wall zone 26 | 72.0 | lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 845 | Select Clay: Wall zone 26 | 71.0 | lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 846 | Select Clay: Wall zone 27 | 72.0 | lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 847 | Select Clay: Wall Zone 27 | 71.0 | lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 848 | Select Clay: Wall Zone 16 | 73.0 | lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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# Field Compaction Report

**Report Date:** 06/21/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 849 | | 06/19/23 | P-03 | | CH | 20.2 | 99.3 | 22.6 | 97.3 | 119.3 | 6 | 98 | 95 | 0 / 10 | A |
| 850 | | 06/19/23 | P-19 | | CH | 18.4 | 105.0 | 19.8 | 101.6 | 121.7 | 6 | 97 | 95 | 0 / 10 | A |
| 851 | | 06/19/23 | P-16 | | CH | 20.2 | 101.8 | 23.5 | 99.7 | 123.1 | 6 | 98 | 95 | 0 / 10 | A |
| 852 | | 06/19/23 | P-01 | | CH | 19.4 | 100.8 | 19.9 | 99.0 | 118.7 | 6 | 98 | 95 | 0 / 10 | A |
| 853 | | 06/19/23 | P-16 | | CH | 20.2 | 101.8 | 22.3 | 101.9 | 124.6 | 6 | 100 | 95 | 0 / 10 | A |
| 854 | | 06/20/23 | P-03 | | CH | 20.2 | 99.3 | 24.3 | 95.3 | 118.5 | 6 | 96 | 95 | 0 / 10 | A |
| 855 | | 06/20/23 | P-05 | | CH | 24.5 | 96.2 | 25.1 | 94.9 | 118.7 | 6 | 99 | 95 | 0 / 10 | A |
| 856 | | 06/20/23 | P-09 | | CH | 23.9 | 98.6 | 24.6 | 98.2 | 122.4 | 6 | 100 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 849 | Select Clay: Wall Zone 16 | 72.0 | lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 850 | Select Clay: Wall Zone 17 | 73.0 | lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 851 | Select Clay: Wall Zone 17 | 72.0 | lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 852 | Select Clay: Wall Zone 18 | 73.0 | lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 853 | Select Clay: Wall Zone 18 | 72.0 | lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 854 | Select Clay: Wall Zone 23 | 73.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 855 | Select Clay: Wall Zone 24 | 73.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 856 | Select Clay: Wall Zone 25 | 73.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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# Field Compaction Report

**Report Date:** 06/21/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 857 | | 06/20/23 | P-19 | | CH | 18.4 | 105.0 | 22.8 | 102.8 | 126.2 | 6 | 98 | 95 | 0 / 10 | A |
| 858 | | 06/20/23 | P-16 | | CH | 20.2 | 101.8 | 22.6 | 101.8 | 124.8 | 6 | 100 | 95 | 0 / 10 | A |
| 859 | | 06/20/23 | P-16 | | CH | 20.2 | 101.8 | 23.2 | 99.8 | 123.0 | 6 | 98 | 95 | 0 / 10 | A |
| 860 | | 06/20/23 | P-19 | | CH | 18.4 | 105.0 | 20.6 | 104.5 | 126.0 | 6 | 100 | 95 | 0 / 10 | A |
| 861 | | 06/20/23 | P-03 | | CH | 20.2 | 99.3 | 24.2 | 94.9 | 117.9 | 6 | 96 | 95 | 0 / 10 | A |
| 862 | | 06/20/23 | P-19 | | CH | 18.4 | 105.0 | 21.8 | 102.7 | 125.1 | 6 | 98 | 95 | 0 / 10 | A |
| 863 | | 06/20/23 | P-10 | | CH | 25.0 | 94.6 | 26.8 | 92.1 | 116.8 | 6 | 97 | 95 | 0 / 10 | A |
| 864 | | 06/20/23 | P-12 | | CH | 23.6 | 97.4 | 25.1 | 96.3 | 120.5 | 6 | 99 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 857 | Select Clay: Wall Zone 26 | 73.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 858 | Select Clay: Wall Zone 27 | 73.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 859 | Select Clay: Wall Zone 16 | 74.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 860 | Select Clay: Wall Zone 17 | 74.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 861 | Select Clay: Wall Zone 18 | 74.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 862 | Select Clay: Wall Zone 23 | 74.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 863 | Select Clay: Wall Zone 24 | 74.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 864 | Select Clay: Wall Zone 25 | 74.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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# Field Compaction Report

**Report Date:** 06/21/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 865 | | 06/20/23 | P-03 | | CH | 20.2 | 99.3 | 23.4 | 94.7 | 116.9 | 6 | 95 | 95 | 0 / 10 | A |
| 866 | | 06/20/23 | P-11 | | CH | 24.8 | 95.9 | 25.7 | 95.1 | 119.5 | 6 | 99 | 95 | 0 / 10 | A |
| 867 | | 06/20/23 | P-18 | | CH | 25.7 | 94.5 | 27.4 | 93.6 | 119.2 | 6 | 99 | 95 | 0 / 10 | A |
| 868 | | 06/20/23 | P-08 | | CH | 24.4 | 97.0 | 24.7 | 95.9 | 119.6 | 6 | 99 | 95 | 0 / 10 | A |
| 869 | | 06/20/23 | P-11 | | CH | 24.8 | 95.9 | 28.4 | 95.5 | 122.6 | 6 | 100 | 95 | 0 / 10 | A |
| 870 | | 06/20/23 | P-03 | | CH | 20.2 | 99.3 | 24.8 | 97.2 | 121.3 | 6 | 98 | 95 | 0 / 10 | A |
| 871 | | 06/20/23 | P-11 | | CH | 24.8 | 95.9 | 25.9 | 94.5 | 119.0 | 6 | 99 | 95 | 0 / 10 | A |
| 872 | | 06/20/23 | P-10 | | CH | 25.0 | 94.6 | 25.1 | 90.9 | 113.7 | 6 | 96 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 865 | Select Clay: Wall Zone 26 | 74.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 866 | Select Clay: Wall Zone 27 | 74.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 867 | Select Clay: Wall Zone 16 | 75.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 868 | Select Clay: Wall Zone 17 | 75.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 869 | Select Clay: Wall Zone 18 | 75.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 870 | Select Clay: Wall Zone 23 | 75.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 871 | Select Clay: Wall Zone 24 | 75.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 872 | Select Clay: Wall Zone 25 | 75.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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# Field Compaction Report

**Report Date:** 06/21/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 873 | | 06/20/23 | P-16 | | CH | 20.2 | 101.8 | 20.9 | 98.4 | 119.0 | 6 | 97 | 95 | 0 / 10 | A |
| 874 | | 06/20/23 | P-10 | | CH | 25.0 | 94.6 | 25.3 | 94.3 | 118.2 | 6 | 100 | 95 | 0 / 10 | A |
| 875 | | 06/20/23 | P-15 | | CH | 24.1 | 98.6 | 24.7 | 95.9 | 119.6 | 6 | 97 | 95 | 0 / 10 | A |
| 876 | | 06/20/23 | P-16 | | CH | 20.2 | 101.8 | 20.4 | 98.1 | 118.1 | 6 | 96 | 95 | 0 / 10 | A |
| 877 | | 06/20/23 | P-16 | | CH | 20.2 | 101.8 | 21.0 | 99.1 | 119.9 | 6 | 97 | 95 | 0 / 10 | A |
| 878 | | 06/20/23 | P-16 | | CH | 20.2 | 101.8 | 21.8 | 98.2 | 119.6 | 6 | 96 | 95 | 0 / 10 | A |
| 879 | | 06/20/23 | P-16 | | CH | 20.2 | 101.8 | 22.5 | 98.4 | 120.5 | 6 | 97 | 95 | 0 / 10 | A |
| 880 | | 06/20/23 | P-16 | | CH | 20.2 | 101.8 | 23.5 | 98.1 | 121.2 | 6 | 96 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 873 | Select Clay: Wall Zone 26 | 75.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 874 | Select Clay: Wall Zone 27 | 75.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 875 | Select Clay: Wall Zone 16 | 76.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 876 | Select Clay: Wall Zone 17 | 76.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 877 | Select Clay: Wall Zone 18 | 76.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 878 | Select Clay: Wall Zone 23 | 76.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 879 | Select Clay: Wall Zone 24 | 76.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 880 | Select Clay: Wall Zone 25 | 76.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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The Science You Build On.

2908 Morrison Ave.
Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 06/21/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 881 | | 06/20/23 | P-16 | | CH | 20.2 | 101.8 | 22.7 | 102.0 | 125.2 | 6 | 100 | 95 | 0 / 10 | A |
| 882 | | 06/20/23 | P-16 | | CH | 20.2 | 101.8 | 22.6 | 101.8 | 124.8 | 6 | 100 | 95 | 0 / 10 | A |
| 883 | | 06/20/23 | P-16 | | CH | 20.2 | 101.8 | 22.8 | 97.1 | 119.2 | 6 | 95 | 95 | 0 / 10 | A |
| 884 | | 06/20/23 | P-16 | | CH | 20.2 | 101.8 | 22.7 | 101.1 | 124.1 | 6 | 99 | 95 | 0 / 10 | A |
| 885 | | 06/20/23 | P-03 | | CH | 20.2 | 99.3 | 20.9 | 94.7 | 114.5 | 6 | 95 | 95 | 0 / 10 | A |
| 886 | | 06/20/23 | P-08 | | CH | 24.4 | 97.0 | 24.5 | 94.6 | 117.8 | 6 | 98 | 95 | 0 / 10 | A |
| 887 | | 06/20/23 | P-03 | | CH | 20.2 | 99.3 | 22.7 | 97.7 | 119.9 | 6 | 98 | 95 | 0 / 10 | A |
| 888 | | 06/20/23 | P-16 | | CH | 20.2 | 101.8 | 22.8 | 100.2 | 123.0 | 6 | 98 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 881 | Select Clay: Wall Zone 26 | 76.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 882 | Select Clay: Wall Zone 27 | 76.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 883 | Select Clay: Wall Zone 16 | 77.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 884 | Select Clay: Wall Zone 17 | 77.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 885 | Select Clay: Wall Zone 18 | 77.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 886 | Select Clay: Wall Zone 23 | 77.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 887 | Select Clay: Wall Zone 24 | 77.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 888 | Select Clay: Wall Zone 25 | 77.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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# Field Compaction Report

**Report Date:** 06/21/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 889 | | 06/20/23 | P-16 | | CH | 20.2 | 101.8 | 22.0 | 100.8 | 123.0 | 6 | 99 | 95 | 0 / 10 | A |
| 890 | | 06/20/23 | P-16 | | CH | 20.2 | 101.8 | 20.3 | 101.6 | 122.2 | 6 | 100 | 95 | 0 / 10 | A |
| 891 | | 06/20/23 | P-19 | | CH | 18.4 | 105.0 | 21.0 | 104.8 | 126.8 | 6 | 100 | 95 | 0 / 10 | A |
| 892 | | 06/20/23 | P-19 | | CH | 18.4 | 105.0 | 21.0 | 103.6 | 125.4 | 6 | 99 | 95 | 0 / 10 | A |
| 893 | | 06/20/23 | P-19 | | CH | 18.4 | 105.0 | 20.9 | 104.4 | 126.2 | 6 | 99 | 95 | 0 / 10 | A |
| 894 | | 06/20/23 | P-16 | | CH | 20.2 | 101.8 | 21.9 | 101.5 | 123.7 | 6 | 100 | 95 | 0 / 10 | A |
| 895 | | 06/20/23 | P-19 | | CH | 18.4 | 105.0 | 21.7 | 102.5 | 124.7 | 6 | 98 | 95 | 0 / 10 | A |
| 896 | | 06/20/23 | P-16 | | CH | 20.2 | 101.8 | 20.2 | 99.8 | 120.0 | 6 | 98 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 889 | Select Clay: Wall Zone 26 | 77.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 890 | Select Clay: Wall Zone 27 | 77.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 891 | Select Clay: Wall Zone 16 | 78.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 892 | Select Clay: Wall Zone 17 | 78.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 893 | Select Clay: Wall Zone 18 | 78.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 894 | Select Clay: Wall Zone 23 | 78.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 895 | Select Clay: Wall Zone 24 | 78.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 896 | Select Clay: Wall Zone 25 | 78.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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# Field Compaction Report

**Report Date:** 06/21/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 897 | | 06/20/23 | P-21-std | A | CL | 18.1 | 106.3 | 19.2 | 106.2 | 126.6 | 6 | 100 | 95 | 0 / 10 | A |
| 898 | | 06/20/23 | P-19 | | CH | 18.4 | 105.0 | 19.3 | 103.7 | 123.7 | 6 | 99 | 95 | 0 / 10 | A |
| 899 | | 06/20/23 | P-19 | | CH | 18.4 | 105.0 | 21.4 | 103.4 | 125.5 | 6 | 98 | 95 | 0 / 10 | A |
| 900 | | 06/20/23 | P-16 | | CH | 20.2 | 101.8 | 21.3 | 101.9 | 123.6 | 6 | 100 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 897 | Select Clay: Wall Zone 26 | 78.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 898 | Select Clay: Wall Zone 27 | 78.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 899 | Select Clay: Wall Zone 16 | 79.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 900 | Select Clay: Wall Zone 17 | 79.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Kurt Kuechle
06/21/2023

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# Field Compaction Report

**Report Date:** 06/21/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 901 | | 06/20/23 | P-16 | | CH | 20.2 | 101.8 | 21.6 | 101.7 | 123.7 | 6 | 100 | 95 | 0 / 10 | A |
| 902 | | 06/20/23 | P-16 | | CH | 20.2 | 101.8 | 20.8 | 99.5 | 120.2 | 6 | 98 | 95 | 0 / 10 | A |
| 903 | | 06/20/23 | P-16 | | CH | 20.2 | 101.8 | 21.9 | 100.9 | 123.0 | 6 | 99 | 95 | 0 / 10 | A |
| 904 | | 06/20/23 | P-19 | | CH | 18.4 | 105.0 | 18.8 | 101.7 | 120.8 | 6 | 97 | 95 | 0 / 10 | A |
| 905 | | 06/20/23 | P-19 | | CH | 18.4 | 105.0 | 21.2 | 104.3 | 126.4 | 6 | 99 | 95 | 0 / 10 | A |
| 906 | | 06/20/23 | P-19 | | CH | 18.4 | 105.0 | 21.0 | 102.6 | 124.1 | 6 | 98 | 95 | 0 / 10 | A |
| 907 | | 06/20/23 | P-21-std | A | CL | 18.1 | 106.3 | 19.9 | 105.3 | 126.3 | 6 | 99 | 95 | 0 / 10 | A |
| 908 | | 06/20/23 | P-19 | | CH | 18.4 | 105.0 | 20.8 | 103.4 | 124.9 | 6 | 98 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 901 | Select Clay: Wall Zone 18 | 79.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 902 | Select Clay: Wall Zone 23 | 79.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 903 | Select Clay: Wall Zone 24 | 79.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 904 | Select Clay: Wall Zone 25 | 79.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 905 | Select Clay: Wall Zone 26 | 79.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 906 | Select Clay: Wall Zone 27 | 79.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 907 | Select Clay: Wall Zone 16 | 80.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 908 | Select Clay: Wall Zone 17 | 80.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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# Field Compaction Report

**Report Date:** 06/21/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 909 | | 06/20/23 | P-16 | | CH | 20.2 | 101.8 | 21.7 | 100.4 | 122.2 | 6 | 99 | 95 | 0 / 10 | A |
| 910 | | 06/20/23 | P-19 | | CH | 18.4 | 105.0 | 21.3 | 103.4 | 125.4 | 6 | 98 | 95 | 0 / 10 | A |
| 911 | | 06/20/23 | P-19 | | CH | 18.4 | 105.0 | 21.7 | 104.6 | 127.3 | 6 | 100 | 95 | 0 / 10 | A |
| 912 | | 06/20/23 | P-16 | | CH | 20.2 | 101.8 | 20.8 | 98.9 | 119.5 | 6 | 97 | 95 | 0 / 10 | A |
| 913 | | 06/20/23 | P-19 | | CH | 18.4 | 105.0 | 20.0 | 103.6 | 124.3 | 6 | 99 | 95 | 0 / 10 | A |
| 914 | | 06/20/23 | P-19 | | CH | 18.4 | 105.0 | 19.3 | 102.4 | 122.2 | 6 | 98 | 95 | 0 / 10 | A |
| 915 | | 06/20/23 | P-19 | | CH | 18.4 | 105.0 | 20.3 | 100.1 | 120.4 | 6 | 95 | 95 | 0 / 10 | A |
| 916 | | 06/20/23 | P-16 | | CH | 20.2 | 101.8 | 20.9 | 101.8 | 123.1 | 6 | 100 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 909 | Select Clay: Wall Zone 18 | 80.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 910 | Select Clay: Wall Zone 23 | 80.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 911 | Select Clay: Wall Zone 24 | 80.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 912 | Select Clay: Wall Zone 25 | 80.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 913 | Select Clay: Wall Zone 26 | 80.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 914 | Select Clay: Wall Zone 27 | 80.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 915 | Select Clay: Wall Zone 16 | 81.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 916 | Select Clay: Wall Zone 17 | 81.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 06/21/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 917 | | 06/20/23 | P-21-std | A | CL | 18.1 | 106.3 | 20.2 | 105.7 | 127.0 | 6 | 99 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 917 | Select Clay: Wall Zone 18 | 81.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Kurt Kuechle
06/21/2023

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 06/26/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 918 | | 06/21/23 | P-19 | | CH | 18.4 | 105.0 | 21.3 | 103.8 | 125.9 | 6 | 99 | 95 | 0 / 10 | A |
| 919 | | 06/21/23 | P-21-std | A | CL | 18.1 | 106.3 | 21.1 | 105.6 | 127.9 | 6 | 99 | 95 | 0 / 10 | A |
| 920 | | 06/21/23 | P-19 | | CH | 18.4 | 105.0 | 20.7 | 103.6 | 125.0 | 6 | 99 | 95 | 0 / 10 | A |
| 921 | | 06/21/23 | P-19 | | CH | 18.4 | 105.0 | 23.2 | 102.8 | 126.7 | 6 | 98 | 95 | 0 / 10 | A |
| 922 | | 06/21/23 | P-16 | | CH | 20.2 | 101.8 | 22.2 | 101.8 | 124.4 | 6 | 100 | 95 | 0 / 10 | A |
| 923 | | 06/21/23 | P-19 | | CH | 18.4 | 105.0 | 22.7 | 102.9 | 126.3 | 6 | 98 | 95 | 0 / 10 | A |
| 924 | | 06/21/23 | P-19 | | CH | 18.4 | 105.0 | 21.4 | 103.2 | 125.3 | 6 | 98 | 95 | 0 / 10 | A |
| 925 | | 06/21/23 | P-16 | | CH | 20.2 | 101.8 | 21.9 | 101.6 | 123.9 | 6 | 100 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 918 | Select Clay: Wall Zone 23 | 82.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 919 | Select Clay: Wall Zone 23 | 81.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 920 | Select Clay: Wall Zone 24 | 82.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 921 | Select Clay: Wall Zone 24 | 81.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 922 | Select Clay: Wall Zone 25 | 82.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 923 | Select Clay: Wall Zone 25 | 81.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 924 | Select Clay: Wall Zone 26 | 82.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 925 | Select Clay: Wall Zone 26 | 81.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
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# Field Compaction Report

**Report Date:** 06/26/2023
**Test Method:** ASTM D6938

**Client:**
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5301 32nd Ave S
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**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 926 | | 06/21/23 | P-21-std | A | CL | 18.1 | 106.3 | 20.8 | 105.6 | 127.6 | 6 | 99 | 95 | 0 / 10 | A |
| 927 | | 06/21/23 | P-19 | | CH | 18.4 | 105.0 | 22.5 | 102.2 | 125.2 | 6 | 97 | 95 | 0 / 10 | A |
| 928 | | 06/21/23 | P-19 | | CH | 18.4 | 105.0 | 22.6 | 104.4 | 128.0 | 6 | 99 | 95 | 0 / 10 | A |
| 929 | | 06/21/23 | P-16 | | CH | 20.2 | 101.8 | 22.4 | 101.1 | 123.7 | 6 | 99 | 95 | 0 / 10 | A |
| 930 | | 06/21/23 | P-19 | | CH | 18.4 | 105.0 | 21.1 | 104.4 | 126.4 | 6 | 99 | 95 | 0 / 10 | A |
| 931 | | 06/21/23 | P-16 | | CH | 20.2 | 101.8 | 22.7 | 101.2 | 124.2 | 6 | 99 | 95 | 0 / 10 | A |
| 932 | | 06/21/23 | P-21-std | A | CL | 18.1 | 106.3 | 20.0 | 105.2 | 126.2 | 6 | 99 | 95 | 0 / 10 | A |
| 933 | | 06/21/23 | P-19 | | CH | 18.4 | 105.0 | 21.4 | 102.4 | 124.3 | 6 | 98 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 926 | Select Clay: Wall Zone 27 | 82.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 927 | Select Clay: Wall Zone 27 | 81.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 928 | Select Clay: Wall Zone 16 | 83.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 929 | Select Clay: Wall Zone 16 | 82.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 930 | Select Clay: Wall Zone 17 | 83.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 931 | Select Clay: Wall Zone 17 | 82.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 932 | Select Clay: Wall Zone 18 | 83.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 933 | Select Clay: Wall Zone 18 | 82.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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2908 Morrison Ave.
Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 06/26/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 934 | | 06/21/23 | P-16 | | CH | 20.2 | 101.8 | 24.3 | 100.2 | 124.5 | 6 | 98 | 95 | 0 / 10 | A |
| 935 | | 06/21/23 | P-19 | | CH | 18.4 | 105.0 | 19.2 | 103.8 | 123.7 | 6 | 99 | 95 | 0 / 10 | A |
| 936 | | 06/21/23 | P-19 | | CH | 18.4 | 105.0 | 23.9 | 101.6 | 125.9 | 6 | 97 | 95 | 0 / 10 | A |
| 937 | | 06/21/23 | P-16 | | CH | 20.2 | 101.8 | 24.2 | 100.8 | 125.2 | 6 | 99 | 95 | 0 / 10 | A |
| 938 | | 06/21/23 | P-16 | | CH | 20.2 | 101.8 | 21.7 | 101.5 | 123.5 | 6 | 100 | 95 | 0 / 10 | A |
| 939 | | 06/21/23 | P-03 | | CH | 20.2 | 99.3 | 26.2 | 97.4 | 122.9 | 6 | 98 | 95 | 0 / 10 | A |
| 940 | | 06/21/23 | P-03 | | CH | 20.2 | 99.3 | 24.1 | 98.5 | 122.2 | 6 | 99 | 95 | 0 / 10 | A |
| 941 | | 06/21/23 | P-19 | | CH | 18.4 | 105.0 | 22.2 | 102.3 | 125.0 | 6 | 97 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 934 | Select Clay: Wall Zone 23 | 83.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 935 | Select Clay: Wall Zone 24 | 83.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 936 | Select Clay: Wall Zone 25 | 83.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 937 | Select Clay: Wall Zone 26 | 83.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 938 | Select Clay: Wall Zone 27 | 83.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 939 | Select Clay: Wall Zone 16 | 84.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 940 | Select Clay: Wall Zone 17 | 84.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 941 | Select Clay: Wall Zone 18 | 84.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 06/26/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 942 | | 06/21/23 | P-03 | | CH | 20.2 | 99.3 | 22.3 | 98.8 | 120.8 | 6 | 99 | 95 | 0 / 10 | A |
| 943 | | 06/21/23 | P-03 | | CH | 20.2 | 99.3 | 22.6 | 98.6 | 120.9 | 6 | 99 | 95 | 0 / 10 | A |
| 944 | | 06/21/23 | P-16 | | CH | 20.2 | 101.8 | 21.9 | 101.1 | 123.2 | 6 | 99 | 95 | 0 / 10 | A |
| 945 | | 06/21/23 | P-19 | | CH | 18.4 | 105.0 | 21.3 | 104.5 | 126.8 | 6 | 100 | 95 | 0 / 10 | A |
| 946 | | 06/21/23 | P-16 | | CH | 20.2 | 101.8 | 24.4 | 100.0 | 124.4 | 6 | 98 | 95 | 0 / 10 | A |
| 947 | | 06/21/23 | P-19 | | CH | 18.4 | 105.0 | 22.7 | 102.1 | 125.3 | 6 | 97 | 95 | 0 / 10 | A |
| 948 | | 06/21/23 | P-16 | | CH | 20.2 | 101.8 | 23.0 | 99.4 | 122.3 | 6 | 98 | 95 | 0 / 10 | A |
| 949 | | 06/21/23 | P-16 | | CH | 20.2 | 101.8 | 23.8 | 100.6 | 124.5 | 6 | 99 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 942 | Select Clay: Wall Zone 23 | 84.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 943 | Select Clay: Wall Zone 24 | 84.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 944 | Select Clay: Wall Zone 25 | 84.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 945 | Select Clay: Wall Zone 26 | 84.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 946 | Select Clay: Wall Zone 27 | 84.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 947 | Select Clay: Wall Zone 16 | 85.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 948 | Select Clay: Wall Zone 17 | 85.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 949 | Select Clay: Wall Zone 18 | 85.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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# Field Compaction Report

**Report Date:** 06/26/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 950 | | 06/21/23 | P-16 | | CH | 20.2 | 101.8 | 23.3 | 100.6 | 124.0 | 6 | 99 | 95 | 0 / 10 | A |
| 951 | | 06/21/23 | P-16 | | CH | 20.2 | 101.8 | 21.5 | 101.0 | 122.7 | 6 | 99 | 95 | 0 / 10 | A |
| 952 | | 06/21/23 | P-03 | | CH | 20.2 | 99.3 | 22.7 | 97.0 | 119.0 | 6 | 98 | 95 | 0 / 10 | A |
| 953 | | 06/21/23 | P-03 | | CH | 20.2 | 99.3 | 25.4 | 97.1 | 121.8 | 6 | 98 | 95 | 0 / 10 | A |
| 954 | | 06/21/23 | P-03 | | CH | 20.2 | 99.3 | 21.5 | 98.2 | 119.3 | 6 | 99 | 95 | 0 / 10 | A |
| 955 | | 06/21/23 | P-03 | | CH | 20.2 | 99.3 | 24.9 | 97.1 | 121.3 | 6 | 98 | 95 | 0 / 10 | A |
| 956 | | 06/21/23 | P-19 | | CH | 18.4 | 105.0 | 20.1 | 101.5 | 121.9 | 6 | 97 | 95 | 0 / 10 | A |
| 957 | | 06/21/23 | P-19 | | CH | 18.4 | 105.0 | 23.3 | 102.5 | 126.4 | 6 | 98 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 950 | Select Clay: Wall Zone 23 | 85.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 951 | Select Clay: Wall Zone 24 | 85.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 952 | Select Clay: Wall Zone 25 | 85.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 953 | Select Clay: Wall Zone 26 | 85.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 954 | Select Clay: Wall Zone 27 | 85.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 955 | Select Clay: Wall Zone 16 | 86.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 956 | Select Clay: Wall Zone 17 | 86.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 957 | Select Clay: Wall Zone 18 | 86.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 06/26/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 958 | | 06/21/23 | P-03 | | CH | 20.2 | 99.3 | 24.7 | 95.4 | 119.0 | 6 | 96 | 95 | 0 / 10 | A |
| 959 | | 06/21/23 | P-03 | | CH | 20.2 | 99.3 | 24.0 | 96.9 | 120.2 | 6 | 98 | 95 | 0 / 10 | A |
| 960 | | 06/21/23 | P-19 | | CH | 18.4 | 105.0 | 22.0 | 103.2 | 125.9 | 6 | 98 | 95 | 0 / 10 | A |
| 961 | | 06/21/23 | P-16 | | CH | 20.2 | 101.8 | 23.9 | 100.4 | 124.4 | 6 | 99 | 95 | 0 / 10 | A |
| 962 | | 06/21/23 | P-03 | | CH | 20.2 | 99.3 | 24.0 | 96.9 | 120.2 | 6 | 98 | 95 | 0 / 10 | A |
| 963 | | 06/21/23 | P-03 | | CH | 20.2 | 99.3 | 23.7 | 98.4 | 121.7 | 6 | 99 | 95 | 0 / 10 | A |
| 964 | | 06/21/23 | P-03 | | CH | 20.2 | 99.3 | 23.8 | 99.4 | 123.1 | 6 | 100 | 95 | 0 / 10 | A |
| 965 | | 06/21/23 | P-16 | | CH | 20.2 | 101.8 | 21.3 | 101.7 | 123.4 | 6 | 100 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 958 | Select Clay: Wall Zone 23 | 86.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 959 | Select Clay: Wall Zone 24 | 86.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 960 | Select Clay: Wall Zone 25 | 86.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 961 | Select Clay: Wall Zone 26 | 86.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 962 | Select Clay: Wall Zone 27 | 86.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 963 | Select Clay: Wall Zone 16 | 87.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 964 | Select Clay: Wall Zone 17 | 87.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 965 | Select Clay: Wall Zone 18 | 87.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 06/26/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 966 | | 06/21/23 | P-16 | | CH | 20.2 | 101.8 | 22.0 | 101.5 | 123.8 | 6 | 100 | 95 | 0 / 10 | A |
| 967 | | 06/21/23 | P-16 | | CH | 20.2 | 101.8 | 21.0 | 101.4 | 122.7 | 6 | 100 | 95 | 0 / 10 | A |
| 968 | | 06/21/23 | P-03 | | CH | 20.2 | 99.3 | 24.2 | 99.2 | 123.2 | 6 | 100 | 95 | 0 / 10 | A |
| 969 | | 06/21/23 | P-03 | | CH | 20.2 | 99.3 | 25.2 | 97.8 | 122.4 | 6 | 98 | 95 | 0 / 10 | A |
| 970 | | 06/21/23 | P-16 | | CH | 20.2 | 101.8 | 23.5 | 100.3 | 123.9 | 6 | 99 | 95 | 0 / 10 | A |
| 971 | | 06/21/23 | P-03 | | CH | 20.2 | 99.3 | 22.6 | 99.8 | 122.4 | 6 | 101 | 95 | 0 / 10 | A |
| 972 | | 06/21/23 | P-03 | | CH | 20.2 | 99.3 | 25.5 | 97.6 | 122.5 | 6 | 98 | 95 | 0 / 10 | A |
| 973 | | 06/21/23 | P-16 | | CH | 20.2 | 101.8 | 22.5 | 101.1 | 123.8 | 6 | 99 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 966 | Select Clay: Wall Zone 23 | 87.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 967 | Select Clay: Wall Zone 24 | 87.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 968 | Select Clay: Wall Zone 25 | 87.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 969 | Select Clay: Wall Zone 26 | 87.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 970 | Select Clay: Wall Zone 27 | 87.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 971 | Select Clay: Wall Zone 16 | 88.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 972 | Select Clay: Wall Zone 17 | 88.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 973 | Select Clay: Wall Zone 18 | 88.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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# Field Compaction Report

**Report Date:** 06/26/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 974 | | 06/21/23 | P-12 | | CH | 23.6 | 97.4 | 24.4 | 96.0 | 119.4 | 6 | 99 | 95 | 0 / 10 | A |
| 975 | | 06/21/23 | P-03 | | CH | 20.2 | 99.3 | 24.1 | 99.1 | 123.0 | 6 | 100 | 95 | 0 / 10 | A |
| 976 | | 06/21/23 | P-03 | | CH | 20.2 | 99.3 | 21.5 | 96.1 | 116.8 | 6 | 97 | 95 | 0 / 10 | A |
| 977 | | 06/21/23 | P-16 | | CH | 20.2 | 101.8 | 21.7 | 100.9 | 122.8 | 6 | 99 | 95 | 0 / 10 | A |
| 978 | | 06/21/23 | P-16 | | CH | 20.2 | 101.8 | 21.8 | 100.3 | 122.2 | 6 | 99 | 95 | 0 / 10 | A |
| 979 | | 06/21/23 | P-16 | | CH | 20.2 | 101.8 | 20.4 | 101.0 | 121.6 | 6 | 99 | 95 | 0 / 10 | A |
| 980 | | 06/21/23 | P-19 | | CH | 18.4 | 105.0 | 20.3 | 103.9 | 125.0 | 6 | 99 | 95 | 0 / 10 | A |
| 981 | | 06/21/23 | P-16 | | CH | 20.2 | 101.8 | 23.1 | 101.0 | 124.3 | 6 | 99 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 974 | Select Clay: Wall Zone 23 | 88.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 975 | Select Clay: Wall Zone 24 | 88.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 976 | Select Clay: Wall Zone 25 | 88.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 977 | Select Clay: Wall Zone 26 | 88.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 978 | Select Clay: Wall Zone 27 | 88.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 979 | Select Clay: Wall Zone 16 | 89.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 980 | Select Clay: Wall Zone 17 | 89.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 981 | Select Clay: Wall Zone 18 | 89.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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# Field Compaction Report

**Report Date:** 06/26/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 982 | | 06/21/23 | P-16 | | CH | 20.2 | 101.8 | 24.5 | 99.6 | 124.0 | 6 | 98 | 95 | 0 / 10 | A |
| 983 | | 06/21/23 | P-07 | | CH | 22.6 | 93.8 | 26.6 | 91.0 | 115.2 | 6 | 97 | 95 | 0 / 10 | A |
| 984 | | 06/21/23 | P-19 | | CH | 18.4 | 105.0 | 22.1 | 103.6 | 126.5 | 6 | 99 | 95 | 0 / 10 | A |
| 985 | | 06/21/23 | P-03 | | CH | 20.2 | 99.3 | 23.2 | 99.0 | 122.0 | 6 | 100 | 95 | 0 / 10 | A |
| 986 | | 06/21/23 | P-16 | | CH | 20.2 | 101.8 | 22.9 | 101.5 | 124.7 | 6 | 100 | 95 | 0 / 10 | A |
| 987 | | 06/21/23 | P-03 | | CH | 20.2 | 99.3 | 24.1 | 98.2 | 121.9 | 6 | 99 | 95 | 0 / 10 | A |
| 988 | | 06/21/23 | P-19 | | CH | 18.4 | 105.0 | 21.9 | 102.5 | 124.9 | 6 | 98 | 95 | 0 / 10 | A |
| 989 | | 06/21/23 | P-16 | | CH | 20.2 | 101.8 | 22.7 | 101.5 | 124.5 | 6 | 100 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 982 | Select Clay: Wall Zone 23 | 89.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 983 | Select Clay: Wall Zone 24 | 89.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 984 | Select Clay: Wall Zone 25 | 89.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 985 | Select Clay: Wall Zone 26 | 89.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 986 | Select Clay: Wall Zone 27 | 89.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 987 | Select Clay: Wall Zone 16 | 90.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 988 | Select Clay: Wall Zone 17 | 90.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 989 | Select Clay: Wall Zone 18 | 90.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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BRAUN INTERTEC
The Science You Build On.

2908 Morrison Ave.
Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 06/26/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 990 | | 06/21/23 | P-19 | | CH | 18.4 | 105.0 | 22.7 | 102.2 | 125.4 | 6 | 97 | 95 | 0 / 10 | A |
| 991 | | 06/21/23 | P-03 | | CH | 20.2 | 99.3 | 22.6 | 98.0 | 120.1 | 6 | 99 | 95 | 0 / 10 | A |
| 992 | | 06/21/23 | P-16 | | CH | 20.2 | 101.8 | 23.8 | 100.6 | 124.5 | 6 | 99 | 95 | 0 / 10 | A |
| 993 | | 06/21/23 | P-19 | | CH | 18.4 | 105.0 | 23.1 | 102.3 | 125.9 | 12 | 97 | 95 | 0 / 10 | A |
| 994 | | 06/21/23 | P-16 | | CH | 20.2 | 101.8 | 22.3 | 101.8 | 124.5 | 6 | 100 | 95 | 0 / 10 | A |
| 995 | | 06/21/23 | P-21-std | A | CL | 18.1 | 106.3 | 22.0 | 105.3 | 128.5 | 12 | 99 | 95 | 0 / 10 | A |
| 996 | | 06/21/23 | P-16 | | CH | 20.2 | 101.8 | 21.5 | 102.3 | 124.3 | 12 | 100 | 95 | 0 / 10 | A |
| 997 | | 06/21/23 | P-19 | | CH | 18.4 | 105.0 | 21.5 | 102.3 | 124.3 | 12 | 97 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 990 | Select Clay: Wall Zone 23 | 91.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 991 | Select Clay: Wall Zone 23 | 90.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 992 | Select Clay: Wall Zone 24 | 91.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 993 | Select Clay: Wall Zone 24 | 90.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 994 | Select Clay: Wall Zone 25 | 91.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 995 | Select Clay: Wall Zone 25 | 90.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 996 | Select Clay: Wall Zone 26 | 91.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 997 | Select Clay: Wall Zone 26 | 90.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Bismarck, ND 58504
Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 06/26/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 998 | | 06/21/23 | P-03 | | CH | 20.2 | 99.3 | 24.2 | 98.0 | 121.7 | 10 | 99 | 95 | 0 / 10 | A |
| 999 | | 06/21/23 | P-08 | | CH | 24.4 | 97.0 | 26.0 | 95.9 | 120.8 | 6 | 99 | 95 | 0 / 10 | A |
| 1000 | | 06/21/23 | P-19 | | CH | 18.4 | 105.0 | 20.1 | 101.5 | 121.9 | 6 | 97 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 998 | Select Clay: Wall Zone 27 | 91.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 999 | Select Clay: Wall Zone 27 | 90.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1000 | Select Clay: Wall Zone 16 | 91.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Kurt Kuechle
06/26/2023

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 06/22/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ~~998~~ | | ~~06/21/23~~ | ~~P-03~~ | | ~~CH~~ | ~~20.2~~ | ~~99.3~~ | ~~24.2~~ | ~~98.0~~ | ~~121.7~~ | ~~10~~ | ~~99~~ | ~~95~~ | ~~0 / 10~~ | ~~A~~ |
| ~~999~~ | | ~~06/21/23~~ | ~~P-08~~ | | ~~CH~~ | ~~24.4~~ | ~~97.0~~ | ~~26.0~~ | ~~95.9~~ | ~~120.8~~ | ~~6~~ | ~~99~~ | ~~95~~ | ~~0 / 10~~ | ~~A~~ |
| 1000 | | 06/21/23 | P-19 | | CH | 18.4 | 105.0 | 20.1 | 101.5 | 121.9 | 6 | 97 | 95 | 0 / 10 | A |
| 1001 | | 06/21/23 | P-16 | | CH | 20.2 | 101.8 | 20.6 | 101.6 | 122.5 | 6 | 100 | 95 | 0 / 10 | A |
| 1002 | | 06/21/23 | P-16 | | CH | 20.2 | 101.8 | 24.1 | 99.7 | 123.7 | 6 | 98 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| ~~998~~ | ~~Select Clay: Wall Zone 27~~ | ~~90.0~~ | ~~Lift number~~ | ~~InstroTek / 3500 / 1907 /~~ | ~~Bruce, Dalton~~ |
| ~~999~~ | ~~Select Clay: Wall Zone 27~~ | ~~89.0~~ | ~~Lift number~~ | ~~InstroTek / 3500 / 1907 /~~ | ~~Bruce, Dalton~~ |
| 1000 | Select Clay: Wall Zone 16 | 91.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1001 | Select Clay: Wall Zone 17 | 91.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1002 | Select Clay: Wall Zone 18 | 91.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Kurt Kuechle
06/22/2023

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 06/27/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1003 | | 06/26/23 | P-19 | | CH | 18.4 | 105.0 | 19.6 | 102.8 | 123.0 | 6 | 98 | 95 | 0 / 10 | A |
| 1004 | | 06/26/23 | P-16 | | CH | 20.2 | 101.8 | 20.2 | 100.7 | 121.0 | 6 | 99 | 95 | 0 / 10 | A |
| 1005 | | 06/26/23 | P-19 | | CH | 18.4 | 105.0 | 21.0 | 103.0 | 124.6 | 6 | 98 | 95 | 0 / 10 | A |
| 1006 | | 06/26/23 | P-16 | | CH | 20.2 | 101.8 | 22.5 | 100.8 | 123.5 | 6 | 99 | 95 | 0 / 10 | A |
| 1007 | | 06/26/23 | P-02 | | CH | 22.6 | 97.7 | 24.7 | 95.9 | 119.6 | 6 | 98 | 95 | 0 / 10 | A |
| 1008 | | 06/26/23 | P-16 | | CH | 20.2 | 101.8 | 24.2 | 100.1 | 124.3 | 6 | 98 | 95 | 0 / 10 | A |
| 1009 | | 06/26/23 | P-16 | | CH | 20.2 | 101.8 | 23.3 | 99.5 | 122.7 | 6 | 98 | 95 | 0 / 10 | A |
| 1010 | | 06/26/23 | P-19 | | CH | 18.4 | 105.0 | 22.0 | 104.4 | 127.4 | 6 | 99 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1003 | Select Clay: Wall Zone 23 | 92.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1004 | Select Clay: Wall Zone 24 | 92.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1005 | Select Clay: Wall Zone 25 | 92.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1006 | Select Clay: Wall Zone 26 | 92.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1007 | Select Clay: Wall Zone 27 | 92.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1008 | Select Clay: Wall Zone 16 | 92.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1009 | Select Clay: Wall Zone 17 | 92.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1010 | Select Clay: Wall Zone 18 | 92.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 06/27/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1011 | | 06/26/23 | P-19 | | CH | 18.4 | 105.0 | 23.1 | 103.1 | 126.9 | 6 | 98 | 95 | 0 / 10 | A |
| 1012 | | 06/26/23 | P-03 | | CH | 20.2 | 99.3 | 24.2 | 98.3 | 122.1 | 6 | 99 | 95 | 0 / 10 | A |
| 1013 | | 06/26/23 | P-19 | | CH | 18.4 | 105.0 | 21.9 | 104.2 | 127.0 | 6 | 99 | 95 | 0 / 10 | A |
| 1014 | | 06/26/23 | P-16 | | CH | 20.2 | 101.8 | 22.2 | 101.2 | 123.7 | 6 | 99 | 95 | 0 / 10 | A |
| 1015 | | 06/26/23 | P-03 | | CH | 20.2 | 99.3 | 24.9 | 97.0 | 121.2 | 6 | 98 | 95 | 0 / 10 | A |
| 1016 | | 06/26/23 | P-16 | | CH | 20.2 | 101.8 | 22.3 | 100.9 | 123.4 | 6 | 99 | 95 | 0 / 10 | A |
| 1017 | | 06/26/23 | P-03 | | CH | 20.2 | 99.3 | 24.7 | 97.9 | 122.1 | 6 | 99 | 95 | 0 / 10 | A |
| 1018 | | 06/26/23 | P-19 | | CH | 18.4 | 105.0 | 22.8 | 102.9 | 126.4 | 6 | 98 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1011 | Select Clay: Wall Zone 23 | 93.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1012 | Select Clay: Wall Zone 24 | 93.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1013 | Select Clay: Wall Zone 25 | 93.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1014 | Select Clay: Wall Zone 26 | 93.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1015 | Select Clay: Wall Zone 27 | 93.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1016 | Select Clay: Wall Zone 16 | 93.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1017 | Select Clay: Wall Zone 17 | 93.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1018 | Select Clay: Wall Zone 18 | 93.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 06/27/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1019 | | 06/26/23 | P-11 | | CH | 24.8 | 95.9 | 25.0 | 94.9 | 118.6 | 6 | 99 | 95 | 0 / 10 | A |
| 1020 | | 06/26/23 | P-07 | | CH | 22.6 | 93.8 | 27.7 | 93.8 | 119.8 | 6 | 100 | 95 | 0 / 10 | A |
| 1021 | | 06/26/23 | P-16 | | CH | 20.2 | 101.8 | 23.4 | 100.1 | 123.5 | 6 | 98 | 95 | 0 / 10 | A |
| 1022 | | 06/26/23 | P-03 | | CH | 20.2 | 99.3 | 24.0 | 96.7 | 119.9 | 6 | 97 | 95 | 0 / 10 | A |
| 1023 | | 06/26/23 | P-03 | | CH | 20.2 | 99.3 | 21.2 | 96.2 | 116.6 | 6 | 97 | 95 | 0 / 10 | A |
| 1024 | | 06/26/23 | P-19 | | CH | 18.4 | 105.0 | 20.9 | 104.5 | 126.3 | 6 | 100 | 95 | 0 / 10 | A |
| 1025 | | 06/26/23 | P-16 | | CH | 20.2 | 101.8 | 22.3 | 100.6 | 123.0 | 6 | 99 | 95 | 0 / 10 | A |
| 1026 | | 06/26/23 | P-19 | | CH | 18.4 | 105.0 | 20.9 | 102.4 | 123.8 | 6 | 98 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1019 | Select Clay: Wall Zone 23 | 94.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1020 | Select Clay: Wall Zone 24 | 94.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1021 | Select Clay: Wall Zone 25 | 94.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1022 | Select Clay: Wall Zone 26 | 94.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1023 | Select Clay: Wall Zone 27 | 94.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1024 | Select Clay: Wall Zone 16 | 94.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1025 | Select Clay: Wall Zone 17 | 94.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1026 | Select Clay: Wall Zone 18 | 94.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Bismarck, ND 58504
Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 06/27/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1027 | | 06/26/23 | P-03 | | CH | 20.2 | 99.3 | 25.4 | 97.5 | 122.3 | 6 | 98 | 95 | 0 / 10 | A |
| 1028 | | 06/26/23 | P-16 | | CH | 20.2 | 101.8 | 23.4 | 101.5 | 125.3 | 6 | 100 | 95 | 0 / 10 | A |
| 1029 | | 06/26/23 | P-19 | | CH | 18.4 | 105.0 | 21.0 | 105.0 | 127.0 | 6 | 100 | 95 | 0 / 10 | A |
| 1030 | | 06/26/23 | P-16 | | CH | 20.2 | 101.8 | 22.6 | 101.1 | 123.9 | 6 | 99 | 95 | 0 / 10 | A |
| 1031 | | 06/26/23 | P-19 | | CH | 18.4 | 105.0 | 23.1 | 102.9 | 126.7 | 6 | 98 | 95 | 0 / 10 | A |
| 1032 | | 06/26/23 | P-19 | | CH | 18.4 | 105.0 | 21.5 | 105.6 | 128.3 | 6 | 101 | 95 | 0 / 10 | A |
| 1033 | | 06/26/23 | P-19 | | CH | 18.4 | 105.0 | 20.9 | 103.9 | 125.6 | 6 | 99 | 95 | 0 / 10 | A |
| 1034 | | 06/26/23 | P-19 | | CH | 18.4 | 105.0 | 20.2 | 102.2 | 122.8 | 6 | 97 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1027 | Select Clay: Wall Zone 23 | 95.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1028 | Select Clay: Wall Zone 24 | 95.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1029 | Select Clay: Wall Zone 25 | 95.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1030 | Select Clay: Wall Zone 26 | 95.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1031 | Select Clay: Wall Zone 27 | 95.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1032 | Select Clay: Wall Zone 16 | 95.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1033 | Select Clay: Wall Zone 17 | 95.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1034 | Select Clay: Wall Zone 18 | 95.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 06/27/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1035 | | 06/26/23 | P-16 | | CH | 20.2 | 101.8 | 21.1 | 101.2 | 122.6 | 12 | 99 | 95 | 0 / 10 | A |
| 1036 | | 06/26/23 | P-19 | | CH | 18.4 | 105.0 | 20.7 | 103.1 | 124.4 | 6 | 98 | 95 | 0 / 10 | A |
| 1037 | | 06/26/23 | P-19 | | CH | 18.4 | 105.0 | 21.1 | 102.2 | 123.8 | 12 | 97 | 95 | 0 / 10 | A |
| 1038 | | 06/26/23 | P-19 | | CH | 18.4 | 105.0 | 20.5 | 104.6 | 126.0 | 6 | 100 | 95 | 0 / 10 | A |
| 1039 | | 06/26/23 | P-19 | | CH | 18.4 | 105.0 | 20.9 | 104.3 | 126.1 | 12 | 99 | 95 | 0 / 10 | A |
| 1040 | | 06/26/23 | P-19 | | CH | 18.4 | 105.0 | 21.3 | 103.9 | 126.0 | 6 | 99 | 95 | 0 / 10 | A |
| 1041 | | 06/26/23 | P-19 | | CH | 18.4 | 105.0 | 20.2 | 104.5 | 125.6 | 12 | 100 | 95 | 0 / 10 | A |
| 1042 | | 06/26/23 | P-19 | | CH | 18.4 | 105.0 | 21.1 | 105.5 | 127.8 | 6 | 100 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1035 | Select Clay: Wall Zone 23 | 96.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1036 | Select Clay: Wall Zone 23 | 97.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1037 | Select Clay: Wall Zone 24 | 96.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1038 | Select Clay: Wall Zone 24 | 97.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1039 | Select Clay: Wall Zone 25 | 96.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1040 | Select Clay: Wall Zone 25 | 97.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1041 | Select Clay: Wall Zone 26 | 96.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1042 | Select Clay: Wall Zone 26 | 97.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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The Science You Build On.

2908 Morrison Ave.
Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 06/27/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1043 | | 06/26/23 | P-19 | | CH | 18.4 | 105.0 | 20.6 | 102.4 | 123.5 | 12 | 98 | 95 | 0 / 10 | A |
| 1044 | | 06/26/23 | P-16 | | CH | 20.2 | 101.8 | 20.6 | 101.3 | 122.2 | 6 | 100 | 95 | 0 / 10 | A |
| 1045 | | 06/26/23 | P-19 | | CH | 18.4 | 105.0 | 20.1 | 101.1 | 121.4 | 12 | 96 | 95 | 0 / 10 | A |
| 1046 | | 06/26/23 | P-19 | | CH | 18.4 | 105.0 | 20.0 | 102.8 | 123.4 | 6 | 98 | 95 | 0 / 10 | A |
| 1047 | | 06/26/23 | P-19 | | CH | 18.4 | 105.0 | 21.0 | 105.0 | 127.0 | 12 | 100 | 95 | 0 / 10 | A |
| 1048 | | 06/26/23 | P-19 | | CH | 18.4 | 105.0 | 21.4 | 104.7 | 127.1 | 6 | 100 | 95 | 0 / 10 | A |
| 1049 | | 06/26/23 | P-19 | | CH | 18.4 | 105.0 | 20.1 | 104.1 | 125.0 | 12 | 99 | 95 | 0 / 10 | A |
| 1050 | | 06/26/23 | P-19 | | CH | 18.4 | 105.0 | 21.3 | 101.4 | 123.0 | 6 | 97 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1043 | Select Clay: Wall Zone 27 | 96.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1044 | Select Clay: Wall Zone 27 | 97.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1045 | Select Clay: Wall Zone 16 | 96.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1046 | Select Clay: Wall Zone 16 | 97.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1047 | Select Clay: Wall Zone 17 | 96.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1048 | Select Clay: Wall Zone 17 | 97.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1049 | Select Clay: Wall Zone 18 | 96.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1050 | Select Clay: Wall Zone 18 | 97.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Kurt Kuechle
06/27/2023

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Bismarck, ND 58504
Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 06/28/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1051 | | 06/27/23 | P-19 | | CH | 18.4 | 105.0 | 20.3 | 106.0 | 127.5 | 6 | 101 | 95 | 0 / 10 | A |
| 1052 | | 06/27/23 | P-19 | | CH | 18.4 | 105.0 | 20.9 | 103.5 | 125.1 | 6 | 99 | 95 | 0 / 10 | A |
| 1053 | | 06/27/23 | P-19 | | CH | 18.4 | 105.0 | 21.2 | 102.6 | 124.4 | 6 | 98 | 95 | 0 / 10 | A |
| 1054 | | 06/27/23 | P-19 | | CH | 18.4 | 105.0 | 21.1 | 105.0 | 127.2 | 6 | 100 | 95 | 0 / 10 | A |
| 1055 | | 06/27/23 | P-19 | | CH | 18.4 | 105.0 | 21.2 | 104.7 | 126.9 | 6 | 100 | 95 | 0 / 10 | A |
| 1056 | | 06/27/23 | P-19 | | CH | 18.4 | 105.0 | 23.5 | 102.0 | 126.0 | 6 | 97 | 95 | 0 / 10 | A |
| 1057 | | 06/27/23 | P-19 | | CH | 18.4 | 105.0 | 22.8 | 101.6 | 124.8 | 6 | 97 | 95 | 0 / 10 | A |
| 1058 | | 06/27/23 | P-19 | | CH | 18.4 | 105.0 | 21.5 | 101.9 | 123.8 | 6 | 97 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1051 | Select Clay: Wall Zone 23 | 98.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1052 | Select Clay: Wall Zone 24 | 98.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1053 | Select Clay: Wall Zone 25 | 98.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1054 | Select Clay: Wall Zone 26 | 98.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1055 | Select Clay: Wall Zone 27 | 98.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1056 | Select Clay: Wall Zone 16 | 98.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1057 | Select Clay: Wall Zone 17 | 98.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1058 | Select Clay: Wall Zone 18 | 98.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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# Field Compaction Report

**Report Date:** 06/28/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1059 | | 06/27/23 | P-19 | | CH | 18.4 | 105.0 | 23.5 | 101.0 | 124.7 | 6 | 96 | 95 | 0 / 10 | A |
| 1060 | | 06/27/23 | P-03 | | CH | 20.2 | 99.3 | 23.5 | 98.0 | 121.0 | 6 | 99 | 95 | 0 / 10 | A |
| 1061 | | 06/27/23 | P-19 | | CH | 18.4 | 105.0 | 20.1 | 108.2 | 130.0 | 6 | 103 | 95 | 0 / 10 | A |
| 1062 | | 06/27/23 | P-19 | | CH | 18.4 | 105.0 | 22.9 | 100.5 | 123.5 | 6 | 96 | 95 | 0 / 10 | A |
| 1063 | | 06/27/23 | P-19 | | CH | 18.4 | 105.0 | 18.5 | 106.7 | 126.4 | 6 | 102 | 95 | 0 / 10 | A |
| 1064 | | 06/27/23 | P-16 | | CH | 20.2 | 101.8 | 20.6 | 99.8 | 120.4 | 6 | 98 | 95 | 0 / 10 | A |
| 1065 | | 06/27/23 | P-19 | | CH | 18.4 | 105.0 | 22.5 | 101.9 | 124.8 | 6 | 97 | 95 | 0 / 10 | A |
| 1066 | | 06/27/23 | P-19 | | CH | 18.4 | 105.0 | 23.0 | 101.2 | 124.5 | 6 | 96 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1059 | Select Clay: Wall Zone 23 | 99.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1060 | Select Clay: Wall Zone 24 | 99.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1061 | Select Clay: Wall Zone 25 | 99.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1062 | Select Clay: Wall Zone 26 | 99.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1063 | Select Clay: Wall Zone 27 | 99.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1064 | Select Clay: Wall Zone 16 | 99.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1065 | Select Clay: Wall Zone 17 | 99.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1066 | Select Clay: Wall Zone 18 | 99.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 06/28/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1067 | | 06/27/23 | P-19 | | CH | 18.4 | 105.0 | 21.3 | 101.5 | 123.1 | 6 | 97 | 95 | 0 / 10 | A |
| 1068 | | 06/27/23 | P-19 | | CH | 18.4 | 105.0 | 22.9 | 102.6 | 126.1 | 6 | 98 | 95 | 0 / 10 | A |
| 1069 | | 06/27/23 | P-19 | | CH | 18.4 | 105.0 | 20.8 | 106.8 | 129.0 | 6 | 102 | 95 | 0 / 10 | A |
| 1070 | | 06/27/23 | P-19 | | CH | 18.4 | 105.0 | 22.5 | 100.1 | 122.6 | 6 | 95 | 95 | 0 / 10 | A |
| 1071 | | 06/27/23 | P-19 | | CH | 18.4 | 105.0 | 20.5 | 104.9 | 126.4 | 6 | 100 | 95 | 0 / 10 | A |
| 1072 | | 06/27/23 | P-19 | | CH | 18.4 | 105.0 | 21.6 | 102.9 | 125.1 | 6 | 98 | 95 | 0 / 10 | A |
| 1073 | | 06/27/23 | P-03 | | CH | 20.2 | 99.3 | 22.1 | 99.1 | 121.0 | 6 | 100 | 95 | 0 / 10 | A |
| 1074 | | 06/27/23 | P-19 | | CH | 18.4 | 105.0 | 22.8 | 102.2 | 125.5 | 6 | 97 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1067 | Select Clay: Wall Zone 23 | 100.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1068 | Select Clay: Wall Zone 24 | 100.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1069 | Select Clay: Wall Zone 25 | 100.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1070 | Select Clay: Wall Zone 26 | 100.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1071 | Select Clay: Wall Zone 27 | 100.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1072 | Select Clay: Wall Zone 16 | 100.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1073 | Select Clay: Wall Zone 17 | 100.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1074 | Select Clay: Wall Zone 18 | 100.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Bismarck, ND 58504
Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 06/28/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1075 | | 06/27/23 | P-19 | | CH | 18.4 | 105.0 | 23.5 | 100.0 | 123.5 | 6 | 95 | 95 | 0 / 10 | A |
| 1076 | | 06/27/23 | P-19 | | CH | 18.4 | 105.0 | 21.8 | 102.4 | 124.7 | 6 | 98 | 95 | 0 / 10 | A |
| 1077 | | 06/27/23 | P-19 | | CH | 18.4 | 105.0 | 24.7 | 99.8 | 124.5 | 6 | 95 | 95 | 0 / 10 | A |
| 1078 | | 06/27/23 | P-19 | | CH | 18.4 | 105.0 | 21.5 | 104.6 | 127.1 | 6 | 100 | 95 | 0 / 10 | A |
| 1079 | | 06/27/23 | P-19 | | CH | 18.4 | 105.0 | 20.8 | 105.0 | 126.8 | 6 | 100 | 95 | 0 / 10 | A |
| 1080 | | 06/27/23 | P-19 | | CH | 18.4 | 105.0 | 23.3 | 101.9 | 125.6 | 6 | 97 | 95 | 0 / 10 | A |
| 1081 | | 06/27/23 | P-19 | | CH | 18.4 | 105.0 | 22.1 | 103.0 | 125.8 | 6 | 98 | 95 | 0 / 10 | A |
| 1082 | | 06/27/23 | P-19 | | CH | 18.4 | 105.0 | 22.4 | 102.3 | 125.2 | 6 | 97 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1075 | Select Clay: Wall Zone 23 | 101.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1076 | Select Clay: Wall Zone 24 | 101.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1077 | Select Clay: Wall Zone 25 | 101.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1078 | Select Clay: Wall Zone 26 | 101.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1079 | Select Clay: Wall Zone 27 | 101.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1080 | Select Clay: Wall Zone 16 | 101.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1081 | Select Clay: Wall Zone 17 | 101.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1082 | Select Clay: Wall Zone 18 | 101.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Bismarck, ND 58504
Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 06/28/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1083 | | 06/27/23 | P-16 | | CH | 20.2 | 101.8 | 22.9 | 101.9 | 125.2 | 6 | 100 | 95 | 0 / 10 | A |
| 1084 | | 06/27/23 | P-19 | | CH | 18.4 | 105.0 | 22.5 | 104.4 | 127.9 | 6 | 99 | 95 | 0 / 10 | A |
| 1085 | | 06/27/23 | P-19 | | CH | 18.4 | 105.0 | 23.0 | 102.2 | 125.7 | 6 | 97 | 95 | 0 / 10 | A |
| 1086 | | 06/27/23 | P-19 | | CH | 18.4 | 105.0 | 21.7 | 105.4 | 128.3 | 6 | 100 | 95 | 0 / 10 | A |
| 1087 | | 06/27/23 | P-19 | | CH | 18.4 | 105.0 | 22.0 | 102.5 | 125.0 | 6 | 98 | 95 | 0 / 10 | A |
| 1088 | | 06/27/23 | P-19 | | CH | 18.4 | 105.0 | 21.9 | 105.0 | 128.0 | 6 | 100 | 95 | 0 / 10 | A |
| 1089 | | 06/27/23 | P-03 | | CH | 20.2 | 99.3 | 23.2 | 95.8 | 118.0 | 6 | 96 | 95 | 0 / 10 | A |
| 1090 | | 06/27/23 | P-16 | | CH | 20.2 | 101.8 | 24.6 | 101.7 | 126.7 | 6 | 100 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1083 | Select Clay: Wall Zone 23 | 102.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1084 | Select Clay: Wall Zone 24 | 102.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1085 | Select Clay: Wall Zone 25 | 102.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1086 | Select Clay: Wall Zone 26 | 102.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1087 | Select Clay: Wall Zone 27 | 102.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1088 | Select Clay: Wall Zone 16 | 102.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1089 | Select Clay: Wall Zone 17 | 102.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1090 | Select Clay: Wall Zone 23 | 103.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 06/28/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1091 | | 06/27/23 | P-19 | | CH | 18.4 | 105.0 | 22.1 | 103.1 | 125.9 | 6 | 98 | 95 | 0 / 10 | A |
| 1092 | | 06/27/23 | P-19 | | CH | 18.4 | 105.0 | 22.5 | 104.5 | 128.0 | 6 | 100 | 95 | 0 / 10 | A |
| 1093 | | 06/27/23 | P-19 | | CH | 18.4 | 105.0 | 24.3 | 101.3 | 125.9 | 6 | 96 | 95 | 0 / 10 | A |
| 1094 | | 06/27/23 | P-19 | | CH | 18.4 | 105.0 | 20.9 | 102.1 | 123.4 | 6 | 97 | 95 | 0 / 10 | A |
| 1095 | | 06/27/23 | P-19 | | CH | 18.4 | 105.0 | 21.6 | 100.0 | 121.6 | 6 | 95 | 95 | 0 / 10 | A |
| 1096 | | 06/27/23 | P-19 | | CH | 18.4 | 105.0 | 23.2 | 100.2 | 123.4 | 6 | 95 | 95 | 0 / 10 | A |
| 1097 | | 06/27/23 | P-19 | | CH | 18.4 | 105.0 | 20.7 | 104.1 | 125.7 | 12 | 99 | 95 | 0 / 10 | A |
| 1098 | | 06/27/23 | P-19 | | CH | 18.4 | 105.0 | 21.5 | 103.9 | 126.2 | 6 | 99 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1091 | Select Clay: Wall Zone 24 | 103.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1092 | Select Clay: Wall Zone 25 | 103.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1093 | Select Clay: Wall Zone 26 | 103.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1094 | Select Clay: Wall Zone 27 | 103.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1095 | Select Clay: Wall Zone 16 | 103.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1096 | Select Clay: Wall Zone 17 | 103.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1097 | Select Clay: Wall Zone 23 | 104.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1098 | Select Clay: Wall Zone 23 | 105.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

BRAUN INTERTEC
The Science You Build On.

2908 Morrison Ave.
Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 06/28/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1099 | | 06/27/23 | P-19 | | CH | 18.4 | 105.0 | 21.6 | 102.5 | 124.6 | 12 | 98 | 95 | 0 / 10 | A |
| 1100 | | 06/27/23 | P-19 | | CH | 18.4 | 105.0 | 21.8 | 103.2 | 125.7 | 6 | 98 | 95 | 0 / 10 | A |
| 1101 | | 06/27/23 | P-19 | | CH | 18.4 | 105.0 | 21.5 | 104.6 | 127.1 | 6 | 100 | 95 | 0 / 10 | A |
| 1102 | | 06/27/23 | P-19 | | CH | 18.4 | 105.0 | 20.6 | 106.1 | 128.0 | 12 | 101 | 95 | 0 / 10 | A |
| 1103 | | 06/27/23 | P-19 | | CH | 18.4 | 105.0 | 20.6 | 106.1 | 128.0 | 6 | 101 | 95 | 0 / 10 | A |
| 1104 | | 06/27/23 | P-19 | | CH | 18.4 | 105.0 | 23.2 | 104.4 | 128.6 | 12 | 99 | 95 | 0 / 10 | A |
| 1105 | | 06/27/23 | P-19 | | CH | 18.4 | 105.0 | 20.0 | 104.7 | 125.6 | 6 | 100 | 95 | 0 / 10 | A |
| 1106 | | 06/27/23 | P-19 | | CH | 18.4 | 105.0 | 21.4 | 100.7 | 122.3 | 12 | 96 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1099 | Select Clay: Wall Zone 24 | 104.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1100 | Select Clay: Wall Zone 24 | 105.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1101 | Select Clay: Wall Zone 25 | 105.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1102 | Select Clay: Wall Zone 26 | 104.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1103 | Select Clay: Wall Zone 26 | 105.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1104 | Select Clay: Wall Zone 27 | 104.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1105 | Select Clay: Wall Zone 27 | 105.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1106 | Select Clay: Wall Zone 16 | 104.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 06/28/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1107 | | 06/27/23 | P-19 | | CH | 18.4 | 105.0 | 23.4 | 99.5 | 122.8 | 6 | 95 | 95 | 0 / 10 | A |
| 1108 | | 06/27/23 | P-16 | | CH | 20.2 | 101.8 | 22.8 | 99.3 | 121.9 | 12 | 98 | 95 | 0 / 10 | A |
| 1109 | | 06/27/23 | P-19 | | CH | 18.4 | 105.0 | 24.3 | 100.2 | 124.5 | 6 | 95 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1107 | Select Clay: Wall Zone 16 | 105.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1108 | Select Clay: Wall Zone 17 | 104.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1109 | Select Clay: Wall Zone 17 | 105.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Kurt Kuechle
06/28/2023

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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Suite 3
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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 06/29/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1110 | | 06/28/23 | P-19 | | CH | 18.4 | 105.0 | 22.1 | 102.7 | 125.4 | 6 | 98 | 95 | 0 / 10 | A |
| 1111 | | 06/28/23 | P-16 | | CH | 20.2 | 101.8 | 21.5 | 99.3 | 120.6 | 6 | 98 | 95 | 0 / 10 | A |
| 1112 | | 06/28/23 | P-19 | | CH | 18.4 | 105.0 | 21.8 | 100.7 | 122.7 | 6 | 96 | 95 | 0 / 10 | A |
| 1113 | | 06/28/23 | P-19 | | CH | 18.4 | 105.0 | 23.4 | 100.4 | 123.9 | 6 | 96 | 95 | 0 / 10 | A |
| 1114 | | 06/28/23 | P-19 | | CH | 18.4 | 105.0 | 22.1 | 102.7 | 125.4 | 6 | 98 | 95 | 0 / 10 | A |
| 1115 | | 06/28/23 | P-19 | | CH | 18.4 | 105.0 | 19.6 | 104.3 | 124.7 | 6 | 99 | 95 | 0 / 10 | A |
| 1116 | | 06/28/23 | P-19 | | CH | 18.4 | 105.0 | 22.1 | 101.7 | 124.2 | 6 | 97 | 95 | 0 / 10 | A |
| 1117 | | 06/28/23 | P-19 | | CH | 18.4 | 105.0 | 21.4 | 102.9 | 124.9 | 6 | 98 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1110 | Select Clay: Wall Zone 23 | 106.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1111 | Select Clay: Wall Zone 24 | 106.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1112 | Select Clay: Wall Zone 25 | 106.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1113 | Select Clay: Wall Zone 26 | 106.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1114 | Select Clay: Wall Zone 27 | 106.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1115 | Select Clay: Wall Zone 16 | 106.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1116 | Select Clay: Wall Zone 17 | 106.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1117 | Select Clay: Wall Zone 23 | 107.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 06/29/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1118 | | 06/28/23 | P-19 | | CH | 18.4 | 105.0 | 23.6 | 100.4 | 124.1 | 6 | 96 | 95 | 0 / 10 | A |
| 1119 | | 06/28/23 | P-19 | | CH | 18.4 | 105.0 | 23.1 | 99.9 | 123.0 | 6 | 95 | 95 | 0 / 10 | A |
| 1120 | | 06/28/23 | P-03 | | CH | 20.2 | 99.3 | 24.8 | 97.1 | 121.2 | 6 | 98 | 95 | 0 / 10 | A |
| 1121 | | 06/28/23 | P-16 | | CH | 20.2 | 101.8 | 25.1 | 99.0 | 123.8 | 6 | 97 | 95 | 0 / 10 | A |
| 1122 | | 06/28/23 | P-16 | | CH | 20.2 | 101.8 | 21.9 | 100.6 | 122.6 | 6 | 99 | 95 | 0 / 10 | A |
| 1123 | | 06/28/23 | P-19 | | CH | 18.4 | 105.0 | 21.3 | 102.5 | 124.3 | 6 | 98 | 95 | 0 / 10 | A |
| 1124 | | 06/28/23 | P-19 | | CH | 18.4 | 105.0 | 22.1 | 105.2 | 128.4 | 6 | 100 | 95 | 0 / 10 | A |
| 1125 | | 06/28/23 | P-16 | | CH | 20.2 | 101.8 | 23.9 | 99.5 | 123.3 | 6 | 98 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1118 | Select Clay: Wall Zone 24 | 107.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1119 | Select Clay: Wall Zone 25 | 107.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1120 | Select Clay: Wall Zone 26 | 107.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1121 | Select Clay: Wall Zone 27 | 107.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1122 | Select Clay: Wall Zone 16 | 107.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1123 | Select Clay: Wall Zone 17 | 107.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1124 | Select Clay: Wall Zone 23 | 108.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1125 | Select Clay: Wall Zone 24 | 108.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Bismarck, ND 58504
Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 06/29/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1126 | | 06/28/23 | P-16 | | CH | 20.2 | 101.8 | 23.6 | 101.4 | 125.3 | 6 | 100 | 95 | 0 / 10 | A |
| 1127 | | 06/28/23 | P-16 | | CH | 20.2 | 101.8 | 21.9 | 97.5 | 118.9 | 6 | 96 | 95 | 0 / 10 | A |
| 1128 | | 06/28/23 | P-16 | | CH | 20.2 | 101.8 | 23.3 | 99.4 | 122.6 | 6 | 98 | 95 | 0 / 10 | A |
| 1129 | | 06/28/23 | P-16 | | CH | 20.2 | 101.8 | 22.4 | 101.7 | 124.5 | 6 | 100 | 95 | 0 / 10 | A |
| 1130 | | 06/28/23 | P-16 | | CH | 20.2 | 101.8 | 22.4 | 100.2 | 122.6 | 6 | 98 | 95 | 0 / 10 | A |
| 1131 | | 06/28/23 | P-16 | | CH | 20.2 | 101.8 | 24.6 | 99.8 | 124.4 | 6 | 98 | 95 | 0 / 10 | A |
| 1132 | | 06/28/23 | P-03 | | CH | 20.2 | 99.3 | 26.2 | 96.5 | 121.8 | 6 | 97 | 95 | 0 / 10 | A |
| 1133 | | 06/28/23 | P-03 | | CH | 20.2 | 99.3 | 25.0 | 97.7 | 122.1 | 6 | 98 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1126 | Select Clay: Wall Zone 25 | 108.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1127 | Select Clay: Wall Zone 26 | 108.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1128 | Select Clay: Wall Zone 27 | 108.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1129 | Select Clay: Wall Zone 16 | 108.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1130 | Select Clay: Wall Zone 17 | 108.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1131 | Select Clay: Wall Zone 23 | 109.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1132 | Select Clay: Wall Zone 24 | 109.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1133 | Select Clay: Wall Zone 25 | 109.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Bismarck, ND 58504
Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 06/29/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1134 | | 06/28/23 | P-16 | | CH | 20.2 | 101.8 | 23.8 | 99.6 | 123.3 | 6 | 98 | 95 | 0 / 10 | A |
| 1135 | | 06/28/23 | P-16 | | CH | 20.2 | 101.8 | 25.1 | 97.6 | 122.1 | 6 | 96 | 95 | 0 / 10 | A |
| 1136 | | 06/28/23 | P-16 | | CH | 20.2 | 101.8 | 24.8 | 97.2 | 121.3 | 6 | 95 | 95 | 0 / 10 | A |
| 1137 | | 06/28/23 | P-03 | | CH | 20.2 | 99.3 | 24.3 | 95.2 | 118.3 | 6 | 96 | 95 | 0 / 10 | A |
| 1138 | | 06/28/23 | P-16 | | CH | 20.2 | 101.8 | 24.1 | 101.6 | 126.1 | 6 | 100 | 95 | 0 / 10 | A |
| 1139 | | 06/28/23 | P-16 | | CH | 20.2 | 101.8 | 24.9 | 98.7 | 123.3 | 6 | 97 | 95 | 0 / 10 | A |
| 1140 | | 06/28/23 | P-16 | | CH | 20.2 | 101.8 | 24.4 | 100.1 | 124.5 | 6 | 98 | 95 | 0 / 10 | A |
| 1141 | | 06/28/23 | P-16 | | CH | 20.2 | 101.8 | 23.0 | 100.4 | 123.5 | 6 | 99 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1134 | Select Clay: Wall Zone 26 | 109.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1135 | Select Clay: Wall Zone 27 | 109.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1136 | Select Clay: Wall Zone 16 | 109.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1137 | Select Clay: Wall Zone 17 | 109.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1138 | Select Clay: Wall Zone 23 | 110.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1139 | Select Clay: Wall Zone 24 | 110.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1140 | Select Clay: Wall Zone 25 | 110.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1141 | Select Clay: Wall Zone 26 | 110.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 06/29/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1142 | | 06/28/23 | P-16 | | CH | 20.2 | 101.8 | 23.4 | 98.8 | 121.9 | 6 | 97 | 95 | 0 / 10 | A |
| 1143 | | 06/28/23 | P-19 | | CH | 18.4 | 105.0 | 20.3 | 105.2 | 126.6 | 6 | 100 | 95 | 0 / 10 | A |
| 1144 | | 06/28/23 | P-19 | | CH | 18.4 | 105.0 | 21.2 | 101.1 | 122.5 | 6 | 96 | 95 | 0 / 10 | A |
| 1145 | | 06/28/23 | P-03 | | CH | 20.2 | 99.3 | 22.9 | 99.2 | 121.9 | 6 | 100 | 95 | 0 / 10 | A |
| 1146 | | 06/28/23 | P-03 | | CH | 20.2 | 99.3 | 24.7 | 96.9 | 120.8 | 6 | 98 | 95 | 0 / 10 | A |
| 1147 | | 06/28/23 | P-03 | | CH | 20.2 | 99.3 | 22.3 | 97.2 | 118.9 | 6 | 98 | 95 | 0 / 10 | A |
| 1148 | | 06/28/23 | P-03 | | CH | 20.2 | 99.3 | 24.4 | 96.3 | 119.8 | 6 | 97 | 95 | 0 / 10 | A |
| 1149 | | 06/28/23 | P-16 | | CH | 20.2 | 101.8 | 23.8 | 101.8 | 126.0 | 6 | 100 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1142 | Select Clay: Wall Zone 27 | 110.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1143 | Select Clay: Wall Zone 16 | 110.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1144 | Select Clay: Wall Zone 17 | 110.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1145 | Select Clay: Wall Zone 23 | 111.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1146 | Select Clay: Wall Zone 24 | 111.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1147 | Select Clay: Wall Zone 25 | 111.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1148 | Select Clay: Wall Zone 26 | 111.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1149 | Select Clay: Wall Zone 27 | 111.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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The Science You Build On.

2908 Morrison Ave.
Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 06/29/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1150 | | 06/28/23 | P-07 | | CH | 22.6 | 93.8 | 26.9 | 92.4 | 117.3 | 6 | 99 | 95 | 0 / 10 | A |
| 1151 | | 06/28/23 | P-16 | | CH | 20.2 | 101.8 | 23.6 | 100.3 | 124.0 | 6 | 99 | 95 | 0 / 10 | A |
| 1152 | | 06/28/23 | P-16 | | CH | 20.2 | 101.8 | 22.6 | 100.6 | 123.3 | 6 | 99 | 95 | 0 / 10 | A |
| 1153 | | 06/28/23 | P-03 | | CH | 20.2 | 99.3 | 24.3 | 96.3 | 119.7 | 6 | 97 | 95 | 0 / 10 | A |
| 1154 | | 06/28/23 | P-19 | | CH | 18.4 | 105.0 | 20.0 | 101.2 | 121.4 | 6 | 96 | 95 | 0 / 10 | A |
| 1155 | | 06/28/23 | P-19 | | CH | 18.4 | 105.0 | 19.8 | 102.6 | 122.9 | 6 | 98 | 95 | 0 / 10 | A |
| 1156 | | 06/28/23 | P-03 | | CH | 20.2 | 99.3 | 24.2 | 97.3 | 120.8 | 6 | 98 | 95 | 0 / 10 | A |
| 1157 | | 06/28/23 | P-07 | | CH | 22.6 | 93.8 | 27.2 | 92.7 | 117.9 | 6 | 99 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1150 | Select Clay: Wall Zone 16 | 111.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1151 | Select Clay: Wall Zone 17 | 111.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1152 | Select Clay: Wall Zone 23 | 112.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1153 | Select Clay: Wall Zone 24 | 112.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1154 | Select Clay: Wall Zone 25 | 112.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1155 | Select Clay: Wall Zone 26 | 112.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1156 | Select Clay: Wall Zone 27 | 112.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1157 | Select Clay: Wall Zone 16 | 112.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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2908 Morrison Ave.
Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 06/29/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1158 | | 06/28/23 | P-03 | | CH | 20.2 | 99.3 | 24.3 | 96.8 | 120.3 | 6 | 97 | 95 | 0 / 10 | A |
| 1159 | | 06/28/23 | P-19 | | CH | 18.4 | 105.0 | 20.7 | 102.6 | 123.8 | 12 | 98 | 95 | 0 / 10 | A |
| 1160 | | 06/28/23 | P-03 | | CH | 20.2 | 99.3 | 24.9 | 98.0 | 122.4 | 6 | 99 | 95 | 0 / 10 | A |
| 1161 | | 06/28/23 | P-03 | | CH | 20.2 | 99.3 | 25.0 | 99.2 | 124.0 | 12 | 100 | 95 | 0 / 10 | A |
| 1162 | | 06/28/23 | P-03 | | CH | 20.2 | 99.3 | 24.9 | 96.9 | 121.0 | 6 | 98 | 95 | 0 / 10 | A |
| 1163 | | 06/28/23 | P-16 | | CH | 20.2 | 101.8 | 21.8 | 99.6 | 121.3 | 6 | 98 | 95 | 0 / 10 | A |
| 1164 | | 06/28/23 | P-19 | | CH | 18.4 | 105.0 | 21.6 | 103.8 | 126.2 | 12 | 99 | 95 | 0 / 10 | A |
| 1165 | | 06/28/23 | P-19 | | CH | 18.4 | 105.0 | 20.9 | 105.3 | 127.3 | 12 | 100 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1158 | Select Clay: Wall Zone 17 | 112.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1159 | Select Clay: Wall Zone 23 | 113.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1160 | Select Clay: Wall Zone 23 | 114.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1161 | Select Clay: Wall Zone 24 | 113.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1162 | Select Clay: Wall Zone 24 | 114.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1163 | Select Clay: Wall Zone 25 | 114.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1164 | Select Clay: Wall Zone 25 | 113.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1165 | Select Clay: Wall Zone 26 | 113.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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Bismarck, ND 58504
Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 06/29/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1166 | | 06/28/23 | P-19 | | CH | 18.4 | 105.0 | 22.7 | 103.0 | 126.4 | 6 | 98 | 95 | 0 / 10 | A |
| 1167 | | 06/28/23 | P-03 | | CH | 20.2 | 99.3 | 28.3 | 95.0 | 121.9 | 10 | 96 | 95 | 0 / 10 | A |
| 1168 | | 06/28/23 | P-03 | | CH | 20.2 | 99.3 | 28.0 | 94.9 | 121.5 | 6 | 96 | 95 | 0 / 10 | A |
| 1169 | | 06/28/23 | P-16 | | CH | 20.2 | 101.8 | 21.0 | 100.2 | 121.2 | 12 | 98 | 95 | 0 / 10 | A |
| 1170 | | 06/28/23 | P-03 | | CH | 20.2 | 99.3 | 24.8 | 95.7 | 119.4 | 6 | 96 | 95 | 0 / 10 | A |
| 1171 | | 06/28/23 | P-08 | | CH | 24.4 | 97.0 | 24.8 | 93.6 | 116.8 | 10 | 96 | 95 | 0 / 10 | A |
| 1172 | | 06/28/23 | P-14 | | CH | 27.2 | 92.4 | 27.7 | 90.5 | 115.6 | 6 | 98 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1166 | Select Clay: Wall Zone 26 | 114.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1167 | Select Clay: Wall Zone 27 | 113.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1168 | Select Clay: Wall Zone 27 | 114.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1169 | Select Clay: Wall Zone 16 | 113.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1170 | Select Clay: Wall Zone 16 | 114.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1171 | Select Clay: Wall Zone 17 | 113.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1172 | Select Clay: Wall Zone 17 | 114.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Kurt Kuechle
06/29/2023

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 06/30/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1173 | | 06/29/23 | P-19 | | CH | 18.4 | 105.0 | 18.9 | 104.1 | 123.8 | 6 | 99 | 95 | 0 / 10 | A |
| 1174 | | 06/29/23 | P-19 | | CH | 18.4 | 105.0 | 20.0 | 101.6 | 121.9 | 6 | 97 | 95 | 0 / 10 | A |
| 1175 | | 06/29/23 | P-03 | | CH | 20.2 | 99.3 | 22.5 | 97.8 | 119.8 | 6 | 98 | 95 | 0 / 10 | A |
| 1176 | | 06/29/23 | P-03 | | CH | 20.2 | 99.3 | 24.4 | 97.8 | 121.7 | 6 | 98 | 95 | 0 / 10 | A |
| 1177 | | 06/29/23 | P-19 | | CH | 18.4 | 105.0 | 18.9 | 104.2 | 123.9 | 6 | 99 | 95 | 0 / 10 | A |
| 1178 | | 06/29/23 | P-19 | | CH | 18.4 | 105.0 | 20.5 | 103.7 | 125.0 | 6 | 99 | 95 | 0 / 10 | A |
| 1179 | | 06/29/23 | P-03 | | CH | 20.2 | 99.3 | 24.2 | 99.1 | 123.1 | 6 | 100 | 95 | 0 / 10 | A |
| 1180 | | 06/29/23 | P-21-std | A | CL | 18.1 | 106.3 | 20.5 | 105.6 | 127.3 | 6 | 99 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1173 | Select Clay: Wall Zone 23 | 115.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1174 | Select Clay: Wall Zone 24 | 115.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1175 | Select Clay: Wall Zone 25 | 115.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1176 | Select Clay: Wall Zone 26 | 115.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1177 | Select Clay: Wall Zone 27 | 115.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1178 | Select Clay: Wall Zone 16 | 115.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1179 | Select Clay: Wall Zone 17 | 115.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1180 | Select Clay: Wall Zone 23 | 116.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 06/30/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1181 | | 06/29/23 | P-19 | | CH | 18.4 | 105.0 | 18.9 | 104.1 | 123.8 | 6 | 99 | 95 | 0 / 10 | A |
| 1182 | | 06/29/23 | P-19 | | CH | 18.4 | 105.0 | 22.3 | 104.1 | 127.3 | 6 | 99 | 95 | 0 / 10 | A |
| 1183 | | 06/29/23 | P-19 | | CH | 18.4 | 105.0 | 20.1 | 103.9 | 124.8 | 6 | 99 | 95 | 0 / 10 | A |
| 1184 | | 06/29/23 | P-19 | | CH | 18.4 | 105.0 | 21.3 | 104.2 | 126.4 | 6 | 99 | 95 | 0 / 10 | A |
| 1185 | | 06/29/23 | P-19 | | CH | 18.4 | 105.0 | 21.2 | 101.4 | 122.9 | 6 | 97 | 95 | 0 / 10 | A |
| 1186 | | 06/29/23 | P-19 | | CH | 18.4 | 105.0 | 20.8 | 100.9 | 121.9 | 6 | 96 | 95 | 0 / 10 | A |
| 1187 | | 06/29/23 | P-19 | | CH | 18.4 | 105.0 | 20.9 | 103.0 | 124.5 | 6 | 98 | 95 | 0 / 10 | A |
| 1188 | | 06/29/23 | P-19 | | CH | 18.4 | 105.0 | 22.7 | 100.6 | 123.4 | 6 | 96 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1181 | Select Clay: Wall Zone 24 | 116.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1182 | Select Clay: Wall Zone 25 | 116.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1183 | Select Clay: Wall Zone 26 | 116.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1184 | Select Clay: Wall Zone 27 | 116.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1185 | Select Clay: Wall Zone 16 | 116.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1186 | Select Clay: Wall Zone 17 | 116.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1187 | Select Clay: Wall Zone 23 | 117.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1188 | Select Clay: Wall Zone 24 | 117.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Suite 3
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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 06/30/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1189 | | 06/29/23 | P-03 | | CH | 20.2 | 99.3 | 23.1 | 97.0 | 119.4 | 6 | 98 | 95 | 0 / 10 | A |
| 1190 | | 06/29/23 | P-07 | | CH | 22.6 | 93.8 | 27.5 | 93.4 | 119.1 | 6 | 100 | 95 | 0 / 10 | A |
| 1191 | | 06/29/23 | P-19 | | CH | 18.4 | 105.0 | 22.4 | 103.3 | 126.4 | 6 | 98 | 95 | 0 / 10 | A |
| 1192 | | 06/29/23 | P-19 | | CH | 18.4 | 105.0 | 21.5 | 100.8 | 122.5 | 6 | 96 | 95 | 0 / 10 | A |
| 1193 | | 06/29/23 | P-03 | | CH | 20.2 | 99.3 | 22.6 | 94.4 | 115.7 | 6 | 95 | 95 | 0 / 10 | A |
| 1194 | | 06/29/23 | P-03 | | CH | 20.2 | 99.3 | 24.2 | 95.8 | 119.0 | 6 | 96 | 95 | 0 / 10 | A |
| 1195 | | 06/29/23 | P-03 | | CH | 20.2 | 99.3 | 22.3 | 95.8 | 117.2 | 6 | 96 | 95 | 0 / 10 | A |
| 1196 | | 06/29/23 | P-07 | | CH | 22.6 | 93.8 | 22.7 | 92.7 | 113.7 | 6 | 99 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1189 | Select Clay: Wall Zone 25 | 117.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1190 | Select Clay: Wall Zone 26 | 117.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1191 | Select Clay: Wall Zone 27 | 117.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1192 | Select Clay: Wall Zone 16 | 117.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1193 | Select Clay: Wall Zone 17 | 117.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1194 | Select Clay: Wall Zone 23 | 118.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1195 | Select Clay: Wall Zone 24 | 118.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1196 | Select Clay: Wall Zone 25 | 118.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Bismarck, ND 58504
Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 06/30/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1197 | | 06/29/23 | P-19 | | CH | 18.4 | 105.0 | 21.6 | 103.5 | 125.9 | 6 | 99 | 95 | 0 / 10 | A |
| 1198 | | 06/29/23 | P-19 | | CH | 18.4 | 105.0 | 19.4 | 105.1 | 125.5 | 6 | 100 | 95 | 0 / 10 | A |
| 1199 | | 06/29/23 | P-19 | | CH | 18.4 | 105.0 | 19.4 | 105.1 | 125.5 | 6 | 100 | 95 | 0 / 10 | A |
| 1200 | | 06/29/23 | P-03 | | CH | 20.2 | 99.3 | 21.6 | 97.8 | 118.9 | 6 | 98 | 95 | 0 / 10 | A |
| 1201 | | 06/29/23 | P-03 | | CH | 20.2 | 99.3 | 23.2 | 94.7 | 116.7 | 6 | 95 | 95 | 0 / 10 | A |
| 1202 | | 06/29/23 | P-03 | | CH | 20.2 | 99.3 | 25.9 | 95.2 | 119.9 | 12 | 96 | 95 | 0 / 10 | A |
| 1203 | | 06/29/23 | P-19 | | CH | 18.4 | 105.0 | 23.6 | 99.8 | 123.4 | 6 | 95 | 95 | 0 / 10 | A |
| 1204 | | 06/29/23 | P-03 | | CH | 20.2 | 99.3 | 23.7 | 96.3 | 119.1 | 12 | 97 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1197 | Select Clay: Wall Zone 26 | 118.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1198 | Select Clay: Wall Zone 27 | 118.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1199 | Select Clay: Wall Zone 27 | 118.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1200 | Select Clay: Wall Zone 16 | 118.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1201 | Select Clay: Wall Zone 17 | 118.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1202 | Select Clay: Wall Zone 23 | 119.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1203 | Select Clay: Wall Zone 23 | 120.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1204 | Select Clay: Wall Zone 24 | 119.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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BRAUN INTERTEC
The Science You Build On.

2908 Morrison Ave.
Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 06/30/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1205 | | 06/29/23 | P-03 | | CH | 20.2 | 99.3 | 21.8 | 98.3 | 119.7 | 6 | 99 | 95 | 0 / 10 | A |
| 1206 | | 06/29/23 | P-03 | | CH | 20.2 | 99.3 | 23.0 | 99.6 | 122.5 | 12 | 100 | 95 | 0 / 10 | A |
| 1207 | | 06/29/23 | P-03 | | CH | 20.2 | 99.3 | 23.4 | 97.6 | 120.4 | 6 | 98 | 95 | 0 / 10 | A |
| 1208 | | 06/29/23 | P-19 | | CH | 18.4 | 105.0 | 19.1 | 102.8 | 122.4 | 12 | 98 | 95 | 0 / 10 | A |
| 1209 | | 06/29/23 | P-19 | | CH | 18.4 | 105.0 | 19.5 | 101.0 | 120.7 | 6 | 96 | 95 | 0 / 10 | A |
| 1210 | | 06/29/23 | P-03 | | CH | 20.2 | 99.3 | 21.1 | 99.4 | 120.4 | 12 | 100 | 95 | 0 / 10 | A |
| 1211 | | 06/29/23 | P-19 | | CH | 18.4 | 105.0 | 22.7 | 100.8 | 123.7 | 12 | 96 | 95 | 0 / 10 | A |
| 1212 | | 06/29/23 | P-03 | | CH | 20.2 | 99.3 | 24.0 | 95.3 | 118.2 | 10 | 96 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1205 | Select Clay: Wall Zone 24 | 120.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1206 | Select Clay: Wall Zone 25 | 119.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1207 | Select Clay: Wall Zone 25 | 120.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1208 | Select Clay: Wall Zone 26 | 119.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1209 | Select Clay: Wall Zone 26 | 120.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1210 | Select Clay: Wall Zone 27 | 119.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1211 | Select Clay: Wall Zone 27 | 120.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1212 | Select Clay: Wall Zone 16 | 119.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Bismarck, ND 58504
Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 06/30/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1213 | | 06/29/23 | P-03 | | CH | 20.2 | 99.3 | 22.4 | 95.5 | 116.9 | 6 | 96 | 95 | 0 / 10 | A |
| 1214 | | 06/29/23 | P-03 | | CH | 20.2 | 99.3 | 24.7 | 98.3 | 122.6 | 12 | 99 | 95 | 0 / 10 | A |
| 1215 | | 06/29/23 | P-03 | | CH | 20.2 | 99.3 | 24.4 | 97.4 | 121.2 | 6 | 98 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1213 | Select Clay: Wall Zone 16 | 120.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1214 | Select Clay: Wall Zone 17 | 119.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1215 | Select Clay: Wall Zone 17 | 120.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Kurt Kuechle
06/30/2023

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Bismarck, ND 58504
Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 07/05/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1216 | | 06/30/23 | P-19 | | CH | 18.4 | 105.0 | 21.8 | 101.8 | 124.0 | 6 | 97 | 95 | 0 / 10 | A |
| 1217 | | 06/30/23 | P-19 | | CH | 18.4 | 105.0 | 20.6 | 101.2 | 122.0 | 6 | 96 | 95 | 0 / 10 | A |
| 1218 | | 06/30/23 | P-19 | | CH | 18.4 | 105.0 | 20.2 | 104.5 | 125.6 | 6 | 100 | 95 | 0 / 10 | A |
| 1219 | | 06/30/23 | P-19 | | CH | 18.4 | 105.0 | 22.3 | 103.5 | 126.6 | 6 | 99 | 95 | 0 / 10 | A |
| 1220 | | 06/30/23 | P-19 | | CH | 18.4 | 105.0 | 19.5 | 104.6 | 125.0 | 6 | 100 | 95 | 0 / 10 | A |
| 1221 | | 06/30/23 | P-16 | | CH | 20.2 | 101.8 | 25.6 | 98.2 | 123.3 | 6 | 96 | 95 | 0 / 10 | A |
| 1222 | | 06/30/23 | P-19 | | CH | 18.4 | 105.0 | 21.0 | 102.7 | 124.3 | 6 | 98 | 95 | 0 / 10 | A |
| 1223 | | 06/30/23 | P-19 | | CH | 18.4 | 105.0 | 21.8 | 100.7 | 122.7 | 6 | 96 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1216 | Select Clay: Wall Zone 23 | 121.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1217 | Select Clay: Wall Zone 24 | 121.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1218 | Select Clay: Wall Zone 25 | 121.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1219 | Select Clay: Wall Zone 26 | 121.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1220 | Select Clay: Wall Zone 27 | 121.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1221 | Select Clay: Wall Zone 16 | 121.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1222 | Select Clay: Wall Zone 17 | 121.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1223 | Select Clay: Wall Zone 23 | 122.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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# Field Compaction Report

**Report Date:** 07/05/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1224 | | 06/30/23 | P-07 | | CH | 22.6 | 93.8 | 23.7 | 92.6 | 114.5 | 6 | 99 | 95 | 0 / 10 | A |
| 1225 | | 06/30/23 | P-10 | | CH | 25.0 | 94.6 | 26.1 | 94.4 | 119.0 | 6 | 100 | 95 | 0 / 10 | A |
| 1226 | | 06/30/23 | P-03 | | CH | 20.2 | 99.3 | 25.5 | 95.9 | 120.4 | 6 | 97 | 95 | 0 / 10 | A |
| 1227 | | 06/30/23 | P-19 | | CH | 18.4 | 105.0 | 22.5 | 100.9 | 123.6 | 6 | 96 | 95 | 0 / 10 | A |
| 1228 | | 06/30/23 | P-19 | | CH | 18.4 | 105.0 | 23.0 | 101.3 | 124.6 | 6 | 96 | 95 | 0 / 10 | A |
| 1229 | | 06/30/23 | P-19 | | CH | 18.4 | 105.0 | 23.8 | 100.9 | 124.9 | 6 | 96 | 95 | 0 / 10 | A |
| 1230 | | 06/30/23 | P-19 | | CH | 18.4 | 105.0 | 23.5 | 101.3 | 125.1 | 6 | 96 | 95 | 0 / 10 | A |
| 1231 | | 06/30/23 | P-19 | | CH | 18.4 | 105.0 | 22.6 | 100.0 | 122.6 | 6 | 95 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1224 | Select Clay: Wall Zone 23 | 123.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1225 | Select Clay: Wall Zone 24 | 122.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1226 | Select Clay: Wall Zone 24 | 123.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1227 | Select Clay: Wall Zone 25 | 122.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1228 | Select Clay: Wall Zone 25 | 123.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1229 | Select Clay: Wall Zone 26 | 122.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1230 | Select Clay: Wall Zone 26 | 123.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1231 | Select Clay: Wall Zone 27 | 122.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 07/05/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1232 | | 06/30/23 | P-19 | | CH | 18.4 | 105.0 | 21.2 | 102.9 | 124.7 | 6 | 98 | 95 | 0 / 10 | A |
| 1233 | | 06/30/23 | P-03 | | CH | 20.2 | 99.3 | 22.7 | 98.4 | 120.7 | 6 | 99 | 95 | 0 / 10 | A |
| 1234 | | 06/30/23 | P-03 | | CH | 20.2 | 99.3 | 23.1 | 96.1 | 118.3 | 6 | 97 | 95 | 0 / 10 | A |
| 1235 | | 06/30/23 | P-03 | | CH | 20.2 | 99.3 | 24.6 | 96.2 | 119.9 | 6 | 97 | 95 | 0 / 10 | A |
| 1236 | | 06/30/23 | P-19 | | CH | 18.4 | 105.0 | 20.9 | 100.9 | 122.0 | 6 | 96 | 95 | 0 / 10 | A |
| 1237 | | 06/30/23 | P-03 | | CH | 20.2 | 99.3 | 23.8 | 96.8 | 119.8 | 6 | 97 | 95 | 0 / 10 | A |
| 1238 | | 06/30/23 | P-03 | | CH | 20.2 | 99.3 | 24.6 | 97.7 | 121.7 | 6 | 98 | 95 | 0 / 10 | A |
| 1239 | | 06/30/23 | P-03 | | CH | 20.2 | 99.3 | 24.0 | 97.6 | 121.0 | 6 | 98 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1232 | Select Clay: Wall Zone 27 | 123.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1233 | Select Clay: Wall Zone 16 | 122.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1234 | Select Clay: Wall Zone 16 | 123.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1235 | Select Clay: Wall Zone 17 | 122.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1236 | Select Clay: Wall Zone 17 | 123.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1237 | Select Clay: Wall Zone 23 | 124.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1238 | Select Clay: Wall Zone 23 | 125.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1239 | Select Clay: Wall Zone 24 | 124.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 07/05/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1240 | | 06/30/23 | P-03 | | CH | 20.2 | 99.3 | 22.8 | 95.7 | 117.5 | 6 | 96 | 95 | 0 / 10 | A |
| 1241 | | 06/30/23 | P-19 | | CH | 18.4 | 105.0 | 22.6 | 101.9 | 124.9 | 6 | 97 | 95 | 0 / 10 | A |
| 1242 | | 06/30/23 | P-19 | | CH | 18.4 | 105.0 | 22.8 | 102.5 | 125.9 | 6 | 98 | 95 | 0 / 10 | A |
| 1243 | | 06/30/23 | P-03 | | CH | 20.2 | 99.3 | 24.4 | 97.2 | 120.9 | 6 | 98 | 95 | 0 / 10 | A |
| 1244 | | 06/30/23 | P-19 | | CH | 18.4 | 105.0 | 23.4 | 99.9 | 123.3 | 6 | 95 | 95 | 0 / 10 | A |
| 1245 | | 06/30/23 | P-19 | | CH | 18.4 | 105.0 | 21.2 | 103.8 | 125.8 | 6 | 99 | 95 | 0 / 10 | A |
| 1246 | | 06/30/23 | P-03 | | CH | 20.2 | 99.3 | 25.1 | 96.3 | 120.5 | 6 | 97 | 95 | 0 / 10 | A |
| 1247 | | 06/30/23 | P-19 | | CH | 18.4 | 105.0 | 21.5 | 103.1 | 125.3 | 6 | 98 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1240 | Select Clay: Wall Zone 24 | 125.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1241 | Select Clay: Wall Zone 25 | 124.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1242 | Select Clay: Wall Zone 25 | 125.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1243 | Select Clay: Wall Zone 26 | 124.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1244 | Select Clay: Wall Zone 26 | 125.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1245 | Select Clay: Wall Zone 27 | 124.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1246 | Select Clay: Wall Zone 27 | 125.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1247 | Select Clay: Wall Zone 16 | 124.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 07/05/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1248 | | 06/30/23 | P-19 | | CH | 18.4 | 105.0 | 21.1 | 100.8 | 122.1 | 6 | 96 | 95 | 0 / 10 | A |
| 1249 | | 06/30/23 | P-03 | | CH | 20.2 | 99.3 | 23.2 | 99.3 | 122.3 | 6 | 100 | 95 | 0 / 10 | A |
| 1250 | | 06/30/23 | P-19 | | CH | 18.4 | 105.0 | 22.7 | 101.8 | 124.9 | 6 | 97 | 95 | 0 / 10 | A |
| 1251 | | 06/30/23 | P-19 | | CH | 18.4 | 105.0 | 22.0 | 101.7 | 124.1 | 6 | 97 | 95 | 0 / 10 | A |
| 1252 | | 06/30/23 | P-13 | | CH | 21.7 | 97.9 | 23.1 | 93.4 | 115.0 | 6 | 95 | 95 | 0 / 10 | A |
| 1253 | | 06/30/23 | P-03 | | CH | 20.2 | 99.3 | 23.1 | 98.4 | 121.1 | 6 | 99 | 95 | 0 / 10 | A |
| 1254 | | 06/30/23 | P-19 | | CH | 18.4 | 105.0 | 22.0 | 103.3 | 126.0 | 6 | 98 | 95 | 0 / 10 | A |
| 1255 | | 06/30/23 | P-19 | | CH | 18.4 | 105.0 | 21.1 | 102.3 | 123.9 | 6 | 97 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1248 | Select Clay: Wall Zone 16 | 125.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1249 | Select Clay: Wall Zone 17 | 124.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1250 | Select Clay: Wall Zone 17 | 125.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1251 | Select Clay: Wall Zone 23 | 126.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1252 | Select Clay: Wall Zone 24 | 126.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1253 | Select Clay: Wall Zone 24 | 127.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1254 | Select Clay: Wall Zone 25 | 126.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1255 | Select Clay: Wall Zone 25 | 127.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 07/05/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1256 | | 06/30/23 | P-03 | | CH | 20.2 | 99.3 | 25.1 | 98.7 | 123.5 | 6 | 99 | 95 | 0 / 10 | A |
| 1257 | | 06/30/23 | P-19 | | CH | 18.4 | 105.0 | 22.1 | 101.3 | 123.7 | 6 | 96 | 95 | 0 / 10 | A |
| 1258 | | 06/30/23 | P-03 | | CH | 20.2 | 99.3 | 23.1 | 98.0 | 120.6 | 6 | 99 | 95 | 0 / 10 | A |
| 1259 | | 06/30/23 | P-03 | | CH | 20.2 | 99.3 | 23.8 | 96.9 | 120.0 | 6 | 98 | 95 | 0 / 10 | A |
| 1260 | | 06/30/23 | P-03 | | CH | 20.2 | 99.3 | 22.9 | 97.2 | 119.5 | 6 | 98 | 95 | 0 / 10 | A |
| 1261 | | 06/30/23 | P-21-std | A | CL | 18.1 | 106.3 | 21.3 | 105.4 | 127.8 | 6 | 99 | 95 | 0 / 10 | A |
| 1262 | | 06/30/23 | P-19 | | CH | 18.4 | 105.0 | 21.1 | 101.1 | 122.4 | 6 | 96 | 95 | 0 / 10 | A |
| 1263 | | 06/30/23 | P-19 | | CH | 18.4 | 105.0 | 20.9 | 103.2 | 124.8 | 6 | 98 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1256 | Select Clay: Wall Zone 26 | 126.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1257 | Select Clay: Wall Zone 26 | 127.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1258 | Select Clay: Wall Zone 27 | 126.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1259 | Select Clay: Wall Zone 16 | 126.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1260 | Select Clay: Wall Zone 17 | 126.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1261 | Select Clay: Wall Zone 23 | 127.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1262 | Select Clay: Wall Zone 24 | 128.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1263 | Select Clay: Wall Zone 24 | 129.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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The Science You Build On.

2908 Morrison Ave.
Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 07/05/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1264 | | 06/30/23 | P-19 | | CH | 18.4 | 105.0 | 21.2 | 100.7 | 122.0 | 6 | 96 | 95 | 0 / 10 | A |
| 1265 | | 06/30/23 | P-03 | | CH | 20.2 | 99.3 | 20.3 | 97.2 | 116.9 | 6 | 98 | 95 | 0 / 10 | A |
| 1266 | | 06/30/23 | P-19 | | CH | 18.4 | 105.0 | 21.7 | 100.7 | 122.6 | 6 | 96 | 95 | 0 / 10 | A |
| 1267 | | 06/30/23 | P-03 | | CH | 20.2 | 99.3 | 20.3 | 99.6 | 119.8 | 6 | 100 | 95 | 0 / 10 | A |
| 1268 | | 06/30/23 | P-19 | | CH | 18.4 | 105.0 | 18.7 | 100.2 | 118.9 | 6 | 95 | 95 | 0 / 10 | A |
| 1269 | | 06/30/23 | P-03 | | CH | 20.2 | 99.3 | 22.5 | 99.0 | 121.3 | 6 | 100 | 95 | 0 / 10 | A |
| 1270 | | 06/30/23 | P-21-std | A | CL | 18.1 | 106.3 | 19.8 | 105.6 | 126.5 | 6 | 99 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1264 | Select Clay: Wall Zone 25 | 128.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1265 | Select Clay: Wall Zone 25 | 129.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1266 | Select Clay: Wall Zone 26 | 128.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1267 | Select Clay: Wall Zone 26 | 129.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1268 | Select Clay: Wall Zone 27 | 127.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1269 | Select Clay: Wall Zone 16 | 127.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1270 | Select Clay: Wall Zone 17 | 127.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Kurt Kuechle
07/05/2023

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 07/06/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1271 | | 06/27/23 | P-19 | | CH | 18.4 | 105.0 | 21.8 | 104.9 | 127.8 | 4 | 100 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1271 | Select Clay: Wall Zone 25 | 104.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Kurt Kuechle
07/06/2023

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 07/18/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1272 | | 07/06/23 | P-21-std | A | CL | 18.1 | 106.3 | 19.5 | 107.3 | 128.2 | 6 | 101 | 95 | 0 / 10 | A |
| 1273 | | 07/06/23 | P-21-std | A | CL | 18.1 | 106.3 | 18.2 | 107.7 | 127.3 | 6 | 101 | 95 | 0 / 10 | A |
| 1274 | | 07/06/23 | P-16 | | CH | 20.2 | 101.8 | 22.7 | 100.2 | 122.9 | 6 | 98 | 95 | 0 / 10 | A |
| 1275 | | 07/06/23 | P-21-std | A | CL | 18.1 | 106.3 | 20.2 | 106.8 | 128.4 | 6 | 100 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1272 | Select Clay: Zone 16 | 128.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1273 | Select Clay: Zone 16 | 129.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1274 | Select Clay: Zone 17 | 128.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1275 | Select Clay: Zone 17 | 129.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Kurt Kuechle
07/18/2023

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 07/14/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1276 | | 07/13/23 | P-07 | | CH | 22.6 | 93.8 | 22.7 | 90.7 | 111.3 | 6 | 97 | 95 | -1 / 3 | A |
| 1277 | | 07/13/23 | P-01 | | CH | 19.4 | 100.8 | 19.7 | 96.4 | 115.4 | 6 | 96 | 95 | -1 / 3 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1276 | Select Clay: Wall Zone 23 | 128.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1277 | Select Clay: Wall Zone 23 | 129.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Kurt Kuechle
07/14/2023

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# Field Compaction Report

**Report Date:** 07/25/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1278 | | 07/14/23 | P-19 | | CH | 18.4 | 105.0 | 20.5 | 100.7 | 121.3 | 6 | 96 | 95 | 0 / 10 | A |
| 1279 | | 07/14/23 | P-19 | | CH | 18.4 | 105.0 | 21.3 | 100.2 | 121.5 | 6 | 95 | 95 | 0 / 10 | A |
| 1280 | | 07/14/23 | P-07 | | CH | 22.6 | 93.8 | 23.4 | 91.3 | 112.7 | 6 | 97 | 95 | 0 / 10 | A |
| 1281 | | 07/14/23 | P-19 | | CH | 18.4 | 105.0 | 18.7 | 104.9 | 124.5 | 6 | 100 | 95 | 0 / 10 | A |
| 1282 | | 07/14/23 | P-19 | | CH | 18.4 | 105.0 | 21.3 | 100.7 | 122.1 | 6 | 96 | 95 | 0 / 10 | A |
| 1283 | | 07/14/23 | P-19 | | CH | 18.4 | 105.0 | 19.4 | 102.4 | 122.3 | 6 | 98 | 95 | 0 / 10 | A |
| 1284 | | 07/14/23 | P-19 | | CH | 18.4 | 105.0 | 19.3 | 101.1 | 120.6 | 6 | 96 | 95 | 0 / 10 | A |
| 1285 | | 07/14/23 | P-19 | | CH | 18.4 | 105.0 | 21.2 | 101.9 | 123.5 | 6 | 97 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1278 | Select Clay: Wall Zone 27 | 128.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1279 | Select Clay: Wall Zone 27 | 129.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1280 | Select Clay: Wall Zone 27 | 130.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1281 | Select Clay: Wall Zone 26 | 130.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1282 | Select Clay: Wall Zone 26 | 131.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1283 | Select Clay: Wall Zone 26 | 132.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1284 | Select Clay: Wall Zone 25 | 130.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1285 | Select Clay: Wall Zone 25 | 131.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 07/25/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1286 | | 07/14/23 | P-19 | | CH | 18.4 | 105.0 | 22.1 | 103.3 | 126.1 | 6 | 98 | 95 | 0 / 10 | A |
| 1287 | | 07/14/23 | P-19 | | CH | 18.4 | 105.0 | 21.2 | 102.6 | 124.3 | 6 | 98 | 95 | 0 / 10 | A |
| 1288 | | 07/14/23 | P-19 | | CH | 18.4 | 105.0 | 18.4 | 103.3 | 122.3 | 6 | 98 | 95 | 0 / 10 | A |
| 1289 | | 07/14/23 | P-21-std | A | CL | 18.1 | 106.3 | 19.4 | 107.9 | 128.8 | 6 | 102 | 95 | 0 / 10 | A |
| 1290 | | 07/14/23 | P-19 | | CH | 18.4 | 105.0 | 21.8 | 102.2 | 124.5 | 6 | 97 | 95 | 0 / 10 | A |
| 1291 | | 07/14/23 | P-19 | | CH | 18.4 | 105.0 | 21.2 | 103.7 | 125.7 | 6 | 99 | 95 | 0 / 10 | A |
| 1292 | | 07/14/23 | P-19 | | CH | 18.4 | 105.0 | 21.9 | 102.2 | 124.6 | 6 | 97 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1286 | Select Clay: Wall Zone 25 | 132.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1287 | Select Clay: Wall Zone 24 | 130.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1288 | Select Clay: Wall Zone 24 | 131.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1289 | Select Clay: Wall Zone 24 | 132.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1290 | Select Clay: Wall Zone 23 | 130.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1291 | Select Clay: Wall Zone 16 | 130.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1292 | Select Clay: Wall Zone 17 | 130.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Kurt Kuechle
07/25/2023

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 07/25/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1293 | | 07/24/23 | P-03 | | CH | 20.2 | 99.3 | 25.5 | 96.2 | 120.7 | 6 | 97 | 95 | 0 / 10 | A |
| 1294 | | 07/24/23 | P-03 | | CH | 20.2 | 99.3 | 21.3 | 96.1 | 116.6 | 6 | 97 | 95 | 0 / 10 | A |
| 1295 | | 07/24/23 | P-03 | | CH | 20.2 | 99.3 | 23.1 | 96.9 | 119.3 | 6 | 98 | 95 | 0 / 10 | A |
| 1296 | | 07/24/23 | P-07 | | CH | 22.6 | 93.8 | 27.6 | 93.4 | 119.2 | 6 | 100 | 95 | 0 / 10 | A |
| 1297 | | 07/24/23 | P-03 | | CH | 20.2 | 99.3 | 22.6 | 95.5 | 117.1 | 6 | 96 | 95 | 0 / 10 | A |
| 1298 | | 07/24/23 | P-03 | | CH | 20.2 | 99.3 | 21.9 | 99.6 | 121.4 | 6 | 100 | 95 | 0 / 10 | A |
| 1299 | | 07/24/23 | P-01 | | CH | 19.4 | 100.8 | 22.9 | 100.2 | 123.1 | 6 | 99 | 95 | 0 / 10 | A |
| 1300 | | 07/24/23 | P-01 | | CH | 19.4 | 100.8 | 23.8 | 96.9 | 120.0 | 6 | 96 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1293 | Select Clay: Wall Zone 20 | 1.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1294 | Select Clay: Wall Zone 52 | 1.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1295 | Select Clay: Wall Zone 53 | 1.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1296 | Select Clay: Wall Zone 20 | 2.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1297 | Select Clay: Wall Zone 52 | 2.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1298 | Select Clay: Wall Zone 53 | 2.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1299 | Select Clay: Wall Zone 20 | 3.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1300 | Select Clay: Wall Zone 52 | 3.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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# Field Compaction Report

**Report Date:** 08/07/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1301 | | 07/24/23 | P-03 | | CH | 20.2 | 99.3 | 21.9 | 97.5 | 118.9 | 6 | 98 | 95 | 0 / 10 | A |
| 1302 | | 07/24/23 | P-03 | | CH | 20.2 | 99.3 | 23.1 | 96.8 | 119.2 | 6 | 97 | 95 | 0 / 10 | A |
| 1303 | | 07/24/23 | P-03 | | CH | 20.2 | 99.3 | 22.4 | 96.3 | 117.9 | 6 | 97 | 95 | 0 / 10 | A |
| 1304 | | 07/24/23 | P-03 | | CH | 20.2 | 99.3 | 23.6 | 98.5 | 121.7 | 6 | 99 | 95 | 0 / 10 | A |
| 1305 | | 07/24/23 | P-03 | | CH | 20.2 | 99.3 | 23.1 | 97.2 | 119.7 | 6 | 98 | 95 | 0 / 10 | A |
| 1306 | | 07/24/23 | P-07 | | CH | 22.6 | 93.8 | 27.6 | 91.7 | 117.0 | 6 | 98 | 95 | 0 / 10 | A |
| 1307 | | 07/24/23 | P-01 | | CH | 19.4 | 100.8 | 24.0 | 100.3 | 124.4 | 6 | 100 | 95 | 0 / 10 | A |
| 1308 | | 07/24/23 | P-03 | | CH | 20.2 | 99.3 | 23.7 | 97.6 | 120.7 | 6 | 98 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1301 | Select Clay: Wall Zone 53 | 3.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1302 | Select Clay: Wall Zone 20 | 4.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1303 | Select Clay: Wall Zone 52 | 4.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1304 | Select Clay: Wall Zone 53 | 4.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1305 | Select Clay: Wall Zone 20 | 5.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1306 | Select Clay: Wall Zone 52 | 5.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1307 | Select Clay: Wall Zone 53 | 5.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1308 | Select Clay: Wall Zone 20 | 6.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

BRAUN INTERTEC
The Science You Build On.

2908 Morrison Ave.
Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/07/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1309 | | 07/24/23 | P-16 | | CH | 20.2 | 101.8 | 24.0 | 101.7 | 126.1 | 6 | 100 | 95 | 0 / 10 | A |
| 1310 | | 07/24/23 | P-03 | | CH | 20.2 | 99.3 | 23.6 | 99.3 | 122.7 | 6 | 100 | 95 | 0 / 10 | A |
| 1311 | | 07/24/23 | P-03 | | CH | 20.2 | 99.3 | 23.7 | 99.4 | 123.0 | 6 | 100 | 95 | 0 / 10 | A |
| 1312 | | 07/24/23 | P-19 | | CH | 18.4 | 105.0 | 19.1 | 105.0 | 125.1 | 6 | 100 | 95 | 0 / 10 | A |
| 1313 | | 07/24/23 | P-03 | | CH | 20.2 | 99.3 | 24.1 | 97.5 | 121.0 | 6 | 98 | 95 | 0 / 10 | A |
| 1314 | | 07/24/23 | P-05 | | CH | 24.5 | 96.2 | 27.1 | 94.2 | 119.7 | 6 | 98 | 95 | 0 / 10 | A |
| 1315 | | 07/24/23 | P-14 | | CH | 27.2 | 92.4 | 29.4 | 91.2 | 118.0 | 6 | 99 | 95 | 0 / 10 | A |
| 1316 | | 07/24/23 | P-07 | | CH | 22.6 | 93.8 | 25.8 | 93.5 | 117.6 | 6 | 100 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1309 | Select Clay: Wall Zone 52 | 6.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1310 | Select Clay: Wall Zone 53 | 6.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1311 | Select Clay: Wall Zone 54 | 1.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1312 | Select Clay: Wall Zone 55 | 1.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1313 | Select Clay: Wall Zone 20 | 7.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1314 | Select Clay: Wall Zone 52 | 7.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1315 | Select Clay: Wall Zone 53 | 7.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1316 | Select Clay: Wall Zone 54 | 2.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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2908 Morrison Ave.
Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/07/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1317 | | 07/24/23 | P-14 | | CH | 27.2 | 92.4 | 28.0 | 90.4 | 115.7 | 6 | 98 | 95 | 0 / 10 | A |
| 1318 | | 07/24/23 | P-03 | | CH | 20.2 | 99.3 | 24.7 | 96.5 | 120.3 | 6 | 97 | 95 | 0 / 10 | A |
| 1319 | | 07/24/23 | P-15 | | CH | 24.1 | 98.6 | 24.7 | 94.0 | 117.2 | 6 | 95 | 95 | 0 / 10 | A |
| 1320 | | 07/24/23 | P-16 | | CH | 20.2 | 101.8 | 21.3 | 101.2 | 122.8 | 6 | 99 | 95 | 0 / 10 | A |
| 1321 | | 07/24/23 | P-03 | | CH | 20.2 | 99.3 | 22.3 | 97.8 | 119.6 | 6 | 98 | 95 | 0 / 10 | A |
| 1322 | | 07/24/23 | P-03 | | CH | 20.2 | 99.3 | 24.6 | 98.3 | 122.5 | 6 | 99 | 95 | 0 / 10 | A |
| 1323 | | 07/24/23 | P-07 | | CH | 22.6 | 93.8 | 25.6 | 90.7 | 113.9 | 6 | 97 | 95 | 0 / 10 | A |
| 1324 | | 07/24/23 | P-19 | | CH | 18.4 | 105.0 | 19.7 | 102.5 | 122.7 | 6 | 98 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1317 | Select Clay: Wall Zone 55 | 2.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1318 | Select Clay: Wall Zone 20 | 8.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1319 | Select Clay: Wall Zone 52 | 8.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1320 | Select Clay: Wall Zone 53 | 8.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1321 | Select Clay: Wall Zone 54 | 3.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1322 | Select Clay: Wall Zone 55 | 3.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1323 | Select Clay: Wall Zone 20 | 9.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1324 | Select Clay: Wall Zone 52 | 9.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/07/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1325 | | 07/24/23 | P-19 | | CH | 18.4 | 105.0 | 22.0 | 102.5 | 125.1 | 6 | 98 | 95 | 0 / 10 | A |
| 1326 | | 07/24/23 | P-03 | | CH | 20.2 | 99.3 | 22.6 | 97.6 | 119.7 | 6 | 98 | 95 | 0 / 10 | A |
| 1327 | | 07/24/23 | P-05 | | CH | 24.5 | 96.2 | 28.0 | 93.1 | 119.2 | 6 | 97 | 95 | 0 / 10 | A |
| 1328 | | 07/25/23 | P-19 | | CH | 18.4 | 105.0 | 21.9 | 104.0 | 126.8 | 6 | 99 | 95 | 0 / 10 | A |
| 1329 | | 07/25/23 | P-19 | | CH | 18.4 | 105.0 | 20.7 | 101.4 | 122.4 | 6 | 97 | 95 | 0 / 10 | A |
| 1330 | | 07/25/23 | P-03 | | CH | 20.2 | 99.3 | 20.8 | 98.7 | 119.2 | 6 | 99 | 95 | 0 / 10 | A |
| 1331 | | 07/25/23 | P-03 | | CH | 20.2 | 99.3 | 24.1 | 99.4 | 123.4 | 6 | 100 | 95 | 0 / 10 | A |
| 1332 | | 07/25/23 | P-19 | | CH | 18.4 | 105.0 | 18.9 | 99.8 | 118.7 | 6 | 95 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1325 | Select Clay: Wall Zone 53 | 9.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1326 | Select Clay: Wall Zone 54 | 4.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1327 | Select Clay: Wall Zone 55 | 4.0 | Lift Number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1328 | Select Clay: Wall Zone 20 | 10.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1329 | Select Clay: Wall Zone 52 | 10.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1330 | Select Clay: Wall Zone 53 | 10.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1331 | Select Clay: Wall Zone 54 | 5.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1332 | Select Clay: Wall Zone 55 | 5.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/07/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1333 | | 07/25/23 | P-03 | | CH | 20.2 | 99.3 | 25.6 | 99.4 | 124.8 | 6 | 100 | 95 | 0 / 10 | A |
| 1334 | | 07/25/23 | P-19 | | CH | 18.4 | 105.0 | 24.1 | 101.2 | 125.6 | 6 | 96 | 95 | 0 / 10 | A |
| 1335 | | 07/25/23 | P-19 | | CH | 18.4 | 105.0 | 21.9 | 102.4 | 124.8 | 6 | 98 | 95 | 0 / 10 | A |
| 1336 | | 07/25/23 | P-03 | | CH | 20.2 | 99.3 | 25.1 | 97.5 | 122.0 | 6 | 98 | 95 | 0 / 10 | A |
| 1337 | | 07/25/23 | P-03 | | CH | 20.2 | 99.3 | 26.1 | 97.7 | 123.2 | 6 | 98 | 95 | 0 / 10 | A |
| 1338 | | 07/25/23 | P-16 | | CH | 20.2 | 101.8 | 24.5 | 100.9 | 125.6 | 6 | 99 | 95 | 0 / 10 | A |
| 1339 | | 07/25/23 | P-03 | | CH | 20.2 | 99.3 | 24.8 | 96.7 | 120.7 | 6 | 97 | 95 | 0 / 10 | A |
| 1340 | | 07/25/23 | P-16 | | CH | 20.2 | 101.8 | 24.4 | 100.6 | 125.1 | 6 | 99 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1333 | Select Clay: Wall Zone 20 | 11.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1334 | Select Clay: Wall Zone 52 | 11.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1335 | Select Clay: Wall Zone 53 | 11.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1336 | Select Clay: Wall Zone 54 | 6.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1337 | Select Clay: Wall Zone 55 | 6.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1338 | Select Clay: Wall Zone 20 | 12.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1339 | Select Clay: Wall Zone 52 | 12.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1340 | Select Clay: Wall Zone 53 | 12.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/07/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1341 | | 07/25/23 | P-16 | | CH | 20.2 | 101.8 | 24.0 | 101.1 | 125.4 | 6 | 99 | 95 | 0 / 10 | A |
| 1342 | | 07/25/23 | P-03 | | CH | 20.2 | 99.3 | 22.1 | 96.7 | 118.1 | 6 | 97 | 95 | 0 / 10 | A |
| 1343 | | 07/25/23 | P-16 | | CH | 20.2 | 101.8 | 22.6 | 101.7 | 124.7 | 6 | 100 | 95 | 0 / 10 | A |
| 1344 | | 07/25/23 | P-03 | | CH | 20.2 | 99.3 | 25.5 | 96.1 | 120.6 | 6 | 97 | 95 | 0 / 10 | A |
| 1345 | | 07/25/23 | P-16 | | CH | 20.2 | 101.8 | 22.3 | 100.2 | 122.5 | 6 | 98 | 95 | 0 / 10 | A |
| 1346 | | 07/25/23 | P-03 | | CH | 20.2 | 99.3 | 24.9 | 99.0 | 123.7 | 6 | 100 | 95 | 0 / 10 | A |
| 1347 | | 07/25/23 | P-03 | | CH | 20.2 | 99.3 | 24.9 | 96.5 | 120.5 | 6 | 97 | 95 | 0 / 10 | A |
| 1348 | | 07/25/23 | P-16 | | CH | 20.2 | 101.8 | 14.7 | 101.7 | 116.7 | 6 | 100 | 95 | NA | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1341 | Select Clay: Wall Zone 54 | 7.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1342 | Select Clay: Wall Zone 55 | 7.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1343 | Select Clay: Wall Zone 20 | 13.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1344 | Select Clay: Wall Zone 52 | 13.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1345 | Select Clay: Wall Zone 53 | 13.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1346 | Select Clay: Wall Zone 54 | 8.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1347 | Select Clay: Wall Zone 55 | 8.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1348 | Select Clay: Anchor Trench in Zone 25 | 2,080.0 | Sea level = 0 | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Bismarck, ND 58504
Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/07/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1349 | | 07/25/23 | P-19 | | CH | 18.4 | 105.0 | 18.6 | 99.9 | 118.5 | 6 | 95 | 95 | NA | A |
| 1350 | | 07/25/23 | P-16 | | CH | 20.2 | 101.8 | 14.0 | 100.4 | 114.5 | 6 | 99 | 95 | NA | A |
| 1351 | | 07/25/23 | P-03 | | CH | 20.2 | 99.3 | 13.8 | 96.6 | 109.9 | 6 | 97 | 95 | NA | A |
| 1352 | | 07/25/23 | P-07 | | CH | 22.6 | 93.8 | 16.3 | 90.0 | 104.7 | 6 | 96 | 95 | NA | A |
| 1353 | | 07/25/23 | P-03 | | CH | 20.2 | 99.3 | 24.8 | 97.2 | 121.3 | 6 | 98 | 95 | 0 / 10 | A |
| 1354 | | 07/25/23 | P-03 | | CH | 20.2 | 99.3 | 25.3 | 99.0 | 124.0 | 6 | 100 | 95 | 0 / 10 | A |
| 1355 | | 07/25/23 | P-03 | | CH | 20.2 | 99.3 | 22.1 | 97.9 | 119.5 | 6 | 99 | 95 | 0 / 10 | A |
| 1356 | | 07/25/23 | P-19 | | CH | 18.4 | 105.0 | 18.9 | 100.6 | 119.6 | 6 | 96 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1349 | Select Clay: Anchor Trench in Zone 26 | 2,080.0 | Sea level = 0 | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1350 | Select Clay: Anchor Trench in Zone 27 | 2,080.0 | Sea level = 0 | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1351 | Select Clay: Anchor Trench in Zone 16 | 2,080.0 | Sea level = 0 | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1352 | Select Clay: Anchor Trench in Zone 17 | 2,080.0 | Sea level = 0 | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1353 | Select Clay: Wall Zone 20 | 14.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1354 | Select Clay: Wall Zone 52 | 14.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1355 | Select Clay: Wall Zone 53 | 14.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1356 | Select Clay: Wall Zone 54 | 9.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/07/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1357 | | 07/25/23 | P-19 | | CH | 18.4 | 105.0 | 19.4 | 104.1 | 124.3 | 6 | 99 | 95 | 0 / 10 | A |
| 1358 | | 07/25/23 | P-19 | | CH | 18.4 | 105.0 | 21.2 | 102.6 | 124.3 | 6 | 98 | 95 | 0 / 10 | A |
| 1359 | | 07/25/23 | P-19 | | CH | 18.4 | 105.0 | 21.8 | 101.5 | 123.6 | 6 | 97 | 95 | 0 / 10 | A |
| 1360 | | 07/25/23 | P-19 | | CH | 18.4 | 105.0 | 21.9 | 102.0 | 124.3 | 6 | 97 | 95 | 0 / 10 | A |
| 1361 | | 07/25/23 | P-19 | | CH | 18.4 | 105.0 | 22.8 | 102.0 | 125.3 | 6 | 97 | 95 | 0 / 10 | A |
| 1362 | | 07/25/23 | P-03 | | CH | 20.2 | 99.3 | 24.3 | 96.2 | 119.6 | 6 | 97 | 95 | 0 / 10 | A |
| 1363 | | 07/25/23 | P-19 | | CH | 18.4 | 105.0 | 23.2 | 101.0 | 124.4 | 6 | 96 | 95 | 0 / 10 | A |
| 1364 | | 07/25/23 | P-19 | | CH | 18.4 | 105.0 | 21.2 | 105.4 | 127.7 | 6 | 100 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1357 | Select Clay: Wall Zone 55 | 9.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1358 | Select Clay: Wall Zone 20 | 15.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1359 | Select Clay: Wall Zone 52 | 15.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1360 | Select Clay: Wall Zone 53 | 15.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1361 | Select Clay: Wall Zone 54 | 10.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1362 | Select Clay: Wall Zone 55 | 10.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1363 | Select Clay: Wall Zone 20 | 16.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1364 | Select Clay: Wall Zone 52 | 16.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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2908 Morrison Ave.
Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/07/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1365 | | 07/25/23 | P-03 | | CH | 20.2 | 99.3 | 21.5 | 99.6 | 121.0 | 6 | 100 | 95 | 0 / 10 | A |
| 1366 | | 07/25/23 | P-19 | | CH | 18.4 | 105.0 | 22.7 | 101.7 | 124.8 | 6 | 97 | 95 | 0 / 10 | A |
| 1367 | | 07/25/23 | P-19 | | CH | 18.4 | 105.0 | 24.3 | 100.4 | 124.8 | 6 | 96 | 95 | 0 / 10 | A |
| 1368 | | 07/25/23 | P-19 | | CH | 18.4 | 105.0 | 20.8 | 104.0 | 125.6 | 6 | 99 | 95 | 0 / 10 | A |
| 1369 | | 07/25/23 | P-19 | | CH | 18.4 | 105.0 | 23.0 | 100.2 | 123.2 | 6 | 95 | 95 | 0 / 10 | A |
| 1370 | | 07/25/23 | P-03 | | CH | 20.2 | 99.3 | 24.4 | 97.3 | 121.0 | 6 | 98 | 95 | 0 / 10 | A |
| 1371 | | 07/25/23 | P-19 | | CH | 18.4 | 105.0 | 23.0 | 100.5 | 123.6 | 6 | 96 | 95 | 0 / 10 | A |
| 1372 | | 07/25/23 | P-19 | | CH | 18.4 | 105.0 | 22.8 | 102.3 | 125.6 | 6 | 97 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1365 | Select Clay: Wall Zone 53 | 16.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1366 | Select Clay: Wall Zone 54 | 11.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1367 | Select Clay: Wall Zone 55 | 11.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1368 | Select Clay: Wall Zone 20 | 17.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1369 | Select Clay: Wall Zone 52 | 17.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1370 | Select Clay: Wall Zone 53 | 17.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1371 | Select Clay: Wall Zone 54 | 12.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1372 | Select Clay: Wall Zone 55 | 12.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Bismarck, ND 58504
Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/07/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1373 | | 07/25/23 | P-03 | | CH | 20.2 | 99.3 | 20.7 | 98.2 | 118.5 | 6 | 99 | 95 | 0 / 10 | A |
| 1374 | | 07/25/23 | P-07 | | CH | 22.6 | 93.8 | 26.9 | 90.6 | 115.0 | 6 | 97 | 95 | 0 / 10 | A |
| 1375 | | 07/25/23 | P-19 | | CH | 18.4 | 105.0 | 21.7 | 102.7 | 125.0 | 6 | 98 | 95 | 0 / 10 | A |
| 1376 | | 07/25/23 | P-03 | | CH | 20.2 | 99.3 | 24.7 | 96.3 | 120.1 | 6 | 97 | 95 | 0 / 10 | A |
| 1377 | | 07/25/23 | P-03 | | CH | 20.2 | 99.3 | 23.6 | 98.8 | 122.1 | 6 | 99 | 95 | 0 / 10 | A |
| 1378 | | 07/25/23 | P-07 | | CH | 22.6 | 93.8 | 25.4 | 93.4 | 117.1 | 6 | 100 | 95 | 0 / 10 | A |
| 1379 | | 07/25/23 | P-03 | | CH | 20.2 | 99.3 | 24.6 | 98.9 | 123.2 | 6 | 100 | 95 | 0 / 10 | A |
| 1380 | | 07/25/23 | P-19 | | CH | 18.4 | 105.0 | 21.7 | 104.6 | 127.3 | 6 | 100 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1373 | Select Clay: Wall Zone 20 | 18.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1374 | Select Clay: Wall Zone 52 | 18.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1375 | Select Clay: Wall Zone 53 | 18.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1376 | Select Clay: Wall Zone 54 | 13.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1377 | Select Clay: Wall Zone 55 | 13.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1378 | Select Clay: Wall Zone 20 | 19.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1379 | Select Clay: Wall Zone 52 | 19.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1380 | Select Clay: Wall Zone 53 | 19.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/07/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1381 | | 07/25/23 | P-19 | | CH | 18.4 | 105.0 | 18.7 | 104.5 | 124.0 | 6 | 100 | 95 | 0 / 10 | A |
| 1382 | | 07/25/23 | P-03 | | CH | 20.2 | 99.3 | 26.2 | 94.8 | 119.6 | 6 | 95 | 95 | 0 / 10 | A |
| 1383 | | 07/25/23 | P-19 | | CH | 18.4 | 105.0 | 24.3 | 99.8 | 124.1 | 6 | 95 | 95 | 0 / 10 | A |
| 1384 | | 07/25/23 | P-19 | | CH | 18.4 | 105.0 | 22.7 | 102.9 | 126.3 | 6 | 98 | 95 | 0 / 10 | A |
| 1385 | | 07/25/23 | P-03 | | CH | 20.2 | 99.3 | 21.8 | 99.7 | 121.4 | 6 | 100 | 95 | 0 / 10 | A |
| 1386 | | 07/25/23 | P-19 | | CH | 18.4 | 105.0 | 23.1 | 101.5 | 124.9 | 6 | 97 | 95 | 0 / 10 | A |
| 1387 | | 07/25/23 | P-07 | | CH | 22.6 | 93.8 | 23.8 | 92.6 | 114.6 | 6 | 99 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1381 | Select Clay: Wall Zone 55 | 14.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1382 | Select Clay: Wall Zone 54 | 14.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1383 | Select Clay: Wall Zone 20 | 20.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1384 | Select Clay: Wall Zone 52 | 20.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1385 | Select Clay: Wall Zone 53 | 20.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1386 | Select Clay: Wall Zone 54 | 15.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1387 | Select Clay: Wall Zone 55 | 15.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Kurt Kuechle
08/07/2023

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/09/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1388 | | 07/26/23 | P-19 | | CH | 18.4 | 105.0 | 22.5 | 101.0 | 123.7 | 6 | 96 | 95 | 0 / 10 | A |
| 1389 | | 07/26/23 | P-19 | | CH | 18.4 | 105.0 | 20.0 | 103.6 | 124.3 | 6 | 99 | 95 | 0 / 10 | A |
| 1390 | | 07/26/23 | P-21-std | A | CL | 18.1 | 106.3 | 21.4 | 106.0 | 128.7 | 6 | 100 | 95 | 0 / 10 | A |
| 1391 | | 07/26/23 | P-21-std | A | CL | 18.1 | 106.3 | 18.9 | 105.7 | 125.7 | 6 | 99 | 95 | 0 / 10 | A |
| 1392 | | 07/26/23 | P-21-std | A | CL | 18.1 | 106.3 | 22.0 | 101.4 | 123.7 | 6 | 95 | 95 | 0 / 10 | A |
| 1393 | | 07/26/23 | P-19 | | CH | 18.4 | 105.0 | 23.2 | 100.5 | 123.8 | 6 | 96 | 95 | 0 / 10 | A |
| 1394 | | 07/26/23 | P-19 | | CH | 18.4 | 105.0 | 21.4 | 104.1 | 126.4 | 6 | 99 | 95 | 0 / 10 | A |
| 1395 | | 07/26/23 | P-19 | | CH | 18.4 | 105.0 | 21.6 | 104.0 | 126.5 | 6 | 99 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1388 | Select Clay: Wall Zone 20 | 21.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1389 | Select Clay: Wall Zone 52 | 21.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1390 | Select Clay: Wall Zone 53 | 21.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1391 | Select Clay: Wall Zone 54 | 16.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1392 | Select Clay: Wall Zone 55 | 16.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1393 | Select Clay: Wall Zone 20 | 22.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1394 | Select Clay: Wall Zone 52 | 22.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1395 | Select Clay: Wall Zone 53 | 22.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/09/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1396 | | 07/26/23 | P-03 | | CH | 20.2 | 99.3 | 23.1 | 99.2 | 122.1 | 6 | 100 | 95 | 0 / 10 | A |
| 1397 | | 07/26/23 | P-19 | | CH | 18.4 | 105.0 | 20.4 | 101.7 | 122.4 | 6 | 97 | 95 | 0 / 10 | A |
| 1398 | | 07/26/23 | P-03 | | CH | 20.2 | 99.3 | 23.3 | 98.7 | 121.7 | 6 | 99 | 95 | 0 / 10 | A |
| 1399 | | 07/26/23 | P-19 | | CH | 18.4 | 105.0 | 21.7 | 100.4 | 122.2 | 6 | 96 | 95 | 0 / 10 | A |
| 1400 | | 07/26/23 | P-03 | | CH | 20.2 | 99.3 | 24.6 | 97.3 | 121.2 | 6 | 98 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1396 | Select Clay: Wall Zone 54 | 17.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1397 | Select Clay: Wall Zone 55 | 17.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1398 | Select Clay: Wall Zone 20 | 23.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1399 | Select Clay: Wall Zone 52 | 23.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1400 | Select Clay: Wall Zone 53 | 23.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Kurt Kuechle
08/09/2023

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/09/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1401 | | 07/26/23 | P-03 | | CH | 20.2 | 99.3 | 24.7 | 96.1 | 119.8 | 6 | 97 | 95 | 0 / 10 | A |
| 1402 | | 07/26/23 | P-07 | | CH | 22.6 | 93.8 | 26.1 | 91.7 | 115.6 | 6 | 98 | 95 | 0 / 10 | A |
| 1403 | | 07/26/23 | P-03 | | CH | 20.2 | 99.3 | 23.4 | 98.5 | 121.5 | 6 | 99 | 95 | 0 / 10 | A |
| 1404 | | 07/26/23 | P-19 | | CH | 18.4 | 105.0 | 23.0 | 99.9 | 122.9 | 6 | 95 | 95 | 0 / 10 | A |
| 1405 | | 07/26/23 | P-07 | | CH | 22.6 | 93.8 | 25.6 | 92.7 | 116.4 | 6 | 99 | 95 | 0 / 10 | A |
| 1406 | | 07/26/23 | P-03 | | CH | 20.2 | 99.3 | 22.9 | 97.0 | 119.2 | 6 | 98 | 95 | 0 / 10 | A |
| 1407 | | 07/26/23 | P-03 | | CH | 20.2 | 99.3 | 21.0 | 99.1 | 119.9 | 6 | 100 | 95 | 0 / 10 | A |
| 1408 | | 07/26/23 | P-19 | | CH | 18.4 | 105.0 | 22.5 | 100.3 | 122.9 | 6 | 96 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1401 | Select Clay: Wall Zone 54 | 18.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1402 | Select Clay: Wall Zone 55 | 18.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1403 | Select Clay: Wall Zone 20 | 24.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1404 | Select Clay: Wall Zone 52 | 24.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1405 | Select Clay: Wall Zone 53 | 24.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1406 | Select Clay: Wall Zone 54 | 19.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1407 | Select Clay: Wall Zone 55 | 19.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1408 | Select Clay: Wall Zone 20 | 25.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Bismarck, ND 58504
Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/09/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1409 | | 07/26/23 | P-03 | | CH | 20.2 | 99.3 | 24.1 | 96.2 | 119.4 | 6 | 97 | 95 | 0 / 10 | A |
| 1410 | | 07/26/23 | P-03 | | CH | 20.2 | 99.3 | 23.6 | 95.9 | 118.5 | 6 | 97 | 95 | 0 / 10 | A |
| 1411 | | 07/26/23 | P-19 | | CH | 18.4 | 105.0 | 20.1 | 100.1 | 120.2 | 6 | 95 | 95 | 0 / 10 | A |
| 1412 | | 07/26/23 | P-03 | | CH | 20.2 | 99.3 | 23.7 | 98.5 | 121.8 | 6 | 99 | 95 | 0 / 10 | A |
| 1413 | | 07/26/23 | P-03 | | CH | 20.2 | 99.3 | 26.1 | 96.4 | 121.6 | 6 | 97 | 95 | 0 / 10 | A |
| 1414 | | 07/26/23 | P-03 | | CH | 20.2 | 99.3 | 25.1 | 96.9 | 121.2 | 6 | 98 | 95 | 0 / 10 | A |
| 1415 | | 07/26/23 | P-19 | | CH | 18.4 | 105.0 | 22.4 | 100.7 | 123.3 | 6 | 96 | 95 | 0 / 10 | A |
| 1416 | | 07/26/23 | P-19 | | CH | 18.4 | 105.0 | 23.3 | 100.1 | 123.4 | 6 | 95 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1409 | Select Clay: Wall Zone 52 | 25.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1410 | Select Clay: Wall Zone 53 | 25.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1411 | Select Clay: Wall Zone 55 | 20.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1412 | Select Clay: Wall Zone 54 | 20.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1413 | Select Clay: Wall Zone 20 | 26.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1414 | Select Clay: Wall Zone 52 | 26.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1415 | Select Clay: Wall Zone 53 | 26.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1416 | Select Clay: Wall Zone 54 | 21.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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BRAUN INTERTEC
The Science You Build On.

2908 Morrison Ave.
Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/09/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1417 | | 07/26/23 | P-19 | | CH | 18.4 | 105.0 | 22.6 | 101.6 | 124.6 | 6 | 97 | 95 | 0 / 10 | A |
| 1418 | | 07/26/23 | P-03 | | CH | 20.2 | 99.3 | 22.8 | 97.4 | 119.6 | 6 | 98 | 95 | 0 / 10 | A |
| 1419 | | 07/26/23 | P-03 | | CH | 20.2 | 99.3 | 21.8 | 98.0 | 119.4 | 6 | 99 | 95 | 0 / 10 | A |
| 1420 | | 07/26/23 | P-19 | | CH | 18.4 | 105.0 | 21.6 | 101.3 | 123.2 | 6 | 96 | 95 | 0 / 10 | A |
| 1421 | | 07/26/23 | P-03 | | CH | 20.2 | 99.3 | 24.0 | 97.5 | 120.9 | 6 | 98 | 95 | 0 / 10 | A |
| 1422 | | 07/26/23 | P-03 | | CH | 20.2 | 99.3 | 24.2 | 98.0 | 121.7 | 6 | 99 | 95 | 0 / 10 | A |
| 1423 | | 07/26/23 | P-19 | | CH | 18.4 | 105.0 | 22.3 | 102.7 | 125.6 | 6 | 98 | 95 | 0 / 10 | A |
| 1424 | | 07/26/23 | P-03 | | CH | 20.2 | 99.3 | 22.2 | 98.1 | 119.9 | 6 | 99 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1417 | Select Clay: Wall Zone 55 | 21.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1418 | Select Clay: Wall Zone 20 | 27.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1419 | Select Clay: Wall Zone 52 | 27.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1420 | Select Clay: Wall Zone 53 | 27.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1421 | Select Clay: Wall Zone 54 | 22.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1422 | Select Clay: Wall Zone 55 | 22.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1423 | Select Clay: Wall Zone 20 | 28.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1424 | Select Clay: Wall Zone 52 | 28.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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# Field Compaction Report

**Report Date:** 08/09/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1425 | | 07/26/23 | P-19 | | CH | 18.4 | 105.0 | 19.5 | 104.8 | 125.2 | 6 | 100 | 95 | 0 / 10 | A |
| 1426 | | 07/26/23 | P-19 | | CH | 18.4 | 105.0 | 19.8 | 101.5 | 121.6 | 6 | 97 | 95 | 0 / 10 | A |
| 1427 | | 07/26/23 | P-21-std | A | CL | 18.1 | 106.3 | 20.7 | 106.5 | 128.5 | 6 | 100 | 95 | 0 / 10 | A |
| 1428 | | 07/26/23 | P-19 | | CH | 18.4 | 105.0 | 23.6 | 100.6 | 124.3 | 6 | 96 | 95 | 0 / 10 | A |
| 1429 | | 07/26/23 | P-19 | | CH | 18.4 | 105.0 | 24.0 | 100.5 | 124.6 | 6 | 96 | 95 | 0 / 10 | A |
| 1430 | | 07/26/23 | P-19 | | CH | 18.4 | 105.0 | 21.6 | 101.2 | 123.1 | 6 | 96 | 95 | 0 / 10 | A |
| 1431 | | 07/26/23 | P-19 | | CH | 18.4 | 105.0 | 20.1 | 102.8 | 123.5 | 6 | 98 | 95 | 0 / 10 | A |
| 1432 | | 07/26/23 | P-03 | | CH | 20.2 | 99.3 | 24.5 | 95.2 | 118.5 | 6 | 96 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1425 | Select Clay: Wall Zone 53 | 28.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1426 | Select Clay: Wall Zone 54 | 23.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1427 | Select Clay: Wall Zone 55 | 23.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1428 | Select Clay: Wall Zone 20 | 29.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1429 | Select Clay: Wall Zone 52 | 29.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1430 | Select Clay: Wall Zone 53 | 29.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1431 | Select Clay: Wall Zone 54 | 24.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1432 | Select Clay: Wall Zone 55 | 24.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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# Field Compaction Report

**Report Date:** 08/09/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1433 | | 07/26/23 | P-03 | | CH | 20.2 | 99.3 | 23.7 | 98.8 | 122.2 | 6 | 99 | 95 | 0 / 10 | A |
| 1434 | | 07/26/23 | P-19 | | CH | 18.4 | 105.0 | 22.5 | 102.2 | 125.2 | 6 | 97 | 95 | 0 / 10 | A |
| 1435 | | 07/26/23 | P-03 | | CH | 20.2 | 99.3 | 21.7 | 99.5 | 121.1 | 6 | 100 | 95 | 0 / 10 | A |
| 1436 | | 07/26/23 | P-19 | | CH | 18.4 | 105.0 | 20.3 | 104.3 | 125.5 | 6 | 99 | 95 | 0 / 10 | A |
| 1437 | | 07/26/23 | P-19 | | CH | 18.4 | 105.0 | 22.0 | 102.6 | 125.2 | 6 | 98 | 95 | 0 / 10 | A |
| 1438 | | 07/26/23 | P-19 | | CH | 18.4 | 105.0 | 22.9 | 102.9 | 126.5 | 6 | 98 | 95 | 0 / 10 | A |
| 1439 | | 07/26/23 | P-03 | | CH | 20.2 | 99.3 | 23.2 | 98.6 | 121.5 | 6 | 99 | 95 | 0 / 10 | A |
| 1440 | | 07/26/23 | P-19 | | CH | 18.4 | 105.0 | 21.7 | 102.6 | 124.9 | 6 | 98 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1433 | Select Clay: Wall Zone 20 | 30.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1434 | Select Clay: Wall Zone 52 | 30.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1435 | Select Clay: Wall Zone 53 | 30.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1436 | Select Clay: Wall Zone 54 | 25.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1437 | Select Clay: Wall Zone 55 | 25.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1438 | Select Clay: Wall Zone 20 | 31.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1439 | Select Clay: Wall Zone 52 | 31.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1440 | Select Clay: Wall Zone 53 | 31.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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# Field Compaction Report

**Report Date:** 08/09/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1441 | | 07/26/23 | P-19 | | CH | 18.4 | 105.0 | 21.3 | 105.4 | 127.9 | 6 | 100 | 95 | 0 / 10 | A |
| 1442 | | 07/26/23 | P-21-std | A | CL | 18.1 | 106.3 | 19.9 | 106.3 | 127.5 | 6 | 100 | 95 | 0 / 10 | A |
| 1443 | | 07/26/23 | P-19 | | CH | 18.4 | 105.0 | 19.7 | 102.2 | 122.3 | 6 | 97 | 95 | 0 / 10 | A |
| 1444 | | 07/26/23 | P-19 | | CH | 18.4 | 105.0 | 23.8 | 101.0 | 125.0 | 6 | 96 | 95 | 0 / 10 | A |
| 1445 | | 07/26/23 | P-19 | | CH | 18.4 | 105.0 | 24.7 | 100.2 | 124.9 | 6 | 95 | 95 | 0 / 10 | A |
| 1446 | | 07/26/23 | P-19 | | CH | 18.4 | 105.0 | 21.0 | 103.6 | 125.4 | 6 | 99 | 95 | 0 / 10 | A |
| 1447 | | 07/26/23 | P-19 | | CH | 18.4 | 105.0 | 21.9 | 104.4 | 127.3 | 6 | 99 | 95 | 0 / 10 | A |
| 1448 | | 07/26/23 | P-21-std | A | CL | 18.1 | 106.3 | 20.7 | 105.5 | 127.3 | 6 | 99 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1441 | Select Clay: Wall Zone 54 | 26.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1442 | Select Clay: Wall Zone 55 | 26.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1443 | Select Clay: Wall Zone 20 | 32.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1444 | Select Clay: Wall Zone 52 | 32.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1445 | Select Clay: Wall Zone 53 | 32.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1446 | Select Clay: Wall Zone 54 | 27.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1447 | Select Clay: Wall Zone 55 | 27.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1448 | Select Clay: Wall Zone 20 | 33.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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# Field Compaction Report

**Report Date:** 08/09/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1449 | | 07/26/23 | P-19 | | CH | 18.4 | 105.0 | 23.5 | 100.7 | 124.4 | 6 | 96 | 95 | 0 / 10 | A |
| 1450 | | 07/26/23 | P-19 | | CH | 18.4 | 105.0 | 21.6 | 100.7 | 122.5 | 6 | 96 | 95 | 0 / 10 | A |
| 1451 | | 07/26/23 | P-03 | | CH | 20.2 | 99.3 | 22.2 | 97.4 | 119.0 | 6 | 98 | 95 | 0 / 10 | A |
| 1452 | | 07/26/23 | P-19 | | CH | 18.4 | 105.0 | 21.3 | 103.0 | 124.9 | 6 | 98 | 95 | 0 / 10 | A |
| 1453 | | 07/27/23 | P-03 | | CH | 20.2 | 99.3 | 24.7 | 96.0 | 119.7 | 6 | 97 | 95 | 0 / 10 | A |
| 1454 | | 07/27/23 | P-21-std | A | CL | 18.1 | 106.3 | 20.6 | 106.0 | 127.8 | 6 | 100 | 95 | 0 / 10 | A |
| 1455 | | 07/27/23 | P-19 | | CH | 18.4 | 105.0 | 22.1 | 100.4 | 122.6 | 6 | 96 | 95 | 0 / 10 | A |
| 1456 | | 07/27/23 | P-19 | | CH | 18.4 | 105.0 | 20.7 | 103.9 | 125.4 | 6 | 99 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1449 | Select Clay: Wall Zone 52 | 33.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1450 | Select Clay: Wall Zone 53 | 33.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1451 | Select Clay: Wall Zone 54 | 28.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1452 | Select Clay: Wall Zone 55 | 28.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1453 | Select Clay: Wall Zone 20 | 34.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1454 | Select Clay: Wall Zone 52 | 34.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1455 | Select Clay: Wall Zone 53 | 34.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1456 | Select Clay: Wall Zone 54 | 29.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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# Field Compaction Report

**Report Date:** 08/09/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1457 | | 07/27/23 | P-03 | | CH | 20.2 | 99.3 | 23.5 | 98.9 | 122.1 | 6 | 100 | 95 | 0 / 10 | A |
| 1458 | | 07/27/23 | P-03 | | CH | 20.2 | 99.3 | 23.4 | 96.6 | 119.2 | 6 | 97 | 95 | 0 / 10 | A |
| 1459 | | 07/27/23 | P-19 | | CH | 18.4 | 105.0 | 24.2 | 100.5 | 124.8 | 6 | 96 | 95 | 0 / 10 | A |
| 1460 | | 07/27/23 | P-19 | | CH | 18.4 | 105.0 | 22.9 | 101.9 | 125.2 | 6 | 97 | 95 | 0 / 10 | A |
| 1461 | | 07/27/23 | P-19 | | CH | 18.4 | 105.0 | 24.0 | 101.8 | 126.2 | 6 | 97 | 95 | 0 / 10 | A |
| 1462 | | 07/27/23 | P-19 | | CH | 18.4 | 105.0 | 20.5 | 104.3 | 125.7 | 6 | 99 | 95 | 0 / 10 | A |
| 1463 | | 07/27/23 | P-19 | | CH | 18.4 | 105.0 | 21.5 | 100.5 | 122.1 | 6 | 96 | 95 | 0 / 10 | A |
| 1464 | | 07/27/23 | P-19 | | CH | 18.4 | 105.0 | 21.2 | 101.8 | 123.4 | 6 | 97 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1457 | Select Clay: Wall Zone 55 | 29.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1458 | Select Clay: Wall Zone 20 | 35.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1459 | Select Clay: Wall Zone 52 | 35.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1460 | Select Clay: Wall Zone 53 | 35.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1461 | Select Clay: Wall Zone 54 | 30.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1462 | Select Clay: Wall Zone 55 | 30.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1463 | Select Clay: Wall Zone 20 | 36.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1464 | Select Clay: Wall Zone 52 | 36.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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# Field Compaction Report

**Report Date:** 08/09/2023
**Test Method:** ASTM D6938

**Client:**
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**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1465 | | 07/27/23 | P-19 | | CH | 18.4 | 105.0 | 23.2 | 99.8 | 123.0 | 6 | 95 | 95 | 0 / 10 | A |
| 1466 | | 07/27/23 | P-03 | | CH | 20.2 | 99.3 | 23.4 | 98.2 | 121.2 | 6 | 99 | 95 | 0 / 10 | A |
| 1467 | | 07/27/23 | P-19 | | CH | 18.4 | 105.0 | 22.8 | 103.9 | 127.6 | 6 | 99 | 95 | 0 / 10 | A |
| 1468 | | 07/27/23 | P-21-std | A | CL | 18.1 | 106.3 | 20.7 | 106.1 | 128.1 | 6 | 100 | 95 | 0 / 10 | A |
| 1469 | | 07/27/23 | P-21-std | A | CL | 18.1 | 106.3 | 18.9 | 105.7 | 125.7 | 6 | 99 | 95 | 0 / 10 | A |
| 1470 | | 07/27/23 | P-21-std | A | CL | 18.1 | 106.3 | 20.3 | 106.6 | 128.2 | 6 | 100 | 95 | 0 / 10 | A |
| 1471 | | 07/27/23 | P-21-std | A | CL | 18.1 | 106.3 | 20.2 | 106.2 | 127.7 | 6 | 100 | 95 | 0 / 10 | A |
| 1472 | | 07/27/23 | P-21-std | A | CL | 18.1 | 106.3 | 20.7 | 106.2 | 128.2 | 6 | 100 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1465 | Select Clay: Wall Zone 53 | 36.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1466 | Select Clay: Wall Zone 54 | 31.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1467 | Select Clay: Wall Zone 55 | 31.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1468 | Select Clay: Wall Zone 20 | 37.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1469 | Select Clay: Wall Zone 52 | 37.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1470 | Select Clay: Wall Zone 53 | 37.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1471 | Select Clay: Wall Zone 54 | 32.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1472 | Select Clay: Wall Zone 55 | 32.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

BRAUN INTERTEC
The Science You Build On.

2908 Morrison Ave.
Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/09/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1473 | | 07/27/23 | P-21-std | A | CL | 18.1 | 106.3 | 20.6 | 104.5 | 126.0 | 6 | 98 | 95 | 0 / 10 | A |
| 1474 | | 07/27/23 | P-21-std | A | CL | 18.1 | 106.3 | 24.0 | 101.4 | 125.7 | 6 | 95 | 95 | 0 / 10 | A |
| 1475 | | 07/27/23 | P-21-std | A | CL | 18.1 | 106.3 | 20.9 | 103.5 | 125.1 | 6 | 97 | 95 | 0 / 10 | A |
| 1476 | | 07/27/23 | P-03 | | CH | 20.2 | 99.3 | 24.1 | 96.8 | 120.1 | 6 | 97 | 95 | 0 / 10 | A |
| 1477 | | 07/27/23 | P-03 | | CH | 20.2 | 99.3 | 24.2 | 98.7 | 122.6 | 6 | 99 | 95 | 0 / 10 | A |
| 1478 | | 07/27/23 | P-19 | | CH | 18.4 | 105.0 | 22.8 | 101.0 | 124.0 | 6 | 96 | 95 | 0 / 10 | A |
| 1479 | | 07/27/23 | P-19 | | CH | 18.4 | 105.0 | 21.7 | 103.5 | 126.0 | 6 | 99 | 95 | 0 / 10 | A |
| 1480 | | 07/27/23 | P-03 | | CH | 20.2 | 99.3 | 22.3 | 98.7 | 120.7 | 6 | 99 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1473 | Select Clay: Wall Zone 20 | 38.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1474 | Select Clay: Wall Zone 52 | 38.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1475 | Select Clay: Wall Zone 53 | 38.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1476 | Select Clay: Wall Zone 54 | 33.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1477 | Select Clay: Wall Zone 55 | 33.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1478 | Select Clay: Wall Zone 20 | 39.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1479 | Select Clay: Wall Zone 52 | 39.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1480 | Select Clay: Wall Zone 53 | 39.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/09/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1481 | | 07/27/23 | P-03 | | CH | 20.2 | 99.3 | 22.4 | 99.6 | 121.9 | 6 | 100 | 95 | 0 / 10 | A |
| 1482 | | 07/27/23 | P-19 | | CH | 18.4 | 105.0 | 22.6 | 100.4 | 123.1 | 6 | 96 | 95 | 0 / 10 | A |
| 1483 | | 07/27/23 | P-03 | | CH | 20.2 | 99.3 | 23.7 | 98.8 | 122.2 | 6 | 99 | 95 | 0 / 10 | A |
| 1484 | | 07/27/23 | P-03 | | CH | 20.2 | 99.3 | 20.6 | 97.5 | 117.6 | 6 | 98 | 95 | 0 / 10 | A |
| 1485 | | 07/27/23 | P-03 | | CH | 20.2 | 99.3 | 22.3 | 98.3 | 120.2 | 6 | 99 | 95 | 0 / 10 | A |
| 1486 | | 07/27/23 | P-19 | | CH | 18.4 | 105.0 | 21.3 | 104.4 | 126.6 | 6 | 99 | 95 | 0 / 10 | A |
| 1487 | | 07/27/23 | P-19 | | CH | 18.4 | 105.0 | 22.3 | 102.8 | 125.7 | 6 | 98 | 95 | 0 / 10 | A |
| 1488 | | 07/27/23 | P-07 | | CH | 22.6 | 93.8 | 25.2 | 90.0 | 112.7 | 6 | 96 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1481 | Select Clay: Wall Zone 54 | 34.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1482 | Select Clay: Wall Zone 55 | 34.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1483 | Select Clay: Wall Zone 20 | 40.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1484 | Select Clay: Wall Zone 52 | 40.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1485 | Select Clay: Wall Zone 53 | 40.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1486 | Select Clay: Wall Zone 54 | 35.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1487 | Select Clay: Wall Zone 55 | 35.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1488 | Select Clay: Wall Zone 20 | 41.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/09/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1489 | | 07/27/23 | P-03 | | CH | 20.2 | 99.3 | 23.5 | 99.3 | 122.6 | 6 | 100 | 95 | 0 / 10 | A |
| 1490 | | 07/27/23 | P-19 | | CH | 18.4 | 105.0 | 21.1 | 101.7 | 123.2 | 6 | 97 | 95 | 0 / 10 | A |
| 1491 | | 07/27/23 | P-19 | | CH | 18.4 | 105.0 | 20.3 | 100.7 | 121.1 | 6 | 96 | 95 | 0 / 10 | A |
| 1492 | | 07/27/23 | P-21-std | A | CL | 18.1 | 106.3 | 22.7 | 104.1 | 127.7 | 6 | 98 | 95 | 0 / 10 | A |
| 1493 | | 07/27/23 | P-19 | | CH | 18.4 | 105.0 | 22.0 | 102.5 | 125.1 | 6 | 98 | 95 | 0 / 10 | A |
| 1494 | | 07/27/23 | P-19 | | CH | 18.4 | 105.0 | 20.6 | 105.6 | 127.4 | 6 | 101 | 95 | 0 / 10 | A |
| 1495 | | 07/27/23 | P-19 | | CH | 18.4 | 105.0 | 23.2 | 100.6 | 123.9 | 6 | 96 | 95 | 0 / 10 | A |
| 1496 | | 07/27/23 | P-19 | | CH | 18.4 | 105.0 | 21.3 | 102.5 | 124.3 | 6 | 98 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1489 | Select Clay: Wall Zone 52 | 41.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1490 | Select Clay: Wall Zone 53 | 41.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1491 | Select Clay: Wall Zone 54 | 36.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1492 | Select Clay: Wall Zone 55 | 36.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1493 | Select Clay: Wall Zone 20 | 42.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1494 | Select Clay: Wall Zone 52 | 42.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1495 | Select Clay: Wall Zone 53 | 42.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1496 | Select Clay: Wall Zone 54 | 37.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/09/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1497 | | 07/27/23 | P-03 | | CH | 20.2 | 99.3 | 24.8 | 94.5 | 117.9 | 6 | 95 | 95 | 0 / 10 | A |
| 1498 | | 07/27/23 | P-19 | | CH | 18.4 | 105.0 | 19.5 | 103.4 | 123.6 | 6 | 98 | 95 | 0 / 10 | A |
| 1499 | | 07/27/23 | P-03 | | CH | 20.2 | 99.3 | 24.4 | 99.4 | 123.7 | 6 | 100 | 95 | 0 / 10 | A |
| 1500 | | 07/27/23 | P-19 | | CH | 18.4 | 105.0 | 18.9 | 105.6 | 125.6 | 6 | 101 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1497 | Select Clay: Wall Zone 55 | 37.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1498 | Select Clay: Wall Zone 20 | 43.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1499 | Select Clay: Wall Zone 52 | 43.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1500 | Select Clay: Wall Zone 53 | 43.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Kurt Kuechle
08/09/2023

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# Field Compaction Report

**Report Date:** 08/09/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1501 | | 07/27/23 | P-19 | | CH | 18.4 | 105.0 | 20.5 | 103.3 | 124.5 | 6 | 98 | 95 | 0 / 10 | A |
| 1502 | | 07/27/23 | P-03 | | CH | 20.2 | 99.3 | 24.3 | 98.4 | 122.3 | 6 | 99 | 95 | 0 / 10 | A |
| 1503 | | 07/27/23 | P-19 | | CH | 18.4 | 105.0 | 19.8 | 104.4 | 125.1 | 6 | 99 | 95 | 0 / 10 | A |
| 1504 | | 07/27/23 | P-03 | | CH | 20.2 | 99.3 | 24.3 | 99.3 | 123.4 | 6 | 100 | 95 | 0 / 10 | A |
| 1505 | | 07/27/23 | P-03 | | CH | 20.2 | 99.3 | 27.1 | 94.9 | 120.6 | 6 | 96 | 95 | 0 / 10 | A |
| 1506 | | 07/27/23 | P-07 | | CH | 22.6 | 93.8 | 27.8 | 90.6 | 115.8 | 6 | 97 | 95 | 0 / 10 | A |
| 1507 | | 07/27/23 | P-19 | | CH | 18.4 | 105.0 | 19.8 | 102.2 | 122.4 | 6 | 97 | 95 | 0 / 10 | A |
| 1508 | | 07/27/23 | P-19 | | CH | 18.4 | 105.0 | 19.8 | 104.8 | 125.6 | 6 | 100 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1501 | Select Clay: Wall Zone 54 | 38.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1502 | Select Clay: Wall Zone 55 | 38.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1503 | Select Clay: Wall Zone 20 | 44.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1504 | Select Clay: Wall Zone 52 | 44.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1505 | Select Clay: Wall Zone 53 | 44.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1506 | Select Clay: Wall Zone 54 | 39.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1507 | Select Clay: Wall Zone 55 | 39.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1508 | Select Clay: Wall Zone 20 | 45.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/09/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1509 | | 07/27/23 | P-21-std | A | CL | 18.1 | 106.3 | 18.3 | 103.0 | 121.9 | 6 | 97 | 95 | 0 / 10 | A |
| 1510 | | 07/27/23 | P-19 | | CH | 18.4 | 105.0 | 20.3 | 100.5 | 120.9 | 6 | 96 | 95 | 0 / 10 | A |
| 1511 | | 07/27/23 | P-19 | | CH | 18.4 | 105.0 | 20.3 | 104.2 | 125.4 | 6 | 99 | 95 | 0 / 10 | A |
| 1512 | | 07/27/23 | P-19 | | CH | 18.4 | 105.0 | 21.4 | 102.0 | 123.8 | 6 | 97 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1509 | Select Clay: Wall Zone 52 | 45.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1510 | Select Clay: Wall Zone 53 | 45.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1511 | Select Clay: Wall Zone 54 | 40.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1512 | Select Clay: Wall Zone 55 | 40.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Kurt Kuechle
08/09/2023

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/01/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1513 | | 07/31/23 | P-19 | | CH | 18.4 | 105.0 | 21.6 | 100.4 | 122.1 | 6 | 96 | 95 | 0 / 10 | A |
| 1514 | | 07/31/23 | P-03 | | CH | 20.2 | 99.3 | 24.0 | 97.6 | 121.0 | 6 | 98 | 95 | 0 / 10 | A |
| 1515 | | 07/31/23 | P-03 | | CH | 20.2 | 99.3 | 23.6 | 94.5 | 116.8 | 6 | 95 | 95 | 0 / 10 | A |
| 1516 | | 07/31/23 | P-03 | | CH | 20.2 | 99.3 | 25.6 | 98.5 | 123.7 | 6 | 99 | 95 | 0 / 10 | A |
| 1517 | | 07/31/23 | P-19 | | CH | 18.4 | 105.0 | 22.0 | 100.7 | 122.9 | 6 | 96 | 95 | 0 / 10 | A |
| 1518 | | 07/31/23 | P-07 | | CH | 22.6 | 93.8 | 27.2 | 90.9 | 115.6 | 6 | 97 | 95 | 0 / 10 | A |
| 1519 | | 07/31/23 | P-19 | | CH | 18.4 | 105.0 | 19.4 | 104.0 | 124.2 | 6 | 99 | 95 | 0 / 10 | A |
| 1520 | | 07/31/23 | P-03 | | CH | 20.2 | 99.3 | 24.8 | 99.5 | 124.2 | 6 | 100 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1513 | Select Clay: Wall Zone 21 | 1.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1514 | Select Clay: Wall Zone 60 | 1.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1515 | Select Clay: Wall Zone 59 | 1.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1516 | Select Clay: Wall Zone 58 | 1.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1517 | Select Clay: Wall Zone 57 | 1.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1518 | Select Clay: Wall Zone 56 | 1.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1519 | Select Clay: Wall Zone 20 | 46.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1520 | Select Clay: Wall Zone 52 | 46.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/01/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1521 | | 07/31/23 | P-19 | | CH | 18.4 | 105.0 | 22.1 | 101.5 | 123.9 | 6 | 97 | 95 | 0 / 10 | A |
| 1522 | | 07/31/23 | P-19 | | CH | 18.4 | 105.0 | 23.2 | 101.2 | 124.7 | 6 | 96 | 95 | 0 / 10 | A |
| 1523 | | 07/31/23 | P-20 | | CH | 32.9 | 78.6 | 34.1 | 78.9 | 105.8 | 6 | 100 | 95 | 0 / 10 | A |
| 1524 | | 07/31/23 | P-03 | | CH | 20.2 | 99.3 | 24.1 | 98.3 | 122.0 | 6 | 99 | 95 | 0 / 10 | A |
| 1525 | | 07/31/23 | P-03 | | CH | 20.2 | 99.3 | 24.6 | 95.0 | 118.4 | 6 | 96 | 95 | 0 / 10 | A |
| 1526 | | 07/31/23 | P-14 | | CH | 27.2 | 92.4 | 27.3 | 88.6 | 112.8 | 6 | 96 | 95 | 0 / 10 | A |
| 1527 | | 07/31/23 | P-03 | | CH | 20.2 | 99.3 | 22.0 | 97.7 | 119.2 | 6 | 98 | 95 | 0 / 10 | A |
| 1528 | | 07/31/23 | P-03 | | CH | 20.2 | 99.3 | 24.8 | 97.5 | 121.7 | 6 | 98 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1521 | Select Clay: Wall Zone 53 | 46.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1522 | Select Clay: Wall Zone 54 | 41.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1523 | Select Clay: Wall Zone 55 | 41.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1524 | Select Clay: Wall Zone 21 | 2.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1525 | Select Clay: Wall Zone 60 | 2.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1526 | Select Clay: Wall Zone 59 | 2.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1527 | Select Clay: Wall Zone 58 | 2.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1528 | Select Clay: Wall Zone 57 | 2.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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The Science You Build On.

2908 Morrison Ave.
Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/01/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1529 | | 07/31/23 | P-03 | | CH | 20.2 | 99.3 | 24.6 | 96.6 | 120.4 | 6 | 97 | 95 | 0 / 10 | A |
| 1530 | | 07/31/23 | P-19 | | CH | 18.4 | 105.0 | 23.4 | 99.9 | 123.3 | 6 | 95 | 95 | 0 / 10 | A |
| 1531 | | 07/31/23 | P-03 | | CH | 20.2 | 99.3 | 24.0 | 98.7 | 122.4 | 6 | 99 | 95 | 0 / 10 | A |
| 1532 | | 07/31/23 | P-03 | | CH | 20.2 | 99.3 | 22.7 | 98.2 | 120.5 | 6 | 99 | 95 | 0 / 10 | A |
| 1533 | | 07/31/23 | P-19 | | CH | 18.4 | 105.0 | 23.5 | 99.8 | 123.3 | 6 | 95 | 95 | 0 / 10 | A |
| 1534 | | 07/31/23 | P-07 | | CH | 22.6 | 93.8 | 25.8 | 93.3 | 117.4 | 6 | 99 | 95 | 0 / 10 | A |
| 1535 | | 07/31/23 | P-18 | | CH | 25.7 | 94.5 | 25.9 | 89.8 | 113.1 | 6 | 95 | 95 | 0 / 10 | A |
| 1536 | | 07/31/23 | P-03 | | CH | 20.2 | 99.3 | 24.4 | 95.5 | 118.8 | 6 | 96 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1529 | Select Clay: Wall Zone 56 | 2.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1530 | Select Clay: Wall Zone 20 | 47.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1531 | Select Clay: Wall Zone 52 | 47.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1532 | Select Clay: Wall Zone 53 | 47.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1533 | Select Clay: Wall Zone 54 | 42.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1534 | Select Clay: Wall Zone 55 | 42.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1535 | Select Clay: Wall Zone 21 | 3.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1536 | Select Clay: Wall Zone 60 | 3.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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2908 Morrison Ave.
Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/01/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1537 | | 07/31/23 | P-03 | | CH | 20.2 | 99.3 | 23.6 | 98.6 | 121.9 | 6 | 99 | 95 | 0 / 10 | A |
| 1538 | | 07/31/23 | P-19 | | CH | 18.4 | 105.0 | 23.1 | 101.2 | 124.6 | 6 | 96 | 95 | 0 / 10 | A |
| 1539 | | 07/31/23 | P-03 | | CH | 20.2 | 99.3 | 22.2 | 97.6 | 119.3 | 6 | 98 | 95 | 0 / 10 | A |
| 1540 | | 07/31/23 | P-03 | | CH | 20.2 | 99.3 | 23.5 | 96.7 | 119.4 | 6 | 97 | 95 | 0 / 10 | A |
| 1541 | | 07/31/23 | P-19 | | CH | 18.4 | 105.0 | 22.6 | 100.2 | 122.8 | 6 | 95 | 95 | 0 / 10 | A |
| 1542 | | 07/31/23 | P-03 | | CH | 20.2 | 99.3 | 22.5 | 99.5 | 121.9 | 6 | 100 | 95 | 0 / 10 | A |
| 1543 | | 07/31/23 | P-03 | | CH | 20.2 | 99.3 | 23.9 | 99.7 | 123.5 | 6 | 100 | 95 | 0 / 10 | A |
| 1544 | | 07/31/23 | P-03 | | CH | 20.2 | 99.3 | 25.8 | 94.6 | 119.0 | 6 | 95 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1537 | Select Clay: Wall Zone 59 | 3.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1538 | Select Clay: Wall Zone 58 | 3.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1539 | Select Clay: Wall Zone 57 | 3.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1540 | Select Clay: Wall Zone 56 | 3.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1541 | Select Clay: Wall Zone 20 | 48.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1542 | Select Clay: Wall Zone 52 | 48.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1543 | Select Clay: Wall Zone 53 | 48.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1544 | Select Clay: Wall Zone 54 | 43.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/01/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1545 | | 07/31/23 | P-07 | | CH | 22.6 | 93.8 | 26.5 | 90.8 | 114.9 | 6 | 97 | 95 | 0 / 10 | A |
| 1546 | | 07/31/23 | P-19 | | CH | 18.4 | 105.0 | 21.0 | 103.4 | 125.1 | 6 | 98 | 95 | 0 / 10 | A |
| 1547 | | 07/31/23 | P-03 | | CH | 20.2 | 99.3 | 23.9 | 97.6 | 120.9 | 6 | 98 | 95 | 0 / 10 | A |
| 1548 | | 07/31/23 | P-19 | | CH | 18.4 | 105.0 | 21.6 | 100.6 | 122.3 | 6 | 96 | 95 | 0 / 10 | A |
| 1549 | | 07/31/23 | P-19 | | CH | 18.4 | 105.0 | 19.2 | 103.5 | 123.4 | 6 | 99 | 95 | 0 / 10 | A |
| 1550 | | 07/31/23 | P-03 | | CH | 20.2 | 99.3 | 21.3 | 96.8 | 117.4 | 6 | 97 | 95 | 0 / 10 | A |
| 1551 | | 07/31/23 | P-21-std | A | CL | 18.1 | 106.3 | 18.2 | 108.5 | 128.3 | 6 | 102 | 95 | 0 / 10 | A |
| 1552 | | 07/31/23 | P-03 | | CH | 20.2 | 99.3 | 23.8 | 97.1 | 120.2 | 6 | 98 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1545 | Select Clay: Wall Zone 55 | 43.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1546 | Select Clay: Wall Zone 21 | 4.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1547 | Select Clay: Wall Zone 60 | 4.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1548 | Select Clay: Wall Zone 59 | 4.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1549 | Select Clay: Wall Zone 58 | 4.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1550 | Select Clay: Wall Zone 57 | 4.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1551 | Select Clay: Wall Zone 56 | 4.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1552 | Select Clay: Wall Zone 20 | 49.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/01/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1553 | | 07/31/23 | P-19 | | CH | 18.4 | 105.0 | 21.8 | 102.7 | 125.1 | 6 | 98 | 95 | 0 / 10 | A |
| 1554 | | 07/31/23 | P-03 | | CH | 20.2 | 99.3 | 24.3 | 94.9 | 118.0 | 6 | 96 | 95 | 0 / 10 | A |
| 1555 | | 07/31/23 | P-07 | | CH | 22.6 | 93.8 | 27.7 | 92.0 | 117.5 | 6 | 98 | 95 | 0 / 10 | A |
| 1556 | | 07/31/23 | P-03 | | CH | 20.2 | 99.3 | 24.5 | 97.8 | 121.8 | 6 | 98 | 95 | 0 / 10 | A |
| 1557 | | 07/31/23 | P-19 | | CH | 18.4 | 105.0 | 22.3 | 102.0 | 124.7 | 6 | 97 | 95 | 0 / 10 | A |
| 1558 | | 07/31/23 | P-03 | | CH | 20.2 | 99.3 | 21.3 | 97.5 | 118.3 | 6 | 98 | 95 | 0 / 10 | A |
| 1559 | | 07/31/23 | P-19 | | CH | 18.4 | 105.0 | 19.2 | 101.4 | 120.9 | 6 | 97 | 95 | 0 / 10 | A |
| 1560 | | 07/31/23 | P-19 | | CH | 18.4 | 105.0 | 18.7 | 102.7 | 121.9 | 6 | 98 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1553 | Select Clay: Wall Zone 52 | 49.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1554 | Select Clay: Wall Zone 53 | 49.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1555 | Select Clay: Wall Zone 54 | 44.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1556 | Select Clay: Wall Zone 55 | 44.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1557 | Select Clay: Wall Zone 21 | 5.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1558 | Select Clay: Wall Zone 60 | 5.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1559 | Select Clay: Wall Zone 59 | 5.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1560 | Select Clay: Wall Zone 58 | 5.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/01/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1561 | | 07/31/23 | P-13 | | CH | 21.7 | 97.9 | 22.2 | 93.8 | 114.6 | 6 | 96 | 95 | 0 / 10 | A |
| 1562 | | 07/31/23 | P-19 | | CH | 18.4 | 105.0 | 19.4 | 104.8 | 125.1 | 6 | 100 | 95 | 0 / 10 | A |
| 1563 | | 07/31/23 | P-03 | | CH | 20.2 | 99.3 | 21.0 | 99.0 | 119.8 | 6 | 100 | 95 | 0 / 10 | A |
| 1564 | | 07/31/23 | P-19 | | CH | 18.4 | 105.0 | 21.4 | 101.5 | 123.2 | 6 | 97 | 95 | 0 / 10 | A |
| 1565 | | 07/31/23 | P-19 | | CH | 18.4 | 105.0 | 21.4 | 102.3 | 124.2 | 6 | 97 | 95 | 0 / 10 | A |
| 1566 | | 07/31/23 | P-03 | | CH | 20.2 | 99.3 | 20.8 | 95.5 | 115.4 | 6 | 96 | 95 | 0 / 10 | A |
| 1567 | | 07/31/23 | P-19 | | CH | 18.4 | 105.0 | 21.5 | 103.2 | 125.4 | 6 | 98 | 95 | 0 / 10 | A |
| 1568 | | 07/31/23 | P-03 | | CH | 20.2 | 99.3 | 22.6 | 96.2 | 117.9 | 6 | 97 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1561 | Select Clay: Wall Zone 57 | 5.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1562 | Select Clay: Wall Zone 56 | 5.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1563 | Select Clay: Wall Zone 20 | 50.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1564 | Select Clay: Wall Zone 52 | 50.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1565 | Select Clay: Wall Zone 53 | 50.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1566 | Select Clay: Wall Zone 54 | 45.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1567 | Select Clay: Wall Zone 55 | 45.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1568 | Select Clay: Wall Zone 21 | 6.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/01/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1569 | | 07/31/23 | P-07 | | CH | 22.6 | 93.8 | 26.1 | 93.8 | 118.3 | 6 | 100 | 95 | 0 / 10 | A |
| 1570 | | 07/31/23 | P-03 | | CH | 20.2 | 99.3 | 22.6 | 98.9 | 121.3 | 6 | 100 | 95 | 0 / 10 | A |
| 1571 | | 07/31/23 | P-19 | | CH | 18.4 | 105.0 | 19.7 | 104.5 | 125.1 | 6 | 100 | 95 | 0 / 10 | A |
| 1572 | | 07/31/23 | P-07 | | CH | 22.6 | 93.8 | 25.3 | 93.8 | 117.5 | 6 | 100 | 95 | 0 / 10 | A |
| 1573 | | 07/31/23 | P-19 | | CH | 18.4 | 105.0 | 22.5 | 100.6 | 123.2 | 6 | 96 | 95 | 0 / 10 | A |
| 1574 | | 07/31/23 | P-03 | | CH | 20.2 | 99.3 | 24.7 | 94.6 | 118.0 | 6 | 95 | 95 | 0 / 10 | A |
| 1575 | | 07/31/23 | P-10 | | CH | 25.0 | 94.6 | 25.3 | 94.1 | 117.9 | 6 | 99 | 95 | 0 / 10 | A |
| ~~1576~~ | | ~~07/31/23~~ | ~~P-03~~ | | ~~CH~~ | ~~20.2~~ | ~~99.3~~ | ~~20.9~~ | ~~98.7~~ | ~~119.3~~ | ~~6~~ | ~~99~~ | ~~95~~ | ~~0 / 10~~ | ~~A~~ |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1569 | Select Clay: Wall Zone 60 | 6.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1570 | Select Clay: Wall Zone 59 | 6.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1571 | Select Clay: Wall Zone 58 | 6.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1572 | Select Clay: Wall Zone 57 | 6.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1573 | Select Clay: Wall Zone 56 | 6.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1574 | Select Clay: Wall Zone 20 | 51.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1575 | Select Clay: Wall Zone 52 | 51.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| ~~1576~~ | ~~Select Clay: Wall Zone 53~~ | ~~52.0~~ | ~~Lift number~~ | ~~InstroTek / 3500 / 1907 /~~ | ~~Bruce, Dalton~~ |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/15/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1576 | | 07/31/23 | P-03 | | CH | 20.2 | 99.3 | 20.9 | 98.7 | 119.3 | 6 | 99 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1576 | Select Clay: Wall Zone 53 | 51.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Kurt Kuechle
08/15/2023

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2908 Morrison Ave.
Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/01/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1577 | | 07/31/23 | P-03 | | CH | 20.2 | 99.3 | 20.9 | 98.7 | 119.3 | 6 | 99 | 95 | 0 / 10 | A |
| 1578 | | 07/31/23 | P-19 | | CH | 18.4 | 105.0 | 20.8 | 101.1 | 122.1 | 6 | 96 | 95 | 0 / 10 | A |
| 1579 | | 07/31/23 | P-07 | | CH | 22.6 | 93.8 | 26.0 | 91.2 | 114.9 | 6 | 97 | 95 | 0 / 10 | A |
| 1580 | | 07/31/23 | P-07 | | CH | 22.6 | 93.8 | 26.9 | 92.1 | 116.9 | 6 | 98 | 95 | 0 / 10 | A |
| 1581 | | 07/31/23 | P-19 | | CH | 18.4 | 105.0 | 19.4 | 100.3 | 119.8 | 6 | 96 | 95 | 0 / 10 | A |
| 1582 | | 07/31/23 | P-03 | | CH | 20.2 | 99.3 | 22.4 | 97.6 | 119.5 | 6 | 98 | 95 | 0 / 10 | A |
| 1583 | | 07/31/23 | P-03 | | CH | 20.2 | 99.3 | 22.5 | 98.7 | 120.9 | 6 | 99 | 95 | 0 / 10 | A |
| 1584 | | 07/31/23 | P-03 | | CH | 20.2 | 99.3 | 24.5 | 99.4 | 123.8 | 6 | 100 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1577 | Select Clay: Wall Zone 54 | 46.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1578 | Select Clay: Wall Zone 55 | 46.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1579 | Select Clay: Wall Zone 21 | 7.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1580 | Select Clay: Wall Zone 60 | 7.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1581 | Select Clay: Wall Zone 59 | 7.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1582 | Select Clay: Wall Zone 58 | 7.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1583 | Select Clay: Wall Zone 57 | 7.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1584 | Select Clay: Wall Zone 56 | 7.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1585 | | 07/31/23 | P-19 | | CH | 18.4 | 105.0 | 20.4 | 105.2 | 126.7 | 6 | 100 | 95 | 0 / 10 | A |
| 1586 | | 07/31/23 | P-19 | | CH | 18.4 | 105.0 | 21.7 | 104.6 | 127.3 | 6 | 100 | 95 | 0 / 10 | A |
| 1587 | | 07/31/23 | P-19 | | CH | 18.4 | 105.0 | 23.2 | 102.6 | 126.4 | 6 | 98 | 95 | 0 / 10 | A |
| 1588 | | 07/31/23 | P-03 | | CH | 20.2 | 99.3 | 22.4 | 98.4 | 120.4 | 6 | 99 | 95 | 0 / 10 | A |
| 1589 | | 07/31/23 | P-03 | | CH | 20.2 | 99.3 | 22.4 | 98.4 | 120.4 | 6 | 99 | 95 | 0 / 10 | A |
| 1590 | | 07/31/23 | P-19 | | CH | 18.4 | 105.0 | 24.7 | 100.5 | 125.3 | 6 | 96 | 95 | 0 / 10 | A |
| 1591 | | 07/31/23 | P-19 | | CH | 18.4 | 105.0 | 20.2 | 102.2 | 122.8 | 6 | 97 | 95 | 0 / 10 | A |
| 1592 | | 07/31/23 | P-03 | | CH | 20.2 | 99.3 | 23.4 | 99.6 | 122.9 | 6 | 100 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1585 | Select Clay: Wall Zone 20 | 52.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1586 | Select Clay: Wall Zone 52 | 52.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1587 | Select Clay: Wall Zone 53 | 52.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1588 | Select Clay: Wall Zone 54 | 47.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1589 | Select Clay: Wall Zone 54 | 47.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1590 | Select Clay: Wall Zone 55 | 47.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1591 | Select Clay: Wall Zone 21 | 8.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1592 | Select Clay: Wall Zone 60 | 8.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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**Report Date:** 08/01/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1593 | | 07/31/23 | P-19 | | CH | 18.4 | 105.0 | 21.2 | 101.5 | 123.0 | 6 | 97 | 95 | 0 / 10 | A |
| 1594 | | 07/31/23 | P-19 | | CH | 18.4 | 105.0 | 18.8 | 100.8 | 119.8 | 6 | 96 | 95 | 0 / 10 | A |
| 1595 | | 07/31/23 | P-19 | | CH | 18.4 | 105.0 | 20.5 | 100.2 | 120.7 | 6 | 95 | 95 | 0 / 10 | A |
| 1596 | | 07/31/23 | P-19 | | CH | 18.4 | 105.0 | 19.1 | 102.8 | 122.4 | 6 | 98 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1593 | Select Clay: Wall Zone 59 | 8.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1594 | Select Clay: Wall Zone 58 | 8.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1595 | Select Clay: Wall Zone 57 | 8.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1596 | Select Clay: Wall Zone 56 | 8.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Signed on Behalf of Kurt Kuechle

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# Field Compaction Report

**Report Date:** 08/02/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1597 | | 08/01/23 | P-03 | | CH | 20.2 | 99.3 | 23.2 | 96.4 | 118.8 | 6 | 97 | 95 | 0 / 10 | A |
| 1598 | | 08/01/23 | P-03 | | CH | 20.2 | 99.3 | 22.7 | 99.1 | 121.6 | 6 | 100 | 95 | 0 / 10 | A |
| 1599 | | 08/01/23 | P-19 | | CH | 18.4 | 105.0 | 21.4 | 102.9 | 124.9 | 6 | 98 | 95 | 0 / 10 | A |
| 1600 | | 08/01/23 | P-21-std | A | CL | 18.1 | 106.3 | 20.5 | 105.9 | 127.6 | 6 | 100 | 95 | 0 / 10 | A |
| 1601 | | 08/01/23 | P-21-std | A | CL | 18.1 | 106.3 | 20.7 | 101.0 | 121.9 | 6 | 95 | 95 | 0 / 10 | A |
| 1602 | | 08/01/23 | P-21-std | A | CL | 18.1 | 106.3 | 20.3 | 104.0 | 125.1 | 6 | 98 | 95 | 0 / 10 | A |
| 1603 | | 08/01/23 | P-14 | | CH | 27.2 | 92.4 | 28.2 | 87.8 | 112.6 | 6 | 95 | 95 | 0 / 10 | A |
| 1604 | | 08/01/23 | P-07 | | CH | 22.6 | 93.8 | 23.1 | 91.0 | 112.0 | 6 | 97 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1597 | Select Clay: Wall Zone 56 | 9.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1598 | Select Clay: Wall Zone 57 | 9.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1599 | Select Clay: Wall Zone 58 | 9.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1600 | Select Clay: Wall Zone 59 | 9.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1601 | Select Clay: Wall Zone 60 | 9.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1602 | Select Clay: Wall Zone 21 | 9.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1603 | Select Clay: Wall Zone 55 | 48.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1604 | Select Clay: Wall Zone 55 | 49.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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**Project:**
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Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1605 | | 08/01/23 | P-19 | | CH | 18.4 | 105.0 | 21.3 | 105.1 | 127.5 | 6 | 100 | 95 | 0 / 10 | A |
| 1606 | | 08/01/23 | P-19 | | CH | 18.4 | 105.0 | 20.9 | 100.0 | 120.9 | 6 | 95 | 95 | 0 / 10 | A |
| 1607 | | 08/01/23 | P-21-std | A | CL | 18.1 | 106.3 | 18.2 | 103.5 | 122.3 | 6 | 97 | 95 | 0 / 10 | A |
| 1608 | | 08/01/23 | P-13 | | CH | 21.7 | 97.9 | 22.5 | 93.9 | 115.0 | 6 | 96 | 95 | 0 / 10 | A |
| 1609 | | 08/01/23 | P-03 | | CH | 20.2 | 99.3 | 21.4 | 99.6 | 120.9 | 6 | 100 | 95 | 0 / 10 | A |
| 1610 | | 08/01/23 | P-03 | | CH | 20.2 | 99.3 | 24.0 | 99.3 | 123.1 | 6 | 100 | 95 | 0 / 10 | A |
| 1611 | | 08/01/23 | P-03 | | CH | 20.2 | 99.3 | 25.8 | 96.6 | 121.5 | 6 | 97 | 95 | 0 / 10 | A |
| 1612 | | 08/01/23 | P-19 | | CH | 18.4 | 105.0 | 23.6 | 102.2 | 126.3 | 6 | 97 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1605 | Select Clay: Wall Zone 54 | 48.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1606 | Select Clay: Wall Zone 54 | 49.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1607 | Select Clay: Wall Zone 53 | 53.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1608 | Select Clay: Wall Zone 52 | 53.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1609 | Select Clay: Wall Zone 20 | 53.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1610 | Select Clay: Wall Zone 56 | 10.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1611 | Select Clay: Wall Zone 57 | 10.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1612 | Select Clay: Wall Zone 58 | 10.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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**Client:**
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**Project:**
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Minnkota Cell 5
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Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1613 | | 08/01/23 | P-19 | | CH | 18.4 | 105.0 | 19.5 | 101.8 | 121.7 | 6 | 97 | 95 | 0 / 10 | A |
| 1614 | | 08/01/23 | P-03 | | CH | 20.2 | 99.3 | 22.2 | 98.4 | 120.2 | 6 | 99 | 95 | 0 / 10 | A |
| 1615 | | 08/01/23 | P-03 | | CH | 20.2 | 99.3 | 21.5 | 96.1 | 116.8 | 6 | 97 | 95 | 0 / 10 | A |
| 1616 | | 08/01/23 | P-19 | | CH | 18.4 | 105.0 | 20.8 | 102.6 | 123.9 | 6 | 98 | 95 | 0 / 10 | A |
| 1617 | | 08/01/23 | P-19 | | CH | 18.4 | 105.0 | 21.4 | 102.1 | 123.9 | 6 | 97 | 95 | 0 / 10 | A |
| 1618 | | 08/01/23 | P-19 | | CH | 18.4 | 105.0 | 22.1 | 102.5 | 125.2 | 6 | 98 | 95 | 0 / 10 | A |
| 1619 | | 08/01/23 | P-19 | | CH | 18.4 | 105.0 | 21.1 | 100.9 | 122.2 | 6 | 96 | 95 | 0 / 10 | A |
| 1620 | | 08/01/23 | P-19 | | CH | 18.4 | 105.0 | 19.7 | 102.6 | 122.8 | 6 | 98 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1613 | Select Clay: Wall Zone 59 | 10.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1614 | Select Clay: Wall Zone 60 | 10.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1615 | Select Clay: Wall Zone 21 | 10.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1616 | Select Clay: Wall Zone 55 | 50.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1617 | Select Clay: Wall Zone 55 | 51.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1618 | Select Clay: Wall Zone 54 | 50.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1619 | Select Clay: Wall Zone 54 | 51.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1620 | Select Clay: Wall Zone 53 | 54.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1621 | | 08/01/23 | P-13 | | CH | 21.7 | 97.9 | 21.9 | 94.1 | 114.7 | 6 | 96 | 95 | 0 / 10 | A |
| 1622 | | 08/01/23 | P-19 | | CH | 18.4 | 105.0 | 22.7 | 101.6 | 124.7 | 6 | 97 | 95 | 0 / 10 | A |
| 1623 | | 08/01/23 | P-19 | | CH | 18.4 | 105.0 | 23.4 | 101.1 | 124.8 | 6 | 96 | 95 | 0 / 10 | A |
| 1624 | | 08/01/23 | P-03 | | CH | 20.2 | 99.3 | 23.3 | 98.9 | 121.9 | 6 | 100 | 95 | 0 / 10 | A |
| 1625 | | 08/01/23 | P-19 | | CH | 18.4 | 105.0 | 20.7 | 100.9 | 121.8 | 6 | 96 | 95 | 0 / 10 | A |
| 1626 | | 08/01/23 | P-19 | | CH | 18.4 | 105.0 | 21.7 | 100.0 | 121.7 | 6 | 95 | 95 | 0 / 10 | A |
| 1627 | | 08/01/23 | P-07 | | CH | 22.6 | 93.8 | 28.7 | 93.1 | 119.8 | 6 | 99 | 95 | 0 / 10 | A |
| 1628 | | 08/01/23 | P-19 | | CH | 18.4 | 105.0 | 22.1 | 101.6 | 124.1 | 6 | 97 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1621 | Select Clay: Wall Zone 52 | 54.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1622 | Select Clay: Wall Zone 20 | 54.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1623 | Select Clay: Wall Zone 56 | 11.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1624 | Select Clay: Wall Zone 57 | 11.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1625 | Select Clay: Wall Zone 58 | 11.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1626 | Select Clay: Wall Zone 59 | 11.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1627 | Select Clay: Wall Zone 60 | 11.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1628 | Select Clay: Wall Zone 21 | 11.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
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## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1629 | | 08/01/23 | P-19 | | CH | 18.4 | 105.0 | 19.8 | 102.7 | 123.0 | 6 | 98 | 95 | 0 / 10 | A |
| 1630 | | 08/01/23 | P-19 | | CH | 18.4 | 105.0 | 23.6 | 100.8 | 124.6 | 6 | 96 | 95 | 0 / 10 | A |
| 1631 | | 08/01/23 | P-19 | | CH | 18.4 | 105.0 | 19.5 | 103.8 | 124.0 | 6 | 99 | 95 | 0 / 10 | A |
| 1632 | | 08/01/23 | P-03 | | CH | 20.2 | 99.3 | 21.9 | 99.3 | 121.0 | 6 | 100 | 95 | 0 / 10 | A |
| 1633 | | 08/01/23 | P-19 | | CH | 18.4 | 105.0 | 22.2 | 101.3 | 123.8 | 6 | 96 | 95 | 0 / 10 | A |
| 1634 | | 08/01/23 | P-19 | | CH | 18.4 | 105.0 | 19.5 | 102.7 | 122.7 | 6 | 98 | 95 | 0 / 10 | A |
| 1635 | | 08/01/23 | P-03 | | CH | 20.2 | 99.3 | 22.3 | 98.9 | 121.0 | 6 | 100 | 95 | 0 / 10 | A |
| 1636 | | 08/01/23 | P-07 | | CH | 22.6 | 93.8 | 25.7 | 92.9 | 116.8 | 6 | 99 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1629 | Select Clay: Wall Zone 55 | 52.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1630 | Select Clay: Wall Zone 55 | 53.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1631 | Select Clay: Wall Zone 54 | 52.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1632 | Select Clay: Wall Zone 54 | 53.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1633 | Select Clay: Wall Zone 53 | 55.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1634 | Select Clay: Wall Zone 52 | 55.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1635 | Select Clay: Wall Zone 20 | 55.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1636 | Select Clay: Wall Zone 56 | 12.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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The Science You Build On.

2908 Morrison Ave.
Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/02/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1637 | | 08/01/23 | P-03 | | CH | 20.2 | 99.3 | 21.8 | 99.4 | 121.1 | 6 | 100 | 95 | 0 / 10 | A |
| 1638 | | 08/01/23 | P-03 | | CH | 20.2 | 99.3 | 24.0 | 97.7 | 121.1 | 6 | 98 | 95 | 0 / 10 | A |
| 1639 | | 08/01/23 | P-19 | | CH | 18.4 | 105.0 | 22.0 | 100.4 | 122.5 | 6 | 96 | 95 | 0 / 10 | A |
| 1640 | | 08/01/23 | P-07 | | CH | 22.6 | 93.8 | 28.0 | 91.8 | 117.5 | 6 | 98 | 95 | 0 / 10 | A |
| 1641 | | 08/01/23 | P-19 | | CH | 18.4 | 105.0 | 22.8 | 101.5 | 124.6 | 6 | 97 | 95 | 0 / 10 | A |
| 1642 | | 08/01/23 | P-19 | | CH | 18.4 | 105.0 | 24.2 | 101.1 | 125.6 | 6 | 96 | 95 | 0 / 10 | A |
| 1643 | | 08/01/23 | P-19 | | CH | 18.4 | 105.0 | 23.5 | 102.5 | 126.6 | 6 | 98 | 95 | 0 / 10 | A |
| 1644 | | 08/01/23 | P-19 | | CH | 18.4 | 105.0 | 21.4 | 102.9 | 124.9 | 6 | 98 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1637 | Select Clay: Wall Zone 57 | 12.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1638 | Select Clay: Wall Zone 58 | 12.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1639 | Select Clay: Wall Zone 59 | 12.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1640 | Select Clay: Wall Zone 60 | 12.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1641 | Select Clay: Wall Zone 21 | 12.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1642 | Select Clay: Wall Zone 55 | 54.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1643 | Select Clay: Wall Zone 55 | 55.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1644 | Select Clay: Wall Zone 54 | 54.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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2908 Morrison Ave.
Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/02/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1645 | | 08/01/23 | P-03 | | CH | 20.2 | 99.3 | 23.3 | 99.5 | 122.7 | 6 | 100 | 95 | 0 / 10 | A |
| 1646 | | 08/01/23 | P-19 | | CH | 18.4 | 105.0 | 21.6 | 100.2 | 121.8 | 6 | 95 | 95 | 0 / 10 | A |
| 1647 | | 08/01/23 | P-07 | | CH | 22.6 | 93.8 | 27.3 | 92.2 | 117.4 | 6 | 98 | 95 | 0 / 10 | A |
| 1648 | | 08/01/23 | P-07 | | CH | 22.6 | 93.8 | 26.9 | 90.8 | 115.2 | 6 | 97 | 95 | 0 / 10 | A |
| 1649 | | 08/01/23 | P-03 | | CH | 20.2 | 99.3 | 22.3 | 97.6 | 119.4 | 6 | 98 | 95 | 0 / 10 | A |
| 1650 | | 08/01/23 | P-14 | | CH | 27.2 | 92.4 | 29.8 | 89.6 | 116.3 | 6 | 97 | 95 | 0 / 10 | A |
| 1651 | | 08/01/23 | P-19 | | CH | 18.4 | 105.0 | 22.5 | 101.0 | 123.7 | 6 | 96 | 95 | 0 / 10 | A |
| 1652 | | 08/01/23 | P-03 | | CH | 20.2 | 99.3 | 25.1 | 98.0 | 122.6 | 6 | 99 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1645 | Select Clay: Wall Zone 54 | 55.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1646 | Select Clay: Wall Zone 53 | 56.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1647 | Select Clay: Wall Zone 52 | 56.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1648 | Select Clay: Wall Zone 20 | 56.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1649 | Select Clay: Wall Zone 56 | 13.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1650 | Select Clay: Wall Zone 57 | 13.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1651 | Select Clay: Wall Zone 58 | 13.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1652 | Select Clay: Wall Zone 59 | 13.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/02/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1653 | | 08/01/23 | P-07 | | CH | 22.6 | 93.8 | 26.9 | 91.6 | 116.2 | 6 | 98 | 95 | 0 / 10 | A |
| 1654 | | 08/01/23 | P-03 | | CH | 20.2 | 99.3 | 26.5 | 95.5 | 120.8 | 6 | 96 | 95 | 0 / 10 | A |
| 1655 | | 08/01/23 | P-07 | | CH | 22.6 | 93.8 | 27.2 | 90.5 | 115.1 | 6 | 96 | 95 | 0 / 10 | A |
| 1656 | | 08/01/23 | P-03 | | CH | 20.2 | 99.3 | 23.0 | 99.1 | 121.9 | 6 | 100 | 95 | 0 / 10 | A |
| 1657 | | 08/01/23 | P-07 | | CH | 22.6 | 93.8 | 29.3 | 91.9 | 118.8 | 6 | 98 | 95 | 0 / 10 | A |
| 1658 | | 08/01/23 | P-07 | | CH | 22.6 | 93.8 | 28.0 | 93.6 | 119.8 | 6 | 100 | 95 | 0 / 10 | A |
| 1659 | | 08/01/23 | P-19 | | CH | 18.4 | 105.0 | 21.2 | 102.6 | 124.4 | 6 | 98 | 95 | 0 / 10 | A |
| 1660 | | 08/01/23 | P-19 | | CH | 18.4 | 105.0 | 22.8 | 101.8 | 125.0 | 6 | 97 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1653 | Select Clay: Wall Zone 60 | 13.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1654 | Select Clay: Wall Zone 21 | 13.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1655 | Select Clay: Wall Zone 55 | 56.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1656 | Select Clay: Wall Zone 55 | 57.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1657 | Select Clay: Wall Zone 54 | 56.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1658 | Select Clay: Wall Zone 54 | 57.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1659 | Select Clay: Wall Zone 53 | 57.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1660 | Select Clay: Wall Zone 52 | 57.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/02/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1661 | | 08/01/23 | P-19 | | CH | 18.4 | 105.0 | 21.2 | 104.2 | 126.3 | 6 | 99 | 95 | 0 / 10 | A |
| 1662 | | 08/01/23 | P-19 | | CH | 18.4 | 105.0 | 21.7 | 100.4 | 122.2 | 6 | 96 | 95 | 0 / 10 | A |
| 1663 | | 08/01/23 | P-03 | | CH | 20.2 | 99.3 | 22.7 | 98.4 | 120.7 | 6 | 99 | 95 | 0 / 10 | A |
| 1664 | | 08/01/23 | P-19 | | CH | 18.4 | 105.0 | 22.4 | 101.2 | 123.9 | 6 | 96 | 95 | 0 / 10 | A |
| 1665 | | 08/01/23 | P-07 | | CH | 22.6 | 93.8 | 26.4 | 92.3 | 116.7 | 6 | 98 | 95 | 0 / 10 | A |
| 1666 | | 08/01/23 | P-07 | | CH | 22.6 | 93.8 | 27.7 | 92.0 | 117.5 | 6 | 98 | 95 | 0 / 10 | A |
| 1667 | | 08/01/23 | P-14 | | CH | 27.2 | 92.4 | 30.2 | 87.7 | 114.2 | 6 | 95 | 95 | 0 / 10 | A |
| 1668 | | 08/01/23 | P-07 | | CH | 22.6 | 93.8 | 26.8 | 93.6 | 118.7 | 6 | 100 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1661 | Select Clay: Wall Zone 20 | 57.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1662 | Select Clay: Wall Zone 56 | 14.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1663 | Select Clay: Wall Zone 57 | 14.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1664 | Select Clay: Wall Zone 58 | 14.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1665 | Select Clay: Wall Zone 59 | 14.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1666 | Select Clay: Wall Zone 60 | 14.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1667 | Select Clay: Wall Zone 21 | 14.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1668 | Select Clay: Wall Zone 55 | 58.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/02/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1669 | | 08/01/23 | P-19 | | CH | 18.4 | 105.0 | 21.4 | 101.8 | 123.6 | 6 | 97 | 95 | 0 / 10 | A |
| 1670 | | 08/01/23 | P-14 | | CH | 27.2 | 92.4 | 30.5 | 89.5 | 116.8 | 6 | 97 | 95 | 0 / 10 | A |
| 1671 | | 08/01/23 | P-19 | | CH | 18.4 | 105.0 | 18.9 | 101.8 | 121.0 | 6 | 97 | 95 | 0 / 10 | A |
| 1672 | | 08/01/23 | P-21-std | A | CL | 18.1 | 106.3 | 20.4 | 106.5 | 128.2 | 6 | 100 | 95 | 0 / 10 | A |
| 1673 | | 08/01/23 | P-21-std | A | CL | 18.1 | 106.3 | 18.3 | 105.1 | 124.3 | 6 | 99 | 95 | 0 / 10 | A |
| 1674 | | 08/01/23 | P-19 | | CH | 18.4 | 105.0 | 20.8 | 100.7 | 121.6 | 6 | 96 | 95 | 0 / 10 | A |
| 1675 | | 08/01/23 | P-03 | | CH | 20.2 | 99.3 | 22.5 | 99.0 | 121.3 | 6 | 100 | 95 | 0 / 10 | A |
| 1676 | | 08/01/23 | P-19 | | CH | 18.4 | 105.0 | 21.4 | 104.5 | 126.9 | 6 | 100 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1669 | Select Clay: Wall Zone 54 | 58.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1670 | Select Clay: Wall Zone 53 | 58.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1671 | Select Clay: Wall Zone 52 | 58.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1672 | Select Clay: Wall Zone 20 | 58.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1673 | Select Clay: Wall Zone 56 | 15.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1674 | Select Clay: Wall Zone 57 | 15.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1675 | Select Clay: Wall Zone 58 | 15.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1676 | Select Clay: Wall Zone 59 | 15.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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2908 Morrison Ave.
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Bismarck, ND 58504
Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/02/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1677 | | 08/01/23 | P-19 | | CH | 18.4 | 105.0 | 21.4 | 102.1 | 123.9 | 6 | 97 | 95 | 0 / 10 | A |
| 1678 | | 08/01/23 | P-19 | | CH | 18.4 | 105.0 | 23.1 | 101.6 | 125.1 | 6 | 97 | 95 | 0 / 10 | A |
| 1679 | | 08/01/23 | P-21-std | A | CL | 18.1 | 106.3 | 20.9 | 107.4 | 129.9 | 6 | 101 | 95 | 0 / 10 | A |
| 1680 | | 08/01/23 | P-03 | | CH | 20.2 | 99.3 | 23.1 | 98.7 | 121.5 | 6 | 99 | 95 | 0 / 10 | A |
| 1681 | | 08/01/23 | P-03 | | CH | 20.2 | 99.3 | 25.5 | 95.0 | 119.2 | 6 | 96 | 95 | 0 / 10 | A |
| 1682 | | 08/01/23 | P-19 | | CH | 18.4 | 105.0 | 20.4 | 101.3 | 122.0 | 6 | 96 | 95 | 0 / 10 | A |
| 1683 | | 08/01/23 | P-19 | | CH | 18.4 | 105.0 | 21.3 | 101.4 | 123.0 | 6 | 97 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1677 | Select Clay: Wall Zone 60 | 15.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1678 | Select Clay: Wall Zone 21 | 15.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1679 | Select Clay: Wall Zone 55 | 59.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1680 | Select Clay: Wall Zone 54 | 59.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1681 | Select Clay: Wall Zone 53 | 59.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1682 | Select Clay: Wall Zone 52 | 59.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |
| 1683 | Select Clay: Wall Zone 20 | 59.0 | Lift number | InstroTek / 3500 / 1907 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Signed on Behalf of Kurt Kuechle

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/03/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1684 | | 08/02/23 | P-03 | | CH | 20.2 | 99.3 | 25.8 | 98.5 | 123.9 | 6 | 99 | 95 | 0 / 10 | A |
| 1685 | | 08/02/23 | P-03 | | CH | 20.2 | 99.3 | 25.0 | 99.1 | 123.9 | 6 | 100 | 95 | 0 / 10 | A |
| 1686 | | 08/02/23 | P-19 | | CH | 18.4 | 105.0 | 22.6 | 100.5 | 123.2 | 6 | 96 | 95 | 0 / 10 | A |
| 1687 | | 08/02/23 | P-03 | | CH | 20.2 | 99.3 | 25.7 | 94.9 | 119.3 | 6 | 96 | 95 | 0 / 10 | A |
| 1688 | | 08/02/23 | P-14 | | CH | 27.2 | 92.4 | 31.8 | 89.2 | 117.6 | 6 | 97 | 95 | 0 / 10 | A |
| 1689 | | 08/02/23 | P-03 | | CH | 20.2 | 99.3 | 25.9 | 94.9 | 119.5 | 6 | 96 | 95 | 0 / 10 | A |
| 1690 | | 08/02/23 | P-19 | | CH | 18.4 | 105.0 | 21.0 | 100.4 | 121.5 | 6 | 96 | 95 | 0 / 10 | A |
| 1691 | | 08/02/23 | P-19 | | CH | 18.4 | 105.0 | 20.0 | 103.9 | 124.7 | 6 | 99 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1684 | Select Clay: Wall Zone 56 | 16.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1685 | Select Clay: Wall Zone 57 | 16.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1686 | Select Clay: Wall Zone 58 | 16.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1687 | Select Clay: Wall Zone 59 | 16.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1688 | Select Clay: Wall Zone 60 | 16.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1689 | Select Clay: Wall Zone 21 | 16.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1690 | Select Clay: Wall Zone 55 | 60.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1691 | Select Clay: Wall Zone 54 | 60.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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The Science You Build On.

2908 Morrison Ave.
Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/03/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1692 | | 08/02/23 | P-03 | | CH | 20.2 | 99.3 | 26.3 | 96.1 | 121.4 | 6 | 97 | 95 | 0 / 10 | A |
| 1693 | | 08/02/23 | P-14 | | CH | 27.2 | 92.4 | 28.6 | 90.8 | 116.8 | 6 | 98 | 95 | 0 / 10 | A |
| 1694 | | 08/02/23 | P-03 | | CH | 20.2 | 99.3 | 26.3 | 96.1 | 121.4 | 6 | 97 | 95 | 0 / 10 | A |
| 1695 | | 08/02/23 | P-03 | | CH | 20.2 | 99.3 | 25.9 | 95.3 | 120.0 | 6 | 96 | 95 | 0 / 10 | A |
| 1696 | | 08/02/23 | P-07 | | CH | 22.6 | 93.8 | 26.5 | 92.7 | 117.3 | 6 | 99 | 95 | 0 / 10 | A |
| 1697 | | 08/02/23 | P-10 | | CH | 25.0 | 94.6 | 25.7 | 90.2 | 113.4 | 6 | 95 | 95 | 0 / 10 | A |
| 1698 | | 08/02/23 | P-03 | | CH | 20.2 | 99.3 | 24.2 | 95.1 | 118.1 | 6 | 96 | 95 | 0 / 10 | A |
| 1699 | | 08/02/23 | P-19 | | CH | 18.4 | 105.0 | 19.9 | 101.0 | 121.1 | 6 | 96 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1692 | Select Clay: Wall Zone 53 | 60.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1693 | Select Clay: Wall Zone 52 | 60.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1694 | Select Clay: Wall Zone 20 | 60.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1695 | Select Clay: Wall Zone 56 | 17.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1696 | Select Clay: Wall Zone 57 | 17.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1697 | Select Clay: Wall Zone 58 | 17.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1698 | Select Clay: Wall Zone 59 | 17.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1699 | Select Clay: Wall Zone 60 | 17.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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2908 Morrison Ave.
Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/03/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1700 | | 08/02/23 | P-14 | | CH | 27.2 | 92.4 | 29.6 | 88.9 | 115.2 | 6 | 96 | 95 | 0 / 10 | A |
| 1701 | | 08/02/23 | P-10 | | CH | 25.0 | 94.6 | 26.2 | 92.0 | 116.1 | 6 | 97 | 95 | 0 / 10 | A |
| 1702 | | 08/02/23 | P-07 | | CH | 22.6 | 93.8 | 24.6 | 92.3 | 115.0 | 6 | 98 | 95 | 0 / 10 | A |
| 1703 | | 08/02/23 | P-07 | | CH | 22.6 | 93.8 | 28.8 | 90.2 | 116.2 | 6 | 96 | 95 | 0 / 10 | A |
| 1704 | | 08/02/23 | P-03 | | CH | 20.2 | 99.3 | 21.4 | 95.3 | 115.7 | 6 | 96 | 95 | 0 / 10 | A |
| 1705 | | 08/02/23 | P-09 | | CH | 23.9 | 98.6 | 24.3 | 94.2 | 117.1 | 6 | 96 | 95 | 0 / 10 | A |
| 1706 | | 08/02/23 | P-19 | | CH | 18.4 | 105.0 | 21.3 | 101.0 | 122.5 | 6 | 96 | 95 | 0 / 10 | A |
| 1707 | | 08/02/23 | P-19 | | CH | 18.4 | 105.0 | 19.2 | 100.9 | 120.3 | 6 | 96 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1700 | Select Clay: Wall Zone 21 | 17.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1701 | Select Clay: Wall Zone 55 | 61.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1702 | Select Clay: Wall Zone 54 | 61.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1703 | Select Clay: Wall Zone 53 | 61.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1704 | Select Clay: Wall Zone 52 | 61.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1705 | Select Clay: Wall Zone 20 | 61.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1706 | Select Clay: Wall Zone 56 | 18.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1707 | Select Clay: Wall Zone 57 | 18.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/03/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1708 | | 08/02/23 | P-03 | | CH | 20.2 | 99.3 | 24.6 | 97.0 | 120.9 | 6 | 98 | 95 | 0 / 10 | A |
| 1709 | | 08/02/23 | P-07 | | CH | 22.6 | 93.8 | 26.7 | 89.5 | 113.4 | 6 | 95 | 95 | 0 / 10 | A |
| 1710 | | 08/02/23 | P-19 | | CH | 18.4 | 105.0 | 18.4 | 104.2 | 123.4 | 6 | 99 | 95 | 0 / 10 | A |
| 1711 | | 08/02/23 | P-03 | | CH | 20.2 | 99.3 | 23.4 | 99.4 | 122.7 | 6 | 100 | 95 | 0 / 10 | A |
| 1712 | | 08/02/23 | P-19 | | CH | 18.4 | 105.0 | 21.2 | 100.2 | 121.4 | 6 | 95 | 95 | 0 / 10 | A |
| 1713 | | 08/02/23 | P-19 | | CH | 18.4 | 105.0 | 22.0 | 104.3 | 127.2 | 6 | 99 | 95 | 0 / 10 | A |
| 1714 | | 08/02/23 | P-07 | | CH | 22.6 | 93.8 | 23.8 | 93.3 | 115.5 | 6 | 99 | 95 | 0 / 10 | A |
| 1715 | | 08/02/23 | P-07 | | CH | 22.6 | 93.8 | 25.0 | 90.3 | 112.9 | 6 | 96 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1708 | Select Clay: Wall Zone 58 | 18.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1709 | Select Clay: Wall Zone 59 | 18.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1710 | Select Clay: Wall Zone 60 | 18.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1711 | Select Clay: Wall Zone 21 | 18.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1712 | Select Clay: Wall Zone 55 | 62.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1713 | Select Clay: Wall Zone 54 | 62.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1714 | Select Clay: Wall Zone 53 | 62.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1715 | Select Clay: Wall Zone 52 | 62.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/03/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1716 | | 08/02/23 | P-19 | | CH | 18.4 | 105.0 | 19.1 | 100.4 | 119.6 | 6 | 96 | 95 | 0 / 10 | A |
| 1717 | | 08/02/23 | P-03 | | CH | 20.2 | 99.3 | 26.5 | 94.5 | 119.5 | 6 | 95 | 95 | 0 / 10 | A |
| 1718 | | 08/02/23 | P-03 | | CH | 20.2 | 99.3 | 26.2 | 95.9 | 121.0 | 6 | 97 | 95 | 0 / 10 | A |
| 1719 | | 08/02/23 | P-19 | | CH | 18.4 | 105.0 | 19.8 | 104.9 | 125.7 | 6 | 100 | 95 | 0 / 10 | A |
| 1720 | | 08/02/23 | P-03 | | CH | 20.2 | 99.3 | 24.6 | 97.8 | 121.9 | 6 | 98 | 95 | 0 / 10 | A |
| 1721 | | 08/02/23 | P-03 | | CH | 20.2 | 99.3 | 22.6 | 98.1 | 120.3 | 6 | 99 | 95 | 0 / 10 | A |
| 1722 | | 08/02/23 | P-03 | | CH | 20.2 | 99.3 | 22.7 | 99.9 | 122.6 | 6 | 101 | 95 | 0 / 10 | A |
| 1723 | | 08/02/23 | P-03 | | CH | 20.2 | 99.3 | 22.7 | 96.8 | 118.8 | 6 | 97 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1716 | Select Clay: Wall Zone 20 | 62.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1717 | Select Clay: Wall Zone 56 | 19.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1718 | Select Clay: Wall Zone 57 | 19.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1719 | Select Clay: Wall Zone 58 | 19.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1720 | Select Clay: Wall Zone 59 | 19.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1721 | Select Clay: Wall Zone 60 | 19.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1722 | Select Clay: Wall Zone 21 | 19.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1723 | Select Clay: Wall Zone 55 | 63.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/03/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1724 | | 08/02/23 | P-03 | | CH | 20.2 | 99.3 | 21.6 | 100.2 | 121.8 | 6 | 101 | 95 | 0 / 10 | A |
| 1725 | | 08/02/23 | P-01 | | CH | 19.4 | 100.8 | 19.4 | 99.3 | 118.6 | 6 | 99 | 95 | 0 / 10 | A |
| 1726 | | 08/02/23 | P-19 | | CH | 18.4 | 105.0 | 20.1 | 102.3 | 122.9 | 6 | 97 | 95 | 0 / 10 | A |
| 1727 | | 08/02/23 | P-03 | | CH | 20.2 | 99.3 | 23.1 | 95.3 | 117.3 | 6 | 96 | 95 | 0 / 10 | A |
| 1728 | | 08/02/23 | P-03 | | CH | 20.2 | 99.3 | 27.6 | 97.2 | 124.0 | 6 | 98 | 95 | 0 / 10 | A |
| 1729 | | 08/02/23 | P-03 | | CH | 20.2 | 99.3 | 25.1 | 98.6 | 123.3 | 6 | 99 | 95 | 0 / 10 | A |
| 1730 | | 08/02/23 | P-19 | | CH | 18.4 | 105.0 | 21.1 | 102.0 | 123.5 | 6 | 97 | 95 | 0 / 10 | A |
| 1731 | | 08/02/23 | P-19 | | CH | 18.4 | 105.0 | 21.1 | 102.6 | 124.2 | 6 | 98 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1724 | Select Clay: Wall Zone 54 | 63.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1725 | Select Clay: Wall Zone 53 | 63.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1726 | Select Clay: Wall Zone 52 | 63.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1727 | Select Clay: Wall Zone 20 | 63.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1728 | Select Clay: Wall Zone 56 | 20.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1729 | Select Clay: Wall Zone 57 | 20.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1730 | Select Clay: Wall Zone 58 | 20.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1731 | Select Clay: Wall Zone 59 | 20.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/03/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1732 | | 08/02/23 | P-14 | | CH | 27.2 | 92.4 | 27.4 | 88.8 | 113.1 | 6 | 96 | 95 | 0 / 10 | A |
| 1733 | | 08/02/23 | P-03 | | CH | 20.2 | 99.3 | 24.4 | 98.1 | 122.0 | 6 | 99 | 95 | 0 / 10 | A |
| 1734 | | 08/02/23 | P-03 | | CH | 20.2 | 99.3 | 22.7 | 99.5 | 122.1 | 6 | 100 | 95 | 0 / 10 | A |
| 1735 | | 08/02/23 | P-03 | | CH | 20.2 | 99.3 | 20.9 | 100.1 | 121.0 | 6 | 101 | 95 | 0 / 10 | A |
| 1736 | | 08/02/23 | P-03 | | CH | 20.2 | 99.3 | 23.3 | 100.5 | 123.9 | 6 | 101 | 95 | 0 / 10 | A |
| 1737 | | 08/02/23 | P-19 | | CH | 18.4 | 105.0 | 18.6 | 105.0 | 124.5 | 6 | 100 | 95 | 0 / 10 | A |
| 1738 | | 08/02/23 | P-07 | | CH | 22.6 | 93.8 | 25.9 | 93.7 | 118.0 | 6 | 100 | 95 | 0 / 10 | A |
| 1739 | | 08/02/23 | P-19 | | CH | 18.4 | 105.0 | 19.6 | 102.5 | 122.6 | 6 | 98 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1732 | Select Clay: Wall Zone 60 | 20.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1733 | Select Clay: Wall Zone 21 | 20.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1734 | Select Clay: Wall Zone 55 | 64.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1735 | Select Clay: Wall Zone 54 | 64.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1736 | Select Clay: Wall Zone 53 | 64.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1737 | Select Clay: Wall Zone 52 | 64.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1738 | Select Clay: Wall Zone 20 | 64.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1739 | Select Clay: Wall Zone 56 | 21.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/03/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1740 | | 08/02/23 | P-19 | | CH | 18.4 | 105.0 | 19.1 | 103.2 | 122.9 | 6 | 98 | 95 | 0 / 10 | A |
| 1741 | | 08/02/23 | P-19 | | CH | 18.4 | 105.0 | 22.6 | 103.0 | 126.3 | 6 | 98 | 95 | 0 / 10 | A |
| 1742 | | 08/02/23 | P-03 | | CH | 20.2 | 99.3 | 25.8 | 94.7 | 119.1 | 6 | 95 | 95 | 0 / 10 | A |
| 1743 | | 08/02/23 | P-03 | | CH | 20.2 | 99.3 | 23.8 | 98.4 | 121.8 | 6 | 99 | 95 | 0 / 10 | A |
| 1744 | | 08/02/23 | P-03 | | CH | 20.2 | 99.3 | 24.1 | 98.4 | 122.1 | 6 | 99 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1740 | Select Clay: Wall Zone 57 | 21.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1741 | Select Clay: Wall Zone 58 | 21.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1742 | Select Clay: Wall Zone 59 | 21.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1743 | Select Clay: Wall Zone 60 | 21.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1744 | Select Clay: Wall Zone 21 | 21.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Kurt Kuechle
08/03/2023

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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2908 Morrison Ave.
Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/04/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1745 | | 08/03/23 | P-19 | | CH | 18.4 | 105.0 | 22.4 | 103.9 | 127.2 | 6 | 99 | 95 | 0 / 10 | A |
| 1746 | | 08/03/23 | P-19 | | CH | 18.4 | 105.0 | 21.8 | 102.2 | 124.5 | 6 | 97 | 95 | 0 / 10 | A |
| 1747 | | 08/03/23 | P-19 | | CH | 18.4 | 105.0 | 24.3 | 102.0 | 126.8 | 6 | 97 | 95 | 0 / 10 | A |
| 1748 | | 08/03/23 | P-19 | | CH | 18.4 | 105.0 | 22.5 | 102.9 | 126.1 | 6 | 98 | 95 | 0 / 10 | A |
| 1749 | | 08/03/23 | P-03 | | CH | 20.2 | 99.3 | 22.4 | 99.4 | 121.7 | 6 | 100 | 95 | 0 / 10 | A |
| 1750 | | 08/03/23 | P-03 | | CH | 20.2 | 99.3 | 27.0 | 96.3 | 122.3 | 6 | 97 | 95 | 0 / 10 | A |
| 1751 | | 08/03/23 | P-19 | | CH | 18.4 | 105.0 | 22.9 | 100.4 | 123.4 | 6 | 96 | 95 | 0 / 10 | A |
| 1752 | | 08/03/23 | P-19 | | CH | 18.4 | 105.0 | 23.1 | 102.3 | 125.9 | 6 | 97 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1745 | Select Clay: Wall Zone 56 | 22.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1746 | Select Clay: Wall Zone 57 | 22.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1747 | Select Clay: Wall Zone 58 | 22.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1748 | Select Clay: Wall Zone 59 | 22.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1749 | Select Clay: Wall Zone 60 | 22.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1750 | Select Clay: Wall Zone 21 | 22.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1751 | Select Clay: Wall Zone 55 | 65.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1752 | Select Clay: Wall Zone 54 | 65.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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2908 Morrison Ave.
Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/04/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1753 | | 08/03/23 | P-03 | | CH | 20.2 | 99.3 | 25.7 | 95.6 | 120.2 | 6 | 96 | 95 | 0 / 10 | A |
| 1754 | | 08/03/23 | P-03 | | CH | 20.2 | 99.3 | 24.1 | 99.9 | 124.0 | 6 | 101 | 95 | 0 / 10 | A |
| 1755 | | 08/03/23 | P-19 | | CH | 18.4 | 105.0 | 23.3 | 101.4 | 125.0 | 6 | 97 | 95 | 0 / 10 | A |
| 1756 | | 08/03/23 | P-19 | | CH | 18.4 | 105.0 | 20.2 | 102.0 | 122.6 | 6 | 97 | 95 | 0 / 10 | A |
| 1757 | | 08/03/23 | P-19 | | CH | 18.4 | 105.0 | 22.2 | 101.8 | 124.4 | 6 | 97 | 95 | 0 / 10 | A |
| 1758 | | 08/03/23 | P-19 | | CH | 18.4 | 105.0 | 23.6 | 100.2 | 123.8 | 6 | 95 | 95 | 0 / 10 | A |
| 1759 | | 08/03/23 | P-19 | | CH | 18.4 | 105.0 | 24.1 | 99.9 | 124.0 | 6 | 95 | 95 | 0 / 10 | A |
| 1760 | | 08/03/23 | P-03 | | CH | 20.2 | 99.3 | 24.4 | 98.4 | 122.4 | 6 | 99 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1753 | Select Clay: Wall Zone 53 | 65.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1754 | Select Clay: Wall Zone 52 | 65.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1755 | Select Clay: Wall Zone 20 | 65.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1756 | Select Clay: Wall Zone 56 | 23.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1757 | Select Clay: Wall Zone 57 | 23.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1758 | Select Clay: Wall Zone 58 | 23.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1759 | Select Clay: Wall Zone 59 | 23.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1760 | Select Clay: Wall Zone 60 | 23.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/04/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1761 | | 08/03/23 | P-19 | | CH | 18.4 | 105.0 | 21.9 | 101.5 | 123.7 | 6 | 97 | 95 | 0 / 10 | A |
| 1762 | | 08/03/23 | P-03 | | CH | 20.2 | 99.3 | 25.6 | 98.7 | 124.0 | 6 | 99 | 95 | 0 / 10 | A |
| 1763 | | 08/03/23 | P-03 | | CH | 20.2 | 99.3 | 26.5 | 97.1 | 122.8 | 6 | 98 | 95 | 0 / 10 | A |
| 1764 | | 08/03/23 | P-19 | | CH | 18.4 | 105.0 | 24.4 | 100.7 | 125.3 | 6 | 96 | 95 | 0 / 10 | A |
| 1765 | | 08/03/23 | P-03 | | CH | 20.2 | 99.3 | 24.8 | 99.8 | 124.6 | 6 | 101 | 95 | 0 / 10 | A |
| 1766 | | 08/03/23 | P-03 | | CH | 20.2 | 99.3 | 24.8 | 100.0 | 124.8 | 6 | 101 | 95 | 0 / 10 | A |
| 1767 | | 08/03/23 | P-19 | | CH | 18.4 | 105.0 | 20.7 | 102.9 | 124.2 | 6 | 98 | 95 | 0 / 10 | A |
| 1768 | | 08/03/23 | P-19 | | CH | 18.4 | 105.0 | 20.8 | 100.1 | 120.9 | 6 | 95 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1761 | Select Clay: Wall Zone 21 | 23.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1762 | Select Clay: Wall Zone 55 | 66.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1763 | Select Clay: Wall Zone 54 | 66.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1764 | Select Clay: Wall Zone 53 | 66.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1765 | Select Clay: Wall Zone 52 | 66.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1766 | Select Clay: Wall Zone 20 | 66.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1767 | Select Clay: Wall Zone 56 | 24.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1768 | Select Clay: Wall Zone 57 | 24.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/04/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1769 | | 08/03/23 | P-03 | | CH | 20.2 | 99.3 | 22.1 | 98.7 | 120.5 | 6 | 99 | 95 | 0 / 10 | A |
| 1770 | | 08/03/23 | P-03 | | CH | 20.2 | 99.3 | 23.3 | 99.9 | 123.2 | 6 | 101 | 95 | 0 / 10 | A |
| 1771 | | 08/03/23 | P-03 | | CH | 20.2 | 99.3 | 23.7 | 99.9 | 123.6 | 6 | 101 | 95 | 0 / 10 | A |
| 1772 | | 08/03/23 | P-03 | | CH | 20.2 | 99.3 | 23.9 | 99.1 | 122.8 | 6 | 100 | 95 | 0 / 10 | A |
| 1773 | | 08/03/23 | P-03 | | CH | 20.2 | 99.3 | 23.5 | 97.8 | 120.8 | 6 | 98 | 95 | 0 / 10 | A |
| 1774 | | 08/03/23 | P-03 | | CH | 20.2 | 99.3 | 23.3 | 100.2 | 123.5 | 6 | 101 | 95 | 0 / 10 | A |
| 1775 | | 08/03/23 | P-03 | | CH | 20.2 | 99.3 | 24.5 | 97.5 | 121.4 | 6 | 98 | 95 | 0 / 10 | A |
| 1776 | | 08/03/23 | P-03 | | CH | 20.2 | 99.3 | 24.2 | 98.8 | 122.7 | 6 | 99 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1769 | Select Clay: Wall Zone 58 | 24.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1770 | Select Clay: Wall Zone 59 | 24.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1771 | Select Clay: Wall Zone 60 | 24.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1772 | Select Clay: Wall Zone 21 | 24.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1773 | Select Clay: Wall Zone 55 | 67.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1774 | Select Clay: Wall Zone 54 | 67.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1775 | Select Clay: Wall Zone 53 | 67.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1776 | Select Clay: Wall Zone 52 | 67.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/04/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1777 | | 08/03/23 | P-19 | | CH | 18.4 | 105.0 | 22.8 | 100.6 | 123.5 | 6 | 96 | 95 | 0 / 10 | A |
| 1778 | | 08/03/23 | P-03 | | CH | 20.2 | 99.3 | 26.8 | 95.9 | 121.6 | 6 | 97 | 95 | 0 / 10 | A |
| 1779 | | 08/03/23 | P-03 | | CH | 20.2 | 99.3 | 27.3 | 95.2 | 121.2 | 6 | 96 | 95 | 0 / 10 | A |
| 1780 | | 08/03/23 | P-03 | | CH | 20.2 | 99.3 | 26.6 | 96.6 | 122.3 | 6 | 97 | 95 | 0 / 10 | A |
| 1781 | | 08/03/23 | P-03 | | CH | 20.2 | 99.3 | 24.0 | 100.2 | 124.2 | 6 | 101 | 95 | 0 / 10 | A |
| 1782 | | 08/03/23 | P-03 | | CH | 20.2 | 99.3 | 25.0 | 97.3 | 121.6 | 6 | 98 | 95 | 0 / 10 | A |
| 1783 | | 08/03/23 | P-07 | | CH | 22.6 | 93.8 | 27.6 | 94.3 | 120.3 | 6 | 101 | 95 | 0 / 10 | A |
| 1784 | | 08/03/23 | P-03 | | CH | 20.2 | 99.3 | 24.2 | 97.9 | 121.6 | 6 | 99 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1777 | Select Clay: Wall Zone 20 | 67.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1778 | Select Clay: Wall Zone 56 | 25.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1779 | Select Clay: Wall Zone 57 | 25.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1780 | Select Clay: Wall Zone 58 | 25.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1781 | Select Clay: Wall Zone 59 | 25.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1782 | Select Clay: Wall Zone 60 | 25.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1783 | Select Clay: Wall Zone 21 | 25.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1784 | Select Clay: Wall Zone 55 | 68.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Suite 3
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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/04/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1785 | | 08/03/23 | P-03 | | CH | 20.2 | 99.3 | 25.8 | 95.5 | 120.1 | 6 | 96 | 95 | 0 / 10 | A |
| 1786 | | 08/03/23 | P-03 | | CH | 20.2 | 99.3 | 24.0 | 98.5 | 122.1 | 6 | 99 | 95 | 0 / 10 | A |
| 1787 | | 08/03/23 | P-03 | | CH | 20.2 | 99.3 | 23.5 | 100.3 | 123.9 | 6 | 101 | 95 | 0 / 10 | A |
| 1788 | | 08/03/23 | P-19 | | CH | 18.4 | 105.0 | 23.1 | 100.7 | 124.0 | 6 | 96 | 95 | 0 / 10 | A |
| 1789 | | 08/03/23 | P-19 | | CH | 18.4 | 105.0 | 23.4 | 101.0 | 124.6 | 6 | 96 | 95 | 0 / 10 | A |
| 1790 | | 08/03/23 | P-03 | | CH | 20.2 | 99.3 | 21.9 | 99.7 | 121.5 | 6 | 100 | 95 | 0 / 10 | A |
| 1791 | | 08/03/23 | P-19 | | CH | 18.4 | 105.0 | 20.8 | 101.2 | 122.3 | 6 | 96 | 95 | 0 / 10 | A |
| 1792 | | 08/03/23 | P-07 | | CH | 22.6 | 93.8 | 25.8 | 93.0 | 117.0 | 6 | 99 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1785 | Select Clay: Wall Zone 54 | 68.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1786 | Select Clay: Wall Zone 53 | 68.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1787 | Select Clay: Wall Zone 52 | 68.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1788 | Select Clay: Wall Zone 20 | 68.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1789 | Select Clay: Wall Zone 56 | 26.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1790 | Select Clay: Wall Zone 57 | 26.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1791 | Select Clay: Wall Zone 58 | 26.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1792 | Select Clay: Wall Zone 59 | 26.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/04/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1793 | | 08/03/23 | P-03 | | CH | 20.2 | 99.3 | 24.3 | 95.3 | 118.5 | 6 | 96 | 95 | 0 / 10 | A |
| 1794 | | 08/03/23 | P-03 | | CH | 20.2 | 99.3 | 25.4 | 97.4 | 122.1 | 6 | 98 | 95 | 0 / 10 | A |
| 1795 | | 08/03/23 | P-07 | | CH | 22.6 | 93.8 | 29.4 | 90.0 | 116.5 | 6 | 96 | 95 | 0 / 10 | A |
| 1796 | | 08/03/23 | P-07 | | CH | 22.6 | 93.8 | 27.6 | 91.7 | 117.0 | 6 | 98 | 95 | 0 / 10 | A |
| 1797 | | 08/03/23 | P-03 | | CH | 20.2 | 99.3 | 25.5 | 97.3 | 122.1 | 6 | 98 | 95 | 0 / 10 | A |
| 1798 | | 08/03/23 | P-03 | | CH | 20.2 | 99.3 | 28.1 | 96.0 | 123.0 | 6 | 97 | 95 | 0 / 10 | A |
| 1799 | | 08/03/23 | P-19 | | CH | 18.4 | 105.0 | 20.5 | 102.1 | 123.0 | 6 | 97 | 95 | 0 / 10 | A |
| 1800 | | 08/03/23 | P-03 | | CH | 20.2 | 99.3 | 26.0 | 95.5 | 120.3 | 6 | 96 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1793 | Select Clay: Wall Zone 60 | 26.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1794 | Select Clay: Wall Zone 21 | 26.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1795 | Select Clay: Wall Zone 55 | 69.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1796 | Select Clay: Wall Zone 54 | 69.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1797 | Select Clay: Wall Zone 53 | 69.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1798 | Select Clay: Wall Zone 52 | 69.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1799 | Select Clay: Wall Zone 20 | 69.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1800 | Select Clay: Wall Zone 56 | 27.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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BRAUN INTERTEC
The Science You Build On.

2908 Morrison Ave.
Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/04/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1801 | | 08/03/23 | P-03 | | CH | 20.2 | 99.3 | 25.0 | 95.7 | 119.6 | 6 | 96 | 95 | 0 / 10 | A |
| 1802 | | 08/03/23 | P-19 | | CH | 18.4 | 105.0 | 20.6 | 102.2 | 123.3 | 6 | 97 | 95 | 0 / 10 | A |
| 1803 | | 08/03/23 | P-03 | | CH | 20.2 | 99.3 | 25.6 | 96.1 | 120.7 | 6 | 97 | 95 | 0 / 10 | A |
| 1804 | | 08/03/23 | P-19 | | CH | 18.4 | 105.0 | 22.2 | 100.2 | 122.4 | 6 | 95 | 95 | 0 / 10 | A |
| 1805 | | 08/03/23 | P-03 | | CH | 20.2 | 99.3 | 24.1 | 99.1 | 123.0 | 6 | 100 | 95 | 0 / 10 | A |
| 1806 | | 08/03/23 | P-07 | | CH | 22.6 | 93.8 | 22.7 | 92.8 | 113.9 | 6 | 99 | 95 | 0 / 10 | A |
| 1807 | | 08/03/23 | P-03 | | CH | 20.2 | 99.3 | 22.9 | 99.2 | 121.9 | 6 | 100 | 95 | 0 / 10 | A |
| 1808 | | 08/03/23 | P-07 | | CH | 22.6 | 93.8 | 24.3 | 94.3 | 117.2 | 6 | 101 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1801 | Select Clay: Wall Zone 57 | 27.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1802 | Select Clay: Wall Zone 58 | 27.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1803 | Select Clay: Wall Zone 59 | 27.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1804 | Select Clay: Wall Zone 60 | 27.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1805 | Select Clay: Wall Zone 21 | 27.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1806 | Select Clay: Wall Zone 55 | 70.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1807 | Select Clay: Wall Zone 54 | 70.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1808 | Select Clay: Wall Zone 53 | 70.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/04/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1809 | | 08/03/23 | P-03 | | CH | 20.2 | 99.3 | 21.9 | 98.5 | 120.1 | 6 | 99 | 95 | 0 / 10 | A |
| 1810 | | 08/03/23 | P-03 | | CH | 20.2 | 99.3 | 25.9 | 95.1 | 119.7 | 6 | 96 | 95 | 0 / 10 | A |
| 1811 | | 08/03/23 | P-03 | | CH | 20.2 | 99.3 | 27.1 | 95.2 | 121.0 | 6 | 96 | 95 | 0 / 10 | A |
| 1812 | | 08/03/23 | P-19 | | CH | 18.4 | 105.0 | 23.0 | 99.9 | 122.9 | 6 | 95 | 95 | 0 / 10 | A |
| 1813 | | 08/03/23 | P-19 | | CH | 18.4 | 105.0 | 20.8 | 103.3 | 124.8 | 6 | 98 | 95 | 0 / 10 | A |
| 1814 | | 08/03/23 | P-03 | | CH | 20.2 | 99.3 | 22.5 | 97.6 | 119.6 | 6 | 98 | 95 | 0 / 10 | A |
| 1815 | | 08/03/23 | P-03 | | CH | 20.2 | 99.3 | 25.4 | 98.6 | 123.6 | 6 | 99 | 95 | 0 / 10 | A |
| 1816 | | 08/03/23 | P-03 | | CH | 20.2 | 99.3 | 26.4 | 97.5 | 123.2 | 6 | 98 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1809 | Select Clay: Wall Zone 52 | 70.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1810 | Select Clay: Wall Zone 20 | 70.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1811 | Select Clay: Wall Zone 56 | 28.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1812 | Select Clay: Wall Zone 57 | 28.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1813 | Select Clay: Wall Zone 58 | 28.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1814 | Select Clay: Wall Zone 59 | 28.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1815 | Select Clay: Wall Zone 60 | 28.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1816 | Select Clay: Wall Zone 21 | 28.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Kurt Kuechle
08/04/2023

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# Field Compaction Report

**Report Date:** 08/09/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1817 | | 08/07/23 | P-19 | | CH | 18.4 | 105.0 | 21.9 | 101.9 | 124.2 | 6 | 97 | 95 | 0 / 10 | A |
| 1818 | | 08/07/23 | P-03 | | CH | 20.2 | 99.3 | 23.6 | 98.6 | 121.9 | 6 | 99 | 95 | 0 / 10 | A |
| 1819 | | 08/07/23 | P-03 | | CH | 20.2 | 99.3 | 24.2 | 99.6 | 123.7 | 6 | 100 | 95 | 0 / 10 | A |
| 1820 | | 08/07/23 | P-03 | | CH | 20.2 | 99.3 | 25.4 | 97.0 | 121.6 | 6 | 98 | 95 | 0 / 10 | A |
| 1821 | | 08/07/23 | P-03 | | CH | 20.2 | 99.3 | 24.5 | 97.9 | 121.9 | 6 | 99 | 95 | 0 / 10 | A |
| 1822 | | 08/07/23 | P-07 | | CH | 22.6 | 93.8 | 27.2 | 93.8 | 119.3 | 6 | 100 | 95 | 0 / 10 | A |
| 1823 | | 08/07/23 | P-03 | | CH | 20.2 | 99.3 | 25.8 | 95.6 | 120.3 | 6 | 96 | 95 | 0 / 10 | A |
| 1824 | | 08/07/23 | P-19 | | CH | 18.4 | 105.0 | 22.2 | 101.5 | 124.0 | 6 | 97 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1817 | Select Clay: Wall Zone 19 | 1.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1818 | Select Clay: Wall Zone 19 | 2.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1819 | Select Clay: Wall Zone 19 | 3.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1820 | Select Clay: Wall Zone 19 | 4.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1821 | Select Clay: Wall Zone 19 | 5.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1822 | Select Clay: Wall Zone 19 | 6.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1823 | Select Clay: Wall Zone 19 | 7.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1824 | Select Clay: Wall Zone 19 | 8.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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# Field Compaction Report

**Report Date:** 08/09/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1825 | | 08/07/23 | P-19 | | CH | 18.4 | 105.0 | 21.6 | 100.1 | 121.7 | 6 | 95 | 95 | 0 / 10 | A |
| 1826 | | 08/07/23 | P-19 | | CH | 18.4 | 105.0 | 21.2 | 105.3 | 127.6 | 6 | 100 | 95 | 0 / 10 | A |
| 1827 | | 08/07/23 | P-19 | | CH | 18.4 | 105.0 | 19.9 | 99.9 | 119.8 | 6 | 95 | 95 | 0 / 10 | A |
| 1828 | | 08/07/23 | P-19 | | CH | 18.4 | 105.0 | 21.9 | 100.1 | 122.0 | 6 | 95 | 95 | 0 / 10 | A |
| 1829 | | 08/07/23 | P-03 | | CH | 20.2 | 99.3 | 21.2 | 96.3 | 116.7 | 6 | 97 | 95 | 0 / 10 | A |
| 1830 | | 08/07/23 | P-03 | | CH | 20.2 | 99.3 | 23.3 | 96.8 | 119.4 | 6 | 97 | 95 | 0 / 10 | A |
| 1831 | | 08/07/23 | P-19 | | CH | 18.4 | 105.0 | 21.1 | 100.9 | 122.2 | 6 | 96 | 95 | 0 / 10 | A |
| 1832 | | 08/07/23 | P-19 | | CH | 18.4 | 105.0 | 22.1 | 100.9 | 123.2 | 6 | 96 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1825 | Select Clay: Wall Zone 19 | 9.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1826 | Select Clay: Wall Zone 20 | 71.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1827 | Select Clay: Wall Zone 52 | 71.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1828 | Select Clay: Wall Zone 53 | 71.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1829 | Select Clay: Wall Zone 54 | 71.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1830 | Select Clay: Wall Zone 55 | 71.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1831 | Select Clay: Wall Zone 19 | 10.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1832 | Select Clay: Wall Zone 19 | 11.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/09/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1833 | | 08/07/23 | P-19 | | CH | 18.4 | 105.0 | 20.1 | 101.7 | 122.1 | 6 | 97 | 95 | 0 / 10 | A |
| 1834 | | 08/07/23 | P-19 | | CH | 18.4 | 105.0 | 21.6 | 105.0 | 127.7 | 6 | 100 | 95 | 0 / 10 | A |
| 1835 | | 08/07/23 | P-19 | | CH | 18.4 | 105.0 | 23.9 | 100.7 | 124.8 | 6 | 96 | 95 | 0 / 10 | A |
| 1836 | | 08/07/23 | P-19 | | CH | 18.4 | 105.0 | 22.1 | 100.8 | 123.1 | 6 | 96 | 95 | 0 / 10 | A |
| 1837 | | 08/07/23 | P-19 | | CH | 18.4 | 105.0 | 22.2 | 100.0 | 122.2 | 6 | 95 | 95 | 0 / 10 | A |
| 1838 | | 08/07/23 | P-19 | | CH | 18.4 | 105.0 | 21.5 | 100.5 | 122.1 | 6 | 96 | 95 | 0 / 10 | A |
| 1839 | | 08/07/23 | P-19 | | CH | 18.4 | 105.0 | 22.8 | 102.6 | 126.0 | 6 | 98 | 95 | 0 / 10 | A |
| 1840 | | 08/07/23 | P-19 | | CH | 18.4 | 105.0 | 21.9 | 103.7 | 126.4 | 6 | 99 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1833 | Select Clay: Wall Zone 19 | 12.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1834 | Select Clay: Wall Zone 19 | 13.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1835 | Select Clay: Wall Zone 19 | 14.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1836 | Select Clay: Wall Zone 19 | 15.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1837 | Select Clay: Wall Zone 19 | 16.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1838 | Select Clay: Wall Zone 19 | 17.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1839 | Select Clay: Wall Zone 19 | 18.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1840 | Select Clay: Wall Zone 19 | 19.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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# Field Compaction Report

**Report Date:** 08/09/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1841 | | 08/07/23 | P-03 | | CH | 20.2 | 99.3 | 22.9 | 98.2 | 120.7 | 6 | 99 | 95 | 0 / 10 | A |
| 1842 | | 08/07/23 | P-19 | | CH | 18.4 | 105.0 | 21.6 | 101.4 | 123.3 | 6 | 97 | 95 | 0 / 10 | A |
| 1843 | | 08/07/23 | P-03 | | CH | 20.2 | 99.3 | 23.7 | 95.5 | 118.1 | 6 | 96 | 95 | 0 / 10 | A |
| 1844 | | 08/07/23 | P-19 | | CH | 18.4 | 105.0 | 22.3 | 101.3 | 123.9 | 6 | 96 | 95 | 0 / 10 | A |
| 1845 | | 08/07/23 | P-19 | | CH | 18.4 | 105.0 | 22.2 | 102.1 | 124.8 | 6 | 97 | 95 | 0 / 10 | A |
| 1846 | | 08/07/23 | P-19 | | CH | 18.4 | 105.0 | 23.0 | 101.1 | 124.4 | 6 | 96 | 95 | 0 / 10 | A |
| 1847 | | 08/07/23 | P-19 | | CH | 18.4 | 105.0 | 23.0 | 103.1 | 126.8 | 6 | 98 | 95 | 0 / 10 | A |
| 1848 | | 08/07/23 | P-19 | | CH | 18.4 | 105.0 | 21.7 | 103.8 | 126.3 | 6 | 99 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1841 | Select Clay: Wall Zone 19 | 20.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1842 | Select Clay: Wall Zone 19 | 21.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1843 | Select Clay: Wall Zone 19 | 22.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1844 | Select Clay: Wall Zone 19 | 23.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1845 | Select Clay: Wall Zone 19 | 24.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1846 | Select Clay: Wall Zone 19 | 25.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1847 | Select Clay: Wall Zone 19 | 26.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1848 | Select Clay: Wall Zone 19 | 27.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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# Field Compaction Report

**Report Date:** 08/09/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1849 | | 08/07/23 | P-19 | | CH | 18.4 | 105.0 | 21.2 | 105.2 | 127.5 | 6 | 100 | 95 | 0 / 10 | A |
| 1850 | | 08/07/23 | P-19 | | CH | 18.4 | 105.0 | 20.4 | 104.4 | 125.7 | 6 | 99 | 95 | 0 / 10 | A |
| 1851 | | 08/07/23 | P-03 | | CH | 20.2 | 99.3 | 21.8 | 97.3 | 118.5 | 6 | 98 | 95 | 0 / 10 | A |
| 1852 | | 08/07/23 | P-19 | | CH | 18.4 | 105.0 | 21.5 | 102.3 | 124.3 | 6 | 97 | 95 | 0 / 10 | A |
| 1853 | | 08/07/23 | P-03 | | CH | 20.2 | 99.3 | 22.5 | 97.7 | 119.7 | 6 | 98 | 95 | 0 / 10 | A |
| 1854 | | 08/07/23 | P-19 | | CH | 18.4 | 105.0 | 21.4 | 101.1 | 122.7 | 6 | 96 | 95 | 0 / 10 | A |
| 1855 | | 08/07/23 | P-03 | | CH | 20.2 | 99.3 | 22.1 | 99.4 | 121.4 | 6 | 100 | 95 | 0 / 10 | A |
| 1856 | | 08/07/23 | P-19 | | CH | 18.4 | 105.0 | 22.4 | 100.6 | 123.1 | 6 | 96 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1849 | Select Clay: Wall Zone 20 | 72.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1850 | Select Clay: Wall Zone 52 | 72.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1851 | Select Clay: Wall Zone 53 | 72.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1852 | Select Clay: Wall Zone 54 | 72.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1853 | Select Clay: Wall Zone 55 | 72.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1854 | Select Clay: Wall Zone 56 | 29.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1855 | Select Clay: Wall Zone 57 | 29.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1856 | Select Clay: Wall Zone 19 | 28.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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The Science You Build On.

2908 Morrison Ave.
Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/09/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1857 | | 08/07/23 | P-19 | | CH | 18.4 | 105.0 | 21.2 | 100.0 | 121.2 | 6 | 95 | 95 | 0 / 10 | A |
| 1858 | | 08/07/23 | P-19 | | CH | 18.4 | 105.0 | 21.0 | 102.4 | 123.9 | 6 | 98 | 95 | 0 / 10 | A |
| 1859 | | 08/07/23 | P-19 | | CH | 18.4 | 105.0 | 22.2 | 101.8 | 124.4 | 6 | 97 | 95 | 0 / 10 | A |
| 1860 | | 08/07/23 | P-07 | | CH | 22.6 | 93.8 | 28.9 | 91.1 | 117.4 | 6 | 97 | 95 | 0 / 10 | A |
| 1861 | | 08/07/23 | P-03 | | CH | 20.2 | 99.3 | 21.2 | 96.6 | 117.1 | 6 | 97 | 95 | 0 / 10 | A |
| 1862 | | 08/07/23 | P-19 | | CH | 18.4 | 105.0 | 21.5 | 103.2 | 125.4 | 6 | 98 | 95 | 0 / 10 | A |
| 1863 | | 08/07/23 | P-07 | | CH | 22.6 | 93.8 | 26.1 | 90.8 | 114.5 | 6 | 97 | 95 | 0 / 10 | A |
| 1864 | | 08/07/23 | P-19 | | CH | 18.4 | 105.0 | 23.1 | 102.1 | 125.7 | 6 | 97 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1857 | Select Clay: Wall Zone 19 | 29.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1858 | Select Clay: Wall Zone 19 | 30.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1859 | Select Clay: Wall Zone 19 | 31.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1860 | Select Clay: Wall Zone 58 | 29.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1861 | Select Clay: Wall Zone 59 | 29.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1862 | Select Clay: Wall Zone 60 | 29.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1863 | Select Clay: Wall Zone 21 | 29.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1864 | Select Clay: Wall Zone 19 | 32.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/09/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1865 | | 08/07/23 | P-19 | | CH | 18.4 | 105.0 | 23.8 | 100.4 | 124.3 | 6 | 96 | 95 | 0 / 10 | A |
| 1866 | | 08/07/23 | P-19 | | CH | 18.4 | 105.0 | 21.7 | 104.0 | 126.6 | 6 | 99 | 95 | 0 / 10 | A |
| 1867 | | 08/07/23 | P-19 | | CH | 18.4 | 105.0 | 21.8 | 104.0 | 126.7 | 6 | 99 | 95 | 0 / 10 | A |
| 1868 | | 08/07/23 | P-03 | | CH | 20.2 | 99.3 | 22.1 | 99.5 | 121.5 | 6 | 100 | 95 | 0 / 10 | A |
| 1869 | | 08/07/23 | P-19 | | CH | 18.4 | 105.0 | 23.6 | 101.4 | 125.3 | 6 | 97 | 95 | 0 / 10 | A |
| 1870 | | 08/07/23 | P-21-std | A | CL | 18.1 | 106.3 | 19.2 | 106.5 | 126.9 | 6 | 100 | 95 | 0 / 10 | A |
| 1871 | | 08/07/23 | P-19 | | CH | 18.4 | 105.0 | 21.7 | 103.8 | 126.3 | 6 | 99 | 95 | 0 / 10 | A |
| 1872 | | 08/07/23 | P-03 | | CH | 20.2 | 99.3 | 24.4 | 95.6 | 118.9 | 6 | 96 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1865 | Select Clay: Wall Zone 19 | 33.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1866 | Select Clay: Wall Zone 20 | 73.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1867 | Select Clay: Wall Zone 52 | 73.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1868 | Select Clay: Wall Zone 53 | 73.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1869 | Select Clay: Wall Zone 54 | 73.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1870 | Select Clay: Wall Zone 55 | 73.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1871 | Select Clay: Wall Zone 56 | 30.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1872 | Select Clay: Wall Zone 57 | 30.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/09/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1873 | | 08/07/23 | P-19 | | CH | 18.4 | 105.0 | 23.2 | 101.0 | 124.4 | 6 | 96 | 95 | 0 / 10 | A |
| 1874 | | 08/07/23 | P-19 | | CH | 18.4 | 105.0 | 23.6 | 100.6 | 124.3 | 6 | 96 | 95 | 0 / 10 | A |
| 1875 | | 08/07/23 | P-03 | | CH | 20.2 | 99.3 | 22.5 | 98.9 | 121.2 | 6 | 100 | 95 | 0 / 10 | A |
| 1876 | | 08/07/23 | P-03 | | CH | 20.2 | 99.3 | 23.9 | 98.8 | 122.4 | 6 | 99 | 95 | 0 / 10 | A |
| 1877 | | 08/07/23 | P-19 | | CH | 18.4 | 105.0 | 22.7 | 103.8 | 127.4 | 6 | 99 | 95 | 0 / 10 | A |
| 1878 | | 08/07/23 | P-19 | | CH | 18.4 | 105.0 | 23.6 | 101.3 | 125.2 | 6 | 96 | 95 | 0 / 10 | A |
| 1879 | | 08/07/23 | P-19 | | CH | 18.4 | 105.0 | 21.8 | 105.0 | 127.9 | 6 | 100 | 95 | 0 / 10 | A |
| 1880 | | 08/07/23 | P-19 | | CH | 18.4 | 105.0 | 22.4 | 102.5 | 125.5 | 6 | 98 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1873 | Select Clay: Wall Zone 58 | 30.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1874 | Select Clay: Wall Zone 59 | 30.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1875 | Select Clay: Wall Zone 60 | 30.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1876 | Select Clay: Wall Zone 21 | 30.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1877 | Select Clay: Wall Zone 19 | 34.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1878 | Select Clay: Wall Zone 20 | 74.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1879 | Select Clay: Wall Zone 52 | 74.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1880 | Select Clay: Wall Zone 53 | 74.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/09/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1881 | | 08/07/23 | P-19 | | CH | 18.4 | 105.0 | 21.8 | 100.2 | 122.0 | 6 | 95 | 95 | 0 / 10 | A |
| 1882 | | 08/07/23 | P-19 | | CH | 18.4 | 105.0 | 22.1 | 102.3 | 124.9 | 6 | 97 | 95 | 0 / 10 | A |
| 1883 | | 08/07/23 | P-19 | | CH | 18.4 | 105.0 | 21.7 | 104.3 | 126.9 | 6 | 99 | 95 | 0 / 10 | A |
| 1884 | | 08/07/23 | P-03 | | CH | 20.2 | 99.3 | 21.8 | 99.3 | 120.9 | 6 | 100 | 95 | 0 / 10 | A |
| 1885 | | 08/07/23 | P-03 | | CH | 20.2 | 99.3 | 25.7 | 94.8 | 119.2 | 6 | 95 | 95 | 0 / 10 | A |
| 1886 | | 08/07/23 | P-03 | | CH | 20.2 | 99.3 | 24.4 | 95.4 | 118.7 | 6 | 96 | 95 | 0 / 10 | A |
| 1887 | | 08/07/23 | P-03 | | CH | 20.2 | 99.3 | 23.1 | 98.2 | 120.9 | 6 | 99 | 95 | 0 / 10 | A |
| 1888 | | 08/07/23 | P-19 | | CH | 18.4 | 105.0 | 20.9 | 103.4 | 125.0 | 6 | 98 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1881 | Select Clay: Wall Zone 54 | 74.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1882 | Select Clay: Wall Zone 55 | 74.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1883 | Select Clay: Wall Zone 56 | 31.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1884 | Select Clay: Wall Zone 57 | 31.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1885 | Select Clay: Wall Zone 21 | 31.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1886 | Select Clay: Wall Zone 60 | 31.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1887 | Select Clay: Wall Zone 59 | 31.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1888 | Select Clay: Wall Zone 58 | 31.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/09/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1889 | | 08/07/23 | P-19 | | CH | 18.4 | 105.0 | 23.7 | 101.1 | 125.1 | 6 | 96 | 95 | 0 / 10 | A |
| 1890 | | 08/07/23 | P-19 | | CH | 18.4 | 105.0 | 20.1 | 103.3 | 124.1 | 6 | 98 | 95 | 0 / 10 | A |
| 1891 | | 08/07/23 | P-19 | | CH | 18.4 | 105.0 | 23.0 | 99.9 | 122.9 | 6 | 95 | 95 | 0 / 10 | A |
| 1892 | | 08/07/23 | P-19 | | CH | 18.4 | 105.0 | 21.2 | 104.8 | 127.0 | 6 | 100 | 95 | 0 / 10 | A |
| 1893 | | 08/07/23 | P-03 | | CH | 20.2 | 99.3 | 25.4 | 97.3 | 122.0 | 6 | 98 | 95 | 0 / 10 | A |
| 1894 | | 08/07/23 | P-03 | | CH | 20.2 | 99.3 | 23.5 | 99.4 | 122.8 | 6 | 100 | 95 | 0 / 10 | A |
| 1895 | | 08/07/23 | P-03 | | CH | 20.2 | 99.3 | 21.9 | 98.0 | 119.5 | 6 | 99 | 95 | 0 / 10 | A |
| 1896 | | 08/07/23 | P-19 | | CH | 18.4 | 105.0 | 21.2 | 103.8 | 125.8 | 6 | 99 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1889 | Select Clay: Wall Zone 19 | 35.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1890 | Select Clay: Wall Zone 20 | 75.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1891 | Select Clay: Wall Zone 52 | 75.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1892 | Select Clay: Wall Zone 53 | 75.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1893 | Select Clay: Wall Zone 54 | 75.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1894 | Select Clay: Wall Zone 55 | 75.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1895 | Select Clay: Wall Zone 21 | 32.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1896 | Select Clay: Wall Zone 60 | 32.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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# Field Compaction Report

**Report Date:** 08/09/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1897 | | 08/07/23 | P-19 | | CH | 18.4 | 105.0 | 21.1 | 103.1 | 124.9 | 6 | 98 | 95 | 0 / 10 | A |
| 1898 | | 08/07/23 | P-03 | | CH | 20.2 | 99.3 | 22.7 | 99.0 | 121.5 | 6 | 100 | 95 | 0 / 10 | A |
| 1899 | | 08/07/23 | P-19 | | CH | 18.4 | 105.0 | 22.5 | 103.5 | 126.8 | 6 | 99 | 95 | 0 / 10 | A |
| 1900 | | 08/07/23 | P-19 | | CH | 18.4 | 105.0 | 22.7 | 100.2 | 122.9 | 6 | 95 | 95 | 0 / 10 | A |
| 1901 | | 08/07/23 | P-19 | | CH | 18.4 | 105.0 | 23.3 | 101.5 | 125.1 | 6 | 97 | 95 | 0 / 10 | A |
| 1902 | | 08/07/23 | P-19 | | CH | 18.4 | 105.0 | 21.8 | 103.4 | 125.9 | 6 | 98 | 95 | 0 / 10 | A |
| 1903 | | 08/07/23 | P-19 | | CH | 18.4 | 105.0 | 22.3 | 101.2 | 123.8 | 6 | 96 | 95 | 0 / 10 | A |
| 1904 | | 08/07/23 | P-19 | | CH | 18.4 | 105.0 | 24.1 | 100.0 | 124.1 | 6 | 95 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1897 | Select Clay: Wall Zone 59 | 32.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1898 | Select Clay: Wall Zone 58 | 32.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1899 | Select Clay: Wall Zone 57 | 32.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1900 | Select Clay: Wall Zone 56 | 32.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1901 | Select Clay: Wall Zone 19 | 36.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1902 | Select Clay: Wall Zone 20 | 76.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1903 | Select Clay: Wall Zone 52 | 76.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1904 | Select Clay: Wall Zone 53 | 76.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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# Field Compaction Report

**Report Date:** 08/09/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1905 | | 08/07/23 | P-19 | | CH | 18.4 | 105.0 | 21.9 | 101.2 | 123.4 | 6 | 96 | 95 | 0 / 10 | A |
| 1906 | | 08/07/23 | P-19 | | CH | 18.4 | 105.0 | 20.2 | 104.2 | 125.3 | 6 | 99 | 95 | 0 / 10 | A |
| 1907 | | 08/07/23 | P-19 | | CH | 18.4 | 105.0 | 21.4 | 104.9 | 127.4 | 6 | 100 | 95 | 0 / 10 | A |
| 1908 | | 08/07/23 | P-19 | | CH | 18.4 | 105.0 | 23.0 | 101.0 | 124.2 | 6 | 96 | 95 | 0 / 10 | A |
| 1909 | | 08/07/23 | P-19 | | CH | 18.4 | 105.0 | 22.0 | 102.7 | 125.3 | 6 | 98 | 95 | 0 / 10 | A |
| 1910 | | 08/07/23 | P-19 | | CH | 18.4 | 105.0 | 21.2 | 103.6 | 125.6 | 6 | 99 | 95 | 0 / 10 | A |
| 1911 | | 08/07/23 | P-19 | | CH | 18.4 | 105.0 | 22.6 | 102.7 | 125.9 | 6 | 98 | 95 | 0 / 10 | A |
| 1912 | | 08/07/23 | P-19 | | CH | 18.4 | 105.0 | 22.9 | 101.2 | 124.4 | 6 | 96 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1905 | Select Clay: Wall Zone 54 | 76.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1906 | Select Clay: Wall Zone 55 | 76.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1907 | Select Clay: Wall Zone 21 | 33.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1908 | Select Clay: Wall Zone 60 | 33.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1909 | Select Clay: Wall Zone 59 | 33.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1910 | Select Clay: Wall Zone 58 | 33.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1911 | Select Clay: Wall Zone 57 | 33.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1912 | Select Clay: Wall Zone 56 | 33.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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The Science You Build On.

2908 Morrison Ave.
Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/09/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

**Test Results**

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1913 | | 08/07/23 | P-19 | | CH | 18.4 | 105.0 | 22.4 | 102.9 | 125.9 | 6 | 98 | 95 | 0 / 10 | A |

**Test Information**

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1913 | Select Clay: Wall Zone 19 | 37.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Kurt Kuechle
08/09/2023

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/15/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1914 | | 08/08/23 | P-19 | | CH | 18.4 | 105.0 | 21.8 | 105.3 | 128.3 | 6 | 100 | 95 | 0 / 10 | A |
| 1915 | | 08/08/23 | P-19 | | CH | 18.4 | 105.0 | 22.3 | 102.6 | 125.5 | 6 | 98 | 95 | 0 / 10 | A |
| 1916 | | 08/08/23 | P-19 | | CH | 18.4 | 105.0 | 19.8 | 102.8 | 123.2 | 6 | 98 | 95 | 0 / 10 | A |
| 1917 | | 08/08/23 | P-19 | | CH | 18.4 | 105.0 | 21.2 | 105.1 | 127.4 | 6 | 100 | 95 | 0 / 10 | A |
| 1918 | | 08/08/23 | P-19 | | CH | 18.4 | 105.0 | 22.4 | 100.8 | 123.4 | 6 | 96 | 95 | 0 / 10 | A |
| 1919 | | 08/08/23 | P-19 | | CH | 18.4 | 105.0 | 21.0 | 104.3 | 126.2 | 6 | 99 | 95 | 0 / 10 | A |
| 1920 | | 08/08/23 | P-03 | | CH | 20.2 | 99.3 | 23.8 | 99.7 | 123.4 | 6 | 100 | 95 | 0 / 10 | A |
| 1921 | | 08/08/23 | P-19 | | CH | 18.4 | 105.0 | 20.8 | 104.4 | 126.1 | 6 | 99 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1914 | Select Clay: Wall Zone 19 | 38.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1915 | Select Clay: Wall Zone 20 | 77.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1916 | Select Clay: Wall Zone 52 | 77.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1917 | Select Clay: Wall Zone 53 | 77.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1918 | Select Clay: Wall Zone 54 | 77.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1919 | Select Clay: Wall Zone 55 | 77.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1920 | Select Clay: Wall Zone 21 | 34.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1921 | Select Clay: Wall Zone 60 | 34.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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# Field Compaction Report

**Report Date:** 08/15/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1922 | | 08/08/23 | P-19 | | CH | 18.4 | 105.0 | 20.1 | 101.8 | 122.3 | 6 | 97 | 95 | 0 / 10 | A |
| 1923 | | 08/08/23 | P-19 | | CH | 18.4 | 105.0 | 22.2 | 105.0 | 128.3 | 6 | 100 | 95 | 0 / 10 | A |
| 1924 | | 08/08/23 | P-19 | | CH | 18.4 | 105.0 | 23.4 | 100.0 | 123.4 | 6 | 95 | 95 | 0 / 10 | A |
| 1925 | | 08/08/23 | P-19 | | CH | 18.4 | 105.0 | 22.4 | 102.4 | 125.3 | 6 | 98 | 95 | 0 / 10 | A |
| 1926 | | 08/08/23 | P-19 | | CH | 18.4 | 105.0 | 21.3 | 105.1 | 127.5 | 6 | 100 | 95 | 0 / 10 | A |
| 1927 | | 08/08/23 | P-21-std | A | CL | 18.1 | 106.3 | 20.4 | 105.9 | 127.5 | 6 | 100 | 95 | 0 / 10 | A |
| 1928 | | 08/08/23 | P-19 | | CH | 18.4 | 105.0 | 21.1 | 105.2 | 127.4 | 6 | 100 | 95 | 0 / 10 | A |
| 1929 | | 08/08/23 | P-19 | | CH | 18.4 | 105.0 | 20.9 | 103.0 | 124.5 | 6 | 98 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1922 | Select Clay: Wall Zone 59 | 34.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1923 | Select Clay: Wall Zone 58 | 34.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1924 | Select Clay: Wall Zone 57 | 34.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1925 | Select Clay: Wall Zone 56 | 34.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1926 | Select Clay: Wall Zone 19 | 39.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1927 | Select Clay: Wall Zone 20 | 78.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1928 | Select Clay: Wall Zone 52 | 78.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1929 | Select Clay: Wall Zone 53 | 78.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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# Field Compaction Report

**Report Date:** 08/15/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1930 | | 08/08/23 | P-19 | | CH | 18.4 | 105.0 | 20.4 | 102.9 | 123.9 | 6 | 98 | 95 | 0 / 10 | A |
| 1931 | | 08/08/23 | P-19 | | CH | 18.4 | 105.0 | 22.5 | 103.9 | 127.3 | 6 | 99 | 95 | 0 / 10 | A |
| 1932 | | 08/08/23 | P-19 | | CH | 18.4 | 105.0 | 21.0 | 101.2 | 122.5 | 6 | 96 | 95 | 0 / 10 | A |
| 1933 | | 08/08/23 | P-19 | | CH | 18.4 | 105.0 | 19.6 | 102.8 | 122.9 | 6 | 98 | 95 | 0 / 10 | A |
| 1934 | | 08/08/23 | P-03 | | CH | 20.2 | 99.3 | 22.6 | 98.1 | 120.3 | 6 | 99 | 95 | 0 / 10 | A |
| 1935 | | 08/08/23 | P-03 | | CH | 20.2 | 99.3 | 21.0 | 94.4 | 114.2 | 6 | 95 | 95 | 0 / 10 | A |
| 1936 | | 08/08/23 | P-21-std | A | CL | 18.1 | 106.3 | 20.3 | 106.5 | 128.1 | 6 | 100 | 95 | 0 / 10 | A |
| 1937 | | 08/08/23 | P-19 | | CH | 18.4 | 105.0 | 20.5 | 103.3 | 124.5 | 6 | 98 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1930 | Select Clay: Wall Zone 54 | 78.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1931 | Select Clay: Wall Zone 55 | 78.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1932 | Select Clay: Wall Zone 21 | 35.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1933 | Select Clay: Wall Zone 60 | 35.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1934 | Select Clay: Wall Zone 59 | 35.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1935 | Select Clay: Wall Zone 58 | 35.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1936 | Select Clay: Wall Zone 57 | 35.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1937 | Select Clay: Wall Zone 56 | 35.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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# Field Compaction Report

**Report Date:** 08/15/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1938 | | 08/08/23 | P-03 | | CH | 20.2 | 99.3 | 24.8 | 99.5 | 124.2 | 6 | 100 | 95 | 0 / 10 | A |
| 1939 | | 08/08/23 | P-19 | | CH | 18.4 | 105.0 | 21.4 | 104.5 | 126.9 | 6 | 100 | 95 | 0 / 10 | A |
| 1940 | | 08/08/23 | P-21-std | A | CL | 18.1 | 106.3 | 22.1 | 105.5 | 128.8 | 6 | 99 | 95 | 0 / 10 | A |
| 1941 | | 08/08/23 | P-21-std | A | CL | 18.1 | 106.3 | 22.8 | 104.6 | 128.4 | 6 | 98 | 95 | 0 / 10 | A |
| 1942 | | 08/08/23 | P-19 | | CH | 18.4 | 105.0 | 21.5 | 105.2 | 127.8 | 6 | 100 | 95 | 0 / 10 | A |
| 1943 | | 08/08/23 | P-19 | | CH | 18.4 | 105.0 | 22.3 | 103.3 | 126.3 | 6 | 98 | 95 | 0 / 10 | A |
| 1944 | | 08/08/23 | P-19 | | CH | 18.4 | 105.0 | 22.3 | 103.3 | 126.3 | 6 | 98 | 95 | 0 / 10 | A |
| 1945 | | 08/08/23 | P-19 | | CH | 18.4 | 105.0 | 18.9 | 102.8 | 122.2 | 6 | 98 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1938 | Select Clay: Wall Zone 19 | 40.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1939 | Select Clay: Wall Zone 20 | 79.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1940 | Select Clay: Wall Zone 52 | 79.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1941 | Select Clay: Wall Zone 53 | 79.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1942 | Select Clay: Wall Zone 54 | 79.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1943 | Select Clay: Wall Zone 55 | 79.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1944 | Select Clay: Wall Zone 56 | 36.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1945 | Select Clay: Wall Zone 57 | 36.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/15/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1946 | | 08/08/23 | P-16 | | CH | 20.2 | 101.8 | 22.3 | 101.8 | 124.5 | 6 | 100 | 95 | 0 / 10 | A |
| 1947 | | 08/08/23 | P-19 | | CH | 18.4 | 105.0 | 21.4 | 103.5 | 125.7 | 6 | 99 | 95 | 0 / 10 | A |
| 1948 | | 08/08/23 | P-19 | | CH | 18.4 | 105.0 | 18.6 | 100.3 | 119.0 | 6 | 96 | 95 | 0 / 10 | A |
| 1949 | | 08/08/23 | P-21-std | A | CL | 18.1 | 106.3 | 19.0 | 105.8 | 125.9 | 6 | 100 | 95 | 0 / 10 | A |
| 1950 | | 08/08/23 | P-19 | | CH | 18.4 | 105.0 | 21.1 | 104.0 | 125.9 | 6 | 99 | 95 | 0 / 10 | A |
| 1951 | | 08/08/23 | P-19 | | CH | 18.4 | 105.0 | 22.0 | 105.1 | 128.2 | 6 | 100 | 95 | 0 / 10 | A |
| 1952 | | 08/08/23 | P-19 | | CH | 18.4 | 105.0 | 21.4 | 104.0 | 126.3 | 6 | 99 | 95 | 0 / 10 | A |
| 1953 | | 08/08/23 | P-19 | | CH | 18.4 | 105.0 | 22.3 | 102.9 | 125.8 | 6 | 98 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1946 | Select Clay: Wall Zone 58 | 36.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1947 | Select Clay: Wall Zone 59 | 36.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1948 | Select Clay: Wall Zone 60 | 36.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1949 | Select Clay: Wall Zone 21 | 36.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1950 | Select Clay: Wall Zone 19 | 41.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1951 | Select Clay: Wall Zone 20 | 80.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1952 | Select Clay: Wall Zone 52 | 80.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1953 | Select Clay: Wall Zone 53 | 80.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/15/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1954 | | 08/08/23 | P-19 | | CH | 18.4 | 105.0 | 19.7 | 104.6 | 125.2 | 6 | 100 | 95 | 0 / 10 | A |
| 1955 | | 08/08/23 | P-19 | | CH | 18.4 | 105.0 | 20.6 | 104.5 | 126.0 | 6 | 100 | 95 | 0 / 10 | A |
| 1956 | | 08/08/23 | P-03 | | CH | 20.2 | 99.3 | 22.8 | 99.2 | 121.8 | 6 | 100 | 95 | 0 / 10 | A |
| 1957 | | 08/08/23 | P-19 | | CH | 18.4 | 105.0 | 20.1 | 104.2 | 125.1 | 6 | 99 | 95 | 0 / 10 | A |
| 1958 | | 08/08/23 | P-19 | | CH | 18.4 | 105.0 | 20.4 | 104.3 | 125.6 | 6 | 99 | 95 | 0 / 10 | A |
| 1959 | | 08/08/23 | P-21-std | A | CL | 18.1 | 106.3 | 20.5 | 106.1 | 127.8 | 6 | 100 | 95 | 0 / 10 | A |
| 1960 | | 08/08/23 | P-19 | | CH | 18.4 | 105.0 | 21.2 | 105.5 | 127.9 | 6 | 100 | 95 | 0 / 10 | A |
| 1961 | | 08/08/23 | P-21-std | A | CL | 18.1 | 106.3 | 20.3 | 106.4 | 128.0 | 6 | 100 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1954 | Select Clay: Wall Zone 54 | 80.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1955 | Select Clay: Wall Zone 55 | 80.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1956 | Select Clay: Wall Zone 56 | 37.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1957 | Select Clay: Wall Zone 57 | 37.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1958 | Select Clay: Wall Zone 58 | 37.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1959 | Select Clay: Wall Zone 59 | 37.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1960 | Select Clay: Wall Zone 60 | 37.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1961 | Select Clay: Wall Zone 21 | 37.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/15/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1962 | | 08/08/23 | P-19 | | CH | 18.4 | 105.0 | 21.3 | 105.0 | 127.4 | 6 | 100 | 95 | 0 / 10 | A |
| 1963 | | 08/08/23 | P-19 | | CH | 18.4 | 105.0 | 20.1 | 104.6 | 125.6 | 6 | 100 | 95 | 0 / 10 | A |
| 1964 | | 08/08/23 | P-21-std | A | CL | 18.1 | 106.3 | 20.2 | 107.0 | 128.6 | 6 | 101 | 95 | 0 / 10 | A |
| 1965 | | 08/08/23 | P-19 | | CH | 18.4 | 105.0 | 22.0 | 103.9 | 126.8 | 6 | 99 | 95 | 0 / 10 | A |
| 1966 | | 08/08/23 | P-19 | | CH | 18.4 | 105.0 | 20.3 | 104.8 | 126.1 | 6 | 100 | 95 | 0 / 10 | A |
| 1967 | | 08/08/23 | P-19 | | CH | 18.4 | 105.0 | 19.3 | 101.9 | 121.6 | 6 | 97 | 95 | 0 / 10 | A |
| 1968 | | 08/08/23 | P-19 | | CH | 18.4 | 105.0 | 22.4 | 100.9 | 123.5 | 6 | 96 | 95 | 0 / 10 | A |
| 1969 | | 08/08/23 | P-19 | | CH | 18.4 | 105.0 | 21.0 | 100.9 | 122.1 | 6 | 96 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1962 | Select Clay: Wall Zone 19 | 42.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1963 | Select Clay: Wall Zone 20 | 81.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1964 | Select Clay: Wall Zone 52 | 81.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1965 | Select Clay: Wall Zone 53 | 81.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1966 | Select Clay: Wall Zone 54 | 81.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1967 | Select Clay: Wall Zone 55 | 81.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1968 | Select Clay: Wall Zone 56 | 38.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1969 | Select Clay: Wall Zone 57 | 38.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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The Science You Build On.

2908 Morrison Ave.
Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/15/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1970 | | 08/08/23 | P-19 | | CH | 18.4 | 105.0 | 20.3 | 101.0 | 121.5 | 6 | 96 | 95 | 0 / 10 | A |
| 1971 | | 08/08/23 | P-19 | | CH | 18.4 | 105.0 | 20.9 | 102.0 | 123.3 | 6 | 97 | 95 | 0 / 10 | A |
| 1972 | | 08/08/23 | P-19 | | CH | 18.4 | 105.0 | 19.6 | 102.7 | 122.8 | 6 | 98 | 95 | 0 / 10 | A |
| 1973 | | 08/08/23 | P-19 | | CH | 18.4 | 105.0 | 23.0 | 102.6 | 126.2 | 6 | 98 | 95 | 0 / 10 | A |
| 1974 | | 08/08/23 | P-16 | | CH | 20.2 | 101.8 | 23.3 | 101.8 | 125.5 | 6 | 100 | 95 | 0 / 10 | A |
| 1975 | | 08/08/23 | P-19 | | CH | 18.4 | 105.0 | 20.1 | 105.5 | 126.7 | 6 | 100 | 95 | 0 / 10 | A |
| 1976 | | 08/08/23 | P-19 | | CH | 18.4 | 105.0 | 21.5 | 104.3 | 126.7 | 6 | 99 | 95 | 0 / 10 | A |
| 1977 | | 08/08/23 | P-21-std | A | CL | 18.1 | 106.3 | 20.4 | 106.4 | 128.1 | 6 | 100 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1970 | Select Clay: Wall Zone 58 | 38.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1971 | Select Clay: Wall Zone 59 | 38.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1972 | Select Clay: Wall Zone 60 | 38.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1973 | Select Clay: Wall Zone 21 | 38.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1974 | Select Clay: Wall Zone 19 | 43.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1975 | Select Clay: Wall Zone 20 | 82.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1976 | Select Clay: Wall Zone 52 | 82.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1977 | Select Clay: Wall Zone 53 | 82.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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2908 Morrison Ave.
Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/15/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1978 | | 08/08/23 | P-19 | | CH | 18.4 | 105.0 | 22.1 | 104.3 | 127.3 | 6 | 99 | 95 | 0 / 10 | A |
| 1979 | | 08/08/23 | P-19 | | CH | 18.4 | 105.0 | 22.0 | 104.1 | 127.0 | 6 | 99 | 95 | 0 / 10 | A |
| 1980 | | 08/08/23 | P-19 | | CH | 18.4 | 105.0 | 19.1 | 100.7 | 119.9 | 6 | 96 | 95 | 0 / 10 | A |
| 1981 | | 08/08/23 | P-19 | | CH | 18.4 | 105.0 | 20.1 | 103.9 | 124.8 | 6 | 99 | 95 | 0 / 10 | A |
| 1982 | | 08/08/23 | P-19 | | CH | 18.4 | 105.0 | 21.4 | 104.7 | 127.1 | 6 | 100 | 95 | 0 / 10 | A |
| 1983 | | 08/08/23 | P-03 | | CH | 20.2 | 99.3 | 22.7 | 98.8 | 121.2 | 6 | 99 | 95 | 0 / 10 | A |
| 1984 | | 08/08/23 | P-19 | | CH | 18.4 | 105.0 | 22.5 | 103.4 | 126.7 | 6 | 98 | 95 | 0 / 10 | A |
| 1985 | | 08/08/23 | P-19 | | CH | 18.4 | 105.0 | 23.8 | 102.3 | 126.6 | 6 | 97 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1978 | Select Clay: Wall Zone 54 | 82.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1979 | Select Clay: Wall Zone 55 | 82.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1980 | Select Clay: Wall Zone 56 | 39.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1981 | Select Clay: Wall Zone 57 | 39.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1982 | Select Clay: Wall Zone 58 | 39.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1983 | Select Clay: Wall Zone 59 | 39.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1984 | Select Clay: Wall Zone 60 | 39.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1985 | Select Clay: Wall Zone 21 | 39.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Bismarck, ND 58504
Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/15/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1986 | | 08/08/23 | P-19 | | CH | 18.4 | 105.0 | 22.1 | 104.3 | 127.3 | 6 | 99 | 95 | 0 / 10 | A |
| 1987 | | 08/08/23 | P-19 | | CH | 18.4 | 105.0 | 21.0 | 104.6 | 126.6 | 6 | 100 | 95 | 0 / 10 | A |
| 1988 | | 08/08/23 | P-21-std | A | CL | 18.1 | 106.3 | 19.0 | 109.3 | 130.1 | 6 | 103 | 95 | 0 / 10 | A |
| 1989 | | 08/08/23 | P-19 | | CH | 18.4 | 105.0 | 22.2 | 104.9 | 128.2 | 6 | 100 | 95 | 0 / 10 | A |
| 1990 | | 08/08/23 | P-21-std | A | CL | 18.1 | 106.3 | 20.5 | 107.5 | 129.5 | 6 | 101 | 95 | 0 / 10 | A |
| 1991 | | 08/08/23 | P-03 | | CH | 20.2 | 99.3 | 22.2 | 99.2 | 121.2 | 6 | 100 | 95 | 0 / 10 | A |
| 1992 | | 08/08/23 | P-16 | | CH | 20.2 | 101.8 | 23.7 | 101.4 | 125.4 | 6 | 100 | 95 | 0 / 10 | A |
| 1993 | | 08/08/23 | P-19 | | CH | 18.4 | 105.0 | 22.7 | 103.0 | 126.4 | 6 | 98 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1986 | Select Clay: Wall Zone 19 | 44.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1987 | Select Clay: Wall Zone 20 | 83.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1988 | Select Clay: Wall Zone 52 | 83.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1989 | Select Clay: Wall Zone 53 | 83.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1990 | Select Clay: Wall Zone 54 | 83.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1991 | Select Clay: Wall Zone 55 | 83.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1992 | Select Clay: Wall Zone 56 | 40.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1993 | Select Clay: Wall Zone 57 | 40.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/15/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1994 | | 08/08/23 | P-19 | | CH | 18.4 | 105.0 | 23.6 | 103.2 | 127.6 | 6 | 98 | 95 | 0 / 10 | A |
| 1995 | | 08/08/23 | P-19 | | CH | 18.4 | 105.0 | 22.6 | 102.4 | 125.5 | 6 | 98 | 95 | 0 / 10 | A |
| 1996 | | 08/08/23 | P-19 | | CH | 18.4 | 105.0 | 22.5 | 102.6 | 125.7 | 6 | 98 | 95 | 0 / 10 | A |
| 1997 | | 08/08/23 | P-16 | | CH | 20.2 | 101.8 | 24.1 | 101.2 | 125.6 | 6 | 99 | 95 | 0 / 10 | A |
| 1998 | | 08/08/23 | P-19 | | CH | 18.4 | 105.0 | 20.8 | 101.7 | 122.9 | 6 | 97 | 95 | 0 / 10 | A |
| 1999 | | 08/08/23 | P-19 | | CH | 18.4 | 105.0 | 21.0 | 102.8 | 124.4 | 6 | 98 | 95 | 0 / 10 | A |
| 2000 | | 08/08/23 | P-16 | | CH | 20.2 | 101.8 | 23.6 | 101.5 | 125.5 | 6 | 100 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 1994 | Select Clay: Wall Zone 58 | 40.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1995 | Select Clay: Wall Zone 59 | 40.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1996 | Select Clay: Wall Zone 60 | 40.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1997 | Select Clay: Wall Zone 21 | 40.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1998 | Select Clay: Wall Zone 19 | 45.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 1999 | Select Clay: Wall Zone 20 | 84.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2000 | Select Clay: Wall Zone 52 | 84.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Kurt Kuechle
08/15/2023

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/15/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2001 | | 08/08/23 | P-19 | | CH | 18.4 | 105.0 | 20.5 | 104.7 | 126.2 | 6 | 100 | 95 | 0 / 10 | A |
| 2002 | | 08/08/23 | P-03 | | CH | 20.2 | 99.3 | 21.4 | 97.0 | 117.8 | 6 | 98 | 95 | 0 / 10 | A |
| 2003 | | 08/08/23 | P-21-std | A | CL | 18.1 | 106.3 | 20.6 | 106.4 | 128.3 | 6 | 100 | 95 | 0 / 10 | A |
| 2004 | | 08/08/23 | P-19 | | CH | 18.4 | 105.0 | 19.6 | 102.3 | 122.4 | 6 | 97 | 95 | 0 / 10 | A |
| 2005 | | 08/08/23 | P-19 | | CH | 18.4 | 105.0 | 20.2 | 103.4 | 124.3 | 6 | 98 | 95 | 0 / 10 | A |
| 2006 | | 08/08/23 | P-19 | | CH | 18.4 | 105.0 | 22.7 | 103.1 | 126.5 | 6 | 98 | 95 | 0 / 10 | A |
| 2007 | | 08/08/23 | P-21-std | A | CL | 18.1 | 106.3 | 21.0 | 109.5 | 132.5 | 6 | 103 | 95 | 0 / 10 | A |
| 2008 | | 08/08/23 | P-16 | | CH | 20.2 | 101.8 | 22.9 | 101.7 | 125.0 | 6 | 100 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2001 | Select Clay: Wall Zone 53 | 84.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2002 | Select Clay: Wall Zone 54 | 84.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2003 | Select Clay: Wall Zone 55 | 84.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2004 | Select Clay: Wall Zone 56 | 41.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2005 | Select Clay: Wall Zone 57 | 41.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2006 | Select Clay: Wall Zone 58 | 41.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2007 | Select Clay: Wall Zone 59 | 41.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2008 | Select Clay: Wall Zone 60 | 41.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/15/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2009 | | 08/08/23 | P-19 | | CH | 18.4 | 105.0 | 20.9 | 103.1 | 124.6 | 6 | 98 | 95 | 0 / 10 | A |
| 2010 | | 08/09/23 | P-03 | | CH | 20.2 | 99.3 | 24.3 | 99.4 | 123.6 | 6 | 100 | 95 | 0 / 10 | A |
| 2011 | | 08/09/23 | P-19 | | CH | 18.4 | 105.0 | 22.6 | 102.6 | 125.8 | 6 | 98 | 95 | 0 / 10 | A |
| 2012 | | 08/09/23 | P-19 | | CH | 18.4 | 105.0 | 21.4 | 104.0 | 126.3 | 6 | 99 | 95 | 0 / 10 | A |
| 2013 | | 08/09/23 | P-16 | | CH | 20.2 | 101.8 | 24.2 | 101.2 | 125.7 | 6 | 99 | 95 | 0 / 10 | A |
| 2014 | | 08/09/23 | P-16 | | CH | 20.2 | 101.8 | 23.9 | 101.8 | 126.1 | 6 | 100 | 95 | 0 / 10 | A |
| 2015 | | 08/09/23 | P-19 | | CH | 18.4 | 105.0 | 23.1 | 103.1 | 126.9 | 6 | 98 | 95 | 0 / 10 | A |
| 2016 | | 08/09/23 | P-19 | | CH | 18.4 | 105.0 | 22.2 | 104.8 | 128.1 | 6 | 100 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2009 | Select Clay: Wall Zone 21 | 41.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2010 | Select Clay: Wall Zone 19 | 46.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2011 | Select Clay: Wall Zone 20 | 85.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2012 | Select Clay: Wall Zone 52 | 85.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2013 | Select Clay: Wall Zone 53 | 85.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2014 | Select Clay: Wall Zone 54 | 85.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2015 | Select Clay: Wall Zone 55 | 85.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2016 | Select Clay: Wall Zone 56 | 42.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/15/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2017 | | 08/09/23 | P-21-std | A | CL | 18.1 | 106.3 | 22.0 | 105.9 | 129.2 | 6 | 100 | 95 | 0 / 10 | A |
| 2018 | | 08/09/23 | P-03 | | CH | 20.2 | 99.3 | 25.0 | 98.1 | 122.6 | 6 | 99 | 95 | 0 / 10 | A |
| 2019 | | 08/09/23 | P-19 | | CH | 18.4 | 105.0 | 22.4 | 102.1 | 125.0 | 6 | 97 | 95 | 0 / 10 | A |
| 2020 | | 08/09/23 | P-19 | | CH | 18.4 | 105.0 | 21.0 | 103.6 | 125.4 | 6 | 99 | 95 | 0 / 10 | A |
| 2021 | | 08/09/23 | P-16 | | CH | 20.2 | 101.8 | 23.2 | 101.6 | 125.2 | 6 | 100 | 95 | 0 / 10 | A |
| 2022 | | 08/09/23 | P-19 | | CH | 18.4 | 105.0 | 23.4 | 102.3 | 126.2 | 6 | 97 | 95 | 0 / 10 | A |
| 2023 | | 08/09/23 | P-19 | | CH | 18.4 | 105.0 | 24.1 | 102.1 | 126.7 | 6 | 97 | 95 | 0 / 10 | A |
| 2024 | | 08/09/23 | P-19 | | CH | 18.4 | 105.0 | 22.2 | 104.8 | 128.1 | 6 | 100 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2017 | Select Clay: Wall Zone 57 | 42.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2018 | Select Clay: Wall Zone 58 | 42.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2019 | Select Clay: Wall Zone 59 | 42.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2020 | Select Clay: Wall Zone 60 | 42.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2021 | Select Clay: Wall Zone 21 | 42.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2022 | Select Clay: Wall Zone 19 | 47.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2023 | Select Clay: Wall Zone 20 | 86.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2024 | Select Clay: Wall Zone 52 | 86.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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The Science You Build On.

2908 Morrison Ave.
Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/15/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2025 | | 08/09/23 | P-19 | | CH | 18.4 | 105.0 | 20.6 | 102.6 | 123.7 | 6 | 98 | 95 | 0 / 10 | A |
| 2026 | | 08/09/23 | P-16 | | CH | 20.2 | 101.8 | 24.8 | 100.8 | 125.8 | 6 | 99 | 95 | 0 / 10 | A |
| 2027 | | 08/09/23 | P-03 | | CH | 20.2 | 99.3 | 20.5 | 99.4 | 119.8 | 6 | 100 | 95 | 0 / 10 | A |
| 2028 | | 08/09/23 | P-16 | | CH | 20.2 | 101.8 | 22.9 | 101.6 | 124.9 | 6 | 100 | 95 | 0 / 10 | A |
| 2029 | | 08/09/23 | P-19 | | CH | 18.4 | 105.0 | 22.8 | 103.5 | 127.1 | 6 | 99 | 95 | 0 / 10 | A |
| 2030 | | 08/09/23 | P-03 | | CH | 20.2 | 99.3 | 24.3 | 94.4 | 117.3 | 6 | 95 | 95 | 0 / 10 | A |
| 2031 | | 08/09/23 | P-19 | | CH | 18.4 | 105.0 | 21.8 | 103.6 | 126.2 | 6 | 99 | 95 | 0 / 10 | A |
| 2032 | | 08/09/23 | P-19 | | CH | 18.4 | 105.0 | 22.0 | 104.6 | 127.6 | 6 | 100 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2025 | Select Clay: Wall Zone 53 | 86.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2026 | Select Clay: Wall Zone 54 | 86.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2027 | Select Clay: Wall Zone 55 | 86.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2028 | Select Clay: Wall Zone 56 | 43.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2029 | Select Clay: Wall Zone 57 | 43.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2030 | Select Clay: Wall Zone 58 | 43.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2031 | Select Clay: Wall Zone 59 | 43.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2032 | Select Clay: Wall Zone 60 | 43.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/15/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2033 | | 08/09/23 | P-19 | | CH | 18.4 | 105.0 | 21.9 | 102.9 | 125.4 | 6 | 98 | 95 | 0 / 10 | A |
| 2034 | | 08/09/23 | P-03 | | CH | 20.2 | 99.3 | 24.5 | 97.2 | 121.0 | 6 | 98 | 95 | 0 / 10 | A |
| 2035 | | 08/09/23 | P-19 | | CH | 18.4 | 105.0 | 21.6 | 104.4 | 127.0 | 6 | 99 | 95 | 0 / 10 | A |
| 2036 | | 08/09/23 | P-16 | | CH | 20.2 | 101.8 | 22.0 | 100.8 | 123.0 | 6 | 99 | 95 | 0 / 10 | A |
| 2037 | | 08/09/23 | P-16 | | CH | 20.2 | 101.8 | 23.3 | 101.5 | 125.1 | 6 | 100 | 95 | 0 / 10 | A |
| 2038 | | 08/09/23 | P-03 | | CH | 20.2 | 99.3 | 24.7 | 99.5 | 124.1 | 6 | 100 | 95 | 0 / 10 | A |
| 2039 | | 08/09/23 | P-16 | | CH | 20.2 | 101.8 | 22.9 | 101.6 | 124.9 | 6 | 100 | 95 | 0 / 10 | A |
| 2040 | | 08/09/23 | P-03 | | CH | 20.2 | 99.3 | 20.9 | 99.9 | 120.8 | 6 | 101 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2033 | Select Clay: Wall Zone 21 | 43.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2034 | Select Clay: Wall Zone 19 | 48.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2035 | Select Clay: Wall Zone 20 | 87.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2036 | Select Clay: Wall Zone 52 | 87.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2037 | Select Clay: Wall Zone 53 | 87.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2038 | Select Clay: Wall Zone 54 | 87.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2039 | Select Clay: Wall Zone 55 | 87.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2040 | Select Clay: Wall Zone 56 | 44.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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# Field Compaction Report

**Report Date:** 08/15/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2041 | | 08/09/23 | P-19 | | CH | 18.4 | 105.0 | 20.5 | 101.9 | 122.8 | 6 | 97 | 95 | 0 / 10 | A |
| 2042 | | 08/09/23 | P-19 | | CH | 18.4 | 105.0 | 21.6 | 102.8 | 125.0 | 6 | 98 | 95 | 0 / 10 | A |
| 2043 | | 08/09/23 | P-19 | | CH | 18.4 | 105.0 | 21.9 | 104.9 | 127.9 | 6 | 100 | 95 | 0 / 10 | A |
| 2044 | | 08/09/23 | P-21-std | A | CL | 18.1 | 106.3 | 21.4 | 105.8 | 128.4 | 6 | 100 | 95 | 0 / 10 | A |
| 2045 | | 08/09/23 | P-19 | | CH | 18.4 | 105.0 | 21.6 | 103.3 | 125.6 | 6 | 98 | 95 | 0 / 10 | A |
| 2046 | | 08/09/23 | P-19 | | CH | 18.4 | 105.0 | 22.5 | 104.7 | 128.3 | 6 | 100 | 95 | 0 / 10 | A |
| 2047 | | 08/09/23 | P-19 | | CH | 18.4 | 105.0 | 21.3 | 102.9 | 124.8 | 6 | 98 | 95 | 0 / 10 | A |
| 2048 | | 08/09/23 | P-19 | | CH | 18.4 | 105.0 | 21.9 | 103.4 | 126.0 | 6 | 98 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2041 | Select Clay: Wall Zone 57 | 44.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2042 | Select Clay: Wall Zone 58 | 44.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2043 | Select Clay: Wall Zone 59 | 44.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2044 | Select Clay: Wall Zone 60 | 44.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2045 | Select Clay: Wall Zone 21 | 44.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2046 | Select Clay: Wall Zone 19 | 49.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2047 | Select Clay: Wall Zone 20 | 88.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2048 | Select Clay: Wall Zone 52 | 88.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/15/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2049 | | 08/09/23 | P-19 | | CH | 18.4 | 105.0 | 20.1 | 105.4 | 126.6 | 6 | 100 | 95 | 0 / 10 | A |
| 2050 | | 08/09/23 | P-19 | | CH | 18.4 | 105.0 | 21.4 | 104.9 | 127.4 | 6 | 100 | 95 | 0 / 10 | A |
| 2051 | | 08/09/23 | P-19 | | CH | 18.4 | 105.0 | 22.3 | 102.5 | 125.4 | 6 | 98 | 95 | 0 / 10 | A |
| 2052 | | 08/09/23 | P-19 | | CH | 18.4 | 105.0 | 22.4 | 104.1 | 127.4 | 6 | 99 | 95 | 0 / 10 | A |
| 2053 | | 08/09/23 | P-19 | | CH | 18.4 | 105.0 | 21.9 | 104.1 | 126.9 | 6 | 99 | 95 | 0 / 10 | A |
| 2054 | | 08/09/23 | P-21-std | A | CL | 18.1 | 106.3 | 20.6 | 106.4 | 128.3 | 6 | 100 | 95 | 0 / 10 | A |
| 2055 | | 08/09/23 | P-16 | | CH | 20.2 | 101.8 | 22.2 | 101.8 | 124.4 | 6 | 100 | 95 | 0 / 10 | A |
| 2056 | | 08/09/23 | P-19 | | CH | 18.4 | 105.0 | 22.5 | 102.0 | 124.9 | 6 | 97 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2049 | Select Clay: Wall Zone 53 | 88.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2050 | Select Clay: Wall Zone 54 | 88.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2051 | Select Clay: Wall Zone 55 | 88.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2052 | Select Clay: Wall Zone 56 | 45.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2053 | Select Clay: Wall Zone 57 | 45.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2054 | Select Clay: Wall Zone 58 | 45.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2055 | Select Clay: Wall Zone 59 | 45.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2056 | Select Clay: Wall Zone 60 | 45.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/15/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2057 | | 08/09/23 | P-19 | | CH | 18.4 | 105.0 | 22.4 | 103.4 | 126.6 | 6 | 98 | 95 | 0 / 10 | A |
| 2058 | | 08/09/23 | P-19 | | CH | 18.4 | 105.0 | 20.8 | 103.2 | 124.7 | 6 | 98 | 95 | 0 / 10 | A |
| 2059 | | 08/09/23 | P-19 | | CH | 18.4 | 105.0 | 21.4 | 104.4 | 126.7 | 6 | 99 | 95 | 0 / 10 | A |
| 2060 | | 08/09/23 | P-16 | | CH | 20.2 | 101.8 | 21.7 | 100.6 | 122.4 | 6 | 99 | 95 | 0 / 10 | A |
| 2061 | | 08/09/23 | P-16 | | CH | 20.2 | 101.8 | 23.2 | 101.7 | 125.3 | 6 | 100 | 95 | 0 / 10 | A |
| 2062 | | 08/09/23 | P-21-std | A | CL | 18.1 | 106.3 | 20.1 | 108.2 | 130.0 | 6 | 102 | 95 | 0 / 10 | A |
| 2063 | | 08/09/23 | P-19 | | CH | 18.4 | 105.0 | 21.8 | 103.9 | 126.5 | 6 | 99 | 95 | 0 / 10 | A |
| 2064 | | 08/09/23 | P-16 | | CH | 20.2 | 101.8 | 22.0 | 100.4 | 122.5 | 6 | 99 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2057 | Select Clay: Wall Zone 21 | 45.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2058 | Select Clay: Wall Zone 19 | 50.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2059 | Select Clay: Wall Zone 20 | 89.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2060 | Select Clay: Wall Zone 52 | 89.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2061 | Select Clay: Wall Zone 53 | 89.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2062 | Select Clay: Wall Zone 54 | 89.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2063 | Select Clay: Wall Zone 55 | 89.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2064 | Select Clay: Wall Zone 56 | 46.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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# Field Compaction Report

**Report Date:** 08/15/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2065 | | 08/09/23 | P-19 | | CH | 18.4 | 105.0 | 22.6 | 102.7 | 125.9 | 6 | 98 | 95 | 0 / 10 | A |
| 2066 | | 08/09/23 | P-19 | | CH | 18.4 | 105.0 | 19.8 | 105.3 | 126.1 | 6 | 100 | 95 | 0 / 10 | A |
| 2067 | | 08/09/23 | P-19 | | CH | 18.4 | 105.0 | 21.6 | 103.3 | 125.6 | 6 | 98 | 95 | 0 / 10 | A |
| 2068 | | 08/09/23 | P-19 | | CH | 18.4 | 105.0 | 21.1 | 105.1 | 127.3 | 6 | 100 | 95 | 0 / 10 | A |
| 2069 | | 08/09/23 | P-21-std | A | CL | 18.1 | 106.3 | 22.3 | 106.6 | 130.4 | 6 | 100 | 95 | 0 / 10 | A |
| 2070 | | 08/09/23 | P-21-std | A | CL | 18.1 | 106.3 | 18.7 | 109.8 | 130.3 | 6 | 103 | 95 | 0 / 10 | A |
| 2071 | | 08/09/23 | P-16 | | CH | 20.2 | 101.8 | 23.5 | 101.8 | 125.7 | 6 | 100 | 95 | 0 / 10 | A |
| 2072 | | 08/09/23 | P-21-std | A | CL | 18.1 | 106.3 | 20.6 | 107.8 | 130.0 | 6 | 101 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2065 | Select Clay: Wall Zone 57 | 46.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2066 | Select Clay: Wall Zone 58 | 46.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2067 | Select Clay: Wall Zone 59 | 46.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2068 | Select Clay: Wall Zone 60 | 46.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2069 | Select Clay: Wall Zone 21 | 46.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2070 | Select Clay: Wall Zone 19 | 51.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2071 | Select Clay: Wall Zone 20 | 90.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2072 | Select Clay: Wall Zone 52 | 90.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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# Field Compaction Report

**Report Date:** 08/15/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2073 | | 08/09/23 | P-19 | | CH | 18.4 | 105.0 | 21.6 | 102.6 | 124.8 | 6 | 98 | 95 | 0 / 10 | A |
| 2074 | | 08/09/23 | P-19 | | CH | 18.4 | 105.0 | 21.2 | 101.0 | 122.4 | 6 | 96 | 95 | 0 / 10 | A |
| 2075 | | 08/09/23 | P-19 | | CH | 18.4 | 105.0 | 21.5 | 103.1 | 125.3 | 6 | 98 | 95 | 0 / 10 | A |
| 2076 | | 08/09/23 | P-19 | | CH | 18.4 | 105.0 | 21.1 | 100.2 | 121.3 | 6 | 95 | 95 | 0 / 10 | A |
| 2077 | | 08/09/23 | P-03 | | CH | 20.2 | 99.3 | 22.4 | 97.2 | 119.0 | 6 | 98 | 95 | 0 / 10 | A |
| 2078 | | 08/09/23 | P-19 | | CH | 18.4 | 105.0 | 21.8 | 102.0 | 124.2 | 6 | 97 | 95 | 0 / 10 | A |
| 2079 | | 08/09/23 | P-19 | | CH | 18.4 | 105.0 | 20.9 | 101.5 | 122.7 | 6 | 97 | 95 | 0 / 10 | A |
| 2080 | | 08/09/23 | P-19 | | CH | 18.4 | 105.0 | 22.0 | 104.0 | 126.9 | 6 | 99 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2073 | Select Clay: Wall Zone 53 | 90.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2074 | Select Clay: Wall Zone 54 | 90.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2075 | Select Clay: Wall Zone 55 | 90.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2076 | Select Clay: Wall Zone 56 | 47.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2077 | Select Clay: Wall Zone 57 | 47.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2078 | Select Clay: Wall Zone 58 | 47.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2079 | Select Clay: Wall Zone 59 | 47.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2080 | Select Clay: Wall Zone 60 | 47.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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The Science You Build On.

2908 Morrison Ave.
Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/15/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2081 | | 08/09/23 | P-19 | | CH | 18.4 | 105.0 | 21.3 | 103.0 | 124.9 | 6 | 98 | 95 | 0 / 10 | A |
| 2082 | | 08/09/23 | P-19 | | CH | 18.4 | 105.0 | 20.9 | 104.4 | 126.2 | 6 | 99 | 95 | 0 / 10 | A |
| 2083 | | 08/09/23 | P-21-std | A | CL | 18.1 | 106.3 | 21.2 | 106.1 | 128.6 | 6 | 100 | 95 | 0 / 10 | A |
| 2084 | | 08/09/23 | P-19 | | CH | 18.4 | 105.0 | 20.8 | 104.9 | 126.7 | 6 | 100 | 95 | 0 / 10 | A |
| 2085 | | 08/09/23 | P-19 | | CH | 18.4 | 105.0 | 19.0 | 101.9 | 121.3 | 6 | 97 | 95 | 0 / 10 | A |
| 2086 | | 08/09/23 | P-16 | | CH | 20.2 | 101.8 | 21.7 | 100.7 | 122.6 | 6 | 99 | 95 | 0 / 10 | A |
| 2087 | | 08/09/23 | P-19 | | CH | 18.4 | 105.0 | 19.8 | 103.4 | 123.9 | 6 | 98 | 95 | 0 / 10 | A |
| 2088 | | 08/10/23 | P-03 | | CH | 20.2 | 99.3 | 22.0 | 96.7 | 118.0 | 6 | 97 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2081 | Select Clay: Wall Zone 21 | 47.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2082 | Select Clay: Wall Zone 19 | 52.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2083 | Select Clay: Wall Zone 20 | 91.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2084 | Select Clay: Wall Zone 52 | 91.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2085 | Select Clay: Wall Zone 53 | 91.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2086 | Select Clay: Wall Zone 54 | 91.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2087 | Select Clay: Wall Zone 55 | 91.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2088 | Select Clay: Wall Zone 19 | 53.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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# Field Compaction Report

**Report Date:** 08/15/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2089 | | 08/10/23 | P-19 | | CH | 18.4 | 105.0 | 21.9 | 103.6 | 126.3 | 6 | 99 | 95 | 0 / 10 | A |
| 2090 | | 08/10/23 | P-21-std | A | CL | 18.1 | 106.3 | 21.1 | 106.9 | 129.5 | 6 | 101 | 95 | 0 / 10 | A |
| 2091 | | 08/10/23 | P-19 | | CH | 18.4 | 105.0 | 20.3 | 105.0 | 126.3 | 6 | 100 | 95 | 0 / 10 | A |
| 2092 | | 08/10/23 | P-21-std | A | CL | 18.1 | 106.3 | 20.9 | 106.7 | 129.0 | 6 | 100 | 95 | 0 / 10 | A |
| 2093 | | 08/10/23 | P-19 | | CH | 18.4 | 105.0 | 21.9 | 104.5 | 127.4 | 6 | 100 | 95 | 0 / 10 | A |
| 2094 | | 08/10/23 | P-03 | | CH | 20.2 | 99.3 | 22.2 | 98.8 | 120.7 | 6 | 99 | 95 | 0 / 10 | A |
| 2095 | | 08/10/23 | P-21-std | A | CL | 18.1 | 106.3 | 20.4 | 106.8 | 128.6 | 6 | 100 | 95 | 0 / 10 | A |
| 2096 | | 08/10/23 | P-19 | | CH | 18.4 | 105.0 | 21.0 | 104.6 | 126.6 | 6 | 100 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2089 | Select Clay: Wall Zone 20 | 92.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2090 | Select Clay: Wall Zone 52 | 92.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2091 | Select Clay: Wall Zone 53 | 92.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2092 | Select Clay: Wall Zone 54 | 92.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2093 | Select Clay: Wall Zone 55 | 92.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2094 | Select Clay: Wall Zone 56 | 48.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2095 | Select Clay: Wall Zone 57 | 48.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2096 | Select Clay: Wall Zone 58 | 48.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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# Field Compaction Report

**Report Date:** 08/15/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2097 | | 08/10/23 | P-19 | | CH | 18.4 | 105.0 | 21.7 | 104.4 | 127.1 | 6 | 99 | 95 | 0 / 10 | A |
| 2098 | | 08/10/23 | P-19 | | CH | 18.4 | 105.0 | 21.3 | 103.3 | 125.3 | 6 | 98 | 95 | 0 / 10 | A |
| 2099 | | 08/10/23 | P-21-std | A | CL | 18.1 | 106.3 | 21.7 | 105.8 | 128.8 | 6 | 100 | 95 | 0 / 10 | A |
| 2100 | | 08/10/23 | P-07 | | CH | 22.6 | 93.8 | 25.3 | 92.2 | 115.5 | 6 | 98 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2097 | Select Clay: Wall Zone 59 | 48.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2098 | Select Clay: Wall Zone 60 | 48.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2099 | Select Clay: Wall Zone 21 | 48.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2100 | Select Clay: Wall Zone 19 | 54.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Kurt Kuechle
08/15/2023

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# Field Compaction Report

**Report Date:** 08/15/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2101 | | 08/10/23 | P-16 | | CH | 20.2 | 101.8 | 23.2 | 100.2 | 123.4 | 6 | 98 | 95 | 0 / 10 | A |
| 2102 | | 08/10/23 | P-19 | | CH | 18.4 | 105.0 | 22.3 | 103.1 | 126.1 | 6 | 98 | 95 | 0 / 10 | A |
| 2103 | | 08/10/23 | P-16 | | CH | 20.2 | 101.8 | 24.1 | 100.9 | 125.2 | 6 | 99 | 95 | 0 / 10 | A |
| 2104 | | 08/10/23 | P-19 | | CH | 18.4 | 105.0 | 22.7 | 104.0 | 127.6 | 6 | 99 | 95 | 0 / 10 | A |
| 2105 | | 08/10/23 | P-19 | | CH | 18.4 | 105.0 | 20.7 | 104.1 | 125.7 | 6 | 99 | 95 | 0 / 10 | A |
| 2106 | | 08/10/23 | P-21-std | A | CL | 18.1 | 106.3 | 21.3 | 107.3 | 130.2 | 6 | 101 | 95 | 0 / 10 | A |
| 2107 | | 08/10/23 | P-16 | | CH | 20.2 | 101.8 | 22.0 | 101.3 | 123.6 | 6 | 100 | 95 | 0 / 10 | A |
| 2108 | | 08/10/23 | P-16 | | CH | 20.2 | 101.8 | 22.0 | 102.1 | 124.6 | 6 | 100 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2101 | Select Clay: Wall Zone 20 | 93.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2102 | Select Clay: Wall Zone 52 | 93.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2103 | Select Clay: Wall Zone 53 | 93.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2104 | Select Clay: Wall Zone 54 | 93.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2105 | Select Clay: Wall Zone 55 | 93.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2106 | Select Clay: Wall Zone 56 | 49.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2107 | Select Clay: Wall Zone 57 | 49.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2108 | Select Clay: Wall Zone 58 | 49.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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# Field Compaction Report

**Report Date:** 08/15/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2109 | | 08/10/23 | P-21-std | A | CL | 18.1 | 106.3 | 20.6 | 106.4 | 128.3 | 6 | 100 | 95 | 0 / 10 | A |
| 2110 | | 08/10/23 | P-19 | | CH | 18.4 | 105.0 | 22.4 | 103.6 | 126.8 | 6 | 99 | 95 | 0 / 10 | A |
| 2111 | | 08/10/23 | P-21-std | A | CL | 18.1 | 106.3 | 21.6 | 105.9 | 128.8 | 6 | 100 | 95 | 0 / 10 | A |
| 2112 | | 08/10/23 | P-16 | | CH | 20.2 | 101.8 | 22.2 | 101.5 | 124.0 | 6 | 100 | 95 | 0 / 10 | A |
| 2113 | | 08/10/23 | P-16 | | CH | 20.2 | 101.8 | 21.1 | 100.8 | 122.1 | 6 | 99 | 95 | 0 / 10 | A |
| 2114 | | 08/10/23 | P-19 | | CH | 18.4 | 105.0 | 22.0 | 104.7 | 127.7 | 6 | 100 | 95 | 0 / 10 | A |
| 2115 | | 08/10/23 | P-19 | | CH | 18.4 | 105.0 | 22.0 | 105.4 | 128.6 | 6 | 100 | 95 | 0 / 10 | A |
| 2116 | | 08/10/23 | P-21-std | A | CL | 18.1 | 106.3 | 20.3 | 106.1 | 127.6 | 6 | 100 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2109 | Select Clay: Wall Zone 59 | 49.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2110 | Select Clay: Wall Zone 60 | 49.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2111 | Select Clay: Wall Zone 21 | 49.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2112 | Select Clay: Wall Zone 19 | 55.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2113 | Select Clay: Wall Zone 20 | 94.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2114 | Select Clay: Wall Zone 52 | 94.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2115 | Select Clay: Wall Zone 53 | 94.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2116 | Select Clay: Wall Zone 54 | 94.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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# Field Compaction Report

**Report Date:** 08/15/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2117 | | 08/10/23 | P-19 | | CH | 18.4 | 105.0 | 20.4 | 104.4 | 125.7 | 6 | 99 | 95 | 0 / 10 | A |
| 2118 | | 08/10/23 | P-16 | | CH | 20.2 | 101.8 | 21.3 | 100.2 | 121.5 | 6 | 98 | 95 | 0 / 10 | A |
| 2119 | | 08/10/23 | P-16 | | CH | 20.2 | 101.8 | 22.6 | 101.6 | 124.6 | 6 | 100 | 95 | 0 / 10 | A |
| 2120 | | 08/10/23 | P-19 | | CH | 18.4 | 105.0 | 20.8 | 105.1 | 127.0 | 6 | 100 | 95 | 0 / 10 | A |
| 2121 | | 08/10/23 | P-21-std | A | CL | 18.1 | 106.3 | 21.4 | 106.1 | 128.8 | 6 | 100 | 95 | 0 / 10 | A |
| 2122 | | 08/10/23 | P-19 | | CH | 18.4 | 105.0 | 20.8 | 102.3 | 123.6 | 6 | 97 | 95 | 0 / 10 | A |
| 2123 | | 08/10/23 | P-21-std | A | CL | 18.1 | 106.3 | 20.6 | 108.2 | 130.5 | 6 | 102 | 95 | 0 / 10 | A |
| 2124 | | 08/10/23 | P-19 | | CH | 18.4 | 105.0 | 22.3 | 104.8 | 128.2 | 6 | 100 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2117 | Select Clay: Wall Zone 55 | 94.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2118 | Select Clay: Wall Zone 56 | 50.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2119 | Select Clay: Wall Zone 57 | 50.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2120 | Select Clay: Wall Zone 58 | 50.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2121 | Select Clay: Wall Zone 59 | 50.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2122 | Select Clay: Wall Zone 60 | 50.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2123 | Select Clay: Wall Zone 21 | 50.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2124 | Select Clay: Wall Zone 19 | 56.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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# Field Compaction Report

**Report Date:** 08/15/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2125 | | 08/10/23 | P-21-std | A | CL | 18.1 | 106.3 | 21.8 | 105.6 | 128.6 | 6 | 99 | 95 | 0 / 10 | A |
| 2126 | | 08/10/23 | P-19 | | CH | 18.4 | 105.0 | 21.6 | 104.0 | 126.5 | 6 | 99 | 95 | 0 / 10 | A |
| 2127 | | 08/10/23 | P-19 | | CH | 18.4 | 105.0 | 21.6 | 104.4 | 127.0 | 6 | 99 | 95 | 0 / 10 | A |
| 2128 | | 08/10/23 | P-19 | | CH | 18.4 | 105.0 | 22.4 | 103.8 | 127.1 | 6 | 99 | 95 | 0 / 10 | A |
| 2129 | | 08/10/23 | P-19 | | CH | 18.4 | 105.0 | 22.7 | 103.3 | 126.7 | 6 | 98 | 95 | 0 / 10 | A |
| 2130 | | 08/10/23 | P-21-std | A | CL | 18.1 | 106.3 | 20.3 | 106.6 | 128.2 | 6 | 100 | 95 | 0 / 10 | A |
| 2131 | | 08/10/23 | P-21-std | A | CL | 18.1 | 106.3 | 20.0 | 106.6 | 127.9 | 6 | 100 | 95 | 0 / 10 | A |
| 2132 | | 08/10/23 | P-21-std | A | CL | 18.1 | 106.3 | 21.2 | 105.9 | 128.4 | 6 | 100 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2125 | Select Clay: Wall Zone 20 | 95.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2126 | Select Clay: Wall Zone 52 | 95.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2127 | Select Clay: Wall Zone 53 | 95.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2128 | Select Clay: Wall Zone 54 | 95.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2129 | Select Clay: Wall Zone 55 | 95.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2130 | Select Clay: Wall Zone 56 | 51.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2131 | Select Clay: Wall Zone 57 | 51.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2132 | Select Clay: Wall Zone 58 | 51.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/15/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2133 | | 08/10/23 | P-21-std | A | CL | 18.1 | 106.3 | 20.7 | 106.2 | 128.2 | 6 | 100 | 95 | 0 / 10 | A |
| 2134 | | 08/10/23 | P-19 | | CH | 18.4 | 105.0 | 22.8 | 103.7 | 127.3 | 6 | 99 | 95 | 0 / 10 | A |
| 2135 | | 08/10/23 | P-19 | | CH | 18.4 | 105.0 | 21.3 | 104.0 | 126.2 | 6 | 99 | 95 | 0 / 10 | A |
| 2136 | | 08/10/23 | P-03 | | CH | 20.2 | 99.3 | 21.3 | 96.8 | 117.4 | 6 | 97 | 95 | 0 / 10 | A |
| 2137 | | 08/10/23 | P-21-std | A | CL | 18.1 | 106.3 | 21.3 | 106.3 | 128.9 | 6 | 100 | 95 | 0 / 10 | A |
| 2138 | | 08/10/23 | P-21-std | A | CL | 18.1 | 106.3 | 19.6 | 106.6 | 127.5 | 6 | 100 | 95 | 0 / 10 | A |
| 2139 | | 08/10/23 | P-21-std | A | CL | 18.1 | 106.3 | 20.8 | 106.5 | 128.7 | 6 | 100 | 95 | 0 / 10 | A |
| 2140 | | 08/10/23 | P-03 | | CH | 20.2 | 99.3 | 23.8 | 98.3 | 121.7 | 6 | 99 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2133 | Select Clay: Wall Zone 59 | 51.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2134 | Select Clay: Wall Zone 60 | 51.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2135 | Select Clay: Wall Zone 21 | 51.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2136 | Select Clay: Wall Zone 19 | 57.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2137 | Select Clay: Wall Zone 20 | 96.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2138 | Select Clay: Wall Zone 52 | 96.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2139 | Select Clay: Wall Zone 53 | 96.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2140 | Select Clay: Wall Zone 54 | 96.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2141 | | 08/10/23 | P-19 | | CH | 18.4 | 105.0 | 21.1 | 105.2 | 127.4 | 6 | 100 | 95 | 0 / 10 | A |
| 2142 | | 08/10/23 | P-16 | | CH | 20.2 | 101.8 | 22.9 | 101.8 | 125.1 | 6 | 100 | 95 | 0 / 10 | A |
| 2143 | | 08/10/23 | P-19 | | CH | 18.4 | 105.0 | 23.7 | 103.1 | 127.5 | 6 | 98 | 95 | 0 / 10 | A |
| 2144 | | 08/10/23 | P-21-std | A | CL | 18.1 | 106.3 | 21.4 | 106.3 | 129.0 | 6 | 100 | 95 | 0 / 10 | A |
| 2145 | | 08/10/23 | P-16 | | CH | 20.2 | 101.8 | 22.6 | 101.3 | 124.2 | 6 | 100 | 95 | 0 / 10 | A |
| 2146 | | 08/10/23 | P-19 | | CH | 18.4 | 105.0 | 21.4 | 103.9 | 126.1 | 6 | 99 | 95 | 0 / 10 | A |
| 2147 | | 08/10/23 | P-19 | | CH | 18.4 | 105.0 | 20.5 | 104.9 | 126.4 | 6 | 100 | 95 | 0 / 10 | A |
| 2148 | | 08/10/23 | P-19 | | CH | 18.4 | 105.0 | 19.8 | 105.4 | 126.3 | 6 | 100 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2141 | Select Clay: Wall Zone 55 | 96.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2142 | Select Clay: Wall Zone 56 | 52.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2143 | Select Clay: Wall Zone 57 | 52.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2144 | Select Clay: Wall Zone 58 | 52.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2145 | Select Clay: Wall Zone 59 | 52.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2146 | Select Clay: Wall Zone 60 | 52.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2147 | Select Clay: Wall Zone 21 | 52.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2148 | Select Clay: Wall Zone 19 | 58.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2149 | | 08/10/23 | P-19 | | CH | 18.4 | 105.0 | 20.8 | 105.1 | 127.0 | 6 | 100 | 95 | 0 / 10 | A |
| 2150 | | 08/10/23 | P-21-std | A | CL | 18.1 | 106.3 | 21.3 | 105.8 | 128.3 | 6 | 100 | 95 | 0 / 10 | A |
| 2151 | | 08/10/23 | P-19 | | CH | 18.4 | 105.0 | 22.2 | 104.3 | 127.5 | 6 | 99 | 95 | 0 / 10 | A |
| 2152 | | 08/10/23 | P-19 | | CH | 18.4 | 105.0 | 21.5 | 105.1 | 127.7 | 6 | 100 | 95 | 0 / 10 | A |
| 2153 | | 08/10/23 | P-19 | | CH | 18.4 | 105.0 | 20.3 | 104.4 | 125.6 | 6 | 99 | 95 | 0 / 10 | A |
| 2154 | | 08/10/23 | P-19 | | CH | 18.4 | 105.0 | 22.2 | 103.6 | 126.6 | 6 | 99 | 95 | 0 / 10 | A |
| 2155 | | 08/10/23 | P-16 | | CH | 20.2 | 101.8 | 21.6 | 100.9 | 122.7 | 6 | 99 | 95 | 0 / 10 | A |
| 2156 | | 08/10/23 | P-19 | | CH | 18.4 | 105.0 | 21.9 | 103.7 | 126.4 | 6 | 99 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2149 | Select Clay: Wall Zone 20 | 97.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2150 | Select Clay: Wall Zone 52 | 97.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2151 | Select Clay: Wall Zone 53 | 97.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2152 | Select Clay: Wall Zone 54 | 97.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2153 | Select Clay: Wall Zone 55 | 97.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2154 | Select Clay: Wall Zone 56 | 53.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2155 | Select Clay: Wall Zone 57 | 53.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2156 | Select Clay: Wall Zone 58 | 53.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2157 | | 08/10/23 | P-19 | | CH | 18.4 | 105.0 | 21.7 | 104.4 | 127.1 | 6 | 99 | 95 | 0 / 10 | A |
| 2158 | | 08/10/23 | P-16 | | CH | 20.2 | 101.8 | 22.0 | 100.9 | 123.1 | 6 | 99 | 95 | 0 / 10 | A |
| 2159 | | 08/10/23 | P-16 | | CH | 20.2 | 101.8 | 22.3 | 101.6 | 124.3 | 6 | 100 | 95 | 0 / 10 | A |
| 2160 | | 08/11/23 | P-19 | | CH | 18.4 | 105.0 | 21.2 | 105.0 | 127.3 | 6 | 100 | 95 | 0 / 10 | A |
| 2161 | | 08/11/23 | P-19 | | CH | 18.4 | 105.0 | 21.2 | 105.3 | 127.6 | 6 | 100 | 95 | 0 / 10 | A |
| 2162 | | 08/11/23 | P-19 | | CH | 18.4 | 105.0 | 22.0 | 105.4 | 128.6 | 6 | 100 | 95 | 0 / 10 | A |
| 2163 | | 08/11/23 | P-19 | | CH | 18.4 | 105.0 | 18.4 | 104.2 | 123.4 | 6 | 99 | 95 | 0 / 10 | A |
| 2164 | | 08/11/23 | P-21-std | A | CL | 18.1 | 106.3 | 20.7 | 108.9 | 131.4 | 6 | 102 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2157 | Select Clay: Wall Zone 59 | 53.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2158 | Select Clay: Wall Zone 60 | 53.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2159 | Select Clay: Wall Zone 21 | 53.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2160 | Select Clay: Wall Zone 19 | 59.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2161 | Select Clay: Wall Zone 20 | 98.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2162 | Select Clay: Wall Zone 52 | 98.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2163 | Select Clay: Wall Zone 53 | 98.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2164 | Select Clay: Wall Zone 54 | 98.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2165 | | 08/11/23 | P-19 | | CH | 18.4 | 105.0 | 21.1 | 105.0 | 127.2 | 6 | 100 | 95 | 0 / 10 | A |
| 2166 | | 08/11/23 | P-19 | | CH | 18.4 | 105.0 | 20.8 | 105.7 | 127.7 | 6 | 101 | 95 | 0 / 10 | A |
| 2167 | | 08/11/23 | P-19 | | CH | 18.4 | 105.0 | 22.1 | 105.1 | 128.3 | 6 | 100 | 95 | 0 / 10 | A |
| 2168 | | 08/11/23 | P-21-std | A | CL | 18.1 | 106.3 | 20.8 | 106.8 | 129.0 | 6 | 100 | 95 | 0 / 10 | A |
| 2169 | | 08/11/23 | P-19 | | CH | 18.4 | 105.0 | 20.5 | 105.2 | 126.8 | 6 | 100 | 95 | 0 / 10 | A |
| 2170 | | 08/11/23 | P-19 | | CH | 18.4 | 105.0 | 20.3 | 103.7 | 124.8 | 6 | 99 | 95 | 0 / 10 | A |
| 2171 | | 08/11/23 | P-19 | | CH | 18.4 | 105.0 | 21.4 | 105.3 | 127.8 | 6 | 100 | 95 | 0 / 10 | A |
| 2172 | | 08/11/23 | P-21-std | A | CL | 18.1 | 106.3 | 21.7 | 105.9 | 128.9 | 6 | 100 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2165 | Select Clay: Wall Zone 55 | 98.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2166 | Select Clay: Wall Zone 56 | 54.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2167 | Select Clay: Wall Zone 57 | 54.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2168 | Select Clay: Wall Zone 58 | 54.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2169 | Select Clay: Wall Zone 59 | 54.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2170 | Select Clay: Wall Zone 60 | 54.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2171 | Select Clay: Wall Zone 21 | 54.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2172 | Select Clay: Wall Zone 19 | 60.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2173 | | 08/11/23 | P-19 | | CH | 18.4 | 105.0 | 22.2 | 103.1 | 126.0 | 6 | 98 | 95 | 0 / 10 | A |
| 2174 | | 08/11/23 | P-21-std | A | CL | 18.1 | 106.3 | 20.0 | 109.5 | 131.4 | 6 | 103 | 95 | 0 / 10 | A |
| 2175 | | 08/11/23 | P-21-std | A | CL | 18.1 | 106.3 | 20.5 | 106.7 | 128.6 | 6 | 100 | 95 | 0 / 10 | A |
| 2176 | | 08/11/23 | P-21-std | A | CL | 18.1 | 106.3 | 22.2 | 106.1 | 129.7 | 6 | 100 | 95 | 0 / 10 | A |
| 2177 | | 08/11/23 | P-21-std | A | CL | 18.1 | 106.3 | 19.3 | 106.0 | 126.5 | 6 | 100 | 95 | 0 / 10 | A |
| 2178 | | 08/11/23 | P-21-std | A | CL | 18.1 | 106.3 | 21.8 | 105.5 | 128.5 | 6 | 99 | 95 | 0 / 10 | A |
| 2179 | | 08/11/23 | P-19 | | CH | 18.4 | 105.0 | 21.8 | 102.1 | 124.4 | 6 | 97 | 95 | 0 / 10 | A |
| 2180 | | 08/11/23 | P-01 | | CH | 19.4 | 100.8 | 21.5 | 100.0 | 121.5 | 6 | 99 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2173 | Select Clay: Wall Zone 20 | 99.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2174 | Select Clay: Wall Zone 52 | 99.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2175 | Select Clay: Wall Zone 53 | 99.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2176 | Select Clay: Wall Zone 54 | 99.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2177 | Select Clay: Wall Zone 55 | 99.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2178 | Select Clay: Wall Zone 56 | 55.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2179 | Select Clay: Wall Zone 57 | 55.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2180 | Select Clay: Wall Zone 58 | 55.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2181 | | 08/11/23 | P-21-std | A | CL | 18.1 | 106.3 | 21.2 | 106.2 | 128.7 | 6 | 100 | 95 | 0 / 10 | A |
| 2182 | | 08/11/23 | P-19 | | CH | 18.4 | 105.0 | 21.1 | 102.4 | 124.0 | 6 | 98 | 95 | 0 / 10 | A |
| 2183 | | 08/11/23 | P-16 | | CH | 20.2 | 101.8 | 24.8 | 99.9 | 124.7 | 6 | 98 | 95 | 0 / 10 | A |
| 2184 | | 08/11/23 | P-21-std | A | CL | 18.1 | 106.3 | 20.5 | 106.6 | 128.4 | 6 | 100 | 95 | 0 / 10 | A |
| 2185 | | 08/11/23 | P-21-std | A | CL | 18.1 | 106.3 | 20.2 | 106.6 | 128.1 | 6 | 100 | 95 | 0 / 10 | A |
| 2186 | | 08/11/23 | P-19 | | CH | 18.4 | 105.0 | 22.3 | 103.2 | 126.2 | 6 | 98 | 95 | 0 / 10 | A |
| 2187 | | 08/11/23 | P-03 | | CH | 20.2 | 99.3 | 20.4 | 98.5 | 118.6 | 6 | 99 | 95 | 0 / 10 | A |
| 2188 | | 08/11/23 | P-19 | | CH | 18.4 | 105.0 | 21.9 | 104.6 | 127.5 | 6 | 100 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2181 | Select Clay: Wall Zone 59 | 55.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2182 | Select Clay: Wall Zone 60 | 55.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2183 | Select Clay: Wall Zone 21 | 55.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2184 | Select Clay: Wall Zone 19 | 61.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2185 | Select Clay: Wall Zone 20 | 100.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2186 | Select Clay: Wall Zone 52 | 100.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2187 | Select Clay: Wall Zone 53 | 100.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2188 | Select Clay: Wall Zone 54 | 100.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
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**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2189 | | 08/11/23 | P-21-std | A | CL | 18.1 | 106.3 | 20.1 | 106.8 | 128.3 | 6 | 100 | 95 | 0 / 10 | A |
| 2190 | | 08/11/23 | P-21-std | A | CL | 18.1 | 106.3 | 21.9 | 105.9 | 129.1 | 6 | 100 | 95 | 0 / 10 | A |
| 2191 | | 08/11/23 | P-21-std | A | CL | 18.1 | 106.3 | 21.5 | 107.1 | 130.1 | 6 | 101 | 95 | 0 / 10 | A |
| 2192 | | 08/11/23 | P-19 | | CH | 18.4 | 105.0 | 18.8 | 105.2 | 125.0 | 6 | 100 | 95 | 0 / 10 | A |
| 2193 | | 08/11/23 | P-21-std | A | CL | 18.1 | 106.3 | 19.0 | 106.2 | 126.4 | 6 | 100 | 95 | 0 / 10 | A |
| 2194 | | 08/11/23 | P-19 | | CH | 18.4 | 105.0 | 21.9 | 105.0 | 128.0 | 6 | 100 | 95 | 0 / 10 | A |
| 2195 | | 08/11/23 | P-21-std | A | CL | 18.1 | 106.3 | 20.4 | 107.5 | 129.4 | 6 | 101 | 95 | 0 / 10 | A |
| 2196 | | 08/11/23 | P-21-std | A | CL | 18.1 | 106.3 | 20.0 | 109.4 | 131.3 | 6 | 103 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2189 | Select Clay: Wall Zone 55 | 100.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2190 | Select Clay: Wall Zone 56 | 56.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2191 | Select Clay: Wall Zone 57 | 56.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2192 | Select Clay: Wall Zone 58 | 56.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2193 | Select Clay: Wall Zone 59 | 56.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2194 | Select Clay: Wall Zone 60 | 56.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2195 | Select Clay: Wall Zone 21 | 56.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2196 | Select Clay: Wall Zone 18 | 101.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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BRAUN INTERTEC
The Science You Build On.

2908 Morrison Ave.
Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/15/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2197 | | 08/11/23 | P-21-std | A | CL | 18.1 | 106.3 | 21.0 | 105.7 | 127.9 | 6 | 99 | 95 | 0 / 10 | A |
| 2198 | | 08/11/23 | P-21-std | A | CL | 18.1 | 106.3 | 20.0 | 109.1 | 130.9 | 6 | 103 | 95 | 0 / 10 | A |
| 2199 | | 08/11/23 | P-16 | | CH | 20.2 | 101.8 | 21.9 | 100.1 | 122.0 | 6 | 98 | 95 | 0 / 10 | A |
| 2200 | | 08/11/23 | P-21-std | A | CL | 18.1 | 106.3 | 20.4 | 106.1 | 127.7 | 6 | 100 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2197 | Select Clay: Wall Zone 19 | 62.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2198 | Select Clay: Wall Zone 18 | 102.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2199 | Select Clay: Wall Zone 19 | 63.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2200 | Select Clay: Wall Zone 20 | 101.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Kurt Kuechle
08/15/2023

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# Field Compaction Report

**Report Date:** 08/15/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2201 | | 08/11/23 | P-21-std | A | CL | 18.1 | 106.3 | 19.6 | 107.6 | 128.7 | 6 | 101 | 95 | 0 / 10 | A |
| 2202 | | 08/11/23 | P-21-std | A | CL | 18.1 | 106.3 | 20.9 | 106.4 | 128.6 | 6 | 100 | 95 | 0 / 10 | A |
| 2203 | | 08/11/23 | P-19 | | CH | 18.4 | 105.0 | 20.7 | 104.6 | 126.2 | 6 | 100 | 95 | 0 / 10 | A |
| 2204 | | 08/11/23 | P-21-std | A | CL | 18.1 | 106.3 | 19.6 | 107.6 | 128.7 | 6 | 101 | 95 | 0 / 10 | A |
| 2205 | | 08/11/23 | P-19 | | CH | 18.4 | 105.0 | 21.4 | 105.3 | 127.8 | 6 | 100 | 95 | 0 / 10 | A |
| 2206 | | 08/11/23 | P-21-std | A | CL | 18.1 | 106.3 | 18.5 | 110.9 | 131.4 | 6 | 104 | 95 | 0 / 10 | A |
| 2207 | | 08/11/23 | P-21-std | A | CL | 18.1 | 106.3 | 20.4 | 107.6 | 129.6 | 6 | 101 | 95 | 0 / 10 | A |
| 2208 | | 08/11/23 | P-21-std | A | CL | 18.1 | 106.3 | 19.2 | 106.5 | 127.0 | 6 | 100 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2201 | Select Clay: Wall Zone 20 | 102.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2202 | Select Clay: Wall Zone 52 | 101.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2203 | Select Clay: Wall Zone 52 | 102.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2204 | Select Clay: Wall Zone 53 | 101.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2205 | Select Clay: Wall Zone 53 | 102.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2206 | Select Clay: Wall Zone 54 | 101.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2207 | Select Clay: Wall Zone 54 | 102.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2208 | Select Clay: Wall Zone 55 | 101.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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# Field Compaction Report

**Report Date:** 08/15/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2209 | | 08/11/23 | P-21-std | A | CL | 18.1 | 106.3 | 19.3 | 106.6 | 127.2 | 6 | 100 | 95 | 0 / 10 | A |
| 2210 | | 08/11/23 | P-21-std | A | CL | 18.1 | 106.3 | 19.5 | 106.6 | 127.4 | 6 | 100 | 95 | 0 / 10 | A |
| 2211 | | 08/11/23 | P-16 | | CH | 20.2 | 101.8 | 23.0 | 101.1 | 124.4 | 6 | 99 | 95 | 0 / 10 | A |
| 2212 | | 08/11/23 | P-19 | | CH | 18.4 | 105.0 | 18.9 | 104.8 | 124.6 | 6 | 100 | 95 | 0 / 10 | A |
| 2213 | | 08/11/23 | P-21-std | A | CL | 18.1 | 106.3 | 20.2 | 107.0 | 128.6 | 6 | 101 | 95 | 0 / 10 | A |
| 2214 | | 08/11/23 | P-21-std | A | CL | 18.1 | 106.3 | 20.1 | 106.9 | 128.4 | 6 | 101 | 95 | 0 / 10 | A |
| 2215 | | 08/11/23 | P-19 | | CH | 18.4 | 105.0 | 22.3 | 102.9 | 125.8 | 6 | 98 | 95 | 0 / 10 | A |
| 2216 | | 08/11/23 | P-21-std | A | CL | 18.1 | 106.3 | 20.2 | 109.1 | 131.1 | 6 | 103 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2209 | Select Clay: Wall Zone 55 | 102.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2210 | Select Clay: Wall Zone 56 | 57.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2211 | Select Clay: Wall Zone 57 | 57.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2212 | Select Clay: Wall Zone 58 | 57.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2213 | Select Clay: Wall Zone 59 | 57.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2214 | Select Clay: Wall Zone 60 | 57.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2215 | Select Clay: Wall Zone 21 | 57.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2216 | Select Clay: Wall Zone 18 | 103.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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# Field Compaction Report

**Report Date:** 08/15/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2217 | | 08/11/23 | P-21-std | A | CL | 18.1 | 106.3 | 19.6 | 107.4 | 128.5 | 6 | 101 | 95 | 0 / 10 | A |
| 2218 | | 08/11/23 | P-21-std | A | CL | 18.1 | 106.3 | 19.1 | 105.8 | 126.0 | 6 | 100 | 95 | 0 / 10 | A |
| 2219 | | 08/11/23 | P-03 | | CH | 20.2 | 99.3 | 24.8 | 97.1 | 121.2 | 6 | 98 | 95 | 0 / 10 | A |
| 2220 | | 08/11/23 | P-21-std | A | CL | 18.1 | 106.3 | 21.0 | 108.0 | 130.7 | 6 | 102 | 95 | 0 / 10 | A |
| 2221 | | 08/11/23 | P-19 | | CH | 18.4 | 105.0 | 20.8 | 103.3 | 124.8 | 6 | 98 | 95 | 0 / 10 | A |
| 2222 | | 08/11/23 | P-19 | | CH | 18.4 | 105.0 | 19.6 | 101.3 | 121.2 | 6 | 96 | 95 | 0 / 10 | A |
| 2223 | | 08/11/23 | P-19 | | CH | 18.4 | 105.0 | 21.1 | 103.6 | 125.5 | 6 | 99 | 95 | 0 / 10 | A |
| 2224 | | 08/11/23 | P-21-std | A | CL | 18.1 | 106.3 | 20.7 | 105.9 | 127.8 | 6 | 100 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2217 | Select Clay: Wall Zone 19 | 64.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2218 | Select Clay: Wall Zone 20 | 103.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2219 | Select Clay: Wall Zone 52 | 103.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2220 | Select Clay: Wall Zone 53 | 103.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2221 | Select Clay: Wall Zone 54 | 103.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2222 | Select Clay: Wall Zone 55 | 103.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2223 | Select Clay: Wall Zone 56 | 58.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2224 | Select Clay: Wall Zone 57 | 58.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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# Field Compaction Report

**Report Date:** 08/15/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2225 | | 08/11/23 | P-19 | | CH | 18.4 | 105.0 | 19.8 | 105.4 | 126.3 | 6 | 100 | 95 | 0 / 10 | A |
| 2226 | | 08/11/23 | P-03 | | CH | 20.2 | 99.3 | 21.1 | 97.0 | 117.5 | 6 | 98 | 95 | 0 / 10 | A |
| 2227 | | 08/11/23 | P-01 | | CH | 19.4 | 100.8 | 19.7 | 100.6 | 120.4 | 6 | 100 | 95 | 0 / 10 | A |
| 2228 | | 08/11/23 | P-19 | | CH | 18.4 | 105.0 | 20.6 | 102.2 | 123.3 | 6 | 97 | 95 | 0 / 10 | A |
| 2229 | | 08/11/23 | P-16 | | CH | 20.2 | 101.8 | 22.0 | 101.4 | 123.7 | 6 | 100 | 95 | 0 / 10 | A |
| 2230 | | 08/11/23 | P-19 | | CH | 18.4 | 105.0 | 21.1 | 103.3 | 125.1 | 6 | 98 | 95 | 0 / 10 | A |
| 2231 | | 08/11/23 | P-16 | | CH | 20.2 | 101.8 | 22.1 | 102.2 | 124.8 | 6 | 100 | 95 | 0 / 10 | A |
| 2232 | | 08/11/23 | P-01 | | CH | 19.4 | 100.8 | 20.9 | 102.0 | 123.3 | 6 | 101 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2225 | Select Clay: Wall Zone 58 | 58.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2226 | Select Clay: Wall Zone 59 | 58.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2227 | Select Clay: Wall Zone 60 | 58.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2228 | Select Clay: Wall Zone 21 | 58.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2229 | Select Clay: Wall Zone 18 | 104.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2230 | Select Clay: Wall Zone 19 | 65.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2231 | Select Clay: Wall Zone 20 | 104.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2232 | Select Clay: Wall Zone 52 | 104.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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# Field Compaction Report

**Report Date:** 08/15/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
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Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2233 | | 08/11/23 | P-16 | | CH | 20.2 | 101.8 | 22.9 | 101.3 | 124.5 | 6 | 100 | 95 | 0 / 10 | A |
| 2234 | | 08/11/23 | P-19 | | CH | 18.4 | 105.0 | 20.6 | 105.0 | 126.6 | 6 | 100 | 95 | 0 / 10 | A |
| 2235 | | 08/11/23 | P-21-std | A | CL | 18.1 | 106.3 | 19.6 | 108.8 | 130.1 | 6 | 102 | 95 | 0 / 10 | A |
| 2236 | | 08/11/23 | P-03 | | CH | 20.2 | 99.3 | 21.6 | 97.9 | 119.0 | 6 | 99 | 95 | 0 / 10 | A |
| 2237 | | 08/11/23 | P-19 | | CH | 18.4 | 105.0 | 20.9 | 101.9 | 123.2 | 6 | 97 | 95 | 0 / 10 | A |
| 2238 | | 08/11/23 | P-21-std | A | CL | 18.1 | 106.3 | 20.0 | 107.5 | 129.0 | 6 | 101 | 95 | 0 / 10 | A |
| 2239 | | 08/11/23 | P-03 | | CH | 20.2 | 99.3 | 23.1 | 95.0 | 116.9 | 6 | 96 | 95 | 0 / 10 | A |
| 2240 | | 08/11/23 | P-19 | | CH | 18.4 | 105.0 | 22.2 | 102.4 | 125.1 | 6 | 98 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2233 | Select Clay: Wall Zone 53 | 104.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2234 | Select Clay: Wall Zone 54 | 104.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2235 | Select Clay: Wall Zone 55 | 105.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2236 | Select Clay: Wall Zone 56 | 59.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2237 | Select Clay: Wall Zone 57 | 59.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2238 | Select Clay: Wall Zone 58 | 59.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2239 | Select Clay: Wall Zone 59 | 59.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2240 | Select Clay: Wall Zone 60 | 59.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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# Field Compaction Report

**Report Date:** 08/15/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
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Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2241 | | 08/11/23 | P-19 | | CH | 18.4 | 105.0 | 22.1 | 104.1 | 127.1 | 6 | 99 | 95 | 0 / 10 | A |
| 2242 | | 08/11/23 | P-03 | | CH | 20.2 | 99.3 | 21.5 | 98.6 | 119.8 | 6 | 99 | 95 | 0 / 10 | A |
| 2243 | | 08/11/23 | P-19 | | CH | 18.4 | 105.0 | 20.4 | 102.1 | 122.9 | 6 | 97 | 95 | 0 / 10 | A |
| 2244 | | 08/11/23 | P-19 | | CH | 18.4 | 105.0 | 20.8 | 103.7 | 125.3 | 6 | 99 | 95 | 0 / 10 | A |
| 2245 | | 08/14/23 | P-19 | | CH | 18.4 | 105.0 | 22.9 | 103.7 | 127.4 | 6 | 99 | 95 | 0 / 10 | A |
| 2246 | | 08/14/23 | P-19 | | CH | 18.4 | 105.0 | 22.5 | 105.2 | 128.9 | 6 | 100 | 95 | 0 / 10 | A |
| 2247 | | 08/14/23 | P-19 | | CH | 18.4 | 105.0 | 21.5 | 104.9 | 127.5 | 6 | 100 | 95 | 0 / 10 | A |
| 2248 | | 08/14/23 | P-19 | | CH | 18.4 | 105.0 | 20.8 | 105.3 | 127.2 | 6 | 100 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2241 | Select Clay: Wall Zone 21 | 59.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2242 | Select Clay: Wall Zone 56 | 60.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2243 | Select Clay: Wall Zone 57 | 60.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2244 | Select Clay: Wall Zone 55 | 105.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2245 | Select Clay: Wall Zone 18 | 105.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2246 | Select Clay: Wall Zone 18 | 106.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2247 | Select Clay: Wall Zone 19 | 66.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2248 | Select Clay: Wall Zone 19 | 67.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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The Science You Build On.

2908 Morrison Ave.
Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/15/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2249 | | 08/14/23 | P-03 | | CH | 20.2 | 99.3 | 23.9 | 96.8 | 119.9 | 6 | 97 | 95 | 0 / 10 | A |
| 2250 | | 08/14/23 | P-19 | | CH | 18.4 | 105.0 | 21.5 | 102.9 | 125.0 | 6 | 98 | 95 | 0 / 10 | A |
| 2251 | | 08/14/23 | P-16 | | CH | 20.2 | 101.8 | 22.8 | 100.8 | 123.8 | 6 | 99 | 95 | 0 / 10 | A |
| 2252 | | 08/14/23 | P-19 | | CH | 18.4 | 105.0 | 22.7 | 102.8 | 126.1 | 6 | 98 | 95 | 0 / 10 | A |
| 2253 | | 08/14/23 | P-21-std | A | CL | 18.1 | 106.3 | 20.4 | 106.1 | 127.7 | 6 | 100 | 95 | 0 / 10 | A |
| 2254 | | 08/14/23 | P-19 | | CH | 18.4 | 105.0 | 24.1 | 103.7 | 128.7 | 6 | 99 | 95 | 0 / 10 | A |
| 2255 | | 08/14/23 | P-03 | | CH | 20.2 | 99.3 | 24.5 | 97.8 | 121.8 | 6 | 98 | 95 | 0 / 10 | A |
| 2256 | | 08/14/23 | P-16 | | CH | 20.2 | 101.8 | 24.7 | 101.4 | 126.4 | 6 | 100 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2249 | Select Clay: Wall Zone 20 | 105.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2250 | Select Clay: Wall Zone 20 | 106.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2251 | Select Clay: Wall Zone 52 | 105.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2252 | Select Clay: Wall Zone 52 | 106.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2253 | Select Clay: Wall Zone 53 | 105.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2254 | Select Clay: Wall Zone 53 | 106.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2255 | Select Clay: Wall Zone 54 | 105.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2256 | Select Clay: Wall Zone 54 | 106.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/15/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2257 | | 08/14/23 | P-19 | | CH | 18.4 | 105.0 | 21.9 | 103.5 | 126.2 | 6 | 99 | 95 | 0 / 10 | A |
| 2258 | | 08/14/23 | P-19 | | CH | 18.4 | 105.0 | 24.2 | 101.9 | 126.6 | 6 | 97 | 95 | 0 / 10 | A |
| 2259 | | 08/14/23 | P-19 | | CH | 18.4 | 105.0 | 20.8 | 103.9 | 125.5 | 6 | 99 | 95 | 0 / 10 | A |
| 2260 | | 08/14/23 | P-16 | | CH | 20.2 | 101.8 | 22.6 | 101.2 | 124.1 | 6 | 99 | 95 | 0 / 10 | A |
| 2261 | | 08/14/23 | P-16 | | CH | 20.2 | 101.8 | 22.2 | 102.1 | 124.8 | 6 | 100 | 95 | 0 / 10 | A |
| 2262 | | 08/14/23 | P-16 | | CH | 20.2 | 101.8 | 22.0 | 101.9 | 124.3 | 6 | 100 | 95 | 0 / 10 | A |
| 2263 | | 08/14/23 | P-16 | | CH | 20.2 | 101.8 | 21.5 | 102.2 | 124.2 | 6 | 100 | 95 | 0 / 10 | A |
| 2264 | | 08/14/23 | P-03 | | CH | 20.2 | 99.3 | 23.1 | 96.9 | 119.3 | 6 | 98 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2257 | Select Clay: Wall Zone 55 | 106.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2258 | Select Clay: Wall Zone 56 | 61.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2259 | Select Clay: Wall Zone 57 | 61.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2260 | Select Clay: Wall Zone 58 | 60.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2261 | Select Clay: Wall Zone 58 | 61.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2262 | Select Clay: Wall Zone 59 | 60.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2263 | Select Clay: Wall Zone 59 | 61.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2264 | Select Clay: Wall Zone 60 | 60.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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# Field Compaction Report

**Report Date:** 08/15/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2265 | | 08/14/23 | P-03 | | CH | 20.2 | 99.3 | 22.6 | 96.1 | 117.8 | 6 | 97 | 95 | 0 / 10 | A |
| 2266 | | 08/14/23 | P-21-std | A | CL | 18.1 | 106.3 | 20.1 | 108.7 | 130.6 | 6 | 102 | 95 | 0 / 10 | A |
| 2267 | | 08/14/23 | P-21-std | A | CL | 18.1 | 106.3 | 20.5 | 107.7 | 129.8 | 6 | 101 | 95 | 0 / 10 | A |
| 2268 | | 08/14/23 | P-16 | | CH | 20.2 | 101.8 | 23.5 | 100.6 | 124.2 | 6 | 99 | 95 | 0 / 10 | A |
| 2269 | | 08/14/23 | P-21-std | A | CL | 18.1 | 106.3 | 21.8 | 105.6 | 128.6 | 6 | 99 | 95 | 0 / 10 | A |
| 2270 | | 08/14/23 | P-21-std | A | CL | 18.1 | 106.3 | 20.3 | 108.4 | 130.4 | 6 | 102 | 95 | 0 / 10 | A |
| 2271 | | 08/14/23 | P-19 | | CH | 18.4 | 105.0 | 22.8 | 104.0 | 127.7 | 6 | 99 | 95 | 0 / 10 | A |
| 2272 | | 08/14/23 | P-16 | | CH | 20.2 | 101.8 | 22.0 | 101.7 | 124.1 | 6 | 100 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2265 | Select Clay: Wall Zone 60 | 61.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2266 | Select Clay: Wall Zone 21 | 60.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2267 | Select Clay: Wall Zone 21 | 61.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2268 | Select Clay: Wall Zone 18 | 107.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2269 | Select Clay: Wall Zone 19 | 68.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2270 | Select Clay: Wall Zone 20 | 107.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2271 | Select Clay: Wall Zone 52 | 107.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2272 | Select Clay: Wall Zone 53 | 107.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/15/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2273 | | 08/14/23 | P-19 | | CH | 18.4 | 105.0 | 22.3 | 104.4 | 127.7 | 6 | 99 | 95 | 0 / 10 | A |
| 2274 | | 08/14/23 | P-16 | | CH | 20.2 | 101.8 | 21.7 | 103.1 | 125.5 | 6 | 101 | 95 | 0 / 10 | A |
| 2275 | | 08/14/23 | P-21-std | A | CL | 18.1 | 106.3 | 21.6 | 106.2 | 129.1 | 6 | 100 | 95 | 0 / 10 | A |
| 2276 | | 08/14/23 | P-19 | | CH | 18.4 | 105.0 | 21.0 | 103.1 | 124.7 | 6 | 98 | 95 | 0 / 10 | A |
| 2277 | | 08/14/23 | P-21-std | A | CL | 18.1 | 106.3 | 20.9 | 108.5 | 131.2 | 6 | 102 | 95 | 0 / 10 | A |
| 2278 | | 08/14/23 | P-16 | | CH | 20.2 | 101.8 | 22.4 | 103.3 | 126.4 | 6 | 101 | 95 | 0 / 10 | A |
| 2279 | | 08/14/23 | P-21-std | A | CL | 18.1 | 106.3 | 19.9 | 109.9 | 131.8 | 6 | 103 | 95 | 0 / 10 | A |
| 2280 | | 08/14/23 | P-19 | | CH | 18.4 | 105.0 | 20.9 | 105.0 | 126.9 | 6 | 100 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2273 | Select Clay: Wall Zone 54 | 107.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2274 | Select Clay: Wall Zone 55 | 107.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2275 | Select Clay: Wall Zone 56 | 62.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2276 | Select Clay: Wall Zone 57 | 62.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2277 | Select Clay: Wall Zone 58 | 62.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2278 | Select Clay: Wall Zone 59 | 62.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2279 | Select Clay: Wall Zone 60 | 62.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2280 | Select Clay: Wall Zone 21 | 62.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Bismarck, ND 58504
Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/15/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2281 | | 08/14/23 | P-19 | | CH | 18.4 | 105.0 | 22.0 | 104.8 | 127.9 | 6 | 100 | 95 | 0 / 10 | A |
| 2282 | | 08/14/23 | P-16 | | CH | 20.2 | 101.8 | 21.9 | 103.7 | 126.4 | 6 | 102 | 95 | 0 / 10 | A |
| 2283 | | 08/14/23 | P-16 | | CH | 20.2 | 101.8 | 23.8 | 100.1 | 123.9 | 6 | 98 | 95 | 0 / 10 | A |
| 2284 | | 08/14/23 | P-03 | | CH | 20.2 | 99.3 | 22.4 | 98.5 | 120.6 | 6 | 99 | 95 | 0 / 10 | A |
| 2285 | | 08/14/23 | P-16 | | CH | 20.2 | 101.8 | 22.7 | 103.0 | 126.4 | 6 | 101 | 95 | 0 / 10 | A |
| 2286 | | 08/14/23 | P-03 | | CH | 20.2 | 99.3 | 22.6 | 99.3 | 121.7 | 6 | 100 | 95 | 0 / 10 | A |
| 2287 | | 08/14/23 | P-16 | | CH | 20.2 | 101.8 | 21.9 | 102.2 | 124.6 | 6 | 100 | 95 | 0 / 10 | A |
| 2288 | | 08/14/23 | P-16 | | CH | 20.2 | 101.8 | 22.3 | 102.0 | 124.7 | 6 | 100 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2281 | Select Clay: Wall Zone 18 | 108.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2282 | Select Clay: Wall Zone 19 | 69.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2283 | Select Clay: Wall Zone 20 | 108.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2284 | Select Clay: Wall Zone 52 | 108.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2285 | Select Clay: Wall Zone 53 | 108.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2286 | Select Clay: Wall Zone 54 | 108.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2287 | Select Clay: Wall Zone 55 | 108.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2288 | Select Clay: Wall Zone 56 | 63.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Suite 3
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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/15/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2289 | | 08/14/23 | P-16 | | CH | 20.2 | 101.8 | 22.9 | 103.2 | 126.8 | 6 | 101 | 95 | 0 / 10 | A |
| 2290 | | 08/14/23 | P-19 | | CH | 18.4 | 105.0 | 20.4 | 102.7 | 123.6 | 6 | 98 | 95 | 0 / 10 | A |
| 2291 | | 08/14/23 | P-19 | | CH | 18.4 | 105.0 | 21.0 | 102.8 | 124.4 | 6 | 98 | 95 | 0 / 10 | A |
| 2292 | | 08/14/23 | P-21-std | A | CL | 18.1 | 106.3 | 21.3 | 106.2 | 128.8 | 6 | 100 | 95 | 0 / 10 | A |
| 2293 | | 08/14/23 | P-16 | | CH | 20.2 | 101.8 | 22.2 | 103.2 | 126.1 | 6 | 101 | 95 | 0 / 10 | A |
| 2294 | | 08/14/23 | P-19 | | CH | 18.4 | 105.0 | 22.1 | 105.6 | 128.9 | 6 | 101 | 95 | 0 / 10 | A |
| 2295 | | 08/14/23 | P-16 | | CH | 20.2 | 101.8 | 22.2 | 103.9 | 127.0 | 6 | 102 | 95 | 0 / 10 | A |
| 2296 | | 08/14/23 | P-19 | | CH | 18.4 | 105.0 | 22.2 | 105.6 | 129.0 | 6 | 101 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2289 | Select Clay: Wall Zone 57 | 63.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2290 | Select Clay: Wall Zone 58 | 63.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2291 | Select Clay: Wall Zone 59 | 63.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2292 | Select Clay: Wall Zone 60 | 63.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2293 | Select Clay: Wall Zone 21 | 63.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2294 | Select Clay: Wall Zone 18 | 109.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2295 | Select Clay: Wall Zone 19 | 70.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2296 | Select Clay: Wall Zone 20 | 109.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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# Field Compaction Report

**Report Date:** 08/15/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2297 | | 08/14/23 | P-19 | | CH | 18.4 | 105.0 | 20.6 | 104.8 | 126.4 | 6 | 100 | 95 | 0 / 10 | A |
| 2298 | | 08/14/23 | P-16 | | CH | 20.2 | 101.8 | 22.7 | 100.9 | 123.8 | 6 | 99 | 95 | 0 / 10 | A |
| 2299 | | 08/14/23 | P-16 | | CH | 20.2 | 101.8 | 24.5 | 102.1 | 127.1 | 6 | 100 | 95 | 0 / 10 | A |
| 2300 | | 08/14/23 | P-16 | | CH | 20.2 | 101.8 | 21.8 | 101.5 | 123.6 | 6 | 100 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2297 | Select Clay: Wall Zone 52 | 109.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2298 | Select Clay: Wall Zone 53 | 109.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2299 | Select Clay: Wall Zone 54 | 109.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2300 | Select Clay: Wall Zone 55 | 109.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Kurt Kuechle
08/15/2023

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2908 Morrison Ave.
Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/15/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2301 | | 08/14/23 | P-16 | | CH | 20.2 | 101.8 | 22.4 | 103.1 | 126.2 | 6 | 101 | 95 | 0 / 10 | A |
| 2302 | | 08/14/23 | P-16 | | CH | 20.2 | 101.8 | 22.2 | 104.0 | 127.1 | 6 | 102 | 95 | 0 / 10 | A |
| 2303 | | 08/14/23 | P-01 | | CH | 19.4 | 100.8 | 20.3 | 101.9 | 122.6 | 6 | 101 | 95 | 0 / 10 | A |
| 2304 | | 08/14/23 | P-21-std | A | CL | 18.1 | 106.3 | 21.5 | 105.7 | 128.4 | 6 | 99 | 95 | 0 / 10 | A |
| 2305 | | 08/14/23 | P-16 | | CH | 20.2 | 101.8 | 22.7 | 104.7 | 128.5 | 6 | 103 | 95 | 0 / 10 | A |
| 2306 | | 08/14/23 | P-16 | | CH | 20.2 | 101.8 | 22.6 | 103.7 | 127.1 | 6 | 102 | 95 | 0 / 10 | A |
| 2307 | | 08/14/23 | P-21-std | A | CL | 18.1 | 106.3 | 20.9 | 106.7 | 129.0 | 6 | 100 | 95 | 0 / 10 | A |
| 2308 | | 08/14/23 | P-03 | | CH | 20.2 | 99.3 | 24.7 | 96.3 | 120.1 | 6 | 97 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2301 | Select Clay: Wall Zone 56 | 64.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2302 | Select Clay: Wall Zone 57 | 64.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2303 | Select Clay: Wall Zone 58 | 64.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2304 | Select Clay: Wall Zone 59 | 64.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2305 | Select Clay: Wall Zone 60 | 64.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2306 | Select Clay: Wall Zone 21 | 64.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2307 | Select Clay: Wall Zone 18 | 110.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2308 | Select Clay: Wall Zone 19 | 71.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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2908 Morrison Ave.
Suite 3
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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/15/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2309 | | 08/14/23 | P-19 | | CH | 18.4 | 105.0 | 19.7 | 104.6 | 125.2 | 6 | 100 | 95 | 0 / 10 | A |
| 2310 | | 08/14/23 | P-16 | | CH | 20.2 | 101.8 | 21.7 | 103.4 | 125.8 | 6 | 102 | 95 | 0 / 10 | A |
| 2311 | | 08/14/23 | P-16 | | CH | 20.2 | 101.8 | 21.7 | 103.0 | 125.4 | 6 | 101 | 95 | 0 / 10 | A |
| 2312 | | 08/14/23 | P-16 | | CH | 20.2 | 101.8 | 23.7 | 101.5 | 125.6 | 6 | 100 | 95 | 0 / 10 | A |
| 2313 | | 08/14/23 | P-21-std | A | CL | 18.1 | 106.3 | 18.9 | 109.3 | 130.0 | 6 | 103 | 95 | 0 / 10 | A |
| 2314 | | 08/14/23 | P-16 | | CH | 20.2 | 101.8 | 22.5 | 102.3 | 125.3 | 6 | 100 | 95 | 0 / 10 | A |
| 2315 | | 08/14/23 | P-16 | | CH | 20.2 | 101.8 | 22.5 | 102.5 | 125.6 | 6 | 101 | 95 | 0 / 10 | A |
| 2316 | | 08/14/23 | P-03 | | CH | 20.2 | 99.3 | 22.9 | 98.7 | 121.3 | 6 | 99 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2309 | Select Clay: Wall Zone 20 | 110.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2310 | Select Clay: Wall Zone 52 | 110.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2311 | Select Clay: Wall Zone 53 | 110.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2312 | Select Clay: Wall Zone 54 | 110.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2313 | Select Clay: Wall Zone 55 | 110.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2314 | Select Clay: Wall Zone 56 | 65.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2315 | Select Clay: Wall Zone 57 | 65.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2316 | Select Clay: Wall Zone 58 | 65.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/15/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2317 | | 08/14/23 | P-03 | | CH | 20.2 | 99.3 | 24.9 | 99.0 | 123.7 | 6 | 100 | 95 | 0 / 10 | A |
| 2318 | | 08/14/23 | P-16 | | CH | 20.2 | 101.8 | 22.7 | 103.9 | 127.5 | 6 | 102 | 95 | 0 / 10 | A |
| 2319 | | 08/14/23 | P-19 | | CH | 18.4 | 105.0 | 19.3 | 105.1 | 125.4 | 6 | 100 | 95 | 0 / 10 | A |
| 2320 | | 08/14/23 | P-19 | | CH | 18.4 | 105.0 | 20.5 | 104.1 | 125.4 | 6 | 99 | 95 | 0 / 10 | A |
| 2321 | | 08/14/23 | P-16 | | CH | 20.2 | 101.8 | 22.2 | 103.2 | 126.1 | 6 | 101 | 95 | 0 / 10 | A |
| 2322 | | 08/14/23 | P-16 | | CH | 20.2 | 101.8 | 21.3 | 103.4 | 125.4 | 6 | 102 | 95 | 0 / 10 | A |
| 2323 | | 08/14/23 | P-03 | | CH | 20.2 | 99.3 | 21.9 | 99.3 | 121.0 | 6 | 100 | 95 | 0 / 10 | A |
| 2324 | | 08/14/23 | P-03 | | CH | 20.2 | 99.3 | 23.1 | 99.3 | 122.2 | 6 | 100 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2317 | Select Clay: Wall Zone 59 | 65.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2318 | Select Clay: Wall Zone 60 | 65.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2319 | Select Clay: Wall Zone 21 | 65.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2320 | Select Clay: Wall Zone 56 | 66.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2321 | Select Clay: Wall Zone 57 | 66.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2322 | Select Clay: Wall Zone 58 | 66.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2323 | Select Clay: Wall Zone 59 | 66.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2324 | Select Clay: Wall Zone 60 | 66.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/15/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2325 | | 08/14/23 | P-16 | | CH | 20.2 | 101.8 | 21.1 | 104.7 | 126.8 | 6 | 103 | 95 | 0 / 10 | A |
| 2326 | | 08/14/23 | P-03 | | CH | 20.2 | 99.3 | 27.3 | 95.1 | 121.1 | 6 | 96 | 95 | 0 / 10 | A |
| 2327 | | 08/14/23 | P-16 | | CH | 20.2 | 101.8 | 23.1 | 101.4 | 124.8 | 6 | 100 | 95 | 0 / 10 | A |
| 2328 | | 08/14/23 | P-19 | | CH | 18.4 | 105.0 | 21.5 | 104.4 | 126.8 | 6 | 99 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2325 | Select Clay: Wall Zone 21 | 66.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2326 | Select Clay: Wall Zone 18 | 111.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2327 | Select Clay: Wall Zone 19 | 72.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2328 | Select Clay: Wall Zone 20 | 111.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Kurt Kuechle
08/15/2023

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/15/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2329 | | 08/14/23 | P-16 | | CH | 20.2 | 101.8 | 22.2 | 104.0 | 127.1 | 6 | 102 | 95 | 0 / 10 | A |
| 2330 | | 08/14/23 | P-16 | | CH | 20.2 | 101.8 | 23.6 | 100.9 | 124.7 | 6 | 99 | 95 | 0 / 10 | A |
| 2331 | | 08/14/23 | P-03 | | CH | 20.2 | 99.3 | 22.2 | 99.5 | 121.6 | 6 | 100 | 95 | 0 / 10 | A |
| 2332 | | 08/14/23 | P-16 | | CH | 20.2 | 101.8 | 21.4 | 102.8 | 124.8 | 6 | 101 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2329 | Select Clay: Wall Zone 52 | 111.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2330 | Select Clay: Wall Zone 53 | 111.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2331 | Select Clay: Wall Zone 54 | 111.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2332 | Select Clay: Wall Zone 55 | 111.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Kurt Kuechle
08/15/2023

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/18/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2333 | | 08/15/23 | P-16 | | CH | 20.2 | 101.8 | 23.0 | 102.7 | 126.3 | 6 | 101 | 95 | 0 / 10 | A |
| 2334 | | 08/15/23 | P-21-std | A | CL | 18.1 | 106.3 | 20.4 | 106.2 | 127.9 | 6 | 100 | 95 | 0 / 10 | A |
| 2335 | | 08/15/23 | P-19 | | CH | 18.4 | 105.0 | 20.6 | 104.5 | 126.0 | 6 | 100 | 95 | 0 / 10 | A |
| 2336 | | 08/15/23 | P-16 | | CH | 20.2 | 101.8 | 21.8 | 102.8 | 125.2 | 6 | 101 | 95 | 0 / 10 | A |
| 2337 | | 08/15/23 | P-21-std | A | CL | 18.1 | 106.3 | 21.4 | 106.1 | 128.8 | 6 | 100 | 95 | 0 / 10 | A |
| 2338 | | 08/15/23 | P-19 | | CH | 18.4 | 105.0 | 22.5 | 105.1 | 128.8 | 6 | 100 | 95 | 0 / 10 | A |
| 2339 | | 08/15/23 | P-21-std | A | CL | 18.1 | 106.3 | 21.6 | 106.1 | 129.0 | 6 | 100 | 95 | 0 / 10 | A |
| 2340 | | 08/15/23 | P-21-std | A | CL | 18.1 | 106.3 | 20.6 | 109.6 | 132.2 | 6 | 103 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2333 | Select Clay: Wall Zone 18 | 112.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2334 | Select Clay: Wall Zone 19 | 73.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2335 | Select Clay: Wall Zone 19 | 74.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2336 | Select Clay: Wall Zone 18 | 113.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2337 | Select Clay: Wall Zone 19 | 75.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2338 | Select Clay: Wall Zone 19 | 76.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2339 | Select Clay: Wall Zone 58 | 67.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2340 | Select Clay: Wall Zone 59 | 67.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/18/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2341 | | 08/15/23 | P-19 | | CH | 18.4 | 105.0 | 20.6 | 105.5 | 127.2 | 6 | 100 | 95 | 0 / 10 | A |
| 2342 | | 08/15/23 | P-21-std | A | CL | 18.1 | 106.3 | 21.7 | 105.9 | 128.9 | 6 | 100 | 95 | 0 / 10 | A |
| 2343 | | 08/15/23 | P-16 | | CH | 20.2 | 101.8 | 24.2 | 101.4 | 125.9 | 6 | 100 | 95 | 0 / 10 | A |
| 2344 | | 08/15/23 | P-19 | | CH | 18.4 | 105.0 | 20.7 | 104.2 | 125.8 | 6 | 99 | 95 | 0 / 10 | A |
| 2345 | | 08/15/23 | P-21-std | A | CL | 18.1 | 106.3 | 19.8 | 105.9 | 126.9 | 6 | 100 | 95 | 0 / 10 | A |
| 2346 | | 08/15/23 | P-21-std | A | CL | 18.1 | 106.3 | 20.4 | 106.2 | 127.9 | 6 | 100 | 95 | 0 / 10 | A |
| 2347 | | 08/15/23 | P-16 | | CH | 20.2 | 101.8 | 21.9 | 103.7 | 126.4 | 6 | 102 | 95 | 0 / 10 | A |
| 2348 | | 08/15/23 | P-21-std | A | CL | 18.1 | 106.3 | 20.7 | 106.4 | 128.4 | 6 | 100 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2341 | Select Clay: Wall Zone 60 | 67.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2342 | Select Clay: Wall Zone 21 | 67.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2343 | Select Clay: Wall Zone 18 | 114.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2344 | Select Clay: Wall Zone 19 | 77.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2345 | Select Clay: Wall Zone 19 | 78.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2346 | Select Clay: Wall Zone 18 | 115.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2347 | Select Clay: Wall Zone 19 | 79.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2348 | Select Clay: Wall Zone 19 | 80.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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# Field Compaction Report

**Report Date:** 08/18/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2349 | | 08/15/23 | P-16 | | CH | 20.2 | 101.8 | 21.7 | 102.6 | 124.9 | 6 | 101 | 95 | 0 / 10 | A |
| 2350 | | 08/15/23 | P-19 | | CH | 18.4 | 105.0 | 20.5 | 104.1 | 125.4 | 6 | 99 | 95 | 0 / 10 | A |
| 2351 | | 08/15/23 | P-16 | | CH | 20.2 | 101.8 | 22.5 | 101.8 | 124.7 | 6 | 100 | 95 | 0 / 10 | A |
| 2352 | | 08/15/23 | P-16 | | CH | 20.2 | 101.8 | 23.6 | 102.0 | 126.1 | 6 | 100 | 95 | 0 / 10 | A |
| 2353 | | 08/15/23 | P-19 | | CH | 18.4 | 105.0 | 19.1 | 105.5 | 125.7 | 6 | 100 | 95 | 0 / 10 | A |
| ~~2354~~ | | ~~08/15/23~~ | ~~P-21-std~~ | ~~A~~ | ~~CL~~ | ~~18.1~~ | ~~106.3~~ | ~~19.6~~ | ~~107.9~~ | ~~129.1~~ | ~~6~~ | ~~102~~ | ~~95~~ | ~~0 / 10~~ | ~~A~~ |
| 2355 | | 08/15/23 | P-16 | | CH | 20.2 | 101.8 | 22.9 | 103.1 | 126.7 | 6 | 101 | 95 | 0 / 10 | A |
| 2356 | | 08/15/23 | P-16 | | CH | 20.2 | 101.8 | 24.1 | 101.4 | 125.8 | 6 | 100 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2349 | Select Clay: Wall Zone 18 | 116.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2350 | Select Clay: Wall Zone 19 | 81.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2351 | Select Clay: Wall Zone 19 | 82.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2352 | Select Clay: Wall Zone 58 | 68.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2353 | Select Clay: Wall Zone 59 | 68.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| ~~2354~~ | ~~Select Clay: Wall Zone 66~~ | ~~68.0~~ | ~~Lift Number~~ | ~~InstroTek / 3500 / 1908 /~~ | ~~Bruce, Dalton~~ |
| 2355 | Select Clay: Wall Zone 21 | 68.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2356 | Select Clay: Wall Zone 18 | 117.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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The Science You Build On.

2908 Morrison Ave.
Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/22/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2354 | | 08/15/23 | P-21-std | A | CL | 18.1 | 106.3 | 19.6 | 107.9 | 129.1 | 6 | 102 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2354 | Select Clay: Wall Zone 60 | 68.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Kurt Kuechle
08/22/2023

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Bismarck, ND 58504
Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/18/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2357 | | 08/15/23 | P-16 | | CH | 20.2 | 101.8 | 22.3 | 103.0 | 126.0 | 6 | 101 | 95 | 0 / 10 | A |
| 2358 | | 08/15/23 | P-19 | | CH | 18.4 | 105.0 | 21.8 | 105.5 | 128.5 | 6 | 100 | 95 | 0 / 10 | A |
| 2359 | | 08/15/23 | P-03 | | CH | 20.2 | 99.3 | 23.7 | 98.5 | 121.8 | 6 | 99 | 95 | 0 / 10 | A |
| 2360 | | 08/15/23 | P-03 | | CH | 20.2 | 99.3 | 26.7 | 97.8 | 123.9 | 6 | 98 | 95 | 0 / 10 | A |
| 2361 | | 08/15/23 | P-03 | | CH | 20.2 | 99.3 | 22.1 | 97.9 | 119.5 | 6 | 99 | 95 | 0 / 10 | A |
| 2362 | | 08/15/23 | P-03 | | CH | 20.2 | 99.3 | 23.4 | 95.1 | 117.4 | 6 | 96 | 95 | 0 / 10 | A |
| 2363 | | 08/15/23 | P-16 | | CH | 20.2 | 101.8 | 21.1 | 97.5 | 118.1 | 6 | 96 | 95 | 0 / 10 | A |
| 2364 | | 08/15/23 | P-07 | | CH | 22.6 | 93.8 | 22.7 | 92.0 | 112.9 | 6 | 98 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2357 | Select Clay: Wall Zone 19 | 83.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2358 | Select Clay: Wall Zone 19 | 84.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2359 | Select Clay: Wall Zone 18 | 118.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2360 | Select Clay: Wall Zone 19 | 85.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2361 | Select Clay: Wall Zone 19 | 86.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2362 | Select Clay: Wall Zone 56 | 67.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2363 | Select Clay: Wall Zone 57 | 67.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2364 | Select Clay: Wall Zone 56 | 68.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/18/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2365 | | 08/15/23 | P-19 | | CH | 18.4 | 105.0 | 19.9 | 100.8 | 120.9 | 6 | 96 | 95 | 0 / 10 | A |
| 2366 | | 08/15/23 | P-16 | | CH | 20.2 | 101.8 | 21.8 | 103.9 | 126.6 | 6 | 102 | 95 | 0 / 10 | A |
| 2367 | | 08/15/23 | P-03 | | CH | 20.2 | 99.3 | 25.5 | 95.6 | 120.0 | 6 | 96 | 95 | 0 / 10 | A |
| 2368 | | 08/15/23 | P-19 | | CH | 18.4 | 105.0 | 20.7 | 105.7 | 127.6 | 6 | 101 | 95 | 0 / 10 | A |
| 2369 | | 08/15/23 | P-21-std | A | CL | 18.1 | 106.3 | 20.6 | 106.2 | 128.1 | 6 | 100 | 95 | 0 / 10 | A |
| 2370 | | 08/15/23 | P-16 | | CH | 20.2 | 101.8 | 21.3 | 102.8 | 124.7 | 6 | 101 | 95 | 0 / 10 | A |
| 2371 | | 08/15/23 | P-07 | | CH | 22.6 | 93.8 | 24.7 | 92.7 | 115.6 | 6 | 99 | 95 | 0 / 10 | A |
| 2372 | | 08/15/23 | P-07 | | CH | 22.6 | 93.8 | 24.3 | 93.6 | 116.3 | 6 | 100 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2365 | Select Clay: Wall Zone 57 | 68.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2366 | Select Clay: Wall Zone 58 | 69.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2367 | Select Clay: Wall Zone 59 | 69.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2368 | Select Clay: Wall Zone 60 | 69.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2369 | Select Clay: Wall Zone 21 | 69.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2370 | Select Clay: Wall Zone 18 | 119.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2371 | Select Clay: Wall Zone 19 | 87.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2372 | Select Clay: Wall Zone 19 | 88.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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# Field Compaction Report

**Report Date:** 08/18/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2373 | | 08/15/23 | P-03 | | CH | 20.2 | 99.3 | 21.5 | 98.6 | 119.8 | 6 | 99 | 95 | 0 / 10 | A |
| 2374 | | 08/15/23 | P-16 | | CH | 20.2 | 101.8 | 23.2 | 100.8 | 124.2 | 6 | 99 | 95 | 0 / 10 | A |
| 2375 | | 08/15/23 | P-16 | | CH | 20.2 | 101.8 | 22.8 | 101.0 | 124.0 | 6 | 99 | 95 | 0 / 10 | A |
| 2376 | | 08/15/23 | P-03 | | CH | 20.2 | 99.3 | 24.3 | 98.7 | 122.7 | 6 | 99 | 95 | 0 / 10 | A |
| 2377 | | 08/15/23 | P-01 | | CH | 19.4 | 100.8 | 24.1 | 99.8 | 123.9 | 6 | 99 | 95 | 0 / 10 | A |
| 2378 | | 08/15/23 | P-03 | | CH | 20.2 | 99.3 | 24.8 | 98.1 | 122.4 | 6 | 99 | 95 | 0 / 10 | A |
| 2379 | | 08/15/23 | P-03 | | CH | 20.2 | 99.3 | 24.1 | 98.3 | 122.0 | 6 | 99 | 95 | 0 / 10 | A |
| 2380 | | 08/15/23 | P-16 | | CH | 20.2 | 101.8 | 22.0 | 101.1 | 123.3 | 6 | 99 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2373 | Select Clay: Wall Zone 18 | 120.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2374 | Select Clay: Wall Zone 19 | 89.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2375 | Select Clay: Wall Zone 19 | 90.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2376 | Select Clay: Wall Zone 56 | 69.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2377 | Select Clay: Wall Zone 57 | 70.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2378 | Select Clay: Wall Zone 56 | 69.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2379 | Select Clay: Wall Zone 57 | 70.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2380 | Select Clay: Wall Zone 58 | 70.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/18/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2381 | | 08/15/23 | P-16 | | CH | 20.2 | 101.8 | 23.5 | 102.7 | 126.8 | 6 | 101 | 95 | 0 / 10 | A |
| 2382 | | 08/15/23 | P-16 | | CH | 20.2 | 101.8 | 22.8 | 102.6 | 126.0 | 6 | 101 | 95 | 0 / 10 | A |
| 2383 | | 08/15/23 | P-16 | | CH | 20.2 | 101.8 | 21.6 | 103.6 | 126.0 | 6 | 102 | 95 | 0 / 10 | A |
| 2384 | | 08/15/23 | P-16 | | CH | 20.2 | 101.8 | 22.6 | 101.4 | 124.3 | 6 | 100 | 95 | 0 / 10 | A |
| 2385 | | 08/15/23 | P-16 | | CH | 20.2 | 101.8 | 22.4 | 104.1 | 127.4 | 6 | 102 | 95 | 0 / 10 | A |
| 2386 | | 08/15/23 | P-21-std | A | CL | 18.1 | 106.3 | 19.5 | 105.8 | 126.4 | 6 | 100 | 95 | 0 / 10 | A |
| 2387 | | 08/15/23 | P-16 | | CH | 20.2 | 101.8 | 22.3 | 104.5 | 127.8 | 6 | 103 | 95 | 0 / 10 | A |
| 2388 | | 08/15/23 | P-16 | | CH | 20.2 | 101.8 | 22.4 | 102.4 | 125.3 | 6 | 101 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2381 | Select Clay: Wall Zone 59 | 70.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2382 | Select Clay: Wall Zone 60 | 70.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2383 | Select Clay: Wall Zone 21 | 70.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2384 | Select Clay: Wall Zone 18 | 121.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2385 | Select Clay: Wall Zone 19 | 91.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2386 | Select Clay: Wall Zone 19 | 92.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2387 | Select Clay: Wall Zone 18 | 122.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2388 | Select Clay: Wall Zone 19 | 93.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Bismarck, ND 58504
Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/18/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2389 | | 08/15/23 | P-16 | | CH | 20.2 | 101.8 | 23.0 | 103.4 | 127.2 | 6 | 102 | 95 | 0 / 10 | A |
| 2390 | | 08/15/23 | P-21-std | A | CL | 18.1 | 106.3 | 20.3 | 105.8 | 127.3 | 6 | 100 | 95 | 0 / 10 | A |
| 2391 | | 08/15/23 | P-19 | | CH | 18.4 | 105.0 | 20.7 | 103.0 | 124.3 | 6 | 98 | 95 | 0 / 10 | A |
| 2392 | | 08/15/23 | P-01 | | CH | 19.4 | 100.8 | 20.2 | 101.0 | 121.4 | 6 | 100 | 95 | 0 / 10 | A |
| 2393 | | 08/15/23 | P-03 | | CH | 20.2 | 99.3 | 23.5 | 95.5 | 117.9 | 6 | 96 | 95 | 0 / 10 | A |
| 2394 | | 08/15/23 | P-21-std | A | CL | 18.1 | 106.3 | 20.7 | 105.9 | 127.8 | 6 | 100 | 95 | 0 / 10 | A |
| 2395 | | 08/15/23 | P-01 | | CH | 19.4 | 100.8 | 20.7 | 102.9 | 124.2 | 6 | 102 | 95 | 0 / 10 | A |
| 2396 | | 08/15/23 | P-16 | | CH | 20.2 | 101.8 | 21.6 | 104.5 | 127.1 | 6 | 103 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2389 | Select Clay: Wall Zone 18 | 123.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2390 | Select Clay: Wall Zone 19 | 94.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2391 | Select Clay: Wall Zone 56 | 71.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2392 | Select Clay: Wall Zone 57 | 71.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2393 | Select Clay: Wall Zone 58 | 71.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2394 | Select Clay: Wall Zone 59 | 71.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2395 | Select Clay: Wall Zone 60 | 71.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2396 | Select Clay: Wall Zone 21 | 71.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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# Field Compaction Report

**Report Date:** 08/18/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2397 | | 08/15/23 | P-21-std | A | CL | 18.1 | 106.3 | 20.2 | 106.6 | 128.1 | 6 | 100 | 95 | 0 / 10 | A |
| 2398 | | 08/15/23 | P-01 | | CH | 19.4 | 100.8 | 20.7 | 104.2 | 125.8 | 6 | 103 | 95 | 0 / 10 | A |
| 2399 | | 08/15/23 | P-16 | | CH | 20.2 | 101.8 | 22.1 | 100.3 | 122.5 | 6 | 99 | 95 | 0 / 10 | A |
| 2400 | | 08/15/23 | P-21-std | A | CL | 18.1 | 106.3 | 21.1 | 106.0 | 128.4 | 6 | 100 | 95 | 0 / 10 | A |
| 2401 | | 08/15/23 | P-16 | | CH | 20.2 | 101.8 | 22.3 | 101.3 | 123.9 | 6 | 100 | 95 | 0 / 10 | A |
| 2402 | | 08/15/23 | P-19 | | CH | 18.4 | 105.0 | 19.2 | 101.4 | 120.9 | 6 | 97 | 95 | 0 / 10 | A |
| 2403 | | 08/15/23 | P-16 | | CH | 20.2 | 101.8 | 23.0 | 100.6 | 123.7 | 6 | 99 | 95 | 0 / 10 | A |
| 2404 | | 08/15/23 | P-16 | | CH | 20.2 | 101.8 | 23.3 | 100.3 | 123.7 | 6 | 99 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2397 | Select Clay: Wall Zone 18 | 124.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2398 | Select Clay: Wall Zone 19 | 95.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2399 | Select Clay: Wall Zone 18 | 125.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2400 | Select Clay: Wall Zone 19 | 96.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2401 | Select Clay: Wall Zone 18 | 126.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2402 | Select Clay: Wall Zone 19 | 97.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2403 | Select Clay: Wall Zone 56 | 72.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2404 | Select Clay: Wall Zone 57 | 72.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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BRAUN INTERTEC
The Science You Build On.

2908 Morrison Ave.
Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/18/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2405 | | 08/15/23 | P-16 | | CH | 20.2 | 101.8 | 21.9 | 102.3 | 124.7 | 6 | 100 | 95 | 0 / 10 | A |
| 2406 | | 08/15/23 | P-16 | | CH | 20.2 | 101.8 | 24.5 | 102.1 | 127.1 | 6 | 100 | 95 | 0 / 10 | A |
| 2407 | | 08/15/23 | P-21-std | A | CL | 18.1 | 106.3 | 20.6 | 107.7 | 129.9 | 6 | 101 | 95 | 0 / 10 | A |
| 2408 | | 08/15/23 | P-19 | | CH | 18.4 | 105.0 | 18.6 | 105.0 | 124.5 | 6 | 100 | 95 | 0 / 10 | A |
| 2409 | | 08/15/23 | P-16 | | CH | 20.2 | 101.8 | 22.5 | 100.4 | 123.0 | 6 | 99 | 95 | 0 / 10 | A |
| 2410 | | 08/15/23 | P-21-std | A | CL | 18.1 | 106.3 | 18.7 | 105.9 | 125.7 | 6 | 100 | 95 | 0 / 10 | A |
| 2411 | | 08/15/23 | P-01 | | CH | 19.4 | 100.8 | 20.9 | 102.9 | 124.4 | 6 | 102 | 95 | 0 / 10 | A |
| 2412 | | 08/15/23 | P-16 | | CH | 20.2 | 101.8 | 21.7 | 102.9 | 125.2 | 6 | 101 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2405 | Select Clay: Wall Zone 58 | 72.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2406 | Select Clay: Wall Zone 59 | 72.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2407 | Select Clay: Wall Zone 60 | 72.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2408 | Select Clay: Wall Zone 21 | 72.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2409 | Select Clay: Wall Zone 18 | 127.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2410 | Select Clay: Wall Zone 19 | 98.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2411 | Select Clay: Wall Zone 56 | 73.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2412 | Select Clay: Wall Zone 57 | 73.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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# Field Compaction Report

**Report Date:** 08/18/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2413 | | 08/15/23 | P-01 | | CH | 19.4 | 100.8 | 21.0 | 102.8 | 124.4 | 6 | 102 | 95 | 0 / 10 | A |
| 2414 | | 08/15/23 | P-19 | | CH | 18.4 | 105.0 | 22.2 | 105.6 | 129.0 | 6 | 101 | 95 | 0 / 10 | A |
| 2415 | | 08/15/23 | P-19 | | CH | 18.4 | 105.0 | 21.5 | 103.6 | 125.9 | 6 | 99 | 95 | 0 / 10 | A |
| 2416 | | 08/15/23 | P-21-std | A | CL | 18.1 | 106.3 | 20.9 | 106.5 | 128.8 | 6 | 100 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2413 | Select Clay: Wall Zone 58 | 73.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2414 | Select Clay: Wall Zone 59 | 73.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2415 | Select Clay: Wall Zone 60 | 73.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2416 | Select Clay: Wall Zone 21 | 73.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Kurt Kuechle
08/18/2023

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# Field Compaction Report

**Report Date:** 08/21/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2417 | | 08/16/23 | P-16 | | CH | 20.2 | 101.8 | 23.8 | 100.1 | 123.9 | 6 | 98 | 95 | 0 / 10 | A |
| 2418 | | 08/16/23 | P-01 | | CH | 19.4 | 100.8 | 20.0 | 103.8 | 124.6 | 6 | 103 | 95 | 0 / 10 | A |
| 2419 | | 08/16/23 | P-01 | | CH | 19.4 | 100.8 | 20.5 | 100.8 | 121.5 | 6 | 100 | 95 | 0 / 10 | A |
| 2420 | | 08/16/23 | P-03 | | CH | 20.2 | 99.3 | 23.7 | 99.5 | 123.1 | 6 | 100 | 95 | 0 / 10 | A |
| 2421 | | 08/16/23 | P-21-std | A | CL | 18.1 | 106.3 | 20.5 | 105.9 | 127.6 | 6 | 100 | 95 | 0 / 10 | A |
| 2422 | | 08/16/23 | P-16 | | CH | 20.2 | 101.8 | 22.9 | 100.9 | 124.0 | 6 | 99 | 95 | 0 / 10 | A |
| 2423 | | 08/16/23 | P-01 | | CH | 19.4 | 100.8 | 23.0 | 100.0 | 123.0 | 6 | 99 | 95 | 0 / 10 | A |
| 2424 | | 08/16/23 | P-03 | | CH | 20.2 | 99.3 | 24.8 | 99.0 | 123.6 | 6 | 100 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2417 | Select Clay: Wall Zone 18 | 128.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2418 | Select Clay: Wall Zone 19 | 99.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2419 | Select Clay: Wall Zone 18 | 129.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2420 | Select Clay: Wall Zone 19 | 100.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2421 | Select Clay: Wall Zone 18 | 130.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2422 | Select Clay: Wall Zone 19 | 101.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2423 | Select Clay: Wall Zone 56 | 74.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2424 | Select Clay: Wall Zone 57 | 74.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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# Field Compaction Report

**Report Date:** 08/21/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2425 | | 08/16/23 | P-16 | | CH | 20.2 | 101.8 | 22.7 | 101.7 | 124.8 | 6 | 100 | 95 | 0 / 10 | A |
| 2426 | | 08/16/23 | P-16 | | CH | 20.2 | 101.8 | 22.7 | 103.6 | 127.1 | 6 | 102 | 95 | 0 / 10 | A |
| 2427 | | 08/16/23 | P-21-std | A | CL | 18.1 | 106.3 | 19.0 | 109.1 | 129.8 | 6 | 103 | 95 | 0 / 10 | A |
| 2428 | | 08/16/23 | P-21-std | A | CL | 18.1 | 106.3 | 20.8 | 107.5 | 129.9 | 6 | 101 | 95 | 0 / 10 | A |
| 2429 | | 08/16/23 | P-03 | | CH | 20.2 | 99.3 | 24.5 | 98.3 | 122.4 | 6 | 99 | 95 | 0 / 10 | A |
| 2430 | | 08/16/23 | P-16 | | CH | 20.2 | 101.8 | 22.7 | 103.4 | 126.9 | 6 | 102 | 95 | 0 / 10 | A |
| 2431 | | 08/16/23 | P-01 | | CH | 19.4 | 100.8 | 24.0 | 100.5 | 124.6 | 6 | 100 | 95 | 0 / 10 | A |
| 2432 | | 08/16/23 | P-16 | | CH | 20.2 | 101.8 | 21.4 | 101.9 | 123.7 | 6 | 100 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2425 | Select Clay: Wall Zone 58 | 74.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2426 | Select Clay: Wall Zone 59 | 74.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2427 | Select Clay: Wall Zone 60 | 74.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2428 | Select Clay: Wall Zone 21 | 74.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2429 | Select Clay: Wall Zone 18 | 131.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2430 | Select Clay: Wall Zone 19 | 102.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2431 | Select Clay: Wall Zone 18 | 132.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2432 | Select Clay: Wall Zone 19 | 103.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/21/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2433 | | 08/16/23 | P-21-std | A | CL | 18.1 | 106.3 | 19.9 | 106.0 | 127.1 | 6 | 100 | 95 | 0 / 10 | A |
| 2434 | | 08/16/23 | P-16 | | CH | 20.2 | 101.8 | 22.1 | 103.3 | 126.1 | 6 | 101 | 95 | 0 / 10 | A |
| 2435 | | 08/16/23 | P-16 | | CH | 20.2 | 101.8 | 22.7 | 102.0 | 125.2 | 6 | 100 | 95 | 0 / 10 | A |
| 2436 | | 08/16/23 | P-19 | | CH | 18.4 | 105.0 | 20.8 | 104.4 | 126.1 | 6 | 99 | 95 | 0 / 10 | A |
| 2437 | | 08/16/23 | P-01 | | CH | 19.4 | 100.8 | 20.7 | 103.8 | 125.3 | 6 | 103 | 95 | 0 / 10 | A |
| 2438 | | 08/16/23 | P-21-std | A | CL | 18.1 | 106.3 | 19.1 | 107.2 | 127.7 | 6 | 101 | 95 | 0 / 10 | A |
| 2439 | | 08/16/23 | P-19 | | CH | 18.4 | 105.0 | 21.4 | 105.1 | 127.6 | 6 | 100 | 95 | 0 / 10 | A |
| 2440 | | 08/16/23 | P-01 | | CH | 19.4 | 100.8 | 23.3 | 100.5 | 123.9 | 6 | 100 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2433 | Select Clay: Wall Zone 56 | 75.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2434 | Select Clay: Wall Zone 57 | 75.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2435 | Select Clay: Wall Zone 58 | 75.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2436 | Select Clay: Wall Zone 59 | 75.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2437 | Select Clay: Wall Zone 60 | 75.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2438 | Select Clay: Wall Zone 21 | 75.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2439 | Select Clay: Wall Zone 18 | 133.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2440 | Select Clay: Wall Zone 19 | 104.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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# Field Compaction Report

**Report Date:** 08/21/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2441 | | 08/16/23 | P-16 | | CH | 20.2 | 101.8 | 21.1 | 101.7 | 123.2 | 6 | 100 | 95 | 0 / 10 | A |
| 2442 | | 08/16/23 | P-16 | | CH | 20.2 | 101.8 | 22.6 | 102.8 | 126.0 | 6 | 101 | 95 | 0 / 10 | A |
| 2443 | | 08/16/23 | P-19 | | CH | 18.4 | 105.0 | 19.8 | 104.8 | 125.5 | 6 | 100 | 95 | 0 / 10 | A |
| 2444 | | 08/16/23 | P-16 | | CH | 20.2 | 101.8 | 21.7 | 102.5 | 124.7 | 6 | 101 | 95 | 0 / 10 | A |
| 2445 | | 08/16/23 | P-16 | | CH | 20.2 | 101.8 | 22.5 | 104.0 | 127.4 | 6 | 102 | 95 | 0 / 10 | A |
| 2446 | | 08/16/23 | P-16 | | CH | 20.2 | 101.8 | 21.7 | 103.0 | 125.4 | 6 | 101 | 95 | 0 / 10 | A |
| 2447 | | 08/16/23 | P-19 | | CH | 18.4 | 105.0 | 21.3 | 105.3 | 127.7 | 6 | 100 | 95 | 0 / 10 | A |
| 2448 | | 08/16/23 | P-01 | | CH | 19.4 | 100.8 | 20.0 | 104.1 | 124.9 | 6 | 103 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2441 | Select Clay: Wall Zone 56 | 76.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2442 | Select Clay: Wall Zone 57 | 76.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2443 | Select Clay: Wall Zone 18 | 134.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2444 | Select Clay: Wall Zone 19 | 105.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2445 | Select Clay: Wall Zone 58 | 76.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2446 | Select Clay: Wall Zone 59 | 76.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2447 | Select Clay: Wall Zone 60 | 76.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2448 | Select Clay: Wall Zone 21 | 76.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/21/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2449 | | 08/16/23 | P-21-std | A | CL | 18.1 | 106.3 | 20.5 | 105.8 | 127.5 | 6 | 100 | 95 | 0 / 10 | A |
| 2450 | | 08/16/23 | P-01 | | CH | 19.4 | 100.8 | 21.9 | 100.3 | 122.3 | 6 | 100 | 95 | 0 / 10 | A |
| 2451 | | 08/16/23 | P-16 | | CH | 20.2 | 101.8 | 23.2 | 102.4 | 126.2 | 6 | 101 | 95 | 0 / 10 | A |
| 2452 | | 08/16/23 | P-16 | | CH | 20.2 | 101.8 | 23.5 | 101.5 | 125.4 | 6 | 100 | 95 | 0 / 10 | A |
| 2453 | | 08/16/23 | P-19 | | CH | 18.4 | 105.0 | 20.8 | 104.9 | 126.7 | 6 | 100 | 95 | 0 / 10 | A |
| 2454 | | 08/16/23 | P-21-std | A | CL | 18.1 | 106.3 | 20.7 | 106.5 | 128.5 | 6 | 100 | 95 | 0 / 10 | A |
| 2455 | | 08/16/23 | P-03 | | CH | 20.2 | 99.3 | 21.2 | 99.0 | 120.0 | 6 | 100 | 95 | 0 / 10 | A |
| 2456 | | 08/16/23 | P-16 | | CH | 20.2 | 101.8 | 22.4 | 103.5 | 126.7 | 6 | 102 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2449 | Select Clay: Wall Zone 18 | 135.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2450 | Select Clay: Wall Zone 19 | 106.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2451 | Select Clay: Wall Zone 18 | 136.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2452 | Select Clay: Wall Zone 19 | 107.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2453 | Select Clay: Wall Zone 56 | 77.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2454 | Select Clay: Wall Zone 57 | 77.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2455 | Select Clay: Wall Zone 58 | 77.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2456 | Select Clay: Wall Zone 59 | 77.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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BRAUN INTERTEC
The Science You Build On.

2908 Morrison Ave.
Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/21/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2457 | | 08/16/23 | P-16 | | CH | 20.2 | 101.8 | 22.3 | 102.7 | 125.6 | 6 | 101 | 95 | 0 / 10 | A |
| 2458 | | 08/16/23 | P-19 | | CH | 18.4 | 105.0 | 21.1 | 104.6 | 126.7 | 6 | 100 | 95 | 0 / 10 | A |
| 2459 | | 08/16/23 | P-19 | | CH | 18.4 | 105.0 | 20.1 | 104.7 | 125.7 | 6 | 100 | 95 | 0 / 10 | A |
| 2460 | | 08/16/23 | P-01 | | CH | 19.4 | 100.8 | 22.5 | 100.2 | 122.7 | 6 | 99 | 95 | 0 / 10 | A |
| 2461 | | 08/16/23 | P-01 | | CH | 19.4 | 100.8 | 19.8 | 103.0 | 123.4 | 6 | 102 | 95 | 0 / 10 | A |
| 2462 | | 08/16/23 | P-16 | | CH | 20.2 | 101.8 | 22.9 | 102.1 | 125.5 | 6 | 100 | 95 | 0 / 10 | A |
| 2463 | | 08/16/23 | P-21-std | A | CL | 18.1 | 106.3 | 21.5 | 106.0 | 128.8 | 6 | 100 | 95 | 0 / 10 | A |
| 2464 | | 08/16/23 | P-01 | | CH | 19.4 | 100.8 | 21.5 | 100.1 | 121.6 | 6 | 99 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2457 | Select Clay: Wall Zone 60 | 77.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2458 | Select Clay: Wall Zone 18 | 137.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2459 | Select Clay: Wall Zone 19 | 108.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2460 | Select Clay: Wall Zone 56 | 78.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2461 | Select Clay: Wall Zone 57 | 78.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2462 | Select Clay: Wall Zone 58 | 78.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2463 | Select Clay: Wall Zone 59 | 78.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2464 | Select Clay: Wall Zone 60 | 78.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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# Field Compaction Report

**Report Date:** 08/21/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2465 | | 08/16/23 | P-16 | | CH | 20.2 | 101.8 | 22.5 | 104.0 | 127.4 | 6 | 102 | 95 | 0 / 10 | A |
| 2466 | | 08/16/23 | P-21-std | A | CL | 18.1 | 106.3 | 20.6 | 106.0 | 127.8 | 6 | 100 | 95 | 0 / 10 | A |
| 2467 | | 08/16/23 | P-16 | | CH | 20.2 | 101.8 | 22.2 | 102.9 | 125.7 | 6 | 101 | 95 | 0 / 10 | A |
| 2468 | | 08/16/23 | P-16 | | CH | 20.2 | 101.8 | 23.9 | 101.3 | 125.5 | 6 | 100 | 95 | 0 / 10 | A |
| 2469 | | 08/16/23 | P-16 | | CH | 20.2 | 101.8 | 20.5 | 103.8 | 125.1 | 6 | 102 | 95 | 0 / 10 | A |
| 2470 | | 08/16/23 | P-16 | | CH | 20.2 | 101.8 | 23.4 | 103.4 | 127.6 | 6 | 102 | 95 | 0 / 10 | A |
| 2471 | | 08/16/23 | P-21-std | A | CL | 18.1 | 106.3 | 21.5 | 105.6 | 128.3 | 6 | 99 | 95 | 0 / 10 | A |
| 2472 | | 08/16/23 | P-01 | | CH | 19.4 | 100.8 | 23.9 | 100.9 | 125.0 | 6 | 100 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2465 | Select Clay: Wall Zone 18 | 138.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2466 | Select Clay: Wall Zone 19 | 109.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2467 | Select Clay: Wall Zone 56 | 79.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2468 | Select Clay: Wall Zone 57 | 79.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2469 | Select Clay: Wall Zone 58 | 79.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2470 | Select Clay: Wall Zone 59 | 79.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2471 | Select Clay: Wall Zone 60 | 79.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2472 | Select Clay: Wall Zone 18 | 139.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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# Field Compaction Report

**Report Date:** 08/21/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2473 | | 08/16/23 | P-16 | | CH | 20.2 | 101.8 | 23.5 | 101.3 | 125.1 | 6 | 100 | 95 | 0 / 10 | A |
| 2474 | | 08/16/23 | P-01 | | CH | 19.4 | 100.8 | 20.2 | 102.9 | 123.7 | 6 | 102 | 95 | 0 / 10 | A |
| 2475 | | 08/16/23 | P-01 | | CH | 19.4 | 100.8 | 20.7 | 103.4 | 124.8 | 6 | 103 | 95 | 0 / 10 | A |
| 2476 | | 08/16/23 | P-01 | | CH | 19.4 | 100.8 | 23.4 | 100.9 | 124.5 | 6 | 100 | 95 | 0 / 10 | A |
| 2477 | | 08/16/23 | P-16 | | CH | 20.2 | 101.8 | 22.5 | 103.1 | 126.3 | 6 | 101 | 95 | 0 / 10 | A |
| 2478 | | 08/16/23 | P-03 | | CH | 20.2 | 99.3 | 22.5 | 95.4 | 116.9 | 6 | 96 | 95 | 0 / 10 | A |
| 2479 | | 08/16/23 | P-16 | | CH | 20.2 | 101.8 | 23.0 | 101.8 | 125.2 | 6 | 100 | 95 | 0 / 10 | A |
| 2480 | | 08/16/23 | P-01 | | CH | 19.4 | 100.8 | 21.4 | 99.8 | 121.2 | 6 | 99 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2473 | Select Clay: Wall Zone 19 | 110.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2474 | Select Clay: Wall Zone 56 | 80.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2475 | Select Clay: Wall Zone 57 | 80.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2476 | Select Clay: Wall Zone 58 | 80.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2477 | Select Clay: Wall Zone 59 | 80.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2478 | Select Clay: Wall Zone 60 | 80.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2479 | Select Clay: Wall Zone 18 | 140.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2480 | Select Clay: Wall Zone 19 | 111.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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# Field Compaction Report

**Report Date:** 08/21/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2481 | | 08/17/23 | P-01 | | CH | 19.4 | 100.8 | 23.3 | 100.3 | 123.7 | 6 | 100 | 95 | 0 / 10 | A |
| 2482 | | 08/17/23 | P-03 | | CH | 20.2 | 99.3 | 23.8 | 97.2 | 120.3 | 6 | 98 | 95 | 0 / 10 | A |
| 2483 | | 08/17/23 | P-01 | | CH | 19.4 | 100.8 | 19.9 | 100.4 | 120.4 | 6 | 100 | 95 | 0 / 10 | A |
| 2484 | | 08/17/23 | P-16 | | CH | 20.2 | 101.8 | 22.3 | 101.9 | 124.6 | 6 | 100 | 95 | 0 / 10 | A |
| 2485 | | 08/17/23 | P-19 | | CH | 18.4 | 105.0 | 20.5 | 104.6 | 126.0 | 6 | 100 | 95 | 0 / 10 | A |
| 2486 | | 08/17/23 | P-01 | | CH | 19.4 | 100.8 | 20.8 | 102.4 | 123.7 | 6 | 102 | 95 | 0 / 10 | A |
| 2487 | | 08/17/23 | P-03 | | CH | 20.2 | 99.3 | 22.7 | 99.2 | 121.7 | 6 | 100 | 95 | 0 / 10 | A |
| 2488 | | 08/17/23 | P-16 | | CH | 20.2 | 101.8 | 22.4 | 101.7 | 124.5 | 6 | 100 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2481 | Select Clay: Wall Zone 18 | 141.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2482 | Select Clay: Wall Zone 19 | 112.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2483 | Select Clay: Wall Zone 20 | 112.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2484 | Select Clay: Wall Zone 52 | 112.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2485 | Select Clay: Wall Zone 53 | 112.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2486 | Select Clay: Wall Zone 54 | 112.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2487 | Select Clay: Wall Zone 55 | 112.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2488 | Select Clay: Wall Zone 56 | 81.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/21/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2489 | | 08/17/23 | P-16 | | CH | 20.2 | 101.8 | 22.3 | 100.7 | 123.2 | 6 | 99 | 95 | 0 / 10 | A |
| 2490 | | 08/17/23 | P-01 | | CH | 19.4 | 100.8 | 19.6 | 98.9 | 118.3 | 6 | 98 | 95 | 0 / 10 | A |
| 2491 | | 08/17/23 | P-16 | | CH | 20.2 | 101.8 | 22.6 | 103.8 | 127.3 | 6 | 102 | 95 | 0 / 10 | A |
| 2492 | | 08/17/23 | P-21-std | A | CL | 18.1 | 106.3 | 21.2 | 105.5 | 127.9 | 6 | 99 | 95 | 0 / 10 | A |
| 2493 | | 08/17/23 | P-03 | | CH | 20.2 | 99.3 | 22.7 | 98.5 | 120.9 | 6 | 99 | 95 | 0 / 10 | A |
| 2494 | | 08/17/23 | P-16 | | CH | 20.2 | 101.8 | 22.2 | 101.5 | 124.0 | 6 | 100 | 95 | 0 / 10 | A |
| 2495 | | 08/17/23 | P-16 | | CH | 20.2 | 101.8 | 24.5 | 101.3 | 126.1 | 6 | 100 | 95 | 0 / 10 | A |
| 2496 | | 08/17/23 | P-16 | | CH | 20.2 | 101.8 | 22.2 | 102.8 | 125.6 | 6 | 101 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2489 | Select Clay: Wall Zone 57 | 81.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2490 | Select Clay: Wall Zone 58 | 81.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2491 | Select Clay: Wall Zone 59 | 81.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2492 | Select Clay: Wall Zone 60 | 81.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2493 | Select Clay: Wall Zone 18 | 142.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2494 | Select Clay: Wall Zone 19 | 113.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2495 | Select Clay: Wall Zone 20 | 113.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2496 | Select Clay: Wall Zone 52 | 113.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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**Report Date:** 08/21/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2497 | | 08/17/23 | P-01 | | CH | 19.4 | 100.8 | 22.7 | 100.8 | 123.7 | 6 | 100 | 95 | 0 / 10 | A |
| 2498 | | 08/17/23 | P-16 | | CH | 20.2 | 101.8 | 22.2 | 103.0 | 125.9 | 6 | 101 | 95 | 0 / 10 | A |
| 2499 | | 08/17/23 | P-21-std | A | CL | 18.1 | 106.3 | 19.6 | 105.8 | 126.5 | 6 | 100 | 95 | 0 / 10 | A |
| 2500 | | 08/17/23 | P-16 | | CH | 20.2 | 101.8 | 21.2 | 104.1 | 126.2 | 6 | 102 | 95 | 0 / 10 | A |
| 2501 | | 08/17/23 | P-01 | | CH | 19.4 | 100.8 | 23.7 | 100.6 | 124.4 | 6 | 100 | 95 | 0 / 10 | A |
| 2502 | | 08/17/23 | P-16 | | CH | 20.2 | 101.8 | 22.8 | 102.5 | 125.9 | 6 | 101 | 95 | 0 / 10 | A |
| 2503 | | 08/17/23 | P-19 | | CH | 18.4 | 105.0 | 19.5 | 105.2 | 125.7 | 6 | 100 | 95 | 0 / 10 | A |
| 2504 | | 08/17/23 | P-19 | | CH | 18.4 | 105.0 | 21.0 | 105.6 | 127.8 | 6 | 101 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2497 | Select Clay: Wall Zone 53 | 113.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2498 | Select Clay: Wall Zone 54 | 113.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2499 | Select Clay: Wall Zone 55 | 113.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2500 | Select Clay: Wall Zone 56 | 82.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2501 | Select Clay: Wall Zone 57 | 82.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2502 | Select Clay: Wall Zone 58 | 82.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2503 | Select Clay: Wall Zone 59 | 82.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2504 | Select Clay: Wall Zone 60 | 82.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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# Field Compaction Report

**Report Date:** 08/21/2023
**Test Method:** ASTM D6938

**Client:**
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**Project:**
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Minnkota Cell 5
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Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2505 | | 08/17/23 | P-16 | | CH | 20.2 | 101.8 | 22.1 | 104.9 | 128.1 | 6 | 103 | 95 | 0 / 10 | A |
| 2506 | | 08/17/23 | P-16 | | CH | 20.2 | 101.8 | 22.6 | 104.0 | 127.5 | 6 | 102 | 95 | 0 / 10 | A |
| 2507 | | 08/17/23 | P-16 | | CH | 20.2 | 101.8 | 23.5 | 103.8 | 128.2 | 6 | 102 | 95 | 0 / 10 | A |
| 2508 | | 08/17/23 | P-03 | | CH | 20.2 | 99.3 | 23.8 | 97.0 | 120.1 | 6 | 98 | 95 | 0 / 10 | A |
| 2509 | | 08/17/23 | P-16 | | CH | 20.2 | 101.8 | 22.2 | 103.0 | 125.9 | 6 | 101 | 95 | 0 / 10 | A |
| 2510 | | 08/17/23 | P-19 | | CH | 18.4 | 105.0 | 18.8 | 105.1 | 124.9 | 6 | 100 | 95 | 0 / 10 | A |
| 2511 | | 08/17/23 | P-01 | | CH | 19.4 | 100.8 | 22.0 | 100.9 | 123.1 | 6 | 100 | 95 | 0 / 10 | A |
| 2512 | | 08/17/23 | P-16 | | CH | 20.2 | 101.8 | 23.2 | 102.6 | 126.4 | 6 | 101 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2505 | Select Clay: Wall Zone 18 | 143.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2506 | Select Clay: Wall Zone 19 | 114.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2507 | Select Clay: Wall Zone 20 | 114.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2508 | Select Clay: Wall Zone 52 | 114.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2509 | Select Clay: Wall Zone 53 | 114.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2510 | Select Clay: Wall Zone 54 | 114.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2511 | Select Clay: Wall Zone 55 | 114.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2512 | Select Clay: Wall Zone 56 | 83.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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BRAUN INTERTEC
The Science You Build On.

2908 Morrison Ave.
Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/21/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2513 | | 08/17/23 | P-16 | | CH | 20.2 | 101.8 | 23.1 | 101.1 | 124.5 | 6 | 99 | 95 | 0 / 10 | A |
| 2514 | | 08/17/23 | P-16 | | CH | 20.2 | 101.8 | 22.7 | 104.8 | 128.6 | 6 | 103 | 95 | 0 / 10 | A |
| 2515 | | 08/17/23 | P-16 | | CH | 20.2 | 101.8 | 21.2 | 104.4 | 126.5 | 6 | 103 | 95 | 0 / 10 | A |
| 2516 | | 08/17/23 | P-21-std | A | CL | 18.1 | 106.3 | 21.1 | 106.0 | 128.4 | 6 | 100 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2513 | Select Clay: Wall Zone 57 | 83.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2514 | Select Clay: Wall Zone 58 | 83.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2515 | Select Clay: Wall Zone 59 | 83.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2516 | Select Clay: Wall Zone 60 | 83.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Kurt Kuechle
08/21/2023

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# Field Compaction Report

**Report Date:** 08/21/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2517 | | 08/17/23 | P-01 | | CH | 19.4 | 100.8 | 23.5 | 100.5 | 124.1 | 6 | 100 | 95 | 0 / 10 | A |
| 2518 | | 08/17/23 | P-16 | | CH | 20.2 | 101.8 | 22.3 | 102.5 | 125.4 | 6 | 101 | 95 | 0 / 10 | A |
| 2519 | | 08/17/23 | P-03 | | CH | 20.2 | 99.3 | 24.2 | 94.8 | 117.7 | 6 | 95 | 95 | 0 / 10 | A |
| 2520 | | 08/17/23 | P-03 | | CH | 20.2 | 99.3 | 23.1 | 99.0 | 121.9 | 6 | 100 | 95 | 0 / 10 | A |
| 2521 | | 08/17/23 | P-03 | | CH | 20.2 | 99.3 | 22.7 | 99.3 | 121.8 | 6 | 100 | 95 | 0 / 10 | A |
| 2522 | | 08/17/23 | P-03 | | CH | 20.2 | 99.3 | 25.7 | 95.5 | 120.0 | 6 | 96 | 95 | 0 / 10 | A |
| 2523 | | 08/17/23 | P-19 | | CH | 18.4 | 105.0 | 21.9 | 105.5 | 128.6 | 6 | 100 | 95 | 0 / 10 | A |
| 2524 | | 08/17/23 | P-21-std | A | CL | 18.1 | 106.3 | 18.9 | 105.8 | 125.8 | 6 | 100 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2517 | Select Clay: Wall Zone 18 | 144.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2518 | Select Clay: Wall Zone 19 | 115.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2519 | Select Clay: Wall Zone 20 | 115.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2520 | Select Clay: Wall Zone 52 | 115.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2521 | Select Clay: Wall Zone 53 | 115.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2522 | Select Clay: Wall Zone 54 | 115.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2523 | Select Clay: Wall Zone 55 | 115.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2524 | Select Clay: Wall Zone 56 | 84.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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# Field Compaction Report

**Report Date:** 08/21/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2525 | | 08/17/23 | P-19 | | CH | 18.4 | 105.0 | 18.8 | 105.4 | 125.2 | 6 | 100 | 95 | 0 / 10 | A |
| 2526 | | 08/17/23 | P-01 | | CH | 19.4 | 100.8 | 20.4 | 99.6 | 119.9 | 6 | 99 | 95 | 0 / 10 | A |
| 2527 | | 08/17/23 | P-03 | | CH | 20.2 | 99.3 | 23.4 | 98.8 | 121.9 | 6 | 99 | 95 | 0 / 10 | A |
| 2528 | | 08/17/23 | P-16 | | CH | 20.2 | 101.8 | 23.7 | 101.5 | 125.6 | 6 | 100 | 95 | 0 / 10 | A |
| 2529 | | 08/17/23 | P-16 | | CH | 20.2 | 101.8 | 23.1 | 102.9 | 126.7 | 6 | 101 | 95 | 0 / 10 | A |
| 2530 | | 08/17/23 | P-01 | | CH | 19.4 | 100.8 | 23.3 | 100.5 | 123.9 | 6 | 100 | 95 | 0 / 10 | A |
| 2531 | | 08/17/23 | P-01 | | CH | 19.4 | 100.8 | 24.3 | 100.9 | 125.4 | 6 | 100 | 95 | 0 / 10 | A |
| 2532 | | 08/17/23 | P-01 | | CH | 19.4 | 100.8 | 20.6 | 103.9 | 125.3 | 6 | 103 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2525 | Select Clay: Wall Zone 57 | 84.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2526 | Select Clay: Wall Zone 58 | 84.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2527 | Select Clay: Wall Zone 59 | 84.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2528 | Select Clay: Wall Zone 60 | 84.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2529 | Select Clay: Wall Zone 18 | 145.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2530 | Select Clay: Wall Zone 19 | 116.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2531 | Select Clay: Wall Zone 20 | 116.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2532 | Select Clay: Wall Zone 52 | 116.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/21/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2533 | | 08/17/23 | P-16 | | CH | 20.2 | 101.8 | 21.8 | 103.3 | 125.8 | 6 | 101 | 95 | 0 / 10 | A |
| 2534 | | 08/17/23 | P-16 | | CH | 20.2 | 101.8 | 21.3 | 104.1 | 126.3 | 6 | 102 | 95 | 0 / 10 | A |
| 2535 | | 08/17/23 | P-16 | | CH | 20.2 | 101.8 | 22.8 | 101.5 | 124.6 | 6 | 100 | 95 | 0 / 10 | A |
| 2536 | | 08/17/23 | P-19 | | CH | 18.4 | 105.0 | 20.9 | 104.4 | 126.2 | 6 | 99 | 95 | 0 / 10 | A |
| 2537 | | 08/17/23 | P-01 | | CH | 19.4 | 100.8 | 20.5 | 102.4 | 123.4 | 6 | 102 | 95 | 0 / 10 | A |
| 2538 | | 08/17/23 | P-03 | | CH | 20.2 | 99.3 | 25.0 | 96.5 | 120.6 | 6 | 97 | 95 | 0 / 10 | A |
| 2539 | | 08/17/23 | P-16 | | CH | 20.2 | 101.8 | 22.5 | 104.2 | 127.6 | 6 | 102 | 95 | 0 / 10 | A |
| 2540 | | 08/17/23 | P-19 | | CH | 18.4 | 105.0 | 21.1 | 105.2 | 127.4 | 6 | 100 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2533 | Select Clay: Wall Zone 53 | 116.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2534 | Select Clay: Wall Zone 54 | 116.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2535 | Select Clay: Wall Zone 55 | 116.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2536 | Select Clay: Wall Zone 56 | 85.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2537 | Select Clay: Wall Zone 57 | 85.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2538 | Select Clay: Wall Zone 58 | 85.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2539 | Select Clay: Wall Zone 59 | 85.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2540 | Select Clay: Wall Zone 60 | 85.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/21/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2541 | | 08/17/23 | P-19 | | CH | 18.4 | 105.0 | 21.3 | 105.2 | 127.6 | 6 | 100 | 95 | 0 / 10 | A |
| 2542 | | 08/17/23 | P-19 | | CH | 18.4 | 105.0 | 20.4 | 104.5 | 125.8 | 6 | 100 | 95 | 0 / 10 | A |
| 2543 | | 08/17/23 | P-21-std | A | CL | 18.1 | 106.3 | 21.1 | 106.2 | 128.6 | 6 | 100 | 95 | 0 / 10 | A |
| 2544 | | 08/17/23 | P-16 | | CH | 20.2 | 101.8 | 21.8 | 104.9 | 127.8 | 6 | 103 | 95 | 0 / 10 | A |
| 2545 | | 08/17/23 | P-16 | | CH | 20.2 | 101.8 | 22.9 | 101.1 | 124.3 | 6 | 99 | 95 | 0 / 10 | A |
| 2546 | | 08/17/23 | P-16 | | CH | 20.2 | 101.8 | 23.4 | 100.0 | 123.4 | 6 | 98 | 95 | 0 / 10 | A |
| 2547 | | 08/17/23 | P-16 | | CH | 20.2 | 101.8 | 23.2 | 101.6 | 125.2 | 6 | 100 | 95 | 0 / 10 | A |
| 2548 | | 08/17/23 | P-07 | | CH | 22.6 | 93.8 | 24.1 | 92.1 | 114.3 | 6 | 98 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2541 | Select Clay: Wall Zone 18 | 146.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2542 | Select Clay: Wall Zone 19 | 117.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2543 | Select Clay: Wall Zone 20 | 117.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2544 | Select Clay: Wall Zone 52 | 117.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2545 | Select Clay: Wall Zone 53 | 117.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2546 | Select Clay: Wall Zone 54 | 117.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2547 | Select Clay: Wall Zone 56 | 86.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2548 | Select Clay: Wall Zone 57 | 86.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Bismarck, ND 58504
Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/21/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2549 | | 08/17/23 | P-03 | | CH | 20.2 | 99.3 | 23.0 | 99.5 | 122.4 | 6 | 100 | 95 | 0 / 10 | A |
| 2550 | | 08/17/23 | P-16 | | CH | 20.2 | 101.8 | 21.2 | 104.3 | 126.4 | 6 | 102 | 95 | 0 / 10 | A |
| 2551 | | 08/17/23 | P-16 | | CH | 20.2 | 101.8 | 23.8 | 102.1 | 126.4 | 6 | 100 | 95 | 0 / 10 | A |
| 2552 | | 08/17/23 | P-16 | | CH | 20.2 | 101.8 | 22.5 | 103.3 | 126.5 | 6 | 101 | 95 | 0 / 10 | A |
| 2553 | | 08/17/23 | P-01 | | CH | 19.4 | 100.8 | 19.9 | 102.8 | 123.3 | 6 | 102 | 95 | 0 / 10 | A |
| 2554 | | 08/17/23 | P-16 | | CH | 20.2 | 101.8 | 22.8 | 103.3 | 126.9 | 6 | 101 | 95 | 0 / 10 | A |
| 2555 | | 08/17/23 | P-01 | | CH | 19.4 | 100.8 | 22.8 | 100.4 | 123.3 | 6 | 100 | 95 | 0 / 10 | A |
| 2556 | | 08/17/23 | P-01 | | CH | 19.4 | 100.8 | 21.0 | 103.4 | 125.1 | 6 | 103 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2549 | Select Clay: Wall Zone 58 | 86.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2550 | Select Clay: Wall Zone 59 | 86.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2551 | Select Clay: Wall Zone 60 | 86.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2552 | Select Clay: Wall Zone 18 | 147.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2553 | Select Clay: Wall Zone 19 | 118.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2554 | Select Clay: Wall Zone 20 | 118.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2555 | Select Clay: Wall Zone 52 | 118.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2556 | Select Clay: Wall Zone 53 | 118.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/21/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2557 | | 08/17/23 | P-16 | | CH | 20.2 | 101.8 | 22.1 | 104.3 | 127.4 | 6 | 102 | 95 | 0 / 10 | A |
| 2558 | | 08/18/23 | P-01 | | CH | 19.4 | 100.8 | 24.3 | 100.0 | 124.3 | 6 | 99 | 95 | 0 / 10 | A |
| 2559 | | 08/18/23 | P-16 | | CH | 20.2 | 101.8 | 23.5 | 103.0 | 127.2 | 6 | 101 | 95 | 0 / 10 | A |
| 2560 | | 08/18/23 | P-21-std | A | CL | 18.1 | 106.3 | 20.6 | 106.5 | 128.4 | 6 | 100 | 95 | 0 / 10 | A |
| 2561 | | 08/18/23 | P-19 | | CH | 18.4 | 105.0 | 19.5 | 105.3 | 125.8 | 6 | 100 | 95 | 0 / 10 | A |
| 2562 | | 08/18/23 | P-16 | | CH | 20.2 | 101.8 | 23.7 | 101.4 | 125.4 | 6 | 100 | 95 | 0 / 10 | A |
| 2563 | | 08/18/23 | P-16 | | CH | 20.2 | 101.8 | 22.4 | 101.1 | 123.7 | 6 | 99 | 95 | 0 / 10 | A |
| 2564 | | 08/18/23 | P-03 | | CH | 20.2 | 99.3 | 24.5 | 98.9 | 123.1 | 6 | 100 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2557 | Select Clay: Wall Zone 54 | 118.0 | Lift Number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2558 | Select Clay: Wall Zone 18 | 148.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2559 | Select Clay: Wall Zone 19 | 119.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2560 | Select Clay: Wall Zone 20 | 119.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2561 | Select Clay: Wall Zone 52 | 119.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2562 | Select Clay: Wall Zone 53 | 119.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2563 | Select Clay: Wall Zone 54 | 119.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2564 | Select Clay: Wall Zone 56 | 87.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/21/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2565 | | 08/18/23 | P-16 | | CH | 20.2 | 101.8 | 21.8 | 101.2 | 123.3 | 6 | 99 | 95 | 0 / 10 | A |
| 2566 | | 08/18/23 | P-19 | | CH | 18.4 | 105.0 | 20.2 | 104.0 | 125.0 | 6 | 99 | 95 | 0 / 10 | A |
| 2567 | | 08/18/23 | P-01 | | CH | 19.4 | 100.8 | 20.4 | 101.6 | 122.3 | 6 | 101 | 95 | 0 / 10 | A |
| 2568 | | 08/18/23 | P-16 | | CH | 20.2 | 101.8 | 22.8 | 103.1 | 126.6 | 6 | 101 | 95 | 0 / 10 | A |
| 2569 | | 08/18/23 | P-16 | | CH | 20.2 | 101.8 | 21.4 | 103.6 | 125.8 | 6 | 102 | 95 | 0 / 10 | A |
| 2570 | | 08/18/23 | P-16 | | CH | 20.2 | 101.8 | 22.3 | 102.3 | 125.1 | 6 | 100 | 95 | 0 / 10 | A |
| 2571 | | 08/18/23 | P-16 | | CH | 20.2 | 101.8 | 21.8 | 101.3 | 123.4 | 6 | 100 | 95 | 0 / 10 | A |
| 2572 | | 08/18/23 | P-16 | | CH | 20.2 | 101.8 | 22.3 | 102.8 | 125.7 | 6 | 101 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2565 | Select Clay: Wall Zone 57 | 87.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2566 | Select Clay: Wall Zone 58 | 87.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2567 | Select Clay: Wall Zone 59 | 87.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2568 | Select Clay: Wall Zone 60 | 87.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2569 | Select Clay: Wall Zone 18 | 149.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2570 | Select Clay: Wall Zone 19 | 120.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2571 | Select Clay: Wall Zone 20 | 120.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2572 | Select Clay: Wall Zone 52 | 120.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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The Science You Build On.

2908 Morrison Ave.
Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/21/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2573 | | 08/18/23 | P-03 | | CH | 20.2 | 99.3 | 23.4 | 94.4 | 116.5 | 6 | 95 | 95 | 0 / 10 | A |
| 2574 | | 08/18/23 | P-16 | | CH | 20.2 | 101.8 | 22.1 | 103.3 | 126.1 | 6 | 101 | 95 | 0 / 10 | A |
| 2575 | | 08/18/23 | P-03 | | CH | 20.2 | 99.3 | 24.3 | 100.3 | 124.7 | 6 | 101 | 95 | 0 / 10 | A |
| 2576 | | 08/18/23 | P-16 | | CH | 20.2 | 101.8 | 23.0 | 101.4 | 124.7 | 6 | 100 | 95 | 0 / 10 | A |
| 2577 | | 08/18/23 | P-16 | | CH | 20.2 | 101.8 | 22.6 | 102.3 | 125.4 | 6 | 100 | 95 | 0 / 10 | A |
| 2578 | | 08/18/23 | P-16 | | CH | 20.2 | 101.8 | 23.9 | 100.3 | 124.3 | 6 | 99 | 95 | 0 / 10 | A |
| 2579 | | 08/18/23 | P-16 | | CH | 20.2 | 101.8 | 21.3 | 104.0 | 126.2 | 6 | 102 | 95 | 0 / 10 | A |
| 2580 | | 08/18/23 | P-01 | | CH | 19.4 | 100.8 | 20.0 | 101.6 | 121.9 | 6 | 101 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2573 | Select Clay: Wall Zone 53 | 120.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2574 | Select Clay: Wall Zone 54 | 120.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2575 | Select Clay: Wall Zone 56 | 88.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2576 | Select Clay: Wall Zone 57 | 88.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2577 | Select Clay: Wall Zone 58 | 88.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2578 | Select Clay: Wall Zone 59 | 88.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2579 | Select Clay: Wall Zone 60 | 88.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2580 | Select Clay: Wall Zone 18 | 150.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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2908 Morrison Ave.
Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/21/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2581 | | 08/18/23 | P-01 | | CH | 19.4 | 100.8 | 22.5 | 100.2 | 122.7 | 6 | 99 | 95 | 0 / 10 | A |
| 2582 | | 08/18/23 | P-16 | | CH | 20.2 | 101.8 | 22.0 | 103.9 | 126.8 | 6 | 102 | 95 | 0 / 10 | A |
| 2583 | | 08/18/23 | P-19 | | CH | 18.4 | 105.0 | 21.1 | 105.2 | 127.4 | 6 | 100 | 95 | 0 / 10 | A |
| 2584 | | 08/18/23 | P-16 | | CH | 20.2 | 101.8 | 22.8 | 103.0 | 126.5 | 6 | 101 | 95 | 0 / 10 | A |
| 2585 | | 08/18/23 | P-19 | | CH | 18.4 | 105.0 | 21.7 | 105.4 | 128.3 | 6 | 100 | 95 | 0 / 10 | A |
| 2586 | | 08/18/23 | P-16 | | CH | 20.2 | 101.8 | 22.0 | 101.0 | 123.2 | 6 | 99 | 95 | 0 / 10 | A |
| 2587 | | 08/18/23 | P-16 | | CH | 20.2 | 101.8 | 24.2 | 100.6 | 124.9 | 6 | 99 | 95 | 0 / 10 | A |
| 2588 | | 08/18/23 | P-16 | | CH | 20.2 | 101.8 | 22.3 | 102.8 | 125.7 | 6 | 101 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2581 | Select Clay: Wall Zone 19 | 121.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2582 | Select Clay: Wall Zone 20 | 121.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2583 | Select Clay: Wall Zone 52 | 121.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2584 | Select Clay: Wall Zone 53 | 121.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2585 | Select Clay: Wall Zone 54 | 121.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2586 | Select Clay: Wall Zone 56 | 89.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2587 | Select Clay: Wall Zone 57 | 89.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2588 | Select Clay: Wall Zone 58 | 89.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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Suite 3
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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/21/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2589 | | 08/18/23 | P-16 | | CH | 20.2 | 101.8 | 22.5 | 101.2 | 124.0 | 6 | 99 | 95 | 0 / 10 | A |
| 2590 | | 08/18/23 | P-16 | | CH | 20.2 | 101.8 | 22.1 | 101.5 | 123.9 | 6 | 100 | 95 | 0 / 10 | A |
| 2591 | | 08/18/23 | P-01 | | CH | 19.4 | 100.8 | 21.1 | 104.0 | 125.9 | 6 | 103 | 95 | 0 / 10 | A |
| 2592 | | 08/18/23 | P-16 | | CH | 20.2 | 101.8 | 22.3 | 101.0 | 123.5 | 6 | 99 | 95 | 0 / 10 | A |
| 2593 | | 08/18/23 | P-16 | | CH | 20.2 | 101.8 | 22.1 | 104.7 | 127.8 | 6 | 103 | 95 | 0 / 10 | A |
| 2594 | | 08/18/23 | P-16 | | CH | 20.2 | 101.8 | 21.9 | 103.1 | 125.7 | 6 | 101 | 95 | 0 / 10 | A |
| 2595 | | 08/18/23 | P-16 | | CH | 20.2 | 101.8 | 24.1 | 101.5 | 126.0 | 6 | 100 | 95 | 0 / 10 | A |
| 2596 | | 08/18/23 | P-16 | | CH | 20.2 | 101.8 | 22.9 | 102.9 | 126.5 | 6 | 101 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2589 | Select Clay: Wall Zone 59 | 89.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2590 | Select Clay: Wall Zone 60 | 89.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2591 | Select Clay: Wall Zone 18 | 151.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2592 | Select Clay: Wall Zone 19 | 122.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2593 | Select Clay: Wall Zone 20 | 122.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2594 | Select Clay: Wall Zone 52 | 122.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2595 | Select Clay: Wall Zone 53 | 122.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2596 | Select Clay: Wall Zone 54 | 122.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Bismarck, ND 58504
Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/21/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2597 | | 08/18/23 | P-03 | | CH | 20.2 | 99.3 | 24.0 | 99.3 | 123.1 | 6 | 100 | 95 | 0 / 10 | A |
| 2598 | | 08/18/23 | P-16 | | CH | 20.2 | 101.8 | 21.6 | 101.2 | 123.1 | 6 | 99 | 95 | 0 / 10 | A |
| 2599 | | 08/18/23 | P-16 | | CH | 20.2 | 101.8 | 23.9 | 101.3 | 125.5 | 6 | 100 | 95 | 0 / 10 | A |
| 2600 | | 08/18/23 | P-16 | | CH | 20.2 | 101.8 | 21.9 | 101.0 | 123.1 | 6 | 99 | 95 | 0 / 10 | A |
| 2601 | | 08/18/23 | P-03 | | CH | 20.2 | 99.3 | 21.7 | 99.3 | 120.8 | 6 | 100 | 95 | 0 / 10 | A |
| 2602 | | 08/18/23 | P-01 | | CH | 19.4 | 100.8 | 23.7 | 100.9 | 124.8 | 6 | 100 | 95 | 0 / 10 | A |
| 2603 | | 08/18/23 | P-01 | | CH | 19.4 | 100.8 | 23.3 | 99.9 | 123.2 | 6 | 99 | 95 | 0 / 10 | A |
| 2604 | | 08/18/23 | P-19 | | CH | 18.4 | 105.0 | 19.8 | 104.3 | 125.0 | 6 | 99 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2597 | Select Clay: Wall Zone 56 | 90.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2598 | Select Clay: Wall Zone 57 | 90.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2599 | Select Clay: Wall Zone 58 | 90.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2600 | Select Clay: Wall Zone 59 | 90.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2601 | Select Clay: Wall Zone 60 | 90.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2602 | Select Clay: Wall Zone 18 | 152.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2603 | Select Clay: Wall Zone 19 | 123.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2604 | Select Clay: Wall Zone 20 | 123.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/21/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2605 | | 08/18/23 | P-01 | | CH | 19.4 | 100.8 | 21.2 | 102.6 | 124.3 | 6 | 102 | 95 | 0 / 10 | A |
| 2606 | | 08/18/23 | P-16 | | CH | 20.2 | 101.8 | 21.7 | 103.4 | 125.8 | 6 | 102 | 95 | 0 / 10 | A |
| 2607 | | 08/18/23 | P-16 | | CH | 20.2 | 101.8 | 22.2 | 101.8 | 124.4 | 6 | 100 | 95 | 0 / 10 | A |
| 2608 | | 08/18/23 | P-16 | | CH | 20.2 | 101.8 | 21.3 | 102.8 | 124.7 | 6 | 101 | 95 | 0 / 10 | A |
| 2609 | | 08/18/23 | P-03 | | CH | 20.2 | 99.3 | 23.8 | 95.6 | 118.4 | 6 | 96 | 95 | 0 / 10 | A |
| 2610 | | 08/18/23 | P-16 | | CH | 20.2 | 101.8 | 23.3 | 101.4 | 125.0 | 6 | 100 | 95 | 0 / 10 | A |
| 2611 | | 08/18/23 | P-16 | | CH | 20.2 | 101.8 | 22.9 | 104.0 | 127.8 | 6 | 102 | 95 | 0 / 10 | A |
| 2612 | | 08/18/23 | P-01 | | CH | 19.4 | 100.8 | 23.9 | 100.0 | 123.9 | 6 | 99 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2605 | Select Clay: Wall Zone 52 | 123.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2606 | Select Clay: Wall Zone 53 | 123.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2607 | Select Clay: Wall Zone 54 | 123.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2608 | Select Clay: Wall Zone 56 | 91.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2609 | Select Clay: Wall Zone 57 | 91.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2610 | Select Clay: Wall Zone 58 | 91.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2611 | Select Clay: Wall Zone 59 | 91.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2612 | Select Clay: Wall Zone 60 | 91.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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2908 Morrison Ave.
Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/21/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2613 | | 08/18/23 | P-03 | | CH | 20.2 | 99.3 | 22.6 | 99.3 | 121.7 | 6 | 100 | 95 | 0 / 10 | A |
| 2614 | | 08/18/23 | P-16 | | CH | 20.2 | 101.8 | 21.6 | 104.2 | 126.7 | 6 | 102 | 95 | 0 / 10 | A |
| 2615 | | 08/18/23 | P-16 | | CH | 20.2 | 101.8 | 22.0 | 102.1 | 124.6 | 6 | 100 | 95 | 0 / 10 | A |
| 2616 | | 08/18/23 | P-01 | | CH | 19.4 | 100.8 | 21.1 | 103.9 | 125.8 | 6 | 103 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2613 | Select Clay: Wall Zone 18 | 153.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2614 | Select Clay: Wall Zone 19 | 124.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2615 | Select Clay: Wall Zone 20 | 124.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2616 | Select Clay: Wall Zone 52 | 124.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Kurt Kuechle
08/21/2023

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/21/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2617 | | 08/18/23 | P-19 | | CH | 18.4 | 105.0 | 20.5 | 104.5 | 125.9 | 6 | 100 | 95 | 0 / 10 | A |
| 2618 | | 08/18/23 | P-03 | | CH | 20.2 | 99.3 | 24.4 | 94.8 | 117.9 | 6 | 95 | 95 | 0 / 10 | A |
| 2619 | | 08/18/23 | P-16 | | CH | 20.2 | 101.8 | 22.8 | 101.9 | 125.1 | 6 | 100 | 95 | 0 / 10 | A |
| 2620 | | 08/18/23 | P-03 | | CH | 20.2 | 99.3 | 25.3 | 95.8 | 120.0 | 6 | 96 | 95 | 0 / 10 | A |
| 2621 | | 08/18/23 | P-03 | | CH | 20.2 | 99.3 | 26.1 | 97.1 | 122.4 | 6 | 98 | 95 | 0 / 10 | A |
| 2622 | | 08/18/23 | P-16 | | CH | 20.2 | 101.8 | 21.5 | 101.3 | 123.1 | 6 | 100 | 95 | 0 / 10 | A |
| 2623 | | 08/18/23 | P-01 | | CH | 19.4 | 100.8 | 20.3 | 104.2 | 125.4 | 6 | 103 | 95 | 0 / 10 | A |
| 2624 | | 08/18/23 | P-16 | | CH | 20.2 | 101.8 | 21.4 | 103.3 | 125.4 | 6 | 101 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2617 | Select Clay: Wall Zone 53 | 124.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2618 | Select Clay: Wall Zone 54 | 124.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2619 | Select Clay: Wall Zone 56 | 92.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2620 | Select Clay: Wall Zone 57 | 92.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2621 | Select Clay: Wall Zone 58 | 92.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2622 | Select Clay: Wall Zone 59 | 92.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2623 | Select Clay: Wall Zone 60 | 92.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2624 | Select Clay: Wall Zone 18 | 154.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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BRAUN INTERTEC
The Science You Build On.

2908 Morrison Ave.
Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/21/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2625 | | 08/18/23 | P-16 | | CH | 20.2 | 101.8 | 21.8 | 103.6 | 126.2 | 6 | 102 | 95 | 0 / 10 | A |
| 2626 | | 08/18/23 | P-19 | | CH | 18.4 | 105.0 | 20.7 | 105.1 | 126.9 | 6 | 100 | 95 | 0 / 10 | A |
| 2627 | | 08/18/23 | P-21-std | A | CL | 18.1 | 106.3 | 20.8 | 106.6 | 128.8 | 6 | 100 | 95 | 0 / 10 | A |
| 2628 | | 08/18/23 | P-16 | | CH | 20.2 | 101.8 | 22.8 | 101.7 | 124.9 | 6 | 100 | 95 | 0 / 10 | A |
| 2629 | | 08/18/23 | P-16 | | CH | 20.2 | 101.8 | 22.6 | 101.2 | 124.1 | 6 | 99 | 95 | 0 / 10 | A |
| 2630 | | 08/19/23 | P-03 | | CH | 20.2 | 99.3 | 21.4 | 96.3 | 116.9 | 6 | 97 | 95 | 0 / 10 | A |
| 2631 | | 08/19/23 | P-16 | | CH | 20.2 | 101.8 | 21.3 | 102.8 | 124.7 | 6 | 101 | 95 | 0 / 10 | A |
| 2632 | | 08/19/23 | P-16 | | CH | 20.2 | 101.8 | 23.5 | 100.6 | 124.2 | 6 | 99 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2625 | Select Clay: Wall Zone 19 | 125.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2626 | Select Clay: Wall Zone 20 | 125.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2627 | Select Clay: Wall Zone 52 | 125.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2628 | Select Clay: Wall Zone 53 | 125.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2629 | Select Clay: Wall Zone 54 | 125.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2630 | Select Clay: Wall Zone 56 | 93.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2631 | Select Clay: Wall Zone 57 | 93.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2632 | Select Clay: Wall Zone 58 | 93.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Bismarck, ND 58504
Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/21/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2633 | | 08/19/23 | P-21-std | A | CL | 18.1 | 106.3 | 18.4 | 109.8 | 130.0 | 6 | 103 | 95 | 0 / 10 | A |
| 2634 | | 08/19/23 | P-21-std | A | CL | 18.1 | 106.3 | 18.6 | 108.7 | 128.9 | 6 | 102 | 95 | 0 / 10 | A |
| 2635 | | 08/19/23 | P-01 | | CH | 19.4 | 100.8 | 24.6 | 100.7 | 125.5 | 6 | 100 | 95 | 0 / 10 | A |
| 2636 | | 08/19/23 | P-16 | | CH | 20.2 | 101.8 | 24.4 | 102.4 | 127.4 | 6 | 101 | 95 | 0 / 10 | A |
| 2637 | | 08/19/23 | P-21-std | A | CL | 18.1 | 106.3 | 21.7 | 105.9 | 128.9 | 6 | 100 | 95 | 0 / 10 | A |
| 2638 | | 08/19/23 | P-21-std | A | CL | 18.1 | 106.3 | 21.3 | 107.3 | 130.2 | 6 | 101 | 95 | 0 / 10 | A |
| 2639 | | 08/19/23 | P-16 | | CH | 20.2 | 101.8 | 22.2 | 103.3 | 126.2 | 6 | 101 | 95 | 0 / 10 | A |
| 2640 | | 08/19/23 | P-16 | | CH | 20.2 | 101.8 | 21.8 | 102.7 | 125.1 | 6 | 101 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2633 | Select Clay: Wall Zone 59 | 93.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2634 | Select Clay: Wall Zone 60 | 93.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2635 | Select Clay: Wall Zone 18 | 155.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2636 | Select Clay: Wall Zone 19 | 126.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2637 | Select Clay: Wall Zone 20 | 126.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2638 | Select Clay: Wall Zone 52 | 126.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2639 | Select Clay: Wall Zone 53 | 126.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2640 | Select Clay: Wall Zone 56 | 94.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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# Field Compaction Report

**Report Date:** 08/21/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2641 | | 08/19/23 | P-01 | | CH | 19.4 | 100.8 | 20.2 | 101.6 | 122.1 | 6 | 101 | 95 | 0 / 10 | A |
| 2642 | | 08/19/23 | P-21-std | A | CL | 18.1 | 106.3 | 20.7 | 106.6 | 128.7 | 6 | 100 | 95 | 0 / 10 | A |
| 2643 | | 08/19/23 | P-16 | | CH | 20.2 | 101.8 | 22.2 | 103.3 | 126.2 | 6 | 101 | 95 | 0 / 10 | A |
| 2644 | | 08/19/23 | P-01 | | CH | 19.4 | 100.8 | 21.0 | 101.7 | 123.1 | 6 | 101 | 95 | 0 / 10 | A |
| 2645 | | 08/19/23 | P-16 | | CH | 20.2 | 101.8 | 21.9 | 102.3 | 124.7 | 6 | 100 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2641 | Select Clay: Wall Zone 57 | 94.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2642 | Select Clay: Wall Zone 58 | 94.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2643 | Select Clay: Wall Zone 54 | 126.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2644 | Select Clay: Wall Zone 59 | 94.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2645 | Select Clay: Wall Zone 60 | 94.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Kurt Kuechle
08/21/2023

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/22/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2646 | | 08/21/23 | P-03 | | CH | 20.2 | 99.3 | 25.2 | 98.2 | 122.9 | 6 | 99 | 95 | 0 / 10 | A |
| 2647 | | 08/21/23 | P-01 | | CH | 19.4 | 100.8 | 21.6 | 100.6 | 122.3 | 6 | 100 | 95 | 0 / 10 | A |
| 2648 | | 08/21/23 | P-21-std | A | CL | 18.1 | 106.3 | 20.1 | 106.3 | 127.7 | 6 | 100 | 95 | 0 / 10 | A |
| 2649 | | 08/21/23 | P-16 | | CH | 20.2 | 101.8 | 23.4 | 103.8 | 128.1 | 6 | 102 | 95 | 0 / 10 | A |
| 2650 | | 08/21/23 | P-21-std | A | CL | 18.1 | 106.3 | 20.5 | 106.7 | 128.6 | 6 | 100 | 95 | 0 / 10 | A |
| 2651 | | 08/21/23 | P-21-std | A | CL | 18.1 | 106.3 | 19.0 | 106.6 | 126.9 | 6 | 100 | 95 | 0 / 10 | A |
| 2652 | | 08/21/23 | P-21-std | A | CL | 18.1 | 106.3 | 20.4 | 107.8 | 129.8 | 6 | 101 | 95 | 0 / 10 | A |
| 2653 | | 08/21/23 | P-16 | | CH | 20.2 | 101.8 | 22.6 | 101.6 | 124.6 | 6 | 100 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2646 | Select Clay: Wall Zone 18 | 156.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2647 | Select Clay: Wall Zone 19 | 127.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2648 | Select Clay: Wall Zone 20 | 127.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2649 | Select Clay: Wall Zone 52 | 127.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2650 | Select Clay: Wall Zone 53 | 127.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2651 | Select Clay: Wall Zone 54 | 127.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2652 | Select Clay: Wall Zone 56 | 95.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2653 | Select Clay: Wall Zone 57 | 95.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/22/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2654 | | 08/21/23 | P-21-std | A | CL | 18.1 | 106.3 | 20.3 | 106.7 | 128.4 | 6 | 100 | 95 | 0 / 10 | A |
| 2655 | | 08/21/23 | P-21-std | A | CL | 18.1 | 106.3 | 20.9 | 107.1 | 129.5 | 6 | 101 | 95 | 0 / 10 | A |
| 2656 | | 08/21/23 | P-19 | | CH | 18.4 | 105.0 | 18.9 | 104.9 | 124.7 | 6 | 100 | 95 | 0 / 10 | A |
| 2657 | | 08/21/23 | P-03 | | CH | 20.2 | 99.3 | 21.1 | 97.5 | 118.1 | 6 | 98 | 95 | 0 / 10 | A |
| 2658 | | 08/21/23 | P-16 | | CH | 20.2 | 101.8 | 22.7 | 104.5 | 128.2 | 6 | 103 | 95 | 0 / 10 | A |
| 2659 | | 08/21/23 | P-01 | | CH | 19.4 | 100.8 | 19.4 | 103.2 | 123.2 | 6 | 102 | 95 | 0 / 10 | A |
| 2660 | | 08/21/23 | P-16 | | CH | 20.2 | 101.8 | 22.1 | 103.6 | 126.5 | 6 | 102 | 95 | 0 / 10 | A |
| 2661 | | 08/21/23 | P-03 | | CH | 20.2 | 99.3 | 26.5 | 98.2 | 124.2 | 6 | 99 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2654 | Select Clay: Wall Zone 58 | 95.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2655 | Select Clay: Wall Zone 59 | 95.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2656 | Select Clay: Wall Zone 60 | 95.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2657 | Select Clay: Wall Zone 18 | 157.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2658 | Select Clay: Wall Zone 19 | 128.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2659 | Select Clay: Wall Zone 20 | 128.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2660 | Select Clay: Wall Zone 52 | 128.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2661 | Select Clay: Wall Zone 53 | 128.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/22/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2662 | | 08/21/23 | P-01 | | CH | 19.4 | 100.8 | 25.7 | 100.1 | 125.8 | 6 | 99 | 95 | 0 / 10 | A |
| 2663 | | 08/21/23 | P-19 | | CH | 18.4 | 105.0 | 20.3 | 104.2 | 125.4 | 6 | 99 | 95 | 0 / 10 | A |
| 2664 | | 08/21/23 | P-21-std | A | CL | 18.1 | 106.3 | 21.6 | 106.6 | 129.6 | 6 | 100 | 95 | 0 / 10 | A |
| 2665 | | 08/21/23 | P-16 | | CH | 20.2 | 101.8 | 24.7 | 101.1 | 126.1 | 6 | 99 | 95 | 0 / 10 | A |
| 2666 | | 08/21/23 | P-16 | | CH | 20.2 | 101.8 | 21.5 | 103.5 | 125.8 | 6 | 102 | 95 | 0 / 10 | A |
| 2667 | | 08/21/23 | P-03 | | CH | 20.2 | 99.3 | 25.3 | 98.8 | 123.8 | 6 | 99 | 95 | 0 / 10 | A |
| 2668 | | 08/21/23 | P-03 | | CH | 20.2 | 99.3 | 23.7 | 99.4 | 123.0 | 6 | 100 | 95 | 0 / 10 | A |
| 2669 | | 08/21/23 | P-21-std | A | CL | 18.1 | 106.3 | 21.1 | 106.4 | 128.8 | 6 | 100 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2662 | Select Clay: Wall Zone 54 | 128.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2663 | Select Clay: Wall Zone 56 | 96.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2664 | Select Clay: Wall Zone 57 | 96.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2665 | Select Clay: Wall Zone 58 | 96.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2666 | Select Clay: Wall Zone 59 | 96.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2667 | Select Clay: Wall Zone 60 | 96.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2668 | Select Clay: Wall Zone 18 | 158.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2669 | Select Clay: Wall Zone 19 | 129.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/22/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2670 | | 08/21/23 | P-16 | | CH | 20.2 | 101.8 | 22.4 | 103.9 | 127.2 | 6 | 102 | 95 | 0 / 10 | A |
| 2671 | | 08/21/23 | P-16 | | CH | 20.2 | 101.8 | 22.6 | 104.2 | 127.8 | 6 | 102 | 95 | 0 / 10 | A |
| 2672 | | 08/21/23 | P-03 | | CH | 20.2 | 99.3 | 25.4 | 95.9 | 120.3 | 6 | 97 | 95 | 0 / 10 | A |
| 2673 | | 08/21/23 | P-01 | | CH | 19.4 | 100.8 | 20.9 | 103.5 | 125.1 | 6 | 103 | 95 | 0 / 10 | A |
| 2674 | | 08/21/23 | P-19 | | CH | 18.4 | 105.0 | 21.9 | 105.5 | 128.6 | 6 | 100 | 95 | 0 / 10 | A |
| 2675 | | 08/21/23 | P-16 | | CH | 20.2 | 101.8 | 21.6 | 104.4 | 127.0 | 6 | 103 | 95 | 0 / 10 | A |
| 2676 | | 08/21/23 | P-01 | | CH | 19.4 | 100.8 | 20.3 | 102.8 | 123.7 | 6 | 102 | 95 | 0 / 10 | A |
| 2677 | | 08/21/23 | P-16 | | CH | 20.2 | 101.8 | 23.1 | 103.2 | 127.0 | 6 | 101 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2670 | Select Clay: Wall Zone 20 | 129.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2671 | Select Clay: Wall Zone 52 | 129.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2672 | Select Clay: Wall Zone 53 | 129.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2673 | Select Clay: Wall Zone 54 | 129.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2674 | Select Clay: Wall Zone 56 | 97.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2675 | Select Clay: Wall Zone 57 | 97.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2676 | Select Clay: Wall Zone 58 | 97.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2677 | Select Clay: Wall Zone 59 | 97.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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The Science You Build On.

2908 Morrison Ave.
Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/22/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2678 | | 08/21/23 | P-19 | | CH | 18.4 | 105.0 | 21.1 | 104.9 | 127.0 | 6 | 100 | 95 | 0 / 10 | A |
| 2679 | | 08/21/23 | P-16 | | CH | 20.2 | 101.8 | 24.5 | 100.9 | 125.6 | 6 | 99 | 95 | 0 / 10 | A |
| 2680 | | 08/21/23 | P-21-std | A | CL | 18.1 | 106.3 | 20.6 | 106.3 | 128.2 | 6 | 100 | 95 | 0 / 10 | A |
| 2681 | | 08/21/23 | P-16 | | CH | 20.2 | 101.8 | 22.5 | 103.9 | 127.3 | 6 | 102 | 95 | 0 / 10 | A |
| 2682 | | 08/21/23 | P-16 | | CH | 20.2 | 101.8 | 22.5 | 103.9 | 127.3 | 6 | 102 | 95 | 0 / 10 | A |
| 2683 | | 08/21/23 | P-03 | | CH | 20.2 | 99.3 | 24.8 | 98.9 | 123.4 | 6 | 100 | 95 | 0 / 10 | A |
| 2684 | | 08/21/23 | P-19 | | CH | 18.4 | 105.0 | 21.8 | 104.9 | 127.8 | 6 | 100 | 95 | 0 / 10 | A |
| 2685 | | 08/21/23 | P-16 | | CH | 20.2 | 101.8 | 22.7 | 101.1 | 124.0 | 6 | 99 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2678 | Select Clay: Wall Zone 60 | 97.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2679 | Select Clay: Wall Zone, 18 | 159.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2680 | Select Clay: Wall Zone, 19 | 130.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2681 | Select Clay: Wall Zone, 20 | 130.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2682 | Select Clay: Wall Zone, 52 | 130.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2683 | Select Clay: Wall Zone, 53 | 130.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2684 | Select Clay: Wall Zone, 54 | 130.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2685 | Select Clay: Wall Zone, 56 | 98.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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# Field Compaction Report

**Report Date:** 08/22/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2686 | | 08/21/23 | P-01 | | CH | 19.4 | 100.8 | 21.9 | 100.3 | 122.3 | 6 | 100 | 95 | 0 / 10 | A |
| 2687 | | 08/21/23 | P-01 | | CH | 19.4 | 100.8 | 24.2 | 100.9 | 125.3 | 6 | 100 | 95 | 0 / 10 | A |
| 2688 | | 08/21/23 | P-16 | | CH | 20.2 | 101.8 | 23.5 | 102.3 | 126.3 | 6 | 100 | 95 | 0 / 10 | A |
| 2689 | | 08/21/23 | P-16 | | CH | 20.2 | 101.8 | 22.5 | 102.7 | 125.8 | 6 | 101 | 95 | 0 / 10 | A |
| 2690 | | 08/21/23 | P-03 | | CH | 20.2 | 99.3 | 23.8 | 96.9 | 120.0 | 6 | 98 | 95 | 0 / 10 | A |
| 2691 | | 08/21/23 | P-16 | | CH | 20.2 | 101.8 | 23.1 | 102.4 | 126.1 | 6 | 101 | 95 | 0 / 10 | A |
| 2692 | | 08/21/23 | P-16 | | CH | 20.2 | 101.8 | 22.4 | 101.5 | 124.2 | 6 | 100 | 95 | 0 / 10 | A |
| 2693 | | 08/21/23 | P-19 | | CH | 18.4 | 105.0 | 22.1 | 105.4 | 128.7 | 6 | 100 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2686 | Select Clay: Wall Zone, 57 | 98.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2687 | Select Clay: Wall Zone, 58 | 98.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2688 | Select Clay: Wall Zone, 59 | 98.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2689 | Select Clay: Wall Zone, 60 | 98.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2690 | Select Clay: Wall Zone, 18 | 160.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2691 | Select Clay: Wall Zone, 19 | 131.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2692 | Select Clay: Wall Zone, 20 | 131.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2693 | Select Clay: Wall Zone, 52 | 131.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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# Field Compaction Report

**Report Date:** 08/22/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2694 | | 08/21/23 | P-01 | | CH | 19.4 | 100.8 | 24.3 | 99.9 | 124.2 | 6 | 99 | 95 | 0 / 10 | A |
| 2695 | | 08/21/23 | P-16 | | CH | 20.2 | 101.8 | 22.9 | 101.8 | 125.1 | 6 | 100 | 95 | 0 / 10 | A |
| 2696 | | 08/21/23 | P-01 | | CH | 19.4 | 100.8 | 20.6 | 101.7 | 122.6 | 6 | 101 | 95 | 0 / 10 | A |
| 2697 | | 08/21/23 | P-16 | | CH | 20.2 | 101.8 | 21.3 | 105.0 | 127.4 | 6 | 103 | 95 | 0 / 10 | A |
| 2698 | | 08/21/23 | P-16 | | CH | 20.2 | 101.8 | 23.8 | 102.4 | 126.8 | 6 | 101 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2694 | Select Clay: Wall Zone, 53 | 131.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2695 | Select Clay: Wall Zone, 54 | 131.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2696 | Select Clay: Wall Zone, 58 | 99.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2697 | Select Clay: Wall Zone, 59 | 99.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2698 | Select Clay: Wall Zone, 60 | 99.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Kurt Kuechle
08/22/2023

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/23/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2699 | | 08/22/23 | P-16 | | CH | 20.2 | 101.8 | 23.2 | 103.1 | 127.0 | 6 | 101 | 95 | 0 / 10 | A |
| 2700 | | 08/22/23 | P-21-std | A | CL | 18.1 | 106.3 | 21.5 | 106.0 | 128.8 | 6 | 100 | 95 | 0 / 10 | A |
| 2701 | | 08/22/23 | P-16 | | CH | 20.2 | 101.8 | 23.5 | 101.8 | 125.7 | 6 | 100 | 95 | 0 / 10 | A |
| 2702 | | 08/22/23 | P-21-std | A | CL | 18.1 | 106.3 | 20.2 | 107.0 | 128.6 | 6 | 101 | 95 | 0 / 10 | A |
| 2703 | | 08/22/23 | P-16 | | CH | 20.2 | 101.8 | 23.9 | 101.5 | 125.8 | 6 | 100 | 95 | 0 / 10 | A |
| 2704 | | 08/22/23 | P-16 | | CH | 20.2 | 101.8 | 23.4 | 100.9 | 124.5 | 6 | 99 | 95 | 0 / 10 | A |
| 2705 | | 08/22/23 | P-16 | | CH | 20.2 | 101.8 | 22.7 | 104.9 | 128.7 | 6 | 103 | 95 | 0 / 10 | A |
| 2706 | | 08/22/23 | P-16 | | CH | 20.2 | 101.8 | 22.7 | 105.0 | 128.8 | 6 | 103 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2699 | Select Clay: Wall Zone 18 | 161.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2700 | Select Clay: Wall Zone 19 | 132.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2701 | Select Clay: Wall Zone 20 | 132.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2702 | Select Clay: Wall Zone 52 | 132.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2703 | Select Clay: Wall Zone 53 | 132.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2704 | Select Clay: Wall Zone 54 | 132.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2705 | Select Clay: Wall Zone 56 | 99.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2706 | Select Clay: Wall Zone 56 | 100.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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# Field Compaction Report

**Report Date:** 08/23/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2707 | | 08/22/23 | P-21-std | A | CL | 18.1 | 106.3 | 19.9 | 106.8 | 128.1 | 6 | 100 | 95 | 0 / 10 | A |
| 2708 | | 08/22/23 | P-21-std | A | CL | 18.1 | 106.3 | 19.6 | 107.3 | 128.3 | 6 | 101 | 95 | 0 / 10 | A |
| 2709 | | 08/22/23 | P-16 | | CH | 20.2 | 101.8 | 22.5 | 103.2 | 126.4 | 6 | 101 | 95 | 0 / 10 | A |
| 2710 | | 08/22/23 | P-16 | | CH | 20.2 | 101.8 | 21.6 | 103.7 | 126.1 | 6 | 102 | 95 | 0 / 10 | A |
| 2711 | | 08/22/23 | P-16 | | CH | 20.2 | 101.8 | 21.7 | 102.6 | 124.9 | 6 | 101 | 95 | 0 / 10 | A |
| 2712 | | 08/22/23 | P-16 | | CH | 20.2 | 101.8 | 22.2 | 102.7 | 125.5 | 6 | 101 | 95 | 0 / 10 | A |
| 2713 | | 08/22/23 | P-16 | | CH | 20.2 | 101.8 | 23.0 | 102.2 | 125.7 | 6 | 100 | 95 | 0 / 10 | A |
| 2714 | | 08/22/23 | P-16 | | CH | 20.2 | 101.8 | 21.9 | 103.6 | 126.3 | 6 | 102 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2707 | Select Clay: Wall Zone 57 | 99.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2708 | Select Clay: Wall Zone 57 | 100.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2709 | Select Clay: Wall Zone 58 | 100.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2710 | Select Clay: Wall Zone 59 | 100.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2711 | Select Clay: Wall Zone 60 | 100.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2712 | Select Clay: Wall Zone 18 | 162.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2713 | Select Clay: Wall Zone 19 | 133.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2714 | Select Clay: Wall Zone 20 | 133.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/23/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2715 | | 08/22/23 | P-03 | | CH | 20.2 | 99.3 | 22.2 | 99.0 | 121.0 | 6 | 100 | 95 | 0 / 10 | A |
| 2716 | | 08/22/23 | P-16 | | CH | 20.2 | 101.8 | 22.1 | 101.0 | 123.3 | 6 | 99 | 95 | 0 / 10 | A |
| 2717 | | 08/22/23 | P-21-std | A | CL | 18.1 | 106.3 | 19.7 | 106.0 | 126.9 | 6 | 100 | 95 | 0 / 10 | A |
| 2718 | | 08/22/23 | P-03 | | CH | 20.2 | 99.3 | 23.5 | 98.7 | 121.9 | 6 | 99 | 95 | 0 / 10 | A |
| 2719 | | 08/22/23 | P-03 | | CH | 20.2 | 99.3 | 20.7 | 96.8 | 116.8 | 6 | 97 | 95 | 0 / 10 | A |
| 2720 | | 08/22/23 | P-21-std | A | CL | 18.1 | 106.3 | 20.3 | 107.1 | 128.8 | 6 | 101 | 95 | 0 / 10 | A |
| 2721 | | 08/22/23 | P-16 | | CH | 20.2 | 101.8 | 23.5 | 102.6 | 126.7 | 6 | 101 | 95 | 0 / 10 | A |
| 2722 | | 08/22/23 | P-21-std | A | CL | 18.1 | 106.3 | 20.6 | 107.2 | 129.3 | 6 | 101 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2715 | Select Clay: Wall Zone 52 | 133.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2716 | Select Clay: Wall Zone 53 | 133.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2717 | Select Clay: Wall Zone 54 | 133.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2718 | Select Clay: Wall Zone 18 | 163.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2719 | Select Clay: Wall Zone 19 | 134.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2720 | Select Clay: Wall Zone 20 | 134.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2721 | Select Clay: Wall Zone 52 | 134.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2722 | Select Clay: Wall Zone 53 | 134.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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# Field Compaction Report

**Report Date:** 08/23/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2723 | | 08/22/23 | P-03 | | CH | 20.2 | 99.3 | 28.4 | 95.1 | 122.1 | 6 | 96 | 95 | 0 / 10 | A |
| 2724 | | 08/22/23 | P-16 | | CH | 20.2 | 101.8 | 22.5 | 101.8 | 124.7 | 6 | 100 | 95 | 0 / 10 | A |
| 2725 | | 08/22/23 | P-01 | | CH | 19.4 | 100.8 | 20.9 | 102.0 | 123.3 | 6 | 101 | 95 | 0 / 10 | A |
| 2726 | | 08/22/23 | P-16 | | CH | 20.2 | 101.8 | 21.3 | 104.0 | 126.1 | 6 | 102 | 95 | 0 / 10 | A |
| 2727 | | 08/22/23 | P-01 | | CH | 19.4 | 100.8 | 20.2 | 103.6 | 124.5 | 6 | 103 | 95 | 0 / 10 | A |
| 2728 | | 08/22/23 | P-16 | | CH | 20.2 | 101.8 | 23.5 | 102.5 | 126.6 | 6 | 101 | 95 | 0 / 10 | A |
| 2729 | | 08/22/23 | P-03 | | CH | 20.2 | 99.3 | 21.2 | 99.6 | 120.7 | 6 | 100 | 95 | 0 / 10 | A |
| 2730 | | 08/22/23 | P-19 | | CH | 18.4 | 105.0 | 20.9 | 105.3 | 127.3 | 6 | 100 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2723 | Select Clay: Wall Zone 54 | 134.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2724 | Select Clay: Wall Zone 18 | 164.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2725 | Select Clay: Wall Zone 19 | 135.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2726 | Select Clay: Wall Zone 20 | 135.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2727 | Select Clay: Wall Zone 52 | 135.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2728 | Select Clay: Wall Zone 53 | 135.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2729 | Select Clay: Wall Zone 54 | 135.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2730 | Select Clay: Wall Zone 18 | 165.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/23/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2731 | | 08/22/23 | P-03 | | CH | 20.2 | 99.3 | 26.7 | 94.6 | 119.9 | 6 | 95 | 95 | 0 / 10 | A |
| 2732 | | 08/22/23 | P-16 | | CH | 20.2 | 101.8 | 21.7 | 105.1 | 127.9 | 6 | 103 | 95 | 0 / 10 | A |
| 2733 | | 08/22/23 | P-19 | | CH | 18.4 | 105.0 | 20.4 | 105.0 | 126.4 | 6 | 100 | 95 | 0 / 10 | A |
| 2734 | | 08/22/23 | P-01 | | CH | 19.4 | 100.8 | 21.2 | 102.6 | 124.3 | 6 | 102 | 95 | 0 / 10 | A |
| 2735 | | 08/22/23 | P-16 | | CH | 20.2 | 101.8 | 22.9 | 104.1 | 127.9 | 6 | 102 | 95 | 0 / 10 | A |
| 2736 | | 08/22/23 | P-16 | | CH | 20.2 | 101.8 | 23.2 | 99.9 | 123.1 | 6 | 98 | 95 | 0 / 10 | A |
| 2737 | | 08/22/23 | P-16 | | CH | 20.2 | 101.8 | 23.7 | 100.1 | 123.8 | 6 | 98 | 95 | 0 / 10 | A |
| 2738 | | 08/22/23 | P-16 | | CH | 20.2 | 101.8 | 23.7 | 100.1 | 123.8 | 6 | 98 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2731 | Select Clay: Wall Zone 19 | 136.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2732 | Select Clay: Wall Zone 20 | 136.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2733 | Select Clay: Wall Zone 52 | 136.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2734 | Select Clay: Wall Zone 53 | 136.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2735 | Select Clay: Wall Zone 54 | 136.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2736 | Select Clay: Wall Zone 56 | 101.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2737 | Select Clay: Wall Zone 57 | 101.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2738 | Select Clay: Wall Zone 58 | 101.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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BRAUN INTERTEC
The Science You Build On.

2908 Morrison Ave.
Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/23/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2739 | | 08/22/23 | P-19 | | CH | 18.4 | 105.0 | 20.1 | 104.8 | 125.9 | 6 | 100 | 95 | 0 / 10 | A |
| 2740 | | 08/22/23 | P-16 | | CH | 20.2 | 101.8 | 23.2 | 104.1 | 128.2 | 6 | 102 | 95 | 0 / 10 | A |
| 2741 | | 08/22/23 | P-19 | | CH | 18.4 | 105.0 | 22.2 | 105.4 | 128.8 | 6 | 100 | 95 | 0 / 10 | A |
| 2742 | | 08/22/23 | P-19 | | CH | 18.4 | 105.0 | 21.9 | 105.6 | 128.7 | 6 | 101 | 95 | 0 / 10 | A |
| 2743 | | 08/22/23 | P-16 | | CH | 20.2 | 101.8 | 23.1 | 102.0 | 125.6 | 6 | 100 | 95 | 0 / 10 | A |
| 2744 | | 08/22/23 | P-16 | | CH | 20.2 | 101.8 | 21.2 | 104.3 | 126.4 | 6 | 102 | 95 | 0 / 10 | A |
| 2745 | | 08/22/23 | P-16 | | CH | 20.2 | 101.8 | 23.6 | 99.0 | 122.4 | 6 | 97 | 95 | 0 / 10 | A |
| 2746 | | 08/22/23 | P-16 | | CH | 20.2 | 101.8 | 25.2 | 98.8 | 123.7 | 6 | 97 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2739 | Select Clay: Wall Zone 59 | 101.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2740 | Select Clay: Wall Zone 60 | 101.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2741 | Select Clay: Wall Zone 18 | 166.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2742 | Select Clay: Wall Zone 19 | 137.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2743 | Select Clay: Wall Zone 20 | 137.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2744 | Select Clay: Wall Zone 52 | 137.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2745 | Select Clay: Wall Zone 53 | 137.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2746 | Select Clay: Wall Zone 54 | 137.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Suite 3
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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/23/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2747 | | 08/22/23 | P-16 | | CH | 20.2 | 101.8 | 23.1 | 103.0 | 126.8 | 6 | 101 | 95 | 0 / 10 | A |
| 2748 | | 08/22/23 | P-21-std | A | CL | 18.1 | 106.3 | 21.2 | 106.3 | 128.8 | 6 | 100 | 95 | 0 / 10 | A |
| 2749 | | 08/22/23 | P-16 | | CH | 20.2 | 101.8 | 21.2 | 103.7 | 125.7 | 6 | 102 | 95 | 0 / 10 | A |
| 2750 | | 08/22/23 | P-16 | | CH | 20.2 | 101.8 | 23.5 | 101.7 | 125.6 | 6 | 100 | 95 | 0 / 10 | A |
| 2751 | | 08/22/23 | P-21-std | A | CL | 18.1 | 106.3 | 21.5 | 105.8 | 128.5 | 6 | 100 | 95 | 0 / 10 | A |
| 2752 | | 08/22/23 | P-16 | | CH | 20.2 | 101.8 | 23.9 | 101.4 | 125.6 | 6 | 100 | 95 | 0 / 10 | A |
| 2753 | | 08/22/23 | P-01 | | CH | 19.4 | 100.8 | 19.8 | 98.6 | 118.1 | 6 | 98 | 95 | 0 / 10 | A |
| 2754 | | 08/22/23 | P-03 | | CH | 20.2 | 99.3 | 23.9 | 99.5 | 123.3 | 6 | 100 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2747 | Select Clay: Wall Zone 18 | 167.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2748 | Select Clay: Wall Zone 19 | 138.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2749 | Select Clay: Wall Zone 20 | 138.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2750 | Select Clay: Wall Zone 52 | 138.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2751 | Select Clay: Wall Zone 53 | 138.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2752 | Select Clay: Wall Zone 54 | 138.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2753 | Select Clay: Wall Zone 56 | 102.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2754 | Select Clay: Wall Zone 57 | 102.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/23/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2755 | | 08/22/23 | P-21-std | A | CL | 18.1 | 106.3 | 20.7 | 107.5 | 129.8 | 6 | 101 | 95 | 0 / 10 | A |
| 2756 | | 08/22/23 | P-19 | | CH | 18.4 | 105.0 | 20.2 | 104.7 | 125.8 | 6 | 100 | 95 | 0 / 10 | A |
| 2757 | | 08/22/23 | P-16 | | CH | 20.2 | 101.8 | 22.8 | 102.6 | 126.0 | 6 | 101 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2755 | Select Clay: Wall Zone 58 | 102.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2756 | Select Clay: Wall Zone 59 | 102.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2757 | Select Clay: Wall Zone 60 | 102.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Kurt Kuechle
08/23/2023

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/25/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2758 | | 08/24/23 | P-19 | | CH | 18.4 | 105.0 | 19.2 | 101.7 | 121.2 | 6 | 97 | 95 | 0 / 10 | A |
| 2759 | | 08/24/23 | P-03 | | CH | 20.2 | 99.3 | 21.3 | 99.2 | 120.3 | 6 | 100 | 95 | 0 / 10 | A |
| 2760 | | 08/24/23 | P-21-std | A | CL | 18.1 | 106.3 | 20.1 | 108.2 | 130.0 | 6 | 102 | 95 | 0 / 10 | A |
| 2761 | | 08/24/23 | P-19 | | CH | 18.4 | 105.0 | 22.1 | 105.7 | 129.1 | 6 | 101 | 95 | 0 / 10 | A |
| 2762 | | 08/24/23 | P-19 | | CH | 18.4 | 105.0 | 21.3 | 104.9 | 127.2 | 6 | 100 | 95 | 0 / 10 | A |
| 2763 | | 08/24/23 | P-19 | | CH | 18.4 | 105.0 | 19.0 | 103.0 | 122.6 | 6 | 98 | 95 | 0 / 10 | A |
| 2764 | | 08/24/23 | P-19 | | CH | 18.4 | 105.0 | 20.0 | 105.6 | 126.7 | 6 | 101 | 95 | 0 / 10 | A |
| 2765 | | 08/24/23 | P-16 | | CH | 20.2 | 101.8 | 22.0 | 101.5 | 123.8 | 6 | 100 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2758 | Select Clay: Wall Zone 18 | 168.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2759 | Select Clay: Wall Zone 19 | 139.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2760 | Select Clay: Wall Zone 20 | 139.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2761 | Select Clay: Wall Zone 52 | 139.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2762 | Select Clay: Wall Zone 53 | 139.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2763 | Select Clay: Wall Zone 54 | 139.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2764 | Select Clay: Wall Zone 18 | 169.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2765 | Select Clay: Wall Zone 19 | 140.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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# Field Compaction Report

**Report Date:** 08/25/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2766 | | 08/24/23 | P-21-std | A | CL | 18.1 | 106.3 | 20.9 | 106.7 | 129.0 | 6 | 100 | 95 | 0 / 10 | A |
| 2767 | | 08/24/23 | P-03 | | CH | 20.2 | 99.3 | 20.5 | 99.3 | 119.7 | 6 | 100 | 95 | 0 / 10 | A |
| 2768 | | 08/24/23 | P-21-std | A | CL | 18.1 | 106.3 | 19.6 | 106.9 | 127.9 | 6 | 101 | 95 | 0 / 10 | A |
| 2769 | | 08/24/23 | P-16 | | CH | 20.2 | 101.8 | 22.7 | 101.3 | 124.3 | 6 | 100 | 95 | 0 / 10 | A |
| 2770 | | 08/24/23 | P-16 | | CH | 20.2 | 101.8 | 22.5 | 102.2 | 125.2 | 6 | 100 | 95 | 0 / 10 | A |
| 2771 | | 08/24/23 | P-16 | | CH | 20.2 | 101.8 | 22.9 | 101.4 | 124.6 | 6 | 100 | 95 | 0 / 10 | A |
| 2772 | | 08/24/23 | P-01 | | CH | 19.4 | 100.8 | 20.3 | 103.6 | 124.6 | 6 | 103 | 95 | 0 / 10 | A |
| 2773 | | 08/24/23 | P-01 | | CH | 19.4 | 100.8 | 19.7 | 99.8 | 119.5 | 6 | 99 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2766 | Select Clay: Wall Zone 20 | 140.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2767 | Select Clay: Wall Zone 52 | 140.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2768 | Select Clay: Wall Zone 53 | 140.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2769 | Select Clay: Wall Zone 54 | 140.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2770 | Select Clay: Wall Zone 18 | 170.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2771 | Select Clay: Wall Zone 19 | 141.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2772 | Select Clay: Wall Zone 20 | 141.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2773 | Select Clay: Wall Zone 52 | 141.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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# Field Compaction Report

**Report Date:** 08/25/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2774 | | 08/24/23 | P-03 | | CH | 20.2 | 99.3 | 23.8 | 98.4 | 121.8 | 6 | 99 | 95 | 0 / 10 | A |
| 2775 | | 08/24/23 | P-03 | | CH | 20.2 | 99.3 | 23.7 | 98.0 | 121.2 | 6 | 99 | 95 | 0 / 10 | A |
| 2776 | | 08/24/23 | P-16 | | CH | 20.2 | 101.8 | 22.0 | 101.8 | 124.2 | 6 | 100 | 95 | 0 / 10 | A |
| 2777 | | 08/24/23 | P-16 | | CH | 20.2 | 101.8 | 23.2 | 102.8 | 126.7 | 6 | 101 | 95 | 0 / 10 | A |
| 2778 | | 08/24/23 | P-01 | | CH | 19.4 | 100.8 | 20.1 | 100.3 | 120.5 | 6 | 100 | 95 | 0 / 10 | A |
| 2779 | | 08/24/23 | P-16 | | CH | 20.2 | 101.8 | 23.1 | 101.6 | 125.1 | 6 | 100 | 95 | 0 / 10 | A |
| 2780 | | 08/24/23 | P-03 | | CH | 20.2 | 99.3 | 22.6 | 98.6 | 120.9 | 6 | 99 | 95 | 0 / 10 | A |
| 2781 | | 08/24/23 | P-16 | | CH | 20.2 | 101.8 | 22.0 | 103.2 | 125.9 | 6 | 101 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2774 | Select Clay: Wall Zone 53 | 141.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2775 | Select Clay: Wall Zone 54 | 141.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2776 | Select Clay: Wall Zone 18 | 171.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2777 | Select Clay: Wall Zone 19 | 142.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2778 | Select Clay: Wall Zone 20 | 142.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2779 | Select Clay: Wall Zone 52 | 142.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2780 | Select Clay: Wall Zone 53 | 142.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2781 | Select Clay: Wall Zone 54 | 142.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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# Field Compaction Report

**Report Date:** 08/25/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2782 | | 08/24/23 | P-01 | | CH | 19.4 | 100.8 | 24.4 | 100.1 | 124.5 | 6 | 99 | 95 | 0 / 10 | A |
| 2783 | | 08/24/23 | P-16 | | CH | 20.2 | 101.8 | 22.0 | 103.4 | 126.1 | 6 | 102 | 95 | 0 / 10 | A |
| 2784 | | 08/24/23 | P-01 | | CH | 19.4 | 100.8 | 20.2 | 103.5 | 124.4 | 6 | 103 | 95 | 0 / 10 | A |
| 2785 | | 08/24/23 | P-19 | | CH | 18.4 | 105.0 | 20.0 | 104.5 | 125.4 | 6 | 100 | 95 | 0 / 10 | A |
| 2786 | | 08/24/23 | P-03 | | CH | 20.2 | 99.3 | 25.3 | 97.4 | 122.0 | 6 | 98 | 95 | 0 / 10 | A |
| 2787 | | 08/24/23 | P-16 | | CH | 20.2 | 101.8 | 22.0 | 103.5 | 126.3 | 6 | 102 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2782 | Select Clay: Wall Zone 18 | 172.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2783 | Select Clay: Wall Zone 19 | 143.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2784 | Select Clay: Wall Zone 20 | 143.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2785 | Select Clay: Wall Zone 52 | 143.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2786 | Select Clay: Wall Zone 53 | 143.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2787 | Select Clay: Wall Zone 54 | 143.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Kurt Kuechle
08/25/2023

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2908 Morrison Ave.
Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/28/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2788 | | 08/25/23 | P-16 | | CH | 20.2 | 101.8 | 21.5 | 104.5 | 127.0 | 6 | 103 | 95 | 0 / 10 | A |
| 2789 | | 08/25/23 | P-19 | | CH | 18.4 | 105.0 | 20.2 | 104.5 | 125.6 | 6 | 100 | 95 | 0 / 10 | A |
| 2790 | | 08/25/23 | P-16 | | CH | 20.2 | 101.8 | 24.2 | 101.7 | 126.3 | 6 | 100 | 95 | 0 / 10 | A |
| 2791 | | 08/25/23 | P-03 | | CH | 20.2 | 99.3 | 25.1 | 95.9 | 120.0 | 6 | 97 | 95 | 0 / 10 | A |
| 2792 | | 08/25/23 | P-03 | | CH | 20.2 | 99.3 | 22.7 | 99.3 | 121.8 | 6 | 100 | 95 | 0 / 10 | A |
| 2793 | | 08/25/23 | P-03 | | CH | 20.2 | 99.3 | 25.3 | 97.6 | 122.3 | 6 | 98 | 95 | 0 / 10 | A |
| 2794 | | 08/25/23 | P-16 | | CH | 20.2 | 101.8 | 21.9 | 101.6 | 123.9 | 6 | 100 | 95 | 0 / 10 | A |
| 2795 | | 08/25/23 | P-16 | | CH | 20.2 | 101.8 | 23.7 | 101.1 | 125.1 | 6 | 99 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2788 | Select Clay: Wall Zone 57 | 103.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2789 | Select Clay: Wall Zone 56 | 103.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2790 | Select Clay: Wall Zone 58 | 103.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2791 | Select Clay: Wall Zone 59 | 103.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2792 | Select Clay: Wall Zone 18 | 173.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2793 | Select Clay: Wall Zone 19 | 144.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2794 | Select Clay: Wall Zone 20 | 144.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2795 | Select Clay: Wall Zone 52 | 144.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/28/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2796 | | 08/25/23 | P-07 | | CH | 22.6 | 93.8 | 27.7 | 92.0 | 117.5 | 6 | 98 | 95 | 0 / 10 | A |
| 2797 | | 08/25/23 | P-19 | | CH | 18.4 | 105.0 | 19.1 | 105.5 | 125.6 | 6 | 100 | 95 | 0 / 10 | A |
| ~~2798~~ | | ~~08/25/23~~ | ~~P-03~~ | | ~~CH~~ | ~~20.2~~ | ~~99.3~~ | ~~23.5~~ | ~~97.3~~ | ~~120.2~~ | ~~6~~ | ~~98~~ | ~~95~~ | ~~0 / 10~~ | ~~A~~ |
| 2799 | | 08/25/23 | P-03 | | CH | 20.2 | 99.3 | 21.9 | 96.5 | 117.6 | 6 | 97 | 95 | 0 / 10 | A |
| 2800 | | 08/25/23 | P-03 | | CH | 20.2 | 99.3 | 25.1 | 94.5 | 118.2 | 6 | 95 | 95 | 0 / 10 | A |
| 2801 | | 08/25/23 | P-01 | | CH | 19.4 | 100.8 | 24.3 | 100.0 | 124.3 | 6 | 99 | 95 | 0 / 10 | A |
| 2802 | | 08/25/23 | P-16 | | CH | 20.2 | 101.8 | 21.4 | 101.8 | 123.6 | 6 | 100 | 95 | 0 / 10 | A |
| 2803 | | 08/25/23 | P-16 | | CH | 20.2 | 101.8 | 22.8 | 101.6 | 124.8 | 6 | 100 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2796 | Select Clay: Wall Zone 53 | 144.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2797 | Select Clay: Wall Zone 54 | 144.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| ~~2798~~ | ~~Select Clay: Wall Zone 55~~ | ~~118.0~~ | ~~Lift number~~ | ~~InstroTek / 3500 / 1908 /~~ | ~~Bruce, Dalton~~ |
| 2799 | Select Clay: Wall Zone 56 | 104.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2800 | Select Clay: Wall Zone 57 | 104.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2801 | Select Clay: Wall Zone 58 | 104.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2802 | Select Clay: Wall Zone 59 | 104.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2803 | Select Clay: Wall Zone 18 | 174.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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# Field Compaction Report

**Report Date:** 08/31/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

**Test Results**

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2798 | | 08/25/23 | P-03 | | CH | 20.2 | 99.3 | 23.5 | 97.3 | 120.2 | 6 | 98 | 95 | 0 / 10 | A |

**Test Information**

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2798 | Select Clay: Wall Zone 55 | 117.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Kurt Kuechle
08/31/2023

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# Field Compaction Report

**Report Date:** 08/28/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2804 | | 08/25/23 | P-03 | | CH | 20.2 | 99.3 | 24.4 | 97.3 | 121.0 | 6 | 98 | 95 | 0 / 10 | A |
| 2805 | | 08/25/23 | P-19 | | CH | 18.4 | 105.0 | 19.4 | 103.8 | 123.9 | 6 | 99 | 95 | 0 / 10 | A |
| 2806 | | 08/25/23 | P-03 | | CH | 20.2 | 99.3 | 23.3 | 99.4 | 122.6 | 6 | 100 | 95 | 0 / 10 | A |
| 2807 | | 08/25/23 | P-03 | | CH | 20.2 | 99.3 | 25.1 | 97.0 | 121.3 | 6 | 98 | 95 | 0 / 10 | A |
| 2808 | | 08/25/23 | P-16 | | CH | 20.2 | 101.8 | 22.0 | 103.2 | 125.9 | 6 | 101 | 95 | 0 / 10 | A |
| ~~2809~~ | | ~~08/25/23~~ | ~~P-03~~ | | ~~CH~~ | ~~20.2~~ | ~~99.3~~ | ~~24.4~~ | ~~96.6~~ | ~~120.2~~ | ~~6~~ | ~~97~~ | ~~95~~ | ~~0 / 10~~ | ~~A~~ |
| 2810 | | 08/25/23 | P-16 | | CH | 20.2 | 101.8 | 22.4 | 102.3 | 125.2 | 6 | 100 | 95 | 0 / 10 | A |
| 2811 | | 08/25/23 | P-03 | | CH | 20.2 | 99.3 | 25.1 | 98.2 | 122.8 | 6 | 99 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2804 | Select Clay: Wall Zone 19 | 145.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2805 | Select Clay: Wall Zone 20 | 145.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2806 | Select Clay: Wall Zone 52 | 145.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2807 | Select Clay: Wall Zone 53 | 145.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2808 | Select Clay: Wall Zone 54 | 145.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| ~~2809~~ | ~~Select Clay: Wall Zone 55~~ | ~~119.0~~ | ~~Lift number~~ | ~~InstroTek / 3500 / 1908 /~~ | ~~Bruce, Dalton~~ |
| 2810 | Select Clay: Wall Zone 56 | 105.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2811 | Select Clay: Wall Zone 57 | 105.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/31/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2809 | | 08/25/23 | P-03 | | CH | 20.2 | 99.3 | 24.4 | 96.6 | 120.2 | 6 | 97 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2809 | Select Clay: Wall Zone 55 | 118.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Kurt Kuechle
08/31/2023

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# Field Compaction Report

**Report Date:** 08/28/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2812 | | 08/25/23 | P-03 | | CH | 20.2 | 99.3 | 25.4 | 97.3 | 122.0 | 6 | 98 | 95 | 0 / 10 | A |
| 2813 | | 08/25/23 | P-16 | | CH | 20.2 | 101.8 | 23.2 | 102.0 | 125.7 | 6 | 100 | 95 | 0 / 10 | A |
| 2814 | | 08/25/23 | P-01 | | CH | 19.4 | 100.8 | 20.6 | 102.4 | 123.5 | 6 | 102 | 95 | 0 / 10 | A |
| 2815 | | 08/25/23 | P-16 | | CH | 20.2 | 101.8 | 21.2 | 102.8 | 124.6 | 6 | 101 | 95 | 0 / 10 | A |
| 2816 | | 08/25/23 | P-21-std | A | CL | 18.1 | 106.3 | 21.3 | 105.7 | 128.2 | 6 | 99 | 95 | 0 / 10 | A |
| 2817 | | 08/25/23 | P-03 | | CH | 20.2 | 99.3 | 23.8 | 96.8 | 119.8 | 6 | 97 | 95 | 0 / 10 | A |
| 2818 | | 08/25/23 | P-01 | | CH | 19.4 | 100.8 | 21.0 | 102.4 | 123.9 | 6 | 102 | 95 | 0 / 10 | A |
| 2819 | | 08/25/23 | P-01 | | CH | 19.4 | 100.8 | 23.1 | 100.3 | 123.5 | 6 | 100 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2812 | Select Clay: Wall Zone 58 | 105.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2813 | Select Clay: Wall Zone 59 | 105.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2814 | Select Clay: Wall Zone 56 | 106.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2815 | Select Clay: Wall Zone 57 | 106.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2816 | Select Clay: Wall Zone 58 | 106.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2817 | Select Clay: Wall Zone 59 | 106.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2818 | Select Clay: Wall Zone 56 | 107.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2819 | Select Clay: Wall Zone 57 | 107.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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# Field Compaction Report

**Report Date:** 08/28/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2820 | | 08/25/23 | P-03 | | CH | 20.2 | 99.3 | 25.5 | 99.5 | 124.9 | 6 | 100 | 95 | 0 / 10 | A |
| 2821 | | 08/25/23 | P-21-std | A | CL | 18.1 | 106.3 | 19.3 | 106.7 | 127.3 | 6 | 100 | 95 | 0 / 10 | A |
| 2822 | | 08/26/23 | P-16 | | CH | 20.2 | 101.8 | 24.2 | 100.8 | 125.2 | 6 | 99 | 95 | 0 / 10 | A |
| 2823 | | 08/26/23 | P-16 | | CH | 20.2 | 101.8 | 22.7 | 103.3 | 126.7 | 6 | 101 | 95 | 0 / 10 | A |
| 2824 | | 08/26/23 | P-16 | | CH | 20.2 | 101.8 | 22.9 | 102.4 | 125.9 | 6 | 101 | 95 | 0 / 10 | A |
| 2825 | | 08/26/23 | P-03 | | CH | 20.2 | 99.3 | 26.0 | 95.1 | 119.8 | 6 | 96 | 95 | 0 / 10 | A |
| 2826 | | 08/26/23 | P-16 | | CH | 20.2 | 101.8 | 23.3 | 102.4 | 126.3 | 6 | 101 | 95 | 0 / 10 | A |
| 2827 | | 08/26/23 | P-03 | | CH | 20.2 | 99.3 | 24.1 | 98.5 | 122.2 | 6 | 99 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2820 | Select Clay: Wall Zone 58 | 107.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2821 | Select Clay: Wall Zone 59 | 107.0 | Lift number | InstroTek / 3500 / 1908 / | Bruce, Dalton |
| 2822 | Select Clay: Wall Zone 57 | 108.0 | Lift number | Troxler / 3430 / 23996 / | Ficek, Kevin |
| 2823 | Select Clay: Wall Zone 58 | 108.0 | Lift number | Troxler / 3430 / 23996 / | Ficek, Kevin |
| 2824 | Select Clay: Wall Zone 59 | 108.0 | Lift number | Troxler / 3430 / 23996 / | Ficek, Kevin |
| 2825 | Select Clay: Wall Zone 60 | 103.0 | Lift number | Troxler / 3430 / 23996 / | Ficek, Kevin |
| 2826 | Select Clay: Wall Zone 56 | 108.0 | Lift number | Troxler / 3430 / 23996 / | Ficek, Kevin |
| 2827 | Select Clay: Wall Zone 57 | 109.0 | Lift number | Troxler / 3430 / 23996 / | Ficek, Kevin |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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# Field Compaction Report

**Report Date:** 08/28/2023
**Test Method:** ASTM D6938

**Client:**
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5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2828 | | 08/26/23 | P-03 | | CH | 20.2 | 99.3 | 24.4 | 95.0 | 118.2 | 6 | 96 | 95 | 0 / 10 | A |
| 2829 | | 08/26/23 | P-03 | | CH | 20.2 | 99.3 | 23.7 | 95.3 | 117.9 | 6 | 96 | 95 | 0 / 10 | A |
| 2830 | | 08/26/23 | P-03 | | CH | 20.2 | 99.3 | 24.2 | 98.9 | 122.8 | 6 | 100 | 95 | 0 / 10 | A |
| 2831 | | 08/26/23 | P-03 | | CH | 20.2 | 99.3 | 23.7 | 98.4 | 121.7 | 6 | 99 | 95 | 0 / 10 | A |
| 2832 | | 08/26/23 | P-16 | | CH | 20.2 | 101.8 | 22.7 | 102.1 | 125.3 | 6 | 100 | 95 | 0 / 10 | A |
| 2833 | | 08/26/23 | P-16 | | CH | 20.2 | 101.8 | 24.7 | 98.8 | 123.2 | 6 | 97 | 95 | 0 / 10 | A |
| 2834 | | 08/26/23 | P-16 | | CH | 20.2 | 101.8 | 24.5 | 99.5 | 123.9 | 6 | 98 | 95 | 0 / 10 | A |
| 2835 | | 08/26/23 | P-16 | | CH | 20.2 | 101.8 | 22.4 | 104.1 | 127.4 | 6 | 102 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2828 | Select Clay: Wall Zone 58 | 109.0 | Lift number | Troxler / 3430 / 23996 / | Ficek, Kevin |
| 2829 | Select Clay: Wall Zone 59 | 109.0 | Lift number | Troxler / 3430 / 23996 / | Ficek, Kevin |
| 2830 | Select Clay: Wall Zone 60 | 104.0 | Lift number | Troxler / 3430 / 23996 / | Ficek, Kevin |
| 2831 | Select Clay: Wall Zone 56 | 109.0 | Lift number | Troxler / 3430 / 23996 / | Ficek, Kevin |
| 2832 | Select Clay: Wall Zone 57 | 110.0 | Lift number | Troxler / 3430 / 23996 / | Ficek, Kevin |
| 2833 | Select Clay: Wall Zone 58 | 110.0 | Lift number | Troxler / 3430 / 23996 / | Ficek, Kevin |
| 2834 | Select Clay: Wall Zone 59 | 110.0 | Lift number | Troxler / 3430 / 23996 / | Ficek, Kevin |
| 2835 | Select Clay: Wall Zone 60 | 105.0 | Lift number | Troxler / 3430 / 23996 / | Ficek, Kevin |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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2908 Morrison Ave.
Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/28/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2836 | | 08/26/23 | P-16 | | CH | 20.2 | 101.8 | 23.1 | 101.3 | 124.7 | 6 | 100 | 95 | 0 / 10 | A |
| 2837 | | 08/26/23 | P-16 | | CH | 20.2 | 101.8 | 24.3 | 100.5 | 124.9 | 6 | 99 | 95 | 0 / 10 | A |
| 2838 | | 08/26/23 | P-16 | | CH | 20.2 | 101.8 | 26.3 | 96.4 | 121.8 | 6 | 95 | 95 | 0 / 10 | A |
| 2839 | | 08/26/23 | P-16 | | CH | 20.2 | 101.8 | 23.1 | 102.8 | 126.5 | 6 | 101 | 95 | 0 / 10 | A |
| 2840 | | 08/26/23 | P-16 | | CH | 20.2 | 101.8 | 23.6 | 101.7 | 125.7 | 6 | 100 | 95 | 0 / 10 | A |
| 2841 | | 08/26/23 | P-16 | | CH | 20.2 | 101.8 | 23.2 | 102.9 | 126.8 | 6 | 101 | 95 | 0 / 10 | A |
| 2842 | | 08/26/23 | P-16 | | CH | 20.2 | 101.8 | 24.0 | 100.2 | 124.2 | 6 | 98 | 95 | 0 / 10 | A |
| 2843 | | 08/26/23 | P-16 | | CH | 20.2 | 101.8 | 23.4 | 98.8 | 121.9 | 6 | 97 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2836 | Select Clay: Wall Zone 56 | 110.0 | Lift number | Troxler / 3430 / 23996 / | Ficek, Kevin |
| 2837 | Select Clay: Wall Zone 57 | 111.0 | Lift number | Troxler / 3430 / 23996 / | Ficek, Kevin |
| 2838 | Select Clay: Wall Zone 58 | 111.0 | Lift number | Troxler / 3430 / 23996 / | Ficek, Kevin |
| 2839 | Select Clay: Wall Zone 59 | 111.0 | Lift number | Troxler / 3430 / 23996 / | Ficek, Kevin |
| 2840 | Select Clay: Wall Zone 56 | 111.0 | Lift number | Troxler / 3430 / 23996 / | Ficek, Kevin |
| 2841 | Select Clay: Wall Zone 57 | 112.0 | Lift number | Troxler / 3430 / 23996 / | Ficek, Kevin |
| 2842 | Select Clay: Wall Zone 58 | 112.0 | Lift number | Troxler / 3430 / 23996 / | Ficek, Kevin |
| 2843 | Select Clay: Wall Zone 59 | 112.0 | Lift number | Troxler / 3430 / 23996 / | Ficek, Kevin |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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# Field Compaction Report

**Report Date:** 08/28/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2844 | | 08/26/23 | P-16 | | CH | 20.2 | 101.8 | 22.9 | 102.7 | 126.2 | 6 | 101 | 95 | 0 / 10 | A |
| 2845 | | 08/26/23 | P-16 | | CH | 20.2 | 101.8 | 21.5 | 99.7 | 121.1 | 6 | 98 | 95 | 0 / 10 | A |
| 2846 | | 08/26/23 | P-16 | | CH | 20.2 | 101.8 | 23.4 | 102.4 | 126.4 | 6 | 101 | 95 | 0 / 10 | A |
| 2847 | | 08/26/23 | P-16 | | CH | 20.2 | 101.8 | 22.2 | 102.0 | 124.6 | 6 | 100 | 95 | 0 / 10 | A |
| 2848 | | 08/26/23 | P-16 | | CH | 20.2 | 101.8 | 21.7 | 100.9 | 122.8 | 6 | 99 | 95 | 0 / 10 | A |
| 2849 | | 08/26/23 | P-16 | | CH | 20.2 | 101.8 | 22.4 | 103.7 | 126.9 | 6 | 102 | 95 | 0 / 10 | A |
| 2850 | | 08/26/23 | P-16 | | CH | 20.2 | 101.8 | 24.4 | 100.7 | 125.3 | 6 | 99 | 95 | 0 / 10 | A |
| 2851 | | 08/26/23 | P-16 | | CH | 20.2 | 101.8 | 24.5 | 96.9 | 120.6 | 6 | 95 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2844 | Select Clay: Wall Zone 60 | 106.0 | Lift number | Troxler / 3430 / 23996 / | Ficek, Kevin |
| 2845 | Select Clay: Wall Zone 56 | 112.0 | Lift number | Troxler / 3430 / 23996 / | Ficek, Kevin |
| 2846 | Select Clay: Wall Zone 57 | 113.0 | Lift number | Troxler / 3430 / 23996 / | Ficek, Kevin |
| 2847 | Select Clay: Wall Zone 58 | 113.0 | Lift number | Troxler / 3430 / 23996 / | Ficek, Kevin |
| 2848 | Select Clay: Wall Zone 59 | 113.0 | Lift number | Troxler / 3430 / 23996 / | Ficek, Kevin |
| 2849 | Select Clay: Wall Zone 60 | 107.0 | Lift number | Troxler / 3430 / 23996 / | Ficek, Kevin |
| 2850 | Select Clay: Wall Zone 56 | 113.0 | Lift number | Troxler / 3430 / 23996 / | Ficek, Kevin |
| 2851 | Select Clay: Wall Zone 57 | 114.0 | Lift number | Troxler / 3430 / 23996 / | Ficek, Kevin |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/28/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2852 | | 08/26/23 | P-16 | | CH | 20.2 | 101.8 | 22.5 | 102.3 | 125.3 | 6 | 100 | 95 | 0 / 10 | A |
| 2853 | | 08/26/23 | P-16 | | CH | 20.2 | 101.8 | 21.8 | 102.5 | 124.8 | 6 | 101 | 95 | 0 / 10 | A |
| 2854 | | 08/26/23 | P-16 | | CH | 20.2 | 101.8 | 24.4 | 100.6 | 125.1 | 6 | 99 | 95 | 0 / 10 | A |
| 2855 | | 08/26/23 | P-16 | | CH | 20.2 | 101.8 | 23.4 | 101.3 | 125.0 | 6 | 100 | 95 | 0 / 10 | A |
| 2856 | | 08/26/23 | P-16 | | CH | 20.2 | 101.8 | 24.4 | 98.1 | 122.0 | 6 | 96 | 95 | 0 / 10 | A |
| 2857 | | 08/26/23 | P-16 | | CH | 20.2 | 101.8 | 24.2 | 99.9 | 124.1 | 6 | 98 | 95 | 0 / 10 | A |
| 2858 | | 08/26/23 | P-07 | | CH | 22.6 | 93.8 | 26.0 | 93.5 | 117.8 | 6 | 100 | 95 | 0 / 10 | A |
| 2859 | | 08/26/23 | P-07 | | CH | 22.6 | 93.8 | 28.1 | 92.6 | 118.6 | 6 | 99 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2852 | Select Clay: Wall Zone 58 | 114.0 | Lift number | Troxler / 3430 / 23996 / | Ficek, Kevin |
| 2853 | Select Clay: Wall Zone 59 | 114.0 | Lift number | Troxler / 3430 / 23996 / | Ficek, Kevin |
| 2854 | Select Clay: Wall Zone 60 | 108.0 | Lift number | Troxler / 3430 / 23996 / | Ficek, Kevin |
| 2855 | Select Clay: Wall Zone 56 | 114.0 | Lift number | Troxler / 3430 / 23996 / | Ficek, Kevin |
| 2856 | Select Clay: Wall Zone 57 | 115.0 | Lift number | Troxler / 3430 / 23996 / | Ficek, Kevin |
| 2857 | Select Clay: Wall Zone 58 | 115.0 | Lift number | Troxler / 3430 / 23996 / | Ficek, Kevin |
| 2858 | Select Clay: Wall Zone 59 | 115.0 | Lift number | Troxler / 3430 / 23996 / | Ficek, Kevin |
| 2859 | Select Clay: Wall Zone 60 | 109.0 | Lift number | Troxler / 3430 / 23996 / | Ficek, Kevin |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/28/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2860 | | 08/26/23 | P-07 | | CH | 22.6 | 93.8 | 30.0 | 88.9 | 115.6 | 6 | 95 | 95 | 0 / 10 | A |
| 2861 | | 08/26/23 | P-16 | | CH | 20.2 | 101.8 | 21.1 | 100.1 | 121.2 | 6 | 98 | 95 | 0 / 10 | A |
| 2862 | | 08/26/23 | P-16 | | CH | 20.2 | 101.8 | 22.2 | 100.7 | 123.1 | 6 | 99 | 95 | 0 / 10 | A |
| 2863 | | 08/26/23 | P-03 | | CH | 20.2 | 99.3 | 25.9 | 94.6 | 119.1 | 6 | 95 | 95 | 0 / 10 | A |
| 2864 | | 08/26/23 | P-16 | | CH | 20.2 | 101.8 | 22.0 | 103.2 | 125.9 | 6 | 101 | 95 | 0 / 10 | A |
| 2865 | | 08/26/23 | P-16 | | CH | 20.2 | 101.8 | 20.4 | 102.3 | 123.2 | 6 | 100 | 95 | 0 / 10 | A |
| 2866 | | 08/26/23 | P-16 | | CH | 20.2 | 101.8 | 25.2 | 97.5 | 122.1 | 6 | 96 | 95 | 0 / 10 | A |
| 2867 | | 08/26/23 | P-16 | | CH | 20.2 | 101.8 | 24.9 | 99.5 | 124.3 | 6 | 98 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2860 | Select Clay: Wall Zone 56 | 115.0 | Lift number | Troxler / 3430 / 23996 / | Ficek, Kevin |
| 2861 | Select Clay: Wall Zone 57 | 116.0 | Lift number | Troxler / 3430 / 23996 / | Ficek, Kevin |
| 2862 | Select Clay: Wall Zone 58 | 116.0 | Lift number | Troxler / 3430 / 23996 / | Ficek, Kevin |
| 2863 | Select Clay: Wall Zone 59 | 116.0 | Lift number | Troxler / 3430 / 23996 / | Ficek, Kevin |
| 2864 | Select Clay: Wall Zone 60 | 110.0 | Lift number | Troxler / 3430 / 23996 / | Ficek, Kevin |
| 2865 | Select Clay: Wall Zone 56 | 116.0 | Lift Number | Troxler / 3430 / 23996 / | Ficek, Kevin |
| 2866 | Select Clay: Wall Zone 57 | 117.0 | Lift Number | Troxler / 3430 / 23996 / | Ficek, Kevin |
| 2867 | Select Clay: Wall Zone 58 | 117.0 | Lift Number | Troxler / 3430 / 23996 / | Ficek, Kevin |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/28/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2868 | | 08/26/23 | P-16 | | CH | 20.2 | 101.8 | 23.2 | 96.3 | 118.6 | 6 | 95 | 95 | 0 / 10 | A |
| 2869 | | 08/26/23 | P-16 | | CH | 20.2 | 101.8 | 20.9 | 103.3 | 124.9 | 6 | 101 | 95 | 0 / 10 | A |
| 2870 | | 08/26/23 | P-16 | | CH | 20.2 | 101.8 | 22.3 | 100.6 | 123.0 | 6 | 99 | 95 | 0 / 10 | A |
| 2871 | | 08/26/23 | P-16 | | CH | 20.2 | 101.8 | 23.3 | 100.4 | 123.8 | 6 | 99 | 95 | 0 / 10 | A |
| 2872 | | 08/26/23 | P-16 | | CH | 20.2 | 101.8 | 22.5 | 99.2 | 121.5 | 6 | 97 | 95 | 0 / 10 | A |
| 2873 | | 08/26/23 | P-16 | | CH | 20.2 | 101.8 | 24.0 | 100.7 | 124.9 | 6 | 99 | 95 | 0 / 10 | A |
| 2874 | | 08/26/23 | P-16 | | CH | 20.2 | 101.8 | 22.4 | 102.3 | 125.2 | 6 | 100 | 95 | 0 / 10 | A |
| 2875 | | 08/26/23 | P-16 | | CH | 20.2 | 101.8 | 22.2 | 102.7 | 125.5 | 6 | 101 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2868 | Select Clay: Wall Zone 59 | 117.0 | Lift Number | Troxler / 3430 / 23996 / | Ficek, Kevin |
| 2869 | Select Clay: Wall Zone 60 | 111.0 | Lift Number | Troxler / 3430 / 23996 / | Ficek, Kevin |
| 2870 | Select Clay: Wall Zone 56 | 117.0 | Lift Number | Troxler / 3430 / 23996 / | Ficek, Kevin |
| 2871 | Select Clay: Wall Zone 57 | 118.0 | Lift Number | Troxler / 3430 / 23996 / | Ficek, Kevin |
| 2872 | Select Clay: Wall Zone 58 | 118.0 | Lift Number | Troxler / 3430 / 23996 / | Ficek, Kevin |
| 2873 | Select Clay: Wall Zone 59 | 118.0 | Lift Number | Troxler / 3430 / 23996 / | Ficek, Kevin |
| 2874 | Select Clay: Wall Zone 60 | 112.0 | Lift Number | Troxler / 3430 / 23996 / | Ficek, Kevin |
| 2875 | Select Clay: Wall Zone 56 | 118.0 | Lift Number | Troxler / 3430 / 23996 / | Ficek, Kevin |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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# Field Compaction Report

**Report Date:** 08/28/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2876 | | 08/26/23 | P-16 | | CH | 20.2 | 101.8 | 24.0 | 100.7 | 124.9 | 6 | 99 | 95 | 0 / 10 | A |
| 2877 | | 08/26/23 | P-16 | | CH | 20.2 | 101.8 | 23.2 | 98.6 | 121.5 | 6 | 97 | 95 | 0 / 10 | A |
| 2878 | | 08/26/23 | P-16 | | CH | 20.2 | 101.8 | 21.4 | 99.8 | 121.2 | 6 | 98 | 95 | 0 / 10 | A |
| 2879 | | 08/26/23 | P-16 | | CH | 20.2 | 101.8 | 22.1 | 96.5 | 117.8 | 6 | 95 | 95 | 0 / 10 | A |
| 2880 | | 08/27/23 | P-16 | | CH | 20.2 | 101.8 | 23.1 | 102.9 | 126.7 | 6 | 101 | 95 | 0 / 10 | A |
| 2881 | | 08/27/23 | P-16 | | CH | 20.2 | 101.8 | 24.3 | 101.9 | 126.7 | 6 | 100 | 95 | 0 / 10 | A |
| 2882 | | 08/27/23 | P-16 | | CH | 20.2 | 101.8 | 22.1 | 99.1 | 121.0 | 6 | 97 | 95 | 0 / 10 | A |
| 2883 | | 08/27/23 | P-16 | | CH | 20.2 | 101.8 | 21.9 | 102.4 | 124.8 | 6 | 101 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2876 | Select Clay: Wall Zone 57 | 119.0 | Lift Number | Troxler / 3430 / 23996 / | Ficek, Kevin |
| 2877 | Select Clay: Wall Zone 58 | 119.0 | Lift Number | Troxler / 3430 / 23996 / | Ficek, Kevin |
| 2878 | Select Clay: Wall Zone 59 | 119.0 | Lift Number | Troxler / 3430 / 23996 / | Ficek, Kevin |
| 2879 | Select Clay: Wall Zone 60 | 113.0 | Lift Number | Troxler / 3430 / 23996 / | Ficek, Kevin |
| 2880 | Select Clay: Wall Zone 56 | 119.0 | Lift Number | Troxler / 3430 / 23996 / | Ficek, Kevin |
| 2881 | Select Clay: Wall Zone 57 | 120.0 | Lift Number | Troxler / 3430 / 23996 / | Ficek, Kevin |
| 2882 | Select Clay: Wall Zone 58 | 120.0 | Lift Number | Troxler / 3430 / 23996 / | Ficek, Kevin |
| 2883 | Select Clay: Wall Zone 59 | 120.0 | Lift Number | Troxler / 3430 / 23996 / | Ficek, Kevin |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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# Field Compaction Report

**Report Date:** 08/28/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2884 | | 08/27/23 | P-16 | | CH | 20.2 | 101.8 | 23.1 | 100.6 | 123.8 | 6 | 99 | 95 | 0 / 10 | A |
| 2885 | | 08/27/23 | P-16 | | CH | 20.2 | 101.8 | 25.1 | 99.9 | 125.0 | 6 | 98 | 95 | 0 / 10 | A |
| 2886 | | 08/27/23 | P-16 | | CH | 20.2 | 101.8 | 22.0 | 100.2 | 122.2 | 6 | 98 | 95 | 0 / 10 | A |
| 2887 | | 08/27/23 | P-16 | | CH | 20.2 | 101.8 | 23.0 | 99.7 | 122.6 | 6 | 98 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2884 | Select Clay: Wall Zone 60 | 114.0 | Lift Number | Troxler / 3430 / 23996 / | Ficek, Kevin |
| 2885 | Select Clay: Wall Zone 56 | 120.0 | Lift Number | Troxler / 3430 / 23996 / | Ficek, Kevin |
| 2886 | Select Clay: Wall Zone 57 | 121.0 | Lift Number | Troxler / 3430 / 23996 / | Ficek, Kevin |
| 2887 | Select Clay: Wall Zone 58 | 121.0 | Lift Number | Troxler / 3430 / 23996 / | Ficek, Kevin |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Kurt Kuechle
08/28/2023

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BRAUN INTERTEC
The Science You Build On.

2908 Morrison Ave.
Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/28/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2888 | | 08/27/23 | P-16 | | CH | 20.2 | 101.8 | 22.3 | 102.3 | 125.1 | 6 | 100 | 95 | 0 / 10 | A |
| 2889 | | 08/27/23 | P-16 | | CH | 20.2 | 101.8 | 21.2 | 101.1 | 122.5 | 6 | 99 | 95 | 0 / 10 | A |
| 2890 | | 08/27/23 | P-16 | | CH | 20.2 | 101.8 | 22.9 | 102.2 | 125.6 | 6 | 100 | 95 | 0 / 10 | A |
| 2891 | | 08/27/23 | P-16 | | CH | 20.2 | 101.8 | 25.4 | 97.6 | 122.4 | 6 | 96 | 95 | 0 / 10 | A |
| 2892 | | 08/27/23 | P-16 | | CH | 20.2 | 101.8 | 23.2 | 103.2 | 127.1 | 6 | 101 | 95 | 0 / 10 | A |
| 2893 | | 08/27/23 | P-16 | | CH | 20.2 | 101.8 | 23.2 | 103.1 | 127.0 | 6 | 101 | 95 | 0 / 10 | A |
| 2894 | | 08/27/23 | P-16 | | CH | 20.2 | 101.8 | 22.6 | 101.6 | 124.6 | 6 | 100 | 95 | 0 / 10 | A |
| ~~2895~~ | | ~~08/27/23~~ | ~~P-16~~ | | ~~CH~~ | ~~20.2~~ | ~~101.8~~ | ~~21.8~~ | ~~103.1~~ | ~~125.6~~ | ~~6~~ | ~~101~~ | ~~95~~ | ~~0 / 10~~ | ~~A~~ |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2888 | Select Clay: Wall Zone 59 | 121.0 | Lift Number | Troxler / 3430 / 23996 / | Ficek, Kevin |
| 2889 | Select Clay: Wall Zone 60 | 115.0 | Lift Number | Troxler / 3430 / 23996 / | Ficek, Kevin |
| 2890 | Select Clay: Wall Zone 56 | 121.0 | Lift Number | Troxler / 3430 / 23996 / | Ficek, Kevin |
| 2891 | Select Clay: Wall Zone 57 | 122.0 | Lift Number | Troxler / 3430 / 23996 / | Ficek, Kevin |
| 2892 | Select Clay: Wall Zone 58 | 122.0 | Lift Number | Troxler / 3430 / 23996 / | Ficek, Kevin |
| 2893 | Select Clay: Wall Zone 59 | 122.0 | Lift Number | Troxler / 3430 / 23996 / | Ficek, Kevin |
| 2894 | Select Clay: Wall Zone 60 | 116.0 | Lift Number | Troxler / 3430 / 23996 / | Ficek, Kevin |
| ~~2895~~ | ~~Select Clay: Wall Zone 55~~ | ~~122.0~~ | ~~Lift Number~~ | ~~Troxler / 3430 / 23996 /~~ | ~~Ficek, Kevin~~ |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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# Field Compaction Report

**Report Date:** 08/31/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

**Test Results**

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2895 | | 08/27/23 | P-16 | | CH | 20.2 | 101.8 | 21.8 | 103.1 | 125.6 | 6 | 101 | 95 | 0 / 10 | A |

**Test Information**

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2895 | Select Clay: Wall Zone 56 | 122.0 | Lift Number | Troxler / 3430 / 23996 / | Ficek, Kevin |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Kurt Kuechle
08/31/2023

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# Field Compaction Report

**Report Date:** 08/28/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2896 | | 08/27/23 | P-16 | | CH | 20.2 | 101.8 | 22.6 | 102.4 | 125.5 | 6 | 101 | 95 | 0 / 10 | A |
| 2897 | | 08/27/23 | P-16 | | CH | 20.2 | 101.8 | 26.0 | 96.5 | 121.6 | 6 | 95 | 95 | 0 / 10 | A |
| 2898 | | 08/27/23 | P-16 | | CH | 20.2 | 101.8 | 23.2 | 100.9 | 124.3 | 6 | 99 | 95 | 0 / 10 | A |
| 2899 | | 08/27/23 | P-16 | | CH | 20.2 | 101.8 | 25.4 | 98.3 | 123.3 | 6 | 97 | 95 | 0 / 10 | A |
| 2900 | | 08/27/23 | P-16 | | CH | 20.2 | 101.8 | 23.6 | 99.9 | 123.5 | 6 | 98 | 95 | 0 / 10 | A |
| 2901 | | 08/27/23 | P-16 | | CH | 20.2 | 101.8 | 23.9 | 99.5 | 123.3 | 6 | 98 | 95 | 0 / 10 | A |
| 2902 | | 08/27/23 | P-16 | | CH | 20.2 | 101.8 | 25.0 | 99.3 | 124.1 | 6 | 98 | 95 | 0 / 10 | A |
| 2903 | | 08/27/23 | P-16 | | CH | 20.2 | 101.8 | 23.6 | 99.0 | 122.4 | 6 | 97 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2896 | Select Clay: Wall Zone 57 | 123.0 | Lift Number | Troxler / 3430 / 23996 / | Ficek, Kevin |
| 2897 | Select Clay: Wall Zone 58 | 123.0 | Lift Number | Troxler / 3430 / 23996 / | Ficek, Kevin |
| 2898 | Select Clay: Wall Zone 59 | 123.0 | Lift Number | Troxler / 3430 / 23996 / | Ficek, Kevin |
| 2899 | Select Clay: Wall Zone 60 | 117.0 | Lift Number | Troxler / 3430 / 23996 / | Ficek, Kevin |
| 2900 | Select Clay: Wall Zone 56 | 123.0 | Lift Number | Troxler / 3430 / 23996 / | Ficek, Kevin |
| 2901 | Select Clay: Wall Zone 57 | 124.0 | Lift Number | Troxler / 3430 / 23996 / | Ficek, Kevin |
| 2902 | Select Clay: Wall Zone 58 | 124.0 | Lift Number | Troxler / 3430 / 23996 / | Ficek, Kevin |
| 2903 | Select Clay: Wall Zone 59 | 124.0 | Lift Number | Troxler / 3430 / 23996 / | Ficek, Kevin |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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**Report Date:** 08/28/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2904 | | 08/27/23 | P-16 | | CH | 20.2 | 101.8 | 23.3 | 101.1 | 124.7 | 6 | 99 | 95 | 0 / 10 | A |
| 2905 | | 08/27/23 | P-16 | | CH | 20.2 | 101.8 | 24.8 | 99.6 | 124.3 | 6 | 98 | 95 | 0 / 10 | A |
| 2906 | | 08/27/23 | P-16 | | CH | 20.2 | 101.8 | 23.0 | 101.5 | 124.8 | 6 | 100 | 95 | 0 / 10 | A |
| 2907 | | 08/27/23 | P-16 | | CH | 20.2 | 101.8 | 22.1 | 99.6 | 121.6 | 6 | 98 | 95 | 0 / 10 | A |
| 2908 | | 08/27/23 | P-16 | | CH | 20.2 | 101.8 | 22.4 | 102.9 | 125.9 | 6 | 101 | 95 | 0 / 10 | A |
| 2909 | | 08/27/23 | P-16 | | CH | 20.2 | 101.8 | 25.2 | 96.9 | 121.3 | 6 | 95 | 95 | 0 / 10 | A |
| 2910 | | 08/27/23 | P-16 | | CH | 20.2 | 101.8 | 21.7 | 101.2 | 123.2 | 6 | 99 | 95 | 0 / 10 | A |
| 2911 | | 08/27/23 | P-16 | | CH | 20.2 | 101.8 | 24.2 | 98.7 | 122.6 | 6 | 97 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2904 | Select Clay: Wall Zone 60 | 118.0 | Lift Number | Troxler / 3430 / 23996 / | Ficek, Kevin |
| 2905 | Select Clay: Wall Zone 56 | 124.0 | Lift Number | Troxler / 3430 / 23996 / | Ficek, Kevin |
| 2906 | Select Clay: Wall Zone 57 | 125.0 | Lift Number | Troxler / 3430 / 23996 / | Ficek, Kevin |
| 2907 | Select Clay: Wall Zone 58 | 125.0 | Lift Number | Troxler / 3430 / 23996 / | Ficek, Kevin |
| 2908 | Select Clay: Wall Zone 59 | 125.0 | Lift Number | Troxler / 3430 / 23996 / | Ficek, Kevin |
| 2909 | Select Clay: Wall Zone 60 | 119.0 | Lift Number | Troxler / 3430 / 23996 / | Ficek, Kevin |
| 2910 | Select Clay: Wall Zone 56 | 125.0 | Lift Number | Troxler / 3430 / 23996 / | Ficek, Kevin |
| 2911 | Select Clay: Wall Zone 57 | 126.0 | Lift Number | Troxler / 3430 / 23996 / | Ficek, Kevin |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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**Report Date:** 08/28/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2912 | | 08/27/23 | P-16 | | CH | 20.2 | 101.8 | 24.4 | 100.0 | 124.4 | 6 | 98 | 95 | 0 / 10 | A |
| 2913 | | 08/27/23 | P-16 | | CH | 20.2 | 101.8 | 25.0 | 98.0 | 122.5 | 6 | 96 | 95 | 0 / 10 | A |
| 2914 | | 08/27/23 | P-16 | | CH | 20.2 | 101.8 | 25.6 | 97.1 | 122.0 | 6 | 95 | 95 | 0 / 10 | A |
| 2915 | | 08/27/23 | P-16 | | CH | 20.2 | 101.8 | 23.4 | 101.1 | 124.8 | 6 | 99 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2912 | Select Clay: Wall Zone 58 | 126.0 | Lift Number | Troxler / 3430 / 23996 / | Ficek, Kevin |
| 2913 | Select Clay: Wall Zone 59 | 126.0 | Lift Number | Troxler / 3430 / 23996 / | Ficek, Kevin |
| 2914 | Select Clay: Wall Zone 60 | 120.0 | Lift Number | Troxler / 3430 / 23996 / | Ficek, Kevin |
| 2915 | Select Clay: Wall Zone 56 | 126.0 | Lift Number | Troxler / 3430 / 23996 / | Ficek, Kevin |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Kurt Kuechle
08/28/2023

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# Field Compaction Report

**Report Date:** 08/29/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2916 | | 08/28/23 | P-16 | | CH | 20.2 | 101.8 | 21.7 | 104.1 | 126.7 | 6 | 102 | 95 | 0 / 10 | A |
| 2917 | | 08/28/23 | P-16 | | CH | 20.2 | 101.8 | 22.7 | 99.0 | 121.5 | 6 | 97 | 95 | 0 / 10 | A |
| 2918 | | 08/28/23 | P-16 | | CH | 20.2 | 101.8 | 22.1 | 101.8 | 124.3 | 6 | 100 | 95 | 0 / 10 | A |
| 2919 | | 08/28/23 | P-16 | | CH | 20.2 | 101.8 | 23.1 | 102.7 | 126.4 | 6 | 101 | 95 | 0 / 10 | A |
| 2920 | | 08/28/23 | P-03 | | CH | 20.2 | 99.3 | 23.9 | 95.9 | 118.8 | 6 | 97 | 95 | 0 / 10 | A |
| 2921 | | 08/28/23 | P-16 | | CH | 20.2 | 101.8 | 20.6 | 104.8 | 126.4 | 6 | 103 | 95 | 0 / 10 | A |
| 2922 | | 08/28/23 | P-16 | | CH | 20.2 | 101.8 | 23.8 | 99.2 | 122.8 | 6 | 97 | 95 | 0 / 10 | A |
| 2923 | | 08/28/23 | P-16 | | CH | 20.2 | 101.8 | 22.8 | 102.3 | 125.6 | 6 | 100 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2916 | Select Clay: Wall, Zone 56 | 127.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 2917 | Select Clay: Wall, Zone 57 | 127.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 2918 | Select Clay: Wall, Zone 58 | 127.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 2919 | Select Clay: Wall, Zone 59 | 127.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 2920 | Select Clay: Wall, Zone 60 | 121.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 2921 | Select Clay: Wall, Zone 56 | 128.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 2922 | Select Clay: Wall, Zone 57 | 128.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 2923 | Select Clay: Wall, Zone 58 | 128.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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**Report Date:** 08/29/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
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Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2924 | | 08/28/23 | P-16 | | CH | 20.2 | 101.8 | 23.4 | 100.2 | 123.6 | 6 | 98 | 95 | 0 / 10 | A |
| 2925 | | 08/28/23 | P-16 | | CH | 20.2 | 101.8 | 22.9 | 100.6 | 123.6 | 6 | 99 | 95 | 0 / 10 | A |
| 2926 | | 08/28/23 | P-16 | | CH | 20.2 | 101.8 | 20.9 | 103.3 | 124.9 | 6 | 101 | 95 | 0 / 10 | A |
| 2927 | | 08/28/23 | P-16 | | CH | 20.2 | 101.8 | 22.5 | 100.9 | 123.6 | 6 | 99 | 95 | 0 / 10 | A |
| 2928 | | 08/28/23 | P-16 | | CH | 20.2 | 101.8 | 23.3 | 100.2 | 123.5 | 6 | 98 | 95 | 0 / 10 | A |
| 2929 | | 08/28/23 | P-16 | | CH | 20.2 | 101.8 | 22.2 | 101.3 | 123.8 | 6 | 100 | 95 | 0 / 10 | A |
| 2930 | | 08/28/23 | P-16 | | CH | 20.2 | 101.8 | 23.3 | 101.2 | 124.8 | 6 | 99 | 95 | 0 / 10 | A |
| 2931 | | 08/28/23 | P-16 | | CH | 20.2 | 101.8 | 22.6 | 103.2 | 126.5 | 6 | 101 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2924 | Select Clay: Wall, Zone 59 | 128.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 2925 | Select Clay: Wall, Zone 60 | 122.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 2926 | Select Clay: Wall, Zone 56 | 129.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 2927 | Select Clay: Wall, Zone 57 | 129.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 2928 | Select Clay: Wall, Zone 58 | 129.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 2929 | Select Clay: Wall, Zone 59 | 129.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 2930 | Select Clay: Wall, Zone 60 | 123.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 2931 | Select Clay: Wall, Zone 56 | 130.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
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**Project:**
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Minnkota Cell 5
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Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2932 | | 08/28/23 | P-16 | | CH | 20.2 | 101.8 | 22.8 | 100.7 | 123.7 | 6 | 99 | 95 | 0 / 10 | A |
| 2933 | | 08/28/23 | P-13 | | CH | 21.7 | 97.9 | 22.3 | 95.0 | 116.2 | 6 | 97 | 95 | 0 / 10 | A |
| 2934 | | 08/28/23 | P-13 | | CH | 21.7 | 97.9 | 26.7 | 94.0 | 119.1 | 6 | 96 | 95 | 0 / 10 | A |
| 2935 | | 08/28/23 | P-16 | | CH | 20.2 | 101.8 | 22.1 | 102.8 | 125.5 | 6 | 101 | 95 | 0 / 10 | A |
| 2936 | | 08/28/23 | P-16 | | CH | 20.2 | 101.8 | 20.3 | 103.4 | 124.4 | 6 | 102 | 95 | 0 / 10 | A |
| 2937 | | 08/28/23 | P-16 | | CH | 20.2 | 101.8 | 20.8 | 105.2 | 127.1 | 6 | 103 | 95 | 0 / 10 | A |
| 2938 | | 08/28/23 | P-16 | | CH | 20.2 | 101.8 | 23.3 | 101.4 | 125.0 | 6 | 100 | 95 | 0 / 10 | A |
| 2939 | | 08/28/23 | P-16 | | CH | 20.2 | 101.8 | 21.1 | 104.3 | 126.3 | 6 | 102 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2932 | Select Clay: Wall, Zone 57 | 130.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 2933 | Select Clay: Wall, Zone 58 | 130.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 2934 | Select Clay: Wall, Zone 59 | 130.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 2935 | Select Clay: Wall, Zone 60 | 124.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 2936 | Select Clay: Wall, Zone 56 | 131.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 2937 | Select Clay: Wall, Zone 57 | 131.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 2938 | Select Clay: Wall, Zone 58 | 131.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 2939 | Select Clay: Wall, Zone 59 | 131.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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2908 Morrison Ave.
Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/29/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2940 | | 08/28/23 | P-16 | | CH | 20.2 | 101.8 | 21.6 | 98.6 | 119.9 | 6 | 97 | 95 | 0 / 10 | A |
| 2941 | | 08/28/23 | P-16 | | CH | 20.2 | 101.8 | 21.4 | 102.9 | 124.9 | 6 | 101 | 95 | 0 / 10 | A |
| 2942 | | 08/28/23 | P-16 | | CH | 20.2 | 101.8 | 23.7 | 101.1 | 125.1 | 6 | 99 | 95 | 0 / 10 | A |
| 2943 | | 08/28/23 | P-16 | | CH | 20.2 | 101.8 | 20.8 | 100.6 | 121.5 | 6 | 99 | 95 | 0 / 10 | A |
| 2944 | | 08/28/23 | P-16 | | CH | 20.2 | 101.8 | 23.1 | 99.0 | 121.9 | 6 | 97 | 95 | 0 / 10 | A |
| 2945 | | 08/28/23 | P-16 | | CH | 20.2 | 101.8 | 21.0 | 97.6 | 118.1 | 6 | 96 | 95 | 0 / 10 | A |
| 2946 | | 08/28/23 | P-15 | | CH | 24.1 | 98.6 | 27.2 | 95.6 | 121.6 | 6 | 97 | 95 | 0 / 10 | A |
| 2947 | | 08/28/23 | P-16 | | CH | 20.2 | 101.8 | 22.1 | 102.3 | 124.9 | 6 | 100 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2940 | Select Clay: Wall, Zone 60 | 125.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 2941 | Select Clay: Wall, Zone 56 | 132.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 2942 | Select Clay: Wall, Zone 57 | 132.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 2943 | Select Clay: Wall, Zone 58 | 132.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 2944 | Select Clay: Wall, Zone 59 | 132.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 2945 | Select Clay: Wall, Zone 60 | 126.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 2946 | Select Clay: Wall, Zone 56 | 133.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 2947 | Select Clay: Wall, Zone 57 | 133.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/29/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2948 | | 08/28/23 | P-16 | | CH | 20.2 | 101.8 | 22.3 | 101.5 | 124.1 | 6 | 100 | 95 | 0 / 10 | A |
| 2949 | | 08/28/23 | P-16 | | CH | 20.2 | 101.8 | 21.5 | 102.4 | 124.4 | 6 | 101 | 95 | 0 / 10 | A |
| 2950 | | 08/28/23 | P-16 | | CH | 20.2 | 101.8 | 20.7 | 99.2 | 119.7 | 6 | 97 | 95 | 0 / 10 | A |
| 2951 | | 08/28/23 | P-16 | | CH | 20.2 | 101.8 | 22.2 | 103.4 | 126.4 | 6 | 102 | 95 | 0 / 10 | A |
| 2952 | | 08/28/23 | P-16 | | CH | 20.2 | 101.8 | 22.4 | 98.3 | 120.3 | 6 | 97 | 95 | 0 / 10 | A |
| 2953 | | 08/28/23 | P-16 | | CH | 20.2 | 101.8 | 20.3 | 104.0 | 125.1 | 6 | 102 | 95 | 0 / 10 | A |
| 2954 | | 08/28/23 | P-16 | | CH | 20.2 | 101.8 | 22.2 | 101.3 | 123.8 | 6 | 100 | 95 | 0 / 10 | A |
| 2955 | | 08/28/23 | P-16 | | CH | 20.2 | 101.8 | 23.1 | 99.6 | 122.6 | 6 | 98 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2948 | Select Clay: Wall, Zone 58 | 133.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 2949 | Select Clay: Wall, Zone 59 | 133.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 2950 | Select Clay: Wall, Zone 60 | 127.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 2951 | Select Clay: Wall, Zone 56 | 134.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 2952 | Select Clay: Wall, Zone 57 | 134.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 2953 | Select Clay: Wall, Zone 58 | 134.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 2954 | Select Clay: Wall, Zone 59 | 134.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 2955 | Select Clay: Wall, Zone 60 | 128.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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# Field Compaction Report

**Report Date:** 08/29/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2956 | | 08/28/23 | P-16 | | CH | 20.2 | 101.8 | 22.5 | 98.9 | 121.2 | 6 | 97 | 95 | 0 / 10 | A |
| 2957 | | 08/28/23 | P-16 | | CH | 20.2 | 101.8 | 20.6 | 103.1 | 124.3 | 6 | 101 | 95 | 0 / 10 | A |
| 2958 | | 08/28/23 | P-16 | | CH | 20.2 | 101.8 | 24.4 | 96.9 | 120.5 | 6 | 95 | 95 | 0 / 10 | A |
| 2959 | | 08/28/23 | P-16 | | CH | 20.2 | 101.8 | 21.4 | 103.0 | 125.0 | 6 | 101 | 95 | 0 / 10 | A |
| 2960 | | 08/28/23 | P-16 | | CH | 20.2 | 101.8 | 22.6 | 101.9 | 124.9 | 6 | 100 | 95 | 0 / 10 | A |
| 2961 | | 08/28/23 | P-16 | | CH | 20.2 | 101.8 | 23.2 | 102.2 | 125.9 | 6 | 100 | 95 | 0 / 10 | A |
| 2962 | | 08/28/23 | P-16 | | CH | 20.2 | 101.8 | 21.4 | 101.2 | 122.9 | 6 | 99 | 95 | 0 / 10 | A |
| 2963 | | 08/28/23 | P-15 | | CH | 24.1 | 98.6 | 25.3 | 93.8 | 117.5 | 6 | 95 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2956 | Select Clay: Wall, Zone 56 | 135.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 2957 | Select Clay: Wall, Zone 57 | 135.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 2958 | Select Clay: Wall, Zone 58 | 135.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 2959 | Select Clay: Wall, Zone 59 | 135.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 2960 | Select Clay: Wall, Zone 60 | 129.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 2961 | Select Clay: Wall, Zone 56 | 136.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 2962 | Select Clay: Wall, Zone 57 | 136.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 2963 | Select Clay: Wall, Zone 58 | 136.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/29/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2964 | | 08/28/23 | P-16 | | CH | 20.2 | 101.8 | 23.3 | 101.3 | 124.9 | 6 | 100 | 95 | 0 / 10 | A |
| 2965 | | 08/28/23 | P-16 | | CH | 20.2 | 101.8 | 22.3 | 102.7 | 125.6 | 6 | 101 | 95 | 0 / 10 | A |
| ~~2966~~ | ~~08/28/23~~ | ~~P-16~~ | ~~CH~~ | ~~20.2~~ | ~~101.8~~ | ~~21.9~~ | ~~101.6~~ | ~~123.8~~ | ~~6~~ | ~~100~~ | ~~95~~ | ~~0 / 10~~ | ~~A~~ | | |
| 2967 | | 08/28/23 | P-16 | | CH | 20.2 | 101.8 | 23.6 | 100.4 | 124.1 | 6 | 99 | 95 | 0 / 10 | A |
| 2968 | | 08/28/23 | P-16 | | CH | 20.2 | 101.8 | 23.5 | 98.6 | 121.8 | 6 | 97 | 95 | 0 / 10 | A |
| 2969 | | 08/28/23 | P-15 | | CH | 24.1 | 98.6 | 25.9 | 95.5 | 120.2 | 6 | 97 | 95 | 0 / 10 | A |
| 2970 | | 08/28/23 | P-16 | | CH | 20.2 | 101.8 | 22.8 | 101.0 | 124.0 | 6 | 99 | 95 | 0 / 10 | A |
| 2971 | | 08/28/23 | P-16 | | CH | 20.2 | 101.8 | 21.1 | 102.3 | 123.9 | 6 | 100 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2964 | Select Clay: Wall, Zone 59 | 136.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 2965 | Select Clay: Wall, Zone 60 | 130.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| ~~2966~~ | ~~Select Clay: Wall, Zone 55~~ | ~~137.0~~ | ~~Lift Number~~ | ~~InstroTek / 3500 / 1908 /~~ | ~~Wenko, Steve~~ |
| 2967 | Select Clay: Wall, Zone 56 | 137.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 2968 | Select Clay: Wall, Zone 57 | 137.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 2969 | Select Clay: Wall, Zone 58 | 137.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 2970 | Select Clay: Wall, Zone 59 | 137.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 2971 | Select Clay: Wall, Zone 60 | 131.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/31/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2966 | | 08/28/23 | P-16 | | CH | 20.2 | 101.8 | 21.9 | 101.6 | 123.8 | 6 | 100 | 95 | 0 / 10 | A |
| 2972 | | 08/28/23 | P-16 | | CH | 20.2 | 101.8 | 23.5 | 102.0 | 126.0 | 6 | 100 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2966 | Select Clay: Wall, Zone 55 | 119.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 2972 | Select Clay: Wall, Zone 55 | 120.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Kurt Kuechle
08/31/2023

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/29/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ~~2972~~ | | ~~08/28/23~~ | ~~P-16~~ | | ~~CH~~ | ~~20.2~~ | ~~101.8~~ | ~~23.5~~ | ~~102.0~~ | ~~126.0~~ | ~~6~~ | ~~100~~ | ~~95~~ | ~~0 / 10~~ | ~~A~~ |
| 2973 | | 08/28/23 | P-16 | | CH | 20.2 | 101.8 | 22.7 | 99.5 | 122.1 | 6 | 98 | 95 | 0 / 10 | A |
| 2974 | | 08/28/23 | P-16 | | CH | 20.2 | 101.8 | 23.8 | 97.6 | 120.8 | 6 | 96 | 95 | 0 / 10 | A |
| 2975 | | 08/28/23 | P-17 | | CH | 25.6 | 95.9 | 26.4 | 92.0 | 116.3 | 6 | 96 | 95 | 0 / 10 | A |
| 2976 | | 08/28/23 | P-17 | | CH | 25.6 | 95.9 | 26.5 | 94.6 | 119.7 | 6 | 99 | 95 | 0 / 10 | A |
| 2977 | | 08/28/23 | P-13 | | CH | 21.7 | 97.9 | 22.5 | 95.5 | 117.0 | 6 | 98 | 95 | 0 / 10 | A |
| 2978 | | 08/28/23 | P-13 | | CH | 21.7 | 97.9 | 24.5 | 96.5 | 120.1 | 6 | 99 | 95 | 0 / 10 | A |
| 2979 | | 08/28/23 | P-13 | | CH | 21.7 | 97.9 | 26.1 | 95.7 | 120.7 | 6 | 98 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| ~~2972~~ | ~~Select Clay: Wall, Zone 55~~ | ~~138.0~~ | ~~Lift Number~~ | ~~InstroTek / 3500 / 1908 /~~ | ~~Wenko, Steve~~ |
| 2973 | Select Clay: Wall, Zone 56 | 138.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 2974 | Select Clay: Floor, Zone 44 | 1.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 2975 | Select Clay: Floor, Zone 45 | 1.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 2976 | Select Clay: Floor, Zone 46 | 1.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 2977 | Select Clay: Floor, Zone 47 | 1.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 2978 | Select Clay: Floor, Zone 48 | 1.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 2979 | Select Clay: Floor, Zone 49 | 1.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/29/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

**Test Results**

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2980 | | 08/28/23 | P-16 | | CH | 20.2 | 101.8 | 21.3 | 101.5 | 123.1 | 6 | 100 | 95 | 0 / 10 | A |
| 2981 | | 08/28/23 | P-16 | | CH | 20.2 | 101.8 | 21.7 | 99.6 | 121.2 | 6 | 98 | 95 | 0 / 10 | A |

**Test Information**

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2980 | Select Clay: Floor, Zone 50 | 1.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 2981 | Select Clay: Floor, Zone 51 | 1.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Kurt Kuechle
08/29/2023

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Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/30/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2982 | | 08/29/23 | P-16 | | CH | 20.2 | 101.8 | 22.7 | 100.7 | 123.6 | 6 | 99 | 95 | 0 / 10 | A |
| 2983 | | 08/29/23 | P-16 | | CH | 20.2 | 101.8 | 26.1 | 96.8 | 122.1 | 6 | 95 | 95 | 0 / 10 | A |
| 2984 | | 08/29/23 | P-16 | | CH | 20.2 | 101.8 | 24.9 | 98.2 | 122.7 | 6 | 96 | 95 | 0 / 10 | A |
| 2985 | | 08/29/23 | P-16 | | CH | 20.2 | 101.8 | 23.0 | 100.7 | 123.9 | 6 | 99 | 95 | 0 / 10 | A |
| 2986 | | 08/29/23 | P-16 | | CH | 20.2 | 101.8 | 24.8 | 97.4 | 121.6 | 6 | 96 | 95 | 0 / 10 | A |
| 2987 | | 08/29/23 | P-16 | | CH | 20.2 | 101.8 | 23.6 | 99.3 | 122.7 | 6 | 98 | 95 | 0 / 10 | A |
| 2988 | | 08/29/23 | P-16 | | CH | 20.2 | 101.8 | 24.8 | 99.9 | 124.7 | 6 | 98 | 95 | 0 / 10 | A |
| 2989 | | 08/29/23 | P-16 | | CH | 20.2 | 101.8 | 22.1 | 102.5 | 125.2 | 6 | 101 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2982 | Select Clay: Floor, Zone 51 | 2.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 2983 | Select Clay: Floor, Zone 50 | 2.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 2984 | Select Clay: Floor, Zone 49 | 2.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 2985 | Select Clay: Floor, Zone 48 | 2.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 2986 | Select Clay: Floor, Zone 47 | 2.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 2987 | Select Clay: Floor, Zone 46 | 2.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 2988 | Select Clay: Floor, Zone 45 | 2.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 2989 | Select Clay: Floor, Zone 44 | 2.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

BRAUN INTERTEC
The Science You Build On.

2908 Morrison Ave.
Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/30/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2990 | | 08/29/23 | P-16 | | CH | 20.2 | 101.8 | 23.1 | 100.6 | 123.8 | 6 | 99 | 95 | 0 / 10 | A |
| 2991 | | 08/29/23 | P-16 | | CH | 20.2 | 101.8 | 24.8 | 98.0 | 122.3 | 6 | 96 | 95 | 0 / 10 | A |
| 2992 | | 08/29/23 | P-16 | | CH | 20.2 | 101.8 | 22.5 | 103.3 | 126.5 | 6 | 101 | 95 | 0 / 10 | A |
| 2993 | | 08/29/23 | P-16 | | CH | 20.2 | 101.8 | 23.2 | 102.8 | 126.7 | 6 | 101 | 95 | 0 / 10 | A |
| 2994 | | 08/29/23 | P-16 | | CH | 20.2 | 101.8 | 22.6 | 101.2 | 124.1 | 6 | 99 | 95 | 0 / 10 | A |
| 2995 | | 08/29/23 | P-16 | | CH | 20.2 | 101.8 | 24.6 | 97.2 | 121.1 | 6 | 95 | 95 | 0 / 10 | A |
| 2996 | | 08/29/23 | P-16 | | CH | 20.2 | 101.8 | 23.4 | 100.4 | 123.9 | 6 | 99 | 95 | 0 / 10 | A |
| 2997 | | 08/29/23 | P-16 | | CH | 20.2 | 101.8 | 23.1 | 101.9 | 125.4 | 6 | 100 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2990 | Select Clay: Floor, Zone 51 | 3.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 2991 | Select Clay: Floor, Zone 50 | 3.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 2992 | Select Clay: Floor, Zone 49 | 3.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 2993 | Select Clay: Floor, Zone 48 | 3.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 2994 | Select Clay: Floor, Zone 47 | 3.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 2995 | Select Clay: Floor, Zone 46 | 3.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 2996 | Select Clay: Floor, Zone 45 | 3.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 2997 | Select Clay: Floor, Zone 44 | 3.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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2908 Morrison Ave.
Suite 3
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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/30/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2998 | | 08/29/23 | P-16 | | CH | 20.2 | 101.8 | 23.2 | 97.8 | 120.5 | 6 | 96 | 95 | 0 / 10 | A |
| 2999 | | 08/29/23 | P-16 | | CH | 20.2 | 101.8 | 24.5 | 99.0 | 123.3 | 6 | 97 | 95 | 0 / 10 | A |
| 3000 | | 08/29/23 | P-16 | | CH | 20.2 | 101.8 | 24.6 | 98.1 | 122.2 | 6 | 96 | 95 | 0 / 10 | A |
| 3001 | | 08/29/23 | P-16 | | CH | 20.2 | 101.8 | 21.9 | 101.4 | 123.6 | 6 | 100 | 95 | 0 / 10 | A |
| 3002 | | 08/29/23 | P-16 | | CH | 20.2 | 101.8 | 21.8 | 102.9 | 125.3 | 6 | 101 | 95 | 0 / 10 | A |
| 3003 | | 08/29/23 | P-16 | | CH | 20.2 | 101.8 | 24.1 | 100.3 | 124.5 | 6 | 99 | 95 | 0 / 10 | A |
| 3004 | | 08/29/23 | P-16 | | CH | 20.2 | 101.8 | 22.4 | 102.4 | 125.3 | 6 | 101 | 95 | 0 / 10 | A |
| 3005 | | 08/29/23 | P-16 | | CH | 20.2 | 101.8 | 22.3 | 100.3 | 122.7 | 6 | 99 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 2998 | Select Clay: Floor, Zone 51 | 4.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 2999 | Select Clay: Floor, Zone 50 | 4.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3000 | Select Clay: Floor, Zone 49 | 4.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3001 | Select Clay: Floor, Zone 48 | 4.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3002 | Select Clay: Floor, Zone 47 | 4.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3003 | Select Clay: Floor, Zone 46 | 4.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3004 | Select Clay: Floor, Zone 45 | 4.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3005 | Select Clay: Floor, Zone 44 | 4.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/30/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3006 | | 08/29/23 | P-16 | | CH | 20.2 | 101.8 | 22.0 | 103.1 | 125.8 | 6 | 101 | 95 | 0 / 10 | A |
| 3007 | | 08/29/23 | P-16 | | CH | 20.2 | 101.8 | 21.7 | 102.0 | 124.1 | 6 | 100 | 95 | 0 / 10 | A |
| 3008 | | 08/29/23 | P-16 | | CH | 20.2 | 101.8 | 23.1 | 100.6 | 123.8 | 6 | 99 | 95 | 0 / 10 | A |
| 3009 | | 08/29/23 | P-16 | | CH | 20.2 | 101.8 | 22.2 | 101.1 | 123.5 | 6 | 99 | 95 | 0 / 10 | A |
| 3010 | | 08/29/23 | P-16 | | CH | 20.2 | 101.8 | 24.4 | 97.7 | 121.5 | 6 | 96 | 95 | 0 / 10 | A |
| 3011 | | 08/29/23 | P-16 | | CH | 20.2 | 101.8 | 24.6 | 98.6 | 122.9 | 6 | 97 | 95 | 0 / 10 | A |
| 3012 | | 08/29/23 | P-13 | | CH | 21.7 | 97.9 | 23.3 | 95.0 | 117.1 | 6 | 97 | 95 | 0 / 10 | A |
| 3013 | | 08/29/23 | P-13 | | CH | 21.7 | 97.9 | 24.0 | 95.3 | 118.2 | 6 | 97 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 3006 | Select Clay: Floor, Zone 51 | 5.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3007 | Select Clay: Floor, Zone 50 | 5.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3008 | Select Clay: Floor, Zone 49 | 5.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3009 | Select Clay: Floor, Zone 48 | 5.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3010 | Select Clay: Floor, Zone 47 | 5.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3011 | Select Clay: Floor, Zone 46 | 5.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3012 | Select Clay: Floor, Zone 45 | 5.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3013 | Select Clay: Floor, Zone 44 | 5.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/30/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3014 | | 08/29/23 | P-16 | | CH | 20.2 | 101.8 | 23.9 | 98.2 | 121.7 | 6 | 96 | 95 | 0 / 10 | A |
| 3015 | | 08/29/23 | P-16 | | CH | 20.2 | 101.8 | 22.2 | 101.2 | 123.7 | 6 | 99 | 95 | 0 / 10 | A |
| 3016 | | 08/29/23 | P-16 | | CH | 20.2 | 101.8 | 23.9 | 98.4 | 121.9 | 6 | 97 | 95 | 0 / 10 | A |
| 3017 | | 08/29/23 | P-16 | | CH | 20.2 | 101.8 | 22.4 | 101.9 | 124.7 | 6 | 100 | 95 | 0 / 10 | A |
| 3018 | | 08/29/23 | P-16 | | CH | 20.2 | 101.8 | 22.4 | 102.0 | 124.8 | 6 | 100 | 95 | 0 / 10 | A |
| 3019 | | 08/29/23 | P-16 | | CH | 20.2 | 101.8 | 24.5 | 98.2 | 122.3 | 6 | 96 | 95 | 0 / 10 | A |
| 3020 | | 08/29/23 | P-16 | | CH | 20.2 | 101.8 | 22.8 | 102.7 | 126.1 | 6 | 101 | 95 | 0 / 10 | A |
| 3021 | | 08/29/23 | P-16 | | CH | 20.2 | 101.8 | 21.5 | 102.1 | 124.1 | 6 | 100 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 3014 | Select Clay: Floor, Zone 51 | 6.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3015 | Select Clay: Floor, Zone 50 | 6.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3016 | Select Clay: Floor, Zone 49 | 6.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3017 | Select Clay: Floor, Zone 48 | 6.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3018 | Select Clay: Floor, Zone 47 | 6.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3019 | Select Clay: Floor, Zone 46 | 6.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3020 | Select Clay: Floor, Zone 45 | 6.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3021 | Select Clay: Floor, Zone 44 | 6.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/30/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3022 | | 08/29/23 | P-16 | | CH | 20.2 | 101.8 | 23.4 | 98.0 | 120.9 | 6 | 96 | 95 | 0 / 10 | A |
| 3023 | | 08/29/23 | P-16 | | CH | 20.2 | 101.8 | 24.8 | 98.6 | 123.1 | 6 | 97 | 95 | 0 / 10 | A |
| 3024 | | 08/29/23 | P-16 | | CH | 20.2 | 101.8 | 22.4 | 101.3 | 124.0 | 6 | 100 | 95 | 0 / 10 | A |
| 3025 | | 08/29/23 | P-16 | | CH | 20.2 | 101.8 | 22.9 | 98.0 | 120.4 | 6 | 96 | 95 | 0 / 10 | A |
| 3026 | | 08/29/23 | P-16 | | CH | 20.2 | 101.8 | 20.9 | 102.9 | 124.4 | 6 | 101 | 95 | 0 / 10 | A |
| 3027 | | 08/29/23 | P-16 | | CH | 20.2 | 101.8 | 24.2 | 99.9 | 124.1 | 6 | 98 | 95 | 0 / 10 | A |
| 3028 | | 08/29/23 | P-16 | | CH | 20.2 | 101.8 | 24.4 | 99.6 | 123.9 | 6 | 98 | 95 | 0 / 10 | A |
| 3029 | | 08/29/23 | P-16 | | CH | 20.2 | 101.8 | 21.1 | 99.5 | 120.5 | 6 | 98 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 3022 | Select Clay: Floor, Zone 51 | 7.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3023 | Select Clay: Floor, Zone 50 | 7.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3024 | Select Clay: Floor, Zone 49 | 7.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3025 | Select Clay: Floor, Zone 48 | 7.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3026 | Select Clay: Floor, Zone 47 | 7.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3027 | Select Clay: Floor, Zone 46 | 7.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3028 | Select Clay: Floor, Zone 45 | 7.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3029 | Select Clay: Floor, Zone 44 | 7.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Kurt Kuechle
08/30/2023

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/31/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3030 | | 08/30/23 | P-16 | | CH | 20.2 | 101.8 | 25.4 | 97.0 | 121.6 | 6 | 95 | 95 | 0 / 10 | A |
| 3031 | | 08/30/23 | P-16 | | CH | 20.2 | 101.8 | 23.0 | 101.0 | 124.2 | 6 | 99 | 95 | 0 / 10 | A |
| 3032 | | 08/30/23 | P-16 | | CH | 20.2 | 101.8 | 23.1 | 102.4 | 126.1 | 6 | 101 | 95 | 0 / 10 | A |
| 3033 | | 08/30/23 | P-16 | | CH | 20.2 | 101.8 | 22.2 | 102.5 | 125.3 | 6 | 101 | 95 | 0 / 10 | A |
| 3034 | | 08/30/23 | P-16 | | CH | 20.2 | 101.8 | 22.1 | 101.9 | 124.4 | 6 | 100 | 95 | 0 / 10 | A |
| 3035 | | 08/30/23 | P-16 | | CH | 20.2 | 101.8 | 22.0 | 102.2 | 124.7 | 6 | 100 | 95 | 0 / 10 | A |
| 3036 | | 08/30/23 | P-16 | | CH | 20.2 | 101.8 | 24.6 | 98.3 | 122.5 | 6 | 97 | 95 | 0 / 10 | A |
| 3037 | | 08/30/23 | P-16 | | CH | 20.2 | 101.8 | 21.7 | 101.4 | 123.4 | 6 | 100 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 3030 | Select Clay: Wall, Zone 55 | 121.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3031 | Select Clay: Wall, Zone 56 | 139.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3032 | Select Clay: Wall, Zone 57 | 138.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3033 | Select Clay: Wall, Zone 58 | 138.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3034 | Select Clay: Wall, Zone 59 | 138.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3035 | Select Clay: Wall, Zone 60 | 132.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3036 | Select Clay: Wall, Zone 55 | 122.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3037 | Select Clay: Wall, Zone 56 | 140.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/31/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3038 | | 08/30/23 | P-16 | | CH | 20.2 | 101.8 | 23.3 | 99.0 | 122.1 | 6 | 97 | 95 | 0 / 10 | A |
| 3039 | | 08/30/23 | P-16 | | CH | 20.2 | 101.8 | 23.5 | 99.8 | 123.3 | 6 | 98 | 95 | 0 / 10 | A |
| 3040 | | 08/30/23 | P-16 | | CH | 20.2 | 101.8 | 23.1 | 101.9 | 125.4 | 6 | 100 | 95 | 0 / 10 | A |
| 3041 | | 08/30/23 | P-16 | | CH | 20.2 | 101.8 | 22.7 | 102.1 | 125.3 | 6 | 100 | 95 | 0 / 10 | A |
| 3042 | | 08/30/23 | P-16 | | CH | 20.2 | 101.8 | 23.1 | 103.5 | 127.4 | 6 | 102 | 95 | 0 / 10 | A |
| 3043 | | 08/30/23 | P-16 | | CH | 20.2 | 101.8 | 22.1 | 102.7 | 125.4 | 6 | 101 | 95 | 0 / 10 | A |
| 3044 | | 08/30/23 | P-16 | | CH | 20.2 | 101.8 | 20.7 | 102.6 | 123.8 | 6 | 101 | 95 | 0 / 10 | A |
| 3045 | | 08/30/23 | P-16 | | CH | 20.2 | 101.8 | 24.1 | 99.3 | 123.2 | 6 | 98 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 3038 | Select Clay: Wall, Zone 57 | 139.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3039 | Select Clay: Wall, Zone 58 | 139.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3040 | Select Clay: Wall, Zone 59 | 139.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3041 | Select Clay: Wall, Zone 60 | 133.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3042 | Select Clay: Wall, Zone 55 | 123.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3043 | Select Clay: Wall, Zone 56 | 141.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3044 | Select Clay: Wall, Zone 57 | 140.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3045 | Select Clay: Wall, Zone 58 | 140.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

BRAUN INTERTEC
The Science You Build On.

2908 Morrison Ave.
Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/31/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3046 | | 08/30/23 | P-16 | | CH | 20.2 | 101.8 | 23.8 | 100.0 | 123.8 | 6 | 98 | 95 | 0 / 10 | A |
| 3047 | | 08/30/23 | P-16 | | CH | 20.2 | 101.8 | 23.0 | 97.6 | 120.0 | 6 | 96 | 95 | 0 / 10 | A |
| 3048 | | 08/30/23 | P-16 | | CH | 20.2 | 101.8 | 23.5 | 100.8 | 124.5 | 6 | 99 | 95 | 0 / 10 | A |
| 3049 | | 08/30/23 | P-16 | | CH | 20.2 | 101.8 | 20.7 | 101.8 | 122.9 | 6 | 100 | 95 | 0 / 10 | A |
| 3050 | | 08/30/23 | P-16 | | CH | 20.2 | 101.8 | 24.0 | 100.5 | 124.6 | 6 | 99 | 95 | 0 / 10 | A |
| 3051 | | 08/30/23 | P-16 | | CH | 20.2 | 101.8 | 22.6 | 100.9 | 123.7 | 6 | 99 | 95 | 0 / 10 | A |
| 3052 | | 08/30/23 | P-16 | | CH | 20.2 | 101.8 | 22.2 | 102.3 | 125.0 | 6 | 100 | 95 | 0 / 10 | A |
| 3053 | | 08/30/23 | P-16 | | CH | 20.2 | 101.8 | 22.3 | 103.0 | 126.0 | 6 | 101 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 3046 | Select Clay: Wall, Zone 59 | 140.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3047 | Select Clay: Wall, Zone 60 | 134.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3048 | Select Clay: Wall, Zone 55 | 124.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3049 | Select Clay: Wall, Zone 56 | 142.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3050 | Select Clay: Wall, Zone 57 | 141.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3051 | Select Clay: Wall, Zone 58 | 141.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3052 | Select Clay: Wall, Zone 59 | 141.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3053 | Select Clay: Wall, Zone 60 | 135.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/31/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3054 | | 08/30/23 | P-16 | | CH | 20.2 | 101.8 | 23.8 | 103.1 | 127.6 | 6 | 101 | 95 | 0 / 10 | A |
| 3055 | | 08/30/23 | P-16 | | CH | 20.2 | 101.8 | 23.2 | 101.5 | 125.0 | 6 | 100 | 95 | 0 / 10 | A |
| 3056 | | 08/30/23 | P-16 | | CH | 20.2 | 101.8 | 23.4 | 100.1 | 123.5 | 6 | 98 | 95 | 0 / 10 | A |
| 3057 | | 08/30/23 | P-16 | | CH | 20.2 | 101.8 | 23.4 | 97.6 | 120.4 | 6 | 96 | 95 | 0 / 10 | A |
| 3058 | | 08/30/23 | P-13 | | CH | 21.7 | 97.9 | 25.6 | 93.3 | 117.2 | 6 | 95 | 95 | 0 / 10 | A |
| 3059 | | 08/30/23 | P-16 | | CH | 20.2 | 101.8 | 23.2 | 99.3 | 122.3 | 6 | 98 | 95 | 0 / 10 | A |
| 3060 | | 08/30/23 | P-16 | | CH | 20.2 | 101.8 | 20.6 | 102.0 | 123.0 | 6 | 100 | 95 | 0 / 10 | A |
| 3061 | | 08/30/23 | P-16 | | CH | 20.2 | 101.8 | 22.5 | 99.6 | 122.0 | 6 | 98 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 3054 | Select Clay: Wall, Zone 55 | 125.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3055 | Select Clay: Wall, Zone 56 | 143.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3056 | Select Clay: Wall, Zone 55 | 126.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3057 | Select Clay: Wall, Zone 56 | 144.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3058 | Select Clay: Wall, Zone 57 | 142.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3059 | Select Clay: Wall, Zone 58 | 142.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3060 | Select Clay: Wall, Zone 59 | 142.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3061 | Select Clay: Wall, Zone 60 | 136.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/31/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3062 | | 08/30/23 | P-13 | | CH | 21.7 | 97.9 | 22.5 | 95.8 | 117.4 | 6 | 98 | 95 | 0 / 10 | A |
| 3063 | | 08/30/23 | P-13 | | CH | 21.7 | 97.9 | 26.6 | 94.3 | 119.4 | 6 | 96 | 95 | 0 / 10 | A |
| 3064 | | 08/30/23 | P-16 | | CH | 20.2 | 101.8 | 20.5 | 102.9 | 124.0 | 6 | 101 | 95 | 0 / 10 | A |
| 3065 | | 08/30/23 | P-13 | | CH | 21.7 | 97.9 | 23.4 | 95.1 | 117.4 | 6 | 97 | 95 | 0 / 10 | A |
| 3066 | | 08/30/23 | P-16 | | CH | 20.2 | 101.8 | 22.4 | 101.1 | 123.7 | 6 | 99 | 95 | 0 / 10 | A |
| 3067 | | 08/30/23 | P-16 | | CH | 20.2 | 101.8 | 23.1 | 98.9 | 121.7 | 6 | 97 | 95 | 0 / 10 | A |
| 3068 | | 08/30/23 | P-16 | | CH | 20.2 | 101.8 | 23.4 | 100.0 | 123.4 | 6 | 98 | 95 | 0 / 10 | A |
| 3069 | | 08/30/23 | P-16 | | CH | 20.2 | 101.8 | 23.0 | 100.1 | 123.1 | 6 | 98 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 3062 | Select Clay: Wall, Zone 57 | 143.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3063 | Select Clay: Wall, Zone 58 | 143.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3064 | Select Clay: Wall, Zone 59 | 143.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3065 | Select Clay: Wall, Zone 60 | 137.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3066 | Select Clay: Wall, Zone 55 | 127.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3067 | Select Clay: Wall, Zone 56 | 145.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3068 | Select Clay: Wall, Zone 57 | 144.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3069 | Select Clay: Wall, Zone 58 | 144.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/31/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3070 | | 08/30/23 | P-16 | | CH | 20.2 | 101.8 | 21.5 | 102.3 | 124.3 | 6 | 100 | 95 | 0 / 10 | A |
| 3071 | | 08/30/23 | P-16 | | CH | 20.2 | 101.8 | 22.9 | 101.3 | 124.5 | 6 | 100 | 95 | 0 / 10 | A |
| 3072 | | 08/30/23 | P-16 | | CH | 20.2 | 101.8 | 21.3 | 103.5 | 125.5 | 6 | 102 | 95 | 0 / 10 | A |
| 3073 | | 08/30/23 | P-13 | | CH | 21.7 | 97.9 | 23.0 | 96.2 | 118.3 | 6 | 98 | 95 | 0 / 10 | A |
| 3074 | | 08/30/23 | P-13 | | CH | 21.7 | 97.9 | 25.9 | 96.9 | 122.0 | 6 | 99 | 95 | 0 / 10 | A |
| 3075 | | 08/30/23 | P-16 | | CH | 20.2 | 101.8 | 23.6 | 100.4 | 124.1 | 6 | 99 | 95 | 0 / 10 | A |
| 3076 | | 08/30/23 | P-12 | | CH | 23.6 | 97.4 | 27.7 | 93.2 | 119.0 | 6 | 96 | 95 | 0 / 10 | A |
| 3077 | | 08/30/23 | P-12 | | CH | 23.6 | 97.4 | 24.9 | 93.1 | 116.3 | 6 | 96 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 3070 | Select Clay: Wall, Zone 59 | 144.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3071 | Select Clay: Wall, Zone 60 | 138.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3072 | Select Clay: Wall, Zone 55 | 128.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3073 | Select Clay: Wall, Zone 56 | 146.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3074 | Select Clay: Wall, Zone 57 | 145.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3075 | Select Clay: Wall, Zone 58 | 145.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3076 | Select Clay: Wall, Zone 59 | 145.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3077 | Select Clay: Wall, Zone 60 | 139.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 08/31/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3078 | | 08/30/23 | P-16 | | CH | 20.2 | 101.8 | 20.3 | 103.0 | 123.9 | 6 | 101 | 95 | 0 / 10 | A |
| 3079 | | 08/30/23 | P-16 | | CH | 20.2 | 101.8 | 22.1 | 103.1 | 125.9 | 6 | 101 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 3078 | Select Clay: Wall, Zone 55 | 129.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3079 | Select Clay: Wall, Zone 56 | 147.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Kurt Kuechle
08/31/2023

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Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 09/01/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3080 | | 08/31/23 | P-09 | | CH | 23.9 | 98.6 | 25.4 | 96.6 | 121.1 | 6 | 98 | 95 | 0 / 10 | A |
| 3081 | | 08/31/23 | P-16 | | CH | 20.2 | 101.8 | 23.4 | 101.5 | 125.3 | 6 | 100 | 95 | 0 / 10 | A |
| 3082 | | 08/31/23 | P-03 | | CH | 20.2 | 99.3 | 20.6 | 95.2 | 114.8 | 6 | 96 | 95 | 0 / 10 | A |
| 3083 | | 08/31/23 | P-16 | | CH | 20.2 | 101.8 | 21.5 | 102.7 | 124.8 | 6 | 101 | 95 | 0 / 10 | A |
| 3084 | | 08/31/23 | P-16 | | CH | 20.2 | 101.8 | 21.4 | 101.2 | 122.9 | 6 | 99 | 95 | 0 / 10 | A |
| 3085 | | 08/31/23 | P-16 | | CH | 20.2 | 101.8 | 22.3 | 98.6 | 120.6 | 6 | 97 | 95 | 0 / 10 | A |
| 3086 | | 08/31/23 | P-16 | | CH | 20.2 | 101.8 | 23.1 | 101.6 | 125.1 | 6 | 100 | 95 | 0 / 10 | A |
| 3087 | | 08/31/23 | P-16 | | CH | 20.2 | 101.8 | 21.7 | 98.2 | 119.5 | 6 | 96 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 3080 | Select Clay: Wall, Zone 55 | 130.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3081 | Select Clay: Wall, Zone 56 | 148.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3082 | Select Clay: Wall, Zone 57 | 146.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3083 | Select Clay: Wall, Zone 58 | 146.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3084 | Select Clay: Wall, Zone 59 | 146.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3085 | Select Clay: Wall, Zone 60 | 140.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3086 | Select Clay: Wall, Zone 55 | 131.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3087 | Select Clay: Wall, Zone 56 | 149.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Bismarck, ND 58504
Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 09/01/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3088 | | 08/31/23 | P-16 | | CH | 20.2 | 101.8 | 24.0 | 100.4 | 124.5 | 6 | 99 | 95 | 0 / 10 | A |
| 3089 | | 08/31/23 | P-16 | | CH | 20.2 | 101.8 | 21.6 | 100.7 | 122.5 | 6 | 99 | 95 | 0 / 10 | A |
| 3090 | | 08/31/23 | P-12 | | CH | 23.6 | 97.4 | 25.3 | 95.3 | 119.4 | 6 | 98 | 95 | 0 / 10 | A |
| 3091 | | 08/31/23 | P-16 | | CH | 20.2 | 101.8 | 23.2 | 102.8 | 126.7 | 6 | 101 | 95 | 0 / 10 | A |
| 3092 | | 08/31/23 | P-16 | | CH | 20.2 | 101.8 | 22.1 | 101.7 | 124.2 | 6 | 100 | 95 | 0 / 10 | A |
| 3093 | | 08/31/23 | P-16 | | CH | 20.2 | 101.8 | 24.2 | 100.4 | 124.7 | 6 | 99 | 95 | 0 / 10 | A |
| 3094 | | 08/31/23 | P-16 | | CH | 20.2 | 101.8 | 23.0 | 101.9 | 125.3 | 6 | 100 | 95 | 0 / 10 | A |
| 3095 | | 08/31/23 | P-16 | | CH | 20.2 | 101.8 | 21.7 | 100.6 | 122.4 | 6 | 99 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 3088 | Select Clay: Wall, Zone 57 | 147.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3089 | Select Clay: Wall, Zone 58 | 147.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3090 | Select Clay: Wall, Zone 59 | 147.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3091 | Select Clay: Wall, Zone 60 | 141.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3092 | Select Clay: Wall, Zone 55 | 132.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3093 | Select Clay: Wall, Zone 56 | 150.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3094 | Select Clay: Wall, Zone 57 | 148.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3095 | Select Clay: Wall, Zone 58 | 148.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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2908 Morrison Ave.
Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 09/01/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3096 | | 08/31/23 | P-16 | | CH | 20.2 | 101.8 | 23.3 | 100.8 | 124.3 | 6 | 99 | 95 | 0 / 10 | A |
| 3097 | | 08/31/23 | P-16 | | CH | 20.2 | 101.8 | 21.8 | 101.4 | 123.5 | 6 | 100 | 95 | 0 / 10 | A |
| 3098 | | 08/31/23 | P-16 | | CH | 20.2 | 101.8 | 22.6 | 100.9 | 123.7 | 6 | 99 | 95 | 0 / 10 | A |
| 3099 | | 08/31/23 | P-16 | | CH | 20.2 | 101.8 | 24.3 | 101.0 | 125.5 | 6 | 99 | 95 | 0 / 10 | A |
| 3100 | | 08/31/23 | P-01 | | CH | 19.4 | 100.8 | 23.9 | 99.4 | 123.2 | 6 | 99 | 95 | 0 / 10 | A |
| 3101 | | 08/31/23 | P-03 | | CH | 20.2 | 99.3 | 26.1 | 95.7 | 120.7 | 6 | 96 | 95 | 0 / 10 | A |
| 3102 | | 08/31/23 | P-03 | | CH | 20.2 | 99.3 | 24.1 | 95.9 | 119.0 | 6 | 97 | 95 | 0 / 10 | A |
| 3103 | | 08/31/23 | P-16 | | CH | 20.2 | 101.8 | 21.9 | 101.9 | 124.2 | 6 | 100 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 3096 | Select Clay: Wall, Zone 59 | 148.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3097 | Select Clay: Wall, Zone 60 | 142.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3098 | Select Clay: Wall, Zone 55 | 133.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3099 | Select Clay: Wall, Zone 56 | 151.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3100 | Select Clay: Wall, Zone 57 | 149.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3101 | Select Clay: Wall, Zone 58 | 149.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3102 | Select Clay: Wall, Zone 59 | 149.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3103 | Select Clay: Wall, Zone 60 | 143.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 09/01/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3104 | | 08/31/23 | P-01 | | CH | 19.4 | 100.8 | 20.9 | 97.0 | 117.3 | 6 | 96 | 95 | 0 / 10 | A |
| 3105 | | 08/31/23 | P-01 | | CH | 19.4 | 100.8 | 23.2 | 96.1 | 118.4 | 6 | 95 | 95 | 0 / 10 | A |
| 3106 | | 08/31/23 | P-03 | | CH | 20.2 | 99.3 | 25.0 | 95.5 | 119.4 | 6 | 96 | 95 | 0 / 10 | A |
| 3107 | | 08/31/23 | P-03 | | CH | 20.2 | 99.3 | 25.1 | 96.5 | 120.7 | 6 | 97 | 95 | 0 / 10 | A |
| 3108 | | 08/31/23 | P-01 | | CH | 19.4 | 100.8 | 23.4 | 100.9 | 124.5 | 6 | 100 | 95 | 0 / 10 | A |
| 3109 | | 08/31/23 | P-16 | | CH | 20.2 | 101.8 | 22.0 | 101.9 | 124.3 | 6 | 100 | 95 | 0 / 10 | A |
| 3110 | | 08/31/23 | P-03 | | CH | 20.2 | 99.3 | 24.4 | 95.9 | 119.3 | 6 | 97 | 95 | 0 / 10 | A |
| 3111 | | 08/31/23 | P-01 | | CH | 19.4 | 100.8 | 22.8 | 100.6 | 123.5 | 6 | 100 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 3104 | Select Clay: Wall, Zone 55 | 134.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3105 | Select Clay: Wall, Zone 56 | 152.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3106 | Select Clay: Wall, Zone 57 | 150.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3107 | Select Clay: Wall, Zone 58 | 150.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3108 | Select Clay: Wall, Zone 59 | 150.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3109 | Select Clay: Wall, Zone 60 | 144.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3110 | Select Clay: Wall, Zone 55 | 135.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3111 | Select Clay: Wall, Zone 56 | 153.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 09/01/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3112 | | 08/31/23 | P-16 | | CH | 20.2 | 101.8 | 23.0 | 102.3 | 125.8 | 6 | 100 | 95 | 0 / 10 | A |
| 3113 | | 08/31/23 | P-16 | | CH | 20.2 | 101.8 | 20.9 | 102.5 | 123.9 | 6 | 101 | 95 | 0 / 10 | A |
| 3114 | | 08/31/23 | P-16 | | CH | 20.2 | 101.8 | 21.8 | 100.8 | 122.8 | 6 | 99 | 95 | 0 / 10 | A |
| 3115 | | 08/31/23 | P-16 | | CH | 20.2 | 101.8 | 18.5 | 108.1 | 128.1 | 6 | 106 | 95 | 0 / 10 | B |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 3112 | Select Clay: Wall, Zone 57 | 151.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3113 | Select Clay: Wall, Zone 58 | 151.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3114 | Select Clay: Wall, Zone 59 | 151.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3115 | Select Clay: Wall, Zone 60 | 145.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications<br><br>**B:** Test results do not comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Kurt Kuechle
09/01/2023

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 09/04/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3116 | | 09/01/23 | P-16 | | CH | 20.2 | 101.8 | 23.4 | 102.0 | 125.9 | 6 | 100 | 95 | 0 / 10 | A |
| 3117 | | 09/01/23 | P-16 | | CH | 20.2 | 101.8 | 22.6 | 102.8 | 126.0 | 6 | 101 | 95 | 0 / 10 | A |
| 3118 | 3115 | 09/01/23 | P-16 | | CH | 20.2 | 101.8 | 23.3 | 101.9 | 125.6 | 6 | 100 | 95 | 0 / 10 | A |
| 3119 | | 09/01/23 | P-16 | | CH | 20.2 | 101.8 | 20.2 | 101.9 | 122.5 | 6 | 100 | 95 | 0 / 10 | A |
| 3120 | | 09/01/23 | P-16 | | CH | 20.2 | 101.8 | 24.0 | 97.2 | 120.5 | 6 | 95 | 95 | 0 / 10 | A |
| 3121 | | 09/01/23 | P-16 | | CH | 20.2 | 101.8 | 24.2 | 100.4 | 124.7 | 6 | 99 | 95 | 0 / 10 | A |
| 3122 | | 09/01/23 | P-16 | | CH | 20.2 | 101.8 | 22.3 | 101.4 | 124.0 | 6 | 100 | 95 | 0 / 10 | A |
| 3123 | | 09/01/23 | P-01 | | CH | 19.4 | 100.8 | 20.6 | 96.6 | 116.5 | 6 | 96 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 3116 | Select Clay: Wall, Zone 55 | 136.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3117 | Select Clay: Wall, Zone 56 | 154.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3118 | Select Clay: Wall, Zone 60 | 145.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3119 | Select Clay: Floor, Zone 51 | 8.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3120 | Select Clay: Floor, Zone 50 | 8.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3121 | Select Clay: Floor, Zone 49 | 8.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3122 | Select Clay: Floor, Zone 48 | 8.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3123 | Select Clay: Floor, Zone 47 | 8.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 09/04/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3124 | | 09/01/23 | P-01 | | CH | 19.4 | 100.8 | 23.1 | 99.7 | 122.7 | 6 | 99 | 95 | 0 / 10 | A |
| 3125 | | 09/01/23 | P-01 | | CH | 19.4 | 100.8 | 23.6 | 100.1 | 123.7 | 6 | 99 | 95 | 0 / 10 | A |
| 3126 | | 09/01/23 | P-01 | | CH | 19.4 | 100.8 | 23.8 | 100.6 | 124.5 | 6 | 100 | 95 | 0 / 10 | A |
| 3127 | | 09/01/23 | P-03 | | CH | 20.2 | 99.3 | 23.5 | 97.6 | 120.5 | 4 | 98 | 95 | 0 / 10 | A |
| 3128 | | 09/01/23 | P-16 | | CH | 20.2 | 101.8 | 22.8 | 101.6 | 124.8 | 4 | 100 | 95 | 0 / 10 | A |
| 3129 | | 09/01/23 | P-03 | | CH | 20.2 | 99.3 | 24.3 | 97.5 | 121.2 | 4 | 98 | 95 | 0 / 10 | A |
| 3130 | | 09/01/23 | P-03 | | CH | 20.2 | 99.3 | 24.1 | 99.5 | 123.5 | 4 | 100 | 95 | 0 / 10 | A |
| 3131 | | 09/01/23 | P-16 | | CH | 20.2 | 101.8 | 22.9 | 102.1 | 125.5 | 4 | 100 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 3124 | Select Clay: Floor, Zone 46 | 8.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3125 | Select Clay: Floor, Zone 45 | 8.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3126 | Select Clay: Floor, Zone 44 | 8.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3127 | Select Clay: Floor, Zone 43 | 1.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3128 | Select Clay: Floor, Zone 42 | 1.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3129 | Select Clay: Floor, Zone 41 | 1.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3130 | Select Clay: Floor, Zone 40 | 1.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3131 | Select Clay: Floor, Zone 39 | 1.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 09/04/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3132 | | 09/01/23 | P-01 | | CH | 19.4 | 100.8 | 23.7 | 100.0 | 123.7 | 4 | 99 | 95 | 0 / 10 | A |
| 3133 | | 09/01/23 | P-16 | | CH | 20.2 | 101.8 | 23.4 | 100.8 | 124.4 | 4 | 99 | 95 | 0 / 10 | A |
| 3134 | | 09/01/23 | P-16 | | CH | 20.2 | 101.8 | 21.3 | 103.0 | 124.9 | 6 | 101 | 95 | 0 / 10 | A |
| 3135 | | 09/01/23 | P-03 | | CH | 20.2 | 99.3 | 23.4 | 99.0 | 122.2 | 6 | 100 | 95 | 0 / 10 | A |
| 3136 | | 09/01/23 | P-03 | | CH | 20.2 | 99.3 | 22.7 | 96.0 | 117.8 | 6 | 97 | 95 | 0 / 10 | A |
| 3137 | | 09/01/23 | P-16 | | CH | 20.2 | 101.8 | 20.8 | 101.9 | 123.1 | 6 | 100 | 95 | 0 / 10 | A |
| 3138 | | 09/01/23 | P-16 | | CH | 20.2 | 101.8 | 20.9 | 103.1 | 124.6 | 6 | 101 | 95 | 0 / 10 | A |
| 3139 | | 09/01/23 | P-03 | | CH | 20.2 | 99.3 | 24.3 | 95.2 | 118.3 | 6 | 96 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 3132 | Select Clay: Floor, Zone 38 | 1.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3133 | Select Clay: Floor, Zone 37 | 1.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3134 | Select Clay: Floor, Zone 36 | 1.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3135 | Select Clay: Floor, Zone 43 | 2.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3136 | Select Clay: Floor, Zone 42 | 2.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3137 | Select Clay: Floor, Zone 41 | 2.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3138 | Select Clay: Floor, Zone 40 | 2.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3139 | Select Clay: Floor, Zone 39 | 2.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 09/04/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3140 | | 09/01/23 | P-03 | | CH | 20.2 | 99.3 | 22.2 | 97.7 | 119.4 | 6 | 98 | 95 | 0 / 10 | A |
| 3141 | | 09/01/23 | P-16 | | CH | 20.2 | 101.8 | 22.0 | 102.8 | 125.4 | 6 | 101 | 95 | 0 / 10 | A |
| 3142 | | 09/01/23 | P-03 | | CH | 20.2 | 99.3 | 24.3 | 97.7 | 121.4 | 6 | 98 | 95 | 0 / 10 | A |
| 3143 | | 09/01/23 | P-03 | | CH | 20.2 | 99.3 | 24.3 | 96.2 | 119.6 | 6 | 97 | 95 | 0 / 10 | A |
| 3144 | | 09/01/23 | P-03 | | CH | 20.2 | 99.3 | 22.9 | 99.2 | 121.9 | 6 | 100 | 95 | 0 / 10 | A |
| 3145 | | 09/01/23 | P-02 | | CH | 22.6 | 97.7 | 24.8 | 93.9 | 117.2 | 6 | 96 | 95 | 0 / 10 | A |
| 3146 | | 09/01/23 | P-02 | | CH | 22.6 | 97.7 | 25.7 | 94.8 | 119.2 | 6 | 97 | 95 | 0 / 10 | A |
| 3147 | | 09/01/23 | P-03 | | CH | 20.2 | 99.3 | 22.7 | 99.4 | 122.0 | 6 | 100 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 3140 | Select Clay: Floor, Zone 38 | 2.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3141 | Select Clay: Floor, Zone 37 | 2.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3142 | Select Clay: Floor, Zone 36 | 2.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3143 | Select Clay: Floor, Zone 43 | 3.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3144 | Select Clay: Floor, Zone 42 | 3.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3145 | Select Clay: Floor, Zone 41 | 3.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3146 | Select Clay: Floor, Zone 40 | 3.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3147 | Select Clay: Floor, Zone 39 | 3.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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2908 Morrison Ave.
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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 09/04/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3148 | | 09/01/23 | P-03 | | CH | 20.2 | 99.3 | 21.7 | 99.7 | 121.3 | 6 | 100 | 95 | 0 / 10 | A |
| 3149 | | 09/01/23 | P-03 | | CH | 20.2 | 99.3 | 24.8 | 95.6 | 119.3 | 6 | 96 | 95 | 0 / 10 | A |
| 3150 | | 09/01/23 | P-16 | | CH | 20.2 | 101.8 | 22.0 | 102.1 | 124.6 | 6 | 100 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 3148 | Select Clay: Floor, Zone 38 | 3.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3149 | Select Clay: Floor, Zone 37 | 3.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3150 | Select Clay: Floor, Zone 36 | 3.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Kurt Kuechle
09/04/2023

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 09/07/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3151 | | 09/06/23 | P-07 | | CH | 22.6 | 93.8 | 24.9 | 92.8 | 115.9 | 6 | 99 | 95 | 0 / 10 | A |
| 3152 | | 09/06/23 | P-07 | | CH | 22.6 | 93.8 | 22.9 | 91.6 | 112.6 | 6 | 98 | 95 | 0 / 10 | A |
| 3153 | | 09/06/23 | P-07 | | CH | 22.6 | 93.8 | 23.7 | 89.4 | 110.6 | 6 | 95 | 95 | 0 / 10 | A |
| 3154 | | 09/06/23 | P-07 | | CH | 22.6 | 93.8 | 26.3 | 91.6 | 115.7 | 6 | 98 | 95 | 0 / 10 | A |
| 3155 | | 09/06/23 | P-03 | | CH | 20.2 | 99.3 | 26.7 | 95.6 | 121.1 | 6 | 96 | 95 | 0 / 10 | A |
| 3156 | | 09/06/23 | P-03 | | CH | 20.2 | 99.3 | 22.7 | 96.8 | 118.8 | 6 | 97 | 95 | 0 / 10 | A |
| 3157 | | 09/06/23 | P-03 | | CH | 20.2 | 99.3 | 24.5 | 99.4 | 123.8 | 6 | 100 | 95 | 0 / 10 | A |
| 3158 | | 09/06/23 | P-07 | | CH | 22.6 | 93.8 | 26.0 | 90.9 | 114.5 | 6 | 97 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 3151 | Select Clay: Floor, Zone 43 | 4.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3152 | Select Clay: Floor, Zone 42 | 4.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3153 | Select Clay: Floor, Zone 41 | 4.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3154 | Select Clay: Floor, Zone 40 | 4.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3155 | Select Clay: Floor, Zone 39 | 4.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3156 | Select Clay: Floor, Zone 38 | 4.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3157 | Select Clay: Floor, Zone 37 | 4.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3158 | Select Clay: Floor, Zone 36 | 4.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 09/07/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3159 | | 09/06/23 | P-01 | | CH | 19.4 | 100.8 | 22.6 | 100.6 | 123.3 | 6 | 100 | 95 | 0 / 10 | A |
| 3160 | | 09/06/23 | P-01 | | CH | 19.4 | 100.8 | 22.3 | 101.0 | 123.5 | 6 | 100 | 95 | 0 / 10 | A |
| 3161 | | 09/06/23 | P-03 | | CH | 20.2 | 99.3 | 24.2 | 98.3 | 122.1 | 6 | 99 | 95 | 0 / 10 | A |
| 3162 | | 09/06/23 | P-03 | | CH | 20.2 | 99.3 | 21.3 | 97.4 | 118.1 | 6 | 98 | 95 | 0 / 10 | A |
| 3163 | | 09/06/23 | P-03 | | CH | 20.2 | 99.3 | 27.0 | 94.6 | 120.1 | 6 | 95 | 95 | 0 / 10 | A |
| 3164 | | 09/06/23 | P-03 | | CH | 20.2 | 99.3 | 23.7 | 98.8 | 122.2 | 6 | 99 | 95 | 0 / 10 | A |
| 3165 | | 09/06/23 | P-01 | | CH | 19.4 | 100.8 | 20.9 | 102.0 | 123.3 | 6 | 101 | 95 | 0 / 10 | A |
| 3166 | | 09/06/23 | P-07 | | CH | 22.6 | 93.8 | 26.8 | 93.2 | 118.2 | 6 | 99 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 3159 | Select Clay: Floor, Zone 43 | 5.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3160 | Select Clay: Floor, Zone 42 | 5.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3161 | Select Clay: Floor, Zone 41 | 5.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3162 | Select Clay: Floor, Zone 40 | 5.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3163 | Select Clay: Floor, Zone 39 | 5.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3164 | Select Clay: Floor, Zone 38 | 5.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3165 | Select Clay: Floor, Zone 37 | 5.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3166 | Select Clay: Floor, Zone 36 | 5.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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# Field Compaction Report

**Report Date:** 09/07/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3167 | | 09/06/23 | P-03 | | CH | 20.2 | 99.3 | 24.2 | 97.6 | 121.2 | 6 | 98 | 95 | 0 / 10 | A |
| 3168 | | 09/06/23 | P-01 | | CH | 19.4 | 100.8 | 21.8 | 101.0 | 123.0 | 6 | 100 | 95 | 0 / 10 | A |
| 3169 | | 09/06/23 | P-03 | | CH | 20.2 | 99.3 | 22.0 | 95.2 | 116.1 | 6 | 96 | 95 | 0 / 10 | A |
| 3170 | | 09/06/23 | P-03 | | CH | 20.2 | 99.3 | 24.9 | 96.2 | 120.2 | 6 | 97 | 95 | 0 / 10 | A |
| 3171 | | 09/06/23 | P-03 | | CH | 20.2 | 99.3 | 24.3 | 97.3 | 120.9 | 6 | 98 | 95 | 0 / 10 | A |
| 3172 | | 09/06/23 | P-01 | | CH | 19.4 | 100.8 | 22.2 | 102.0 | 124.6 | 6 | 101 | 95 | 0 / 10 | A |
| 3173 | | 09/06/23 | P-07 | | CH | 22.6 | 93.8 | 23.0 | 92.7 | 114.0 | 6 | 99 | 95 | 0 / 10 | A |
| 3174 | | 09/06/23 | P-01 | | CH | 19.4 | 100.8 | 22.8 | 100.4 | 123.3 | 6 | 100 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 3167 | Select Clay: Floor, Zone 43 | 6.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3168 | Select Clay: Floor, Zone 42 | 6.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3169 | Select Clay: Floor, Zone 41 | 6.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3170 | Select Clay: Floor, Zone 40 | 6.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3171 | Select Clay: Floor, Zone 39 | 6.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3172 | Select Clay: Floor, Zone 38 | 6.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3173 | Select Clay: Floor, Zone 37 | 6.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3174 | Select Clay: Floor, Zone 36 | 6.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 09/07/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3175 | | 09/06/23 | P-01 | | CH | 19.4 | 100.8 | 23.2 | 98.6 | 121.5 | 6 | 98 | 95 | 0 / 10 | A |
| 3176 | | 09/06/23 | P-14 | | CH | 27.2 | 92.4 | 29.1 | 92.0 | 118.8 | 6 | 100 | 95 | 0 / 10 | A |
| 3177 | | 09/06/23 | P-03 | | CH | 20.2 | 99.3 | 24.2 | 97.8 | 121.5 | 6 | 98 | 95 | 0 / 10 | A |
| 3178 | | 09/06/23 | P-03 | | CH | 20.2 | 99.3 | 23.8 | 97.2 | 120.3 | 6 | 98 | 95 | 0 / 10 | A |
| 3179 | | 09/06/23 | P-03 | | CH | 20.2 | 99.3 | 23.7 | 99.9 | 123.6 | 6 | 101 | 95 | 0 / 10 | A |
| 3180 | | 09/06/23 | P-01 | | CH | 19.4 | 100.8 | 21.9 | 101.8 | 124.1 | 6 | 101 | 95 | 0 / 10 | A |
| 3181 | | 09/06/23 | P-03 | | CH | 20.2 | 99.3 | 24.4 | 98.8 | 122.9 | 6 | 99 | 95 | 0 / 10 | A |
| 3182 | | 09/06/23 | P-07 | | CH | 22.6 | 93.8 | 26.8 | 89.4 | 113.4 | 6 | 95 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 3175 | Select Clay: Floor, Zone 43 | 7.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3176 | Select Clay: Floor, Zone 42 | 7.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3177 | Select Clay: Floor, Zone 41 | 7.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3178 | Select Clay: Floor, Zone 40 | 7.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3179 | Select Clay: Floor, Zone 39 | 7.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3180 | Select Clay: Floor, Zone 38 | 7.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3181 | Select Clay: Floor, Zone 37 | 7.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3182 | Select Clay: Floor, Zone 36 | 7.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 09/07/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3183 | | 09/06/23 | P-03 | | CH | 20.2 | 99.3 | 21.3 | 99.9 | 121.2 | 6 | 101 | 95 | 0 / 10 | A |
| 3184 | | 09/06/23 | P-01 | | CH | 19.4 | 100.8 | 22.9 | 98.9 | 121.5 | 4 | 98 | 95 | 0 / 10 | A |
| 3185 | | 09/06/23 | P-16 | | CH | 20.2 | 101.8 | 20.8 | 102.9 | 124.3 | 4 | 101 | 95 | 0 / 10 | A |
| 3186 | | 09/06/23 | P-01 | | CH | 19.4 | 100.8 | 20.6 | 99.9 | 120.5 | 4 | 99 | 95 | 0 / 10 | A |
| 3187 | | 09/06/23 | P-16 | | CH | 20.2 | 101.8 | 22.3 | 101.6 | 124.3 | 4 | 100 | 95 | 0 / 10 | A |
| 3188 | | 09/06/23 | P-01 | | CH | 19.4 | 100.8 | 19.8 | 96.8 | 116.0 | 4 | 96 | 95 | 0 / 10 | A |
| 3189 | | 09/06/23 | P-03 | | CH | 20.2 | 99.3 | 22.9 | 97.4 | 119.7 | 4 | 98 | 95 | 0 / 10 | A |
| 3190 | | 09/06/23 | P-16 | | CH | 20.2 | 101.8 | 21.7 | 103.0 | 125.4 | 4 | 101 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 3183 | Select Clay: Floor, Zone 35 | 1.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3184 | Select Clay: Floor, Zone 34 | 1.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3185 | Select Clay: Floor, Zone 33 | 1.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3186 | Select Clay: Floor, Zone 32 | 1.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3187 | Select Clay: Floor, Zone 31 | 1.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3188 | Select Clay: Floor, Zone 30 | 1.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3189 | Select Clay: Floor, Zone 29 | 1.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3190 | Select Clay: Floor, Zone 28 | 1.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 09/07/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3191 | | 09/06/23 | P-01 | | CH | 19.4 | 100.8 | 21.7 | 100.0 | 121.7 | 6 | 99 | 95 | 0 / 10 | A |
| 3192 | | 09/06/23 | P-07 | | CH | 22.6 | 93.8 | 25.6 | 92.9 | 116.7 | 6 | 99 | 95 | 0 / 10 | A |
| 3193 | | 09/06/23 | P-01 | | CH | 19.4 | 100.8 | 22.7 | 99.9 | 122.6 | 6 | 99 | 95 | 0 / 10 | A |
| 3194 | | 09/06/23 | P-14 | | CH | 27.2 | 92.4 | 29.1 | 89.5 | 115.5 | 6 | 97 | 95 | 0 / 10 | A |
| 3195 | | 09/06/23 | P-12 | | CH | 23.6 | 97.4 | 25.3 | 95.2 | 119.3 | 6 | 98 | 95 | 0 / 10 | A |
| 3196 | | 09/06/23 | P-16 | | CH | 20.2 | 101.8 | 22.6 | 102.1 | 125.2 | 6 | 100 | 95 | 0 / 10 | A |
| 3197 | | 09/06/23 | P-01 | | CH | 19.4 | 100.8 | 23.4 | 100.8 | 124.4 | 6 | 100 | 95 | 0 / 10 | A |
| 3198 | | 09/06/23 | P-03 | | CH | 20.2 | 99.3 | 24.8 | 96.7 | 120.7 | 6 | 97 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 3191 | Select Clay: Floor, Zone 36 | 8.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3192 | Select Clay: Floor, Zone 37 | 8.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3193 | Select Clay: Floor, Zone 38 | 8.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3194 | Select Clay: Floor, Zone 39 | 8.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3195 | Select Clay: Floor, Zone 40 | 8.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3196 | Select Clay: Floor, Zone 41 | 8.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3197 | Select Clay: Floor, Zone 42 | 8.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3198 | Select Clay: Floor, Zone 43 | 8.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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# Field Compaction Report

**Report Date:** 09/07/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3199 | | 09/06/23 | P-03 | | CH | 20.2 | 99.3 | 22.5 | 99.7 | 122.1 | 6 | 100 | 95 | 0 / 10 | A |
| 3200 | | 09/06/23 | P-03 | | CH | 20.2 | 99.3 | 24.5 | 99.6 | 124.0 | 6 | 100 | 95 | 0 / 10 | A |
| 3201 | | 09/06/23 | P-01 | | CH | 19.4 | 100.8 | 21.5 | 101.1 | 122.8 | 6 | 100 | 95 | 0 / 10 | A |
| 3202 | | 09/06/23 | P-01 | | CH | 19.4 | 100.8 | 23.1 | 101.3 | 124.7 | 6 | 100 | 95 | 0 / 10 | A |
| 3203 | | 09/06/23 | P-03 | | CH | 20.2 | 99.3 | 25.4 | 96.3 | 120.8 | 6 | 97 | 95 | 0 / 10 | A |
| 3204 | | 09/06/23 | P-03 | | CH | 20.2 | 99.3 | 23.8 | 99.3 | 122.9 | 6 | 100 | 95 | 0 / 10 | A |
| 3205 | | 09/06/23 | P-03 | | CH | 20.2 | 99.3 | 23.3 | 98.8 | 121.8 | 6 | 99 | 95 | 0 / 10 | A |
| 3206 | | 09/06/23 | P-07 | | CH | 22.6 | 93.8 | 23.4 | 93.7 | 115.6 | 6 | 100 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 3199 | Select Clay: Floor, Zone 35 | 2.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3200 | Select Clay: Floor, Zone 34 | 2.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3201 | Select Clay: Floor, Zone 33 | 2.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3202 | Select Clay: Floor, Zone 32 | 2.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3203 | Select Clay: Floor, Zone 31 | 2.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3204 | Select Clay: Floor, Zone 30 | 2.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3205 | Select Clay: Floor, Zone 29 | 2.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3206 | Select Clay: Floor, Zone 28 | 2.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Kurt Kuechle
09/07/2023

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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2908 Morrison Ave.
Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 09/11/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3207 | | 09/07/23 | P-16 | | CH | 20.2 | 101.8 | 22.3 | 103.2 | 126.2 | 6 | 101 | 95 | 0 / 10 | A |
| 3208 | | 09/07/23 | P-01 | | CH | 19.4 | 100.8 | 20.1 | 100.2 | 120.3 | 6 | 99 | 95 | 0 / 10 | A |
| 3209 | | 09/07/23 | P-03 | | CH | 20.2 | 99.3 | 22.9 | 95.0 | 116.8 | 6 | 96 | 95 | 0 / 10 | A |
| 3210 | | 09/07/23 | P-03 | | CH | 20.2 | 99.3 | 24.4 | 98.6 | 122.7 | 6 | 99 | 95 | 0 / 10 | A |
| 3211 | | 09/07/23 | P-03 | | CH | 20.2 | 99.3 | 22.3 | 98.8 | 120.8 | 6 | 99 | 95 | 0 / 10 | A |
| 3212 | | 09/07/23 | P-03 | | CH | 20.2 | 99.3 | 22.1 | 99.0 | 120.9 | 6 | 100 | 95 | 0 / 10 | A |
| 3213 | | 09/07/23 | P-01 | | CH | 19.4 | 100.8 | 22.6 | 100.6 | 123.3 | 6 | 100 | 95 | 0 / 10 | A |
| 3214 | | 09/07/23 | P-01 | | CH | 19.4 | 100.8 | 21.7 | 101.0 | 122.9 | 6 | 100 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 3207 | Select Clay: Floor, Zone 35 | 3.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3208 | Select Clay: Floor, Zone 34 | 3.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3209 | Select Clay: Floor, Zone 33 | 3.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3210 | Select Clay: Floor, Zone 32 | 3.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3211 | Select Clay: Floor, Zone 31 | 3.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3212 | Select Clay: Floor, Zone 30 | 3.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3213 | Select Clay: Floor, Zone 29 | 3.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3214 | Select Clay: Floor, Zone 28 | 3.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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Suite 3
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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 09/11/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3215 | | 09/07/23 | P-13 | | CH | 21.7 | 97.9 | 23.6 | 97.2 | 120.1 | 6 | 99 | 95 | 0 / 10 | A |
| 3216 | | 09/07/23 | P-13 | | CH | 21.7 | 97.9 | 25.1 | 96.7 | 121.0 | 6 | 99 | 95 | 0 / 10 | A |
| 3217 | | 09/07/23 | P-01 | | CH | 19.4 | 100.8 | 23.7 | 101.2 | 125.2 | 6 | 100 | 95 | 0 / 10 | A |
| 3218 | | 09/07/23 | P-13 | | CH | 21.7 | 97.9 | 23.4 | 96.2 | 118.7 | 6 | 98 | 95 | 0 / 10 | A |
| 3219 | | 09/07/23 | P-07 | | CH | 22.6 | 93.8 | 24.9 | 92.4 | 115.4 | 6 | 99 | 95 | 0 / 10 | A |
| 3220 | | 09/07/23 | P-01 | | CH | 19.4 | 100.8 | 23.4 | 100.8 | 124.4 | 6 | 100 | 95 | 0 / 10 | A |
| 3221 | | 09/07/23 | P-13 | | CH | 21.7 | 97.9 | 25.5 | 96.4 | 121.0 | 6 | 98 | 95 | 0 / 10 | A |
| 3222 | | 09/07/23 | P-03 | | CH | 20.2 | 99.3 | 22.1 | 98.6 | 120.4 | 6 | 99 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 3215 | Select Clay: Floor, Zone 35 | 4.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3216 | Select Clay: Floor, Zone 34 | 4.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3217 | Select Clay: Floor, Zone 33 | 4.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3218 | Select Clay: Floor, Zone 32 | 4.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3219 | Select Clay: Floor, Zone 31 | 4.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3220 | Select Clay: Floor, Zone 30 | 4.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3221 | Select Clay: Floor, Zone 29 | 4.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3222 | Select Clay: Floor, Zone 28 | 4.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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# Field Compaction Report

**Report Date:** 09/11/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3223 | | 09/07/23 | P-03 | | CH | 20.2 | 99.3 | 22.6 | 95.4 | 117.0 | 6 | 96 | 95 | 0 / 10 | A |
| 3224 | | 09/07/23 | P-01 | | CH | 19.4 | 100.8 | 22.1 | 101.1 | 123.4 | 6 | 100 | 95 | 0 / 10 | A |
| 3225 | | 09/07/23 | P-03 | | CH | 20.2 | 99.3 | 23.3 | 96.6 | 119.1 | 6 | 97 | 95 | 0 / 10 | A |
| 3226 | | 09/07/23 | P-16 | | CH | 20.2 | 101.8 | 21.0 | 102.6 | 124.1 | 6 | 101 | 95 | 0 / 10 | A |
| 3227 | | 09/07/23 | P-03 | | CH | 20.2 | 99.3 | 21.0 | 97.8 | 118.3 | 6 | 98 | 95 | 0 / 10 | A |
| 3228 | | 09/07/23 | P-01 | | CH | 19.4 | 100.8 | 23.5 | 100.5 | 124.1 | 6 | 100 | 95 | 0 / 10 | A |
| 3229 | | 09/07/23 | P-13 | | CH | 21.7 | 97.9 | 25.6 | 94.2 | 118.3 | 6 | 96 | 95 | 0 / 10 | A |
| 3230 | | 09/07/23 | P-03 | | CH | 20.2 | 99.3 | 23.4 | 97.8 | 120.7 | 6 | 98 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 3223 | Select Clay: Floor, Zone 35 | 5.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3224 | Select Clay: Floor, Zone 34 | 5.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3225 | Select Clay: Floor, Zone 33 | 5.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3226 | Select Clay: Floor, Zone 32 | 5.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3227 | Select Clay: Floor, Zone 31 | 5.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3228 | Select Clay: Floor, Zone 30 | 5.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3229 | Select Clay: Floor, Zone 29 | 5.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3230 | Select Clay: Floor, Zone 28 | 5.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 09/11/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3231 | | 09/08/23 | P-16 | | CH | 20.2 | 101.8 | 21.3 | 102.5 | 124.3 | 6 | 101 | 95 | 0 / 10 | A |
| 3232 | | 09/08/23 | P-01 | | CH | 19.4 | 100.8 | 21.8 | 100.5 | 122.4 | 6 | 100 | 95 | 0 / 10 | A |
| 3233 | | 09/08/23 | P-01 | | CH | 19.4 | 100.8 | 20.3 | 100.9 | 121.4 | 6 | 100 | 95 | 0 / 10 | A |
| 3234 | | 09/08/23 | P-16 | | CH | 20.2 | 101.8 | 20.5 | 103.1 | 124.2 | 6 | 101 | 95 | 0 / 10 | A |
| 3235 | | 09/08/23 | P-16 | | CH | 20.2 | 101.8 | 21.8 | 102.2 | 124.5 | 6 | 100 | 95 | 0 / 10 | A |
| 3236 | | 09/08/23 | P-01 | | CH | 19.4 | 100.8 | 20.2 | 101.0 | 121.4 | 6 | 100 | 95 | 0 / 10 | A |
| 3237 | | 09/08/23 | P-10 | | CH | 25.0 | 94.6 | 27.2 | 89.6 | 114.0 | 6 | 95 | 95 | 0 / 10 | A |
| 3238 | | 09/08/23 | P-03 | | CH | 20.2 | 99.3 | 23.1 | 94.5 | 116.3 | 6 | 95 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 3231 | Select Clay: Floor, Zone 35 | 6.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3232 | Select Clay: Floor, Zone 34 | 6.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3233 | Select Clay: Floor, Zone 33 | 6.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3234 | Select Clay: Floor, Zone 32 | 6.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3235 | Select Clay: Floor, Zone 31 | 6.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3236 | Select Clay: Floor, Zone 30 | 6.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3237 | Select Clay: Floor, Zone 29 | 6.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3238 | Select Clay: Floor, Zone 28 | 6.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 09/11/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3239 | | 09/08/23 | P-03 | | CH | 20.2 | 99.3 | 24.6 | 98.0 | 122.1 | 6 | 99 | 95 | 0 / 10 | A |
| 3240 | | 09/08/23 | P-03 | | CH | 20.2 | 99.3 | 25.3 | 94.5 | 118.4 | 6 | 95 | 95 | 0 / 10 | A |
| 3241 | | 09/08/23 | P-01 | | CH | 19.4 | 100.8 | 22.0 | 101.1 | 123.3 | 6 | 100 | 95 | 0 / 10 | A |
| 3242 | | 09/08/23 | P-03 | | CH | 20.2 | 99.3 | 24.1 | 96.7 | 120.0 | 6 | 97 | 95 | 0 / 10 | A |
| 3243 | | 09/08/23 | P-03 | | CH | 20.2 | 99.3 | 23.6 | 96.3 | 119.0 | 6 | 97 | 95 | 0 / 10 | A |
| 3244 | | 09/08/23 | P-03 | | CH | 20.2 | 99.3 | 23.9 | 99.2 | 122.9 | 6 | 100 | 95 | 0 / 10 | A |
| 3245 | | 09/08/23 | P-03 | | CH | 20.2 | 99.3 | 25.4 | 97.3 | 122.0 | 6 | 98 | 95 | 0 / 10 | A |
| 3246 | | 09/08/23 | P-03 | | CH | 20.2 | 99.3 | 22.3 | 98.6 | 120.6 | 6 | 99 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 3239 | Select Clay: Floor, Zone 35 | 7.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3240 | Select Clay: Floor, Zone 34 | 7.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3241 | Select Clay: Floor, Zone 33 | 7.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3242 | Select Clay: Floor, Zone 32 | 7.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3243 | Select Clay: Floor, Zone 31 | 7.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3244 | Select Clay: Floor, Zone 30 | 7.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3245 | Select Clay: Floor, Zone 29 | 7.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3246 | Select Clay: Floor, Zone 28 | 7.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 09/11/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3247 | | 09/08/23 | P-01 | | CH | 19.4 | 100.8 | 21.9 | 98.0 | 119.5 | 6 | 97 | 95 | 0 / 10 | A |
| 3248 | | 09/08/23 | P-01 | | CH | 19.4 | 100.8 | 20.9 | 100.9 | 122.0 | 6 | 100 | 95 | 0 / 10 | A |
| 3249 | | 09/08/23 | P-01 | | CH | 19.4 | 100.8 | 21.7 | 100.6 | 122.4 | 6 | 100 | 95 | 0 / 10 | A |
| 3250 | | 09/08/23 | P-01 | | CH | 19.4 | 100.8 | 22.4 | 100.7 | 123.3 | 6 | 100 | 95 | 0 / 10 | A |
| 3251 | | 09/08/23 | P-03 | | CH | 20.2 | 99.3 | 23.8 | 98.2 | 121.6 | 6 | 99 | 95 | 0 / 10 | A |
| 3252 | | 09/08/23 | P-01 | | CH | 19.4 | 100.8 | 23.4 | 100.0 | 123.4 | 6 | 99 | 95 | 0 / 10 | A |
| 3253 | | 09/08/23 | P-01 | | CH | 19.4 | 100.8 | 22.4 | 100.9 | 123.5 | 6 | 100 | 95 | 0 / 10 | A |
| 3254 | | 09/08/23 | P-12 | | CH | 23.6 | 97.4 | 27.5 | 96.2 | 122.7 | 6 | 99 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 3247 | Select Clay: Floor, Zone 35 | 8.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3248 | Select Clay: Floor, Zone 34 | 8.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3249 | Select Clay: Floor, Zone 33 | 8.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3250 | Select Clay: Floor, Zone 32 | 8.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3251 | Select Clay: Floor, Zone 31 | 8.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3252 | Select Clay: Floor, Zone 30 | 8.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3253 | Select Clay: Floor, Zone 29 | 8.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3254 | Select Clay: Floor, Zone 28 | 8.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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# Field Compaction Report

**Report Date:** 09/11/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3255 | | 09/08/23 | P-16 | | CH | 20.2 | 101.8 | 22.9 | 101.5 | 124.7 | 4 | 100 | 95 | 0 / 10 | A |
| 3256 | | 09/08/23 | P-01 | | CH | 19.4 | 100.8 | 22.4 | 99.6 | 121.9 | 4 | 99 | 95 | 0 / 10 | A |
| 3257 | | 09/08/23 | P-03 | | CH | 20.2 | 99.3 | 24.3 | 98.5 | 122.4 | 4 | 99 | 95 | 0 / 10 | A |
| 3258 | | 09/08/23 | P-16 | | CH | 20.2 | 101.8 | 21.5 | 102.3 | 124.3 | 6 | 100 | 95 | 0 / 10 | A |
| 3259 | | 09/09/23 | P-01 | | CH | 19.4 | 100.8 | 24.5 | 100.7 | 125.4 | 6 | 100 | 95 | 0 / 10 | A |
| 3260 | | 09/09/23 | P-03 | | CH | 20.2 | 99.3 | 24.8 | 97.2 | 121.3 | 6 | 98 | 95 | 0 / 10 | A |
| 3261 | | 09/09/23 | P-01 | | CH | 19.4 | 100.8 | 22.5 | 100.9 | 123.6 | 6 | 100 | 95 | 0 / 10 | A |
| 3262 | | 09/09/23 | P-03 | | CH | 20.2 | 99.3 | 23.3 | 97.5 | 120.2 | 6 | 98 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 3255 | Select Clay: Wall, Zone 22 | 41.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3256 | Select Clay: Wall, Zone 21 | 77.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3257 | Select Clay: Wall, Zone 21 | 78.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3258 | Select Clay: Wall, Zone 22 | 42.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3259 | Select Clay: Wall, Zone 22 | 43.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3260 | Select Clay: Wall, Zone 22 | 44.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3261 | Select Clay: Wall, Zone 21 | 79.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3262 | Select Clay: Wall, Zone 21 | 80.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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The Science You Build On.

2908 Morrison Ave.
Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 09/11/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3263 | | 09/09/23 | P-01 | | CH | 19.4 | 100.8 | 20.1 | 99.2 | 119.1 | 6 | 98 | 95 | 0 / 10 | A |
| 3264 | | 09/09/23 | P-01 | | CH | 19.4 | 100.8 | 22.7 | 99.8 | 122.5 | 6 | 99 | 95 | 0 / 10 | A |
| 3265 | | 09/09/23 | P-01 | | CH | 19.4 | 100.8 | 21.2 | 101.4 | 122.9 | 6 | 101 | 95 | 0 / 10 | A |
| 3266 | | 09/09/23 | P-01 | | CH | 19.4 | 100.8 | 20.6 | 98.1 | 118.3 | 6 | 97 | 95 | 0 / 10 | A |
| 3267 | | 09/09/23 | P-01 | | CH | 19.4 | 100.8 | 22.8 | 99.8 | 122.6 | 6 | 99 | 95 | 0 / 10 | A |
| 3268 | | 09/09/23 | P-13 | | CH | 21.7 | 97.9 | 24.4 | 95.8 | 119.2 | 6 | 98 | 95 | 0 / 10 | A |
| 3269 | | 09/09/23 | P-03 | | CH | 20.2 | 99.3 | 21.3 | 99.1 | 120.2 | 6 | 100 | 95 | 0 / 10 | A |
| 3270 | | 09/09/23 | P-03 | | CH | 20.2 | 99.3 | 23.2 | 97.8 | 120.5 | 6 | 98 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 3263 | Select Clay: Wall, Zone 22 | 45.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3264 | Select Clay: Wall, Zone 21 | 81.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3265 | Select Clay: Wall, Zone 22 | 46.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3266 | Select Clay: Wall, Zone 21 | 82.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3267 | Select Clay: Wall, Zone 22 | 47.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3268 | Select Clay: Wall, Zone 21 | 83.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3269 | Select Clay: Wall, Zone 22 | 48.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3270 | Select Clay: Wall, Zone 21 | 84.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 09/11/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3271 | | 09/09/23 | P-13 | | CH | 21.7 | 97.9 | 25.2 | 95.0 | 118.9 | 6 | 97 | 95 | 0 / 10 | A |
| 3272 | | 09/09/23 | P-13 | | CH | 21.7 | 97.9 | 23.2 | 96.0 | 118.3 | 6 | 98 | 95 | 0 / 10 | A |
| 3273 | | 09/09/23 | P-02 | | CH | 22.6 | 97.7 | 23.1 | 97.5 | 120.0 | 6 | 100 | 95 | 0 / 10 | A |
| 3274 | | 09/09/23 | P-02 | | CH | 22.6 | 97.7 | 23.6 | 97.1 | 120.0 | 6 | 99 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 3271 | Select Clay: Wall, Zone 22 | 49.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3272 | Select Clay: Wall, Zone 21 | 85.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3273 | Select Clay: Wall, Zone 22 | 50.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3274 | Select Clay: Wall, Zone 21 | 86.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Kurt Kuechle
09/11/2023

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# Field Compaction Report

**Report Date:** 09/12/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3275 | | 09/11/23 | P-16 | | CH | 20.2 | 101.8 | 22.2 | 103.0 | 125.9 | 6 | 101 | 95 | 0 / 10 | A |
| 3276 | | 09/11/23 | P-01 | | CH | 19.4 | 100.8 | 23.4 | 100.8 | 124.4 | 6 | 100 | 95 | 0 / 10 | A |
| 3277 | | 09/11/23 | P-01 | | CH | 19.4 | 100.8 | 23.2 | 100.4 | 123.7 | 6 | 100 | 95 | 0 / 10 | A |
| 3278 | | 09/11/23 | P-01 | | CH | 19.4 | 100.8 | 21.2 | 100.5 | 121.8 | 6 | 100 | 95 | 0 / 10 | A |
| 3279 | | 09/11/23 | P-13 | | CH | 21.7 | 97.9 | 24.5 | 95.9 | 119.4 | 6 | 98 | 95 | 0 / 10 | A |
| 3280 | | 09/11/23 | P-03 | | CH | 20.2 | 99.3 | 23.4 | 99.3 | 122.5 | 6 | 100 | 95 | 0 / 10 | A |
| 3281 | | 09/11/23 | P-03 | | CH | 20.2 | 99.3 | 24.7 | 96.4 | 120.2 | 6 | 97 | 95 | 0 / 10 | A |
| 3282 | | 09/11/23 | P-03 | | CH | 20.2 | 99.3 | 23.9 | 96.7 | 119.8 | 6 | 97 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 3275 | Select Clay: Wall, Zone 22 | 51.0 | Lift Number | Troxler / 3430 / 23996 / | Ficek, Kevin |
| 3276 | Select Clay: Wall, Zone 21 | 87.0 | Lift Number | Troxler / 3430 / 23996 / | Ficek, Kevin |
| 3277 | Select Clay: Wall, Zone 22 | 52.0 | Lift Number | Troxler / 3430 / 23996 / | Ficek, Kevin |
| 3278 | Select Clay: Wall, Zone 21 | 88.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3279 | Select Clay: Wall, Zone 22 | 53.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3280 | Select Clay: Wall, Zone 22 | 54.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3281 | Select Clay: Wall, Zone 21 | 89.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3282 | Select Clay: Wall, Zone 22 | 55.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 09/12/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3283 | | 09/11/23 | P-03 | | CH | 20.2 | 99.3 | 23.2 | 99.7 | 122.8 | 6 | 100 | 95 | 0 / 10 | A |
| 3284 | | 09/11/23 | P-03 | | CH | 20.2 | 99.3 | 23.5 | 99.4 | 122.8 | 6 | 100 | 95 | 0 / 10 | A |
| 3285 | | 09/11/23 | P-01 | | CH | 19.4 | 100.8 | 23.2 | 100.2 | 123.4 | 6 | 99 | 95 | 0 / 10 | A |
| 3286 | | 09/11/23 | P-13 | | CH | 21.7 | 97.9 | 24.6 | 94.2 | 117.4 | 6 | 96 | 95 | 0 / 10 | A |
| 3287 | | 09/11/23 | P-01 | | CH | 19.4 | 100.8 | 21.7 | 100.2 | 121.9 | 6 | 99 | 95 | 0 / 10 | A |
| 3288 | | 09/11/23 | P-13 | | CH | 21.7 | 97.9 | 23.9 | 93.7 | 116.1 | 6 | 96 | 95 | 0 / 10 | A |
| 3289 | | 09/11/23 | P-13 | | CH | 21.7 | 97.9 | 24.3 | 96.2 | 119.6 | 6 | 98 | 95 | 0 / 10 | A |
| 3290 | | 09/11/23 | P-03 | | CH | 20.2 | 99.3 | 23.7 | 98.6 | 122.0 | 6 | 99 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 3283 | Select Clay: Wall, Zone 22 | 56.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3284 | Select Clay: Wall, Zone 21 | 90.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3285 | Select Clay: Wall, Zone 22 | 57.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3286 | Select Clay: Wall, Zone 22 | 58.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3287 | Select Clay: Wall, Zone 21 | 91.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3288 | Select Clay: Wall, Zone 22 | 59.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3289 | Select Clay: Wall, Zone 22 | 60.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3290 | Select Clay: Wall, Zone 21 | 92.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 09/12/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3291 | | 09/11/23 | P-03 | | CH | 20.2 | 99.3 | 21.9 | 99.7 | 121.5 | 6 | 100 | 95 | 0 / 10 | A |
| 3292 | | 09/11/23 | P-16 | | CH | 20.2 | 101.8 | 21.2 | 101.6 | 123.1 | 6 | 100 | 95 | 0 / 10 | A |
| 3293 | | 09/11/23 | P-16 | | CH | 20.2 | 101.8 | 24.4 | 100.3 | 124.8 | 6 | 99 | 95 | 0 / 10 | A |
| 3294 | | 09/11/23 | P-16 | | CH | 20.2 | 101.8 | 21.4 | 101.2 | 122.9 | 6 | 99 | 95 | 0 / 10 | A |
| 3295 | | 09/11/23 | P-03 | | CH | 20.2 | 99.3 | 25.0 | 98.8 | 123.5 | 6 | 99 | 95 | 0 / 10 | A |
| 3296 | | 09/11/23 | P-03 | | CH | 20.2 | 99.3 | 22.1 | 99.5 | 121.5 | 6 | 100 | 95 | 0 / 10 | A |
| 3297 | | 09/11/23 | P-10 | | CH | 25.0 | 94.6 | 27.4 | 91.6 | 116.7 | 6 | 97 | 95 | 0 / 10 | A |
| 3298 | | 09/11/23 | P-03 | | CH | 20.2 | 99.3 | 24.6 | 97.7 | 121.7 | 6 | 98 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 3291 | Select Clay: Wall, Zone 22 | 61.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3292 | Select Clay: Wall, Zone 22 | 62.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3293 | Select Clay: Wall, Zone 21 | 93.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3294 | Select Clay: Wall, Zone 22 | 63.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3295 | Select Clay: Wall, Zone 22 | 64.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3296 | Select Clay: Wall, Zone 21 | 94.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3297 | Select Clay: Wall, Zone 22 | 65.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3298 | Select Clay: Wall, Zone 22 | 66.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 09/12/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3299 | | 09/11/23 | P-03 | | CH | 20.2 | 99.3 | 23.3 | 99.5 | 122.7 | 6 | 100 | 95 | 0 / 10 | A |
| 3300 | | 09/11/23 | P-03 | | CH | 20.2 | 99.3 | 24.3 | 95.2 | 118.3 | 6 | 96 | 95 | 0 / 10 | A |
| 3301 | | 09/11/23 | P-03 | | CH | 20.2 | 99.3 | 23.7 | 94.7 | 117.1 | 6 | 95 | 95 | 0 / 10 | A |
| 3302 | | 09/11/23 | P-01 | | CH | 19.4 | 100.8 | 22.1 | 101.0 | 123.3 | 6 | 100 | 95 | 0 / 10 | A |
| 3303 | | 09/11/23 | P-03 | | CH | 20.2 | 99.3 | 22.2 | 99.2 | 121.2 | 6 | 100 | 95 | 0 / 10 | A |
| 3304 | | 09/11/23 | P-03 | | CH | 20.2 | 99.3 | 24.7 | 95.0 | 118.5 | 6 | 96 | 95 | 0 / 10 | A |
| 3305 | | 09/11/23 | P-03 | | CH | 20.2 | 99.3 | 25.5 | 95.9 | 120.4 | 6 | 97 | 95 | 0 / 10 | A |
| 3306 | | 09/11/23 | P-03 | | CH | 20.2 | 99.3 | 21.7 | 94.4 | 114.9 | 6 | 95 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 3299 | Select Clay: Wall, Zone 21 | 95.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3300 | Select Clay: Wall, Zone 22 | 67.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3301 | Select Clay: Wall, Zone 22 | 68.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3302 | Select Clay: Wall, Zone 21 | 96.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3303 | Select Clay: Wall, Zone 22 | 69.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3304 | Select Clay: Wall, Zone 22 | 70.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3305 | Select Clay: Wall, Zone 21 | 97.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3306 | Select Clay: Wall, Zone 22 | 71.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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# Field Compaction Report

**Report Date:** 09/12/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3307 | | 09/11/23 | P-07 | | CH | 22.6 | 93.8 | 23.0 | 92.8 | 114.1 | 6 | 99 | 95 | 0 / 10 | A |
| 3308 | | 09/11/23 | P-03 | | CH | 20.2 | 99.3 | 21.0 | 96.6 | 116.9 | 6 | 97 | 95 | 0 / 10 | A |
| 3309 | | 09/11/23 | P-03 | | CH | 20.2 | 99.3 | 20.2 | 99.0 | 119.0 | 6 | 100 | 95 | 0 / 10 | A |
| 3310 | | 09/11/23 | P-01 | | CH | 19.4 | 100.8 | 21.9 | 100.8 | 122.9 | 6 | 100 | 95 | 0 / 10 | A |
| 3311 | | 09/11/23 | P-03 | | CH | 20.2 | 99.3 | 23.6 | 98.1 | 121.3 | 6 | 99 | 95 | 0 / 10 | A |
| 3312 | | 09/11/23 | P-03 | | CH | 20.2 | 99.3 | 22.4 | 99.9 | 122.3 | 6 | 101 | 95 | 0 / 10 | A |
| 3313 | | 09/11/23 | P-10 | | CH | 25.0 | 94.6 | 27.8 | 90.3 | 115.4 | 6 | 95 | 95 | 0 / 10 | A |
| 3314 | | 09/11/23 | P-03 | | CH | 20.2 | 99.3 | 22.6 | 94.5 | 115.9 | 6 | 95 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 3307 | Select Clay: Wall, Zone 22 | 72.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3308 | Select Clay: Wall, Zone 21 | 98.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3309 | Select Clay: Wall, Zone 22 | 73.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3310 | Select Clay: Wall, Zone 22 | 74.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3311 | Select Clay: Wall, Zone 21 | 99.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3312 | Select Clay: Wall, Zone 22 | 75.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3313 | Select Clay: Wall, Zone 22 | 76.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3314 | Select Clay: Wall, Zone 21 | 100.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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2908 Morrison Ave.
Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 09/12/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3315 | | 09/11/23 | P-03 | | CH | 20.2 | 99.3 | 24.1 | 95.3 | 118.3 | 6 | 96 | 95 | 0 / 10 | A |
| 3316 | | 09/11/23 | P-03 | | CH | 20.2 | 99.3 | 24.2 | 97.0 | 120.5 | 6 | 98 | 95 | 0 / 10 | A |
| 3317 | | 09/11/23 | P-03 | | CH | 20.2 | 99.3 | 24.5 | 95.8 | 119.3 | 6 | 96 | 95 | 0 / 10 | A |
| 3318 | | 09/11/23 | P-03 | | CH | 20.2 | 99.3 | 22.4 | 98.7 | 120.8 | 6 | 99 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 3315 | Select Clay: Wall, Zone 22 | 77.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3316 | Select Clay: Wall, Zone 22 | 78.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3317 | Select Clay: Wall, Zone 21 | 101.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3318 | Select Clay: Wall, Zone 22 | 79.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Kurt Kuechle
09/12/2023

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# Field Compaction Report

**Report Date:** 09/13/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3319 | | 09/12/23 | P-03 | | CH | 20.2 | 99.3 | 24.2 | 97.1 | 120.6 | 6 | 98 | 95 | 0 / 10 | A |
| 3320 | | 09/12/23 | P-03 | | CH | 20.2 | 99.3 | 23.8 | 97.3 | 120.5 | 6 | 98 | 95 | 0 / 10 | A |
| 3321 | | 09/12/23 | P-16 | | CH | 20.2 | 101.8 | 23.5 | 101.3 | 125.1 | 6 | 100 | 95 | 0 / 10 | A |
| 3322 | | 09/12/23 | P-03 | | CH | 20.2 | 99.3 | 25.4 | 95.6 | 119.9 | 6 | 96 | 95 | 0 / 10 | A |
| 3323 | | 09/12/23 | P-03 | | CH | 20.2 | 99.3 | 24.9 | 96.1 | 120.0 | 6 | 97 | 95 | 0 / 10 | A |
| 3324 | | 09/12/23 | P-01 | | CH | 19.4 | 100.8 | 20.7 | 101.0 | 121.9 | 6 | 100 | 95 | 0 / 10 | A |
| 3325 | | 09/12/23 | P-03 | | CH | 20.2 | 99.3 | 22.8 | 98.5 | 121.0 | 6 | 99 | 95 | 0 / 10 | A |
| 3326 | | 09/12/23 | P-03 | | CH | 20.2 | 99.3 | 23.0 | 96.0 | 118.1 | 6 | 97 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 3319 | Select Clay: Wall, Zone 21 | 102.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3320 | Select Clay: Wall, Zone 22 | 80.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3321 | Select Clay: Wall, Zone 22 | 81.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3322 | Select Clay: Wall, Zone 21 | 103.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3323 | Select Clay: Wall, Zone 22 | 82.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3324 | Select Clay: Wall, Zone 22 | 83.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3325 | Select Clay: Wall, Zone 21 | 104.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3326 | Select Clay: Wall, Zone 22 | 84.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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# Field Compaction Report

**Report Date:** 09/13/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3327 | | 09/12/23 | P-03 | | CH | 20.2 | 99.3 | 21.3 | 97.8 | 118.6 | 6 | 98 | 95 | 0 / 10 | A |
| 3328 | | 09/12/23 | P-07 | | CH | 22.6 | 93.8 | 26.9 | 90.1 | 114.3 | 6 | 96 | 95 | 0 / 10 | A |
| 3329 | | 09/12/23 | P-07 | | CH | 22.6 | 93.8 | 25.5 | 93.2 | 117.0 | 6 | 99 | 95 | 0 / 10 | A |
| 3330 | | 09/12/23 | P-03 | | CH | 20.2 | 99.3 | 21.3 | 99.0 | 120.1 | 6 | 100 | 95 | 0 / 10 | A |
| 3331 | | 09/12/23 | P-01 | | CH | 19.4 | 100.8 | 22.3 | 100.2 | 122.5 | 6 | 99 | 95 | 0 / 10 | A |
| 3332 | | 09/12/23 | P-01 | | CH | 19.4 | 100.8 | 23.6 | 98.4 | 121.6 | 6 | 98 | 95 | 0 / 10 | A |
| 3333 | | 09/12/23 | P-01 | | CH | 19.4 | 100.8 | 21.4 | 100.3 | 121.8 | 6 | 100 | 95 | 0 / 10 | A |
| 3334 | | 09/12/23 | P-01 | | CH | 19.4 | 100.8 | 22.6 | 98.8 | 121.1 | 6 | 98 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 3327 | Select Clay: Wall, Zone 22 | 85.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3328 | Select Clay: Wall, Zone 21 | 105.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3329 | Select Clay: Wall, Zone 22 | 86.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3330 | Select Clay: Wall, Zone 22 | 87.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3331 | Select Clay: Wall, Zone 21 | 106.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3332 | Select Clay: Wall, Zone 22 | 88.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3333 | Select Clay: Wall, Zone 22 | 89.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3334 | Select Clay: Wall, Zone 21 | 107.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 09/13/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3335 | | 09/12/23 | P-07 | | CH | 22.6 | 93.8 | 25.6 | 93.5 | 117.4 | 6 | 100 | 95 | 0 / 10 | A |
| 3336 | | 09/12/23 | P-01 | | CH | 19.4 | 100.8 | 23.9 | 99.9 | 123.8 | 6 | 99 | 95 | 0 / 10 | A |
| 3337 | | 09/12/23 | P-01 | | CH | 19.4 | 100.8 | 23.4 | 99.4 | 122.7 | 6 | 99 | 95 | 0 / 10 | A |
| 3338 | | 09/12/23 | P-01 | | CH | 19.4 | 100.8 | 24.9 | 97.2 | 121.4 | 6 | 96 | 95 | 0 / 10 | A |
| 3339 | | 09/12/23 | P-07 | | CH | 22.6 | 93.8 | 25.1 | 91.8 | 114.8 | 6 | 98 | 95 | 0 / 10 | A |
| 3340 | | 09/12/23 | P-01 | | CH | 19.4 | 100.8 | 21.7 | 98.9 | 120.4 | 6 | 98 | 95 | 0 / 10 | A |
| 3341 | | 09/12/23 | P-01 | | CH | 19.4 | 100.8 | 24.3 | 96.8 | 120.3 | 6 | 96 | 95 | 0 / 10 | A |
| 3342 | | 09/12/23 | P-01 | | CH | 19.4 | 100.8 | 21.7 | 98.2 | 119.5 | 6 | 97 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 3335 | Select Clay: Wall, Zone 22 | 90.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3336 | Select Clay: Wall, Zone 22 | 91.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3337 | Select Clay: Wall, Zone 21 | 108.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3338 | Select Clay: Wall, Zone 22 | 92.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3339 | Select Clay: Wall, Zone 22 | 93.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3340 | Select Clay: Wall, Zone 21 | 109.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3341 | Select Clay: Wall, Zone 22 | 94.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3342 | Select Clay: Wall, Zone 22 | 95.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 09/13/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3343 | | 09/12/23 | P-01 | | CH | 19.4 | 100.8 | 23.6 | 98.9 | 122.2 | 6 | 98 | 95 | 0 / 10 | A |
| 3344 | | 09/12/23 | P-01 | | CH | 19.4 | 100.8 | 24.0 | 99.5 | 123.4 | 6 | 99 | 95 | 0 / 10 | A |
| 3345 | | 09/12/23 | P-01 | | CH | 19.4 | 100.8 | 22.3 | 100.7 | 123.2 | 6 | 100 | 95 | 0 / 10 | A |
| 3346 | | 09/12/23 | P-01 | | CH | 19.4 | 100.8 | 23.0 | 97.1 | 119.4 | 6 | 96 | 95 | 0 / 10 | A |
| 3347 | | 09/12/23 | P-01 | | CH | 19.4 | 100.8 | 21.7 | 98.5 | 119.9 | 6 | 98 | 95 | 0 / 10 | A |
| 3348 | | 09/12/23 | P-01 | | CH | 19.4 | 100.8 | 22.7 | 96.2 | 118.0 | 6 | 95 | 95 | 0 / 10 | A |
| 3349 | | 09/12/23 | P-10 | | CH | 25.0 | 94.6 | 28.3 | 91.9 | 117.9 | 6 | 97 | 95 | 0 / 10 | A |
| 3350 | | 09/12/23 | P-01 | | CH | 19.4 | 100.8 | 22.0 | 98.9 | 120.7 | 6 | 98 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 3343 | Select Clay: Wall, Zone 21 | 110.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3344 | Select Clay: Wall, Zone 22 | 96.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3345 | Select Clay: Wall, Zone 22 | 97.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3346 | Select Clay: Wall, Zone 21 | 111.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3347 | Select Clay: Wall, Zone 22 | 98.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3348 | Select Clay: Wall, Zone 22 | 99.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3349 | Select Clay: Wall, Zone 21 | 112.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3350 | Select Clay: Wall, Zone 22 | 100.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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# Field Compaction Report

**Report Date:** 09/13/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3351 | | 09/12/23 | P-10 | | CH | 25.0 | 94.6 | 26.6 | 90.9 | 115.1 | 6 | 96 | 95 | 0 / 10 | A |
| 3352 | | 09/12/23 | P-01 | | CH | 19.4 | 100.8 | 24.0 | 96.9 | 120.2 | 6 | 96 | 95 | 0 / 10 | A |
| 3353 | | 09/12/23 | P-03 | | CH | 20.2 | 99.3 | 22.2 | 95.5 | 116.7 | 6 | 96 | 95 | 0 / 10 | A |
| 3354 | | 09/12/23 | P-01 | | CH | 19.4 | 100.8 | 23.7 | 97.5 | 120.6 | 6 | 97 | 95 | 0 / 10 | A |
| 3355 | | 09/12/23 | P-01 | | CH | 19.4 | 100.8 | 22.5 | 99.8 | 122.3 | 6 | 99 | 95 | 0 / 10 | A |
| 3356 | | 09/12/23 | P-02 | | CH | 22.6 | 97.7 | 23.9 | 94.7 | 117.3 | 6 | 97 | 95 | 0 / 10 | A |
| 3357 | | 09/12/23 | P-03 | | CH | 20.2 | 99.3 | 21.5 | 96.9 | 117.7 | 6 | 98 | 95 | 0 / 10 | A |
| 3358 | | 09/12/23 | P-02 | | CH | 22.6 | 97.7 | 23.8 | 94.5 | 117.0 | 6 | 97 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 3351 | Select Clay: Wall, Zone 22 | 101.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3352 | Select Clay: Wall, Zone 21 | 113.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3353 | Select Clay: Wall, Zone 22 | 102.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3354 | Select Clay: Wall, Zone 22 | 103.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3355 | Select Clay: Wall, Zone 21 | 114.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3356 | Select Clay: Wall, Zone 22 | 104.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3357 | Select Clay: Wall, Zone 22 | 105.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3358 | Select Clay: Wall, Zone 21 | 115.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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# Field Compaction Report

**Report Date:** 09/13/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3359 | | 09/12/23 | P-02 | | CH | 22.6 | 97.7 | 23.6 | 94.4 | 116.7 | 6 | 97 | 95 | 0 / 10 | A |
| 3360 | | 09/12/23 | P-01 | | CH | 19.4 | 100.8 | 22.3 | 96.9 | 118.5 | 6 | 96 | 95 | 0 / 10 | A |
| 3361 | | 09/12/23 | P-10 | | CH | 25.0 | 94.6 | 27.7 | 91.0 | 116.2 | 6 | 96 | 95 | 0 / 10 | A |
| 3362 | | 09/12/23 | P-01 | | CH | 19.4 | 100.8 | 21.7 | 97.1 | 118.2 | 6 | 96 | 95 | 0 / 10 | A |
| 3363 | | 09/12/23 | P-01 | | CH | 19.4 | 100.8 | 24.6 | 96.8 | 120.6 | 6 | 96 | 95 | 0 / 10 | A |
| 3364 | | 09/12/23 | P-01 | | CH | 19.4 | 100.8 | 24.2 | 95.9 | 119.1 | 6 | 95 | 95 | 0 / 10 | A |
| 3365 | | 09/12/23 | P-01 | | CH | 19.4 | 100.8 | 24.2 | 95.9 | 119.1 | 6 | 95 | 95 | 0 / 10 | A |
| 3366 | | 09/12/23 | P-01 | | CH | 19.4 | 100.8 | 21.3 | 98.1 | 119.0 | 6 | 97 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 3359 | Select Clay: Wall, Zone 22 | 106.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3360 | Select Clay: Wall, Zone 22 | 107.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3361 | Select Clay: Wall, Zone 21 | 116.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3362 | Select Clay: Wall, Zone 22 | 108.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3363 | Select Clay: Wall, Zone 22 | 109.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3364 | Select Clay: Wall, Zone 21 | 117.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3365 | Select Clay: Wall, Zone 22 | 110.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3366 | Select Clay: Wall, Zone 22 | 111.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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2908 Morrison Ave.
Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 09/13/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3367 | | 09/12/23 | P-01 | | CH | 19.4 | 100.8 | 25.5 | 96.5 | 121.1 | 6 | 96 | 95 | 0 / 10 | A |
| 3368 | | 09/12/23 | P-07 | | CH | 22.6 | 93.8 | 24.6 | 92.8 | 115.6 | 6 | 99 | 95 | 0 / 10 | A |
| 3369 | | 09/12/23 | P-02 | | CH | 22.6 | 97.7 | 25.1 | 94.8 | 118.6 | 6 | 97 | 95 | 0 / 10 | A |
| 3370 | | 09/12/23 | P-01 | | CH | 19.4 | 100.8 | 22.9 | 96.9 | 119.1 | 6 | 96 | 95 | 0 / 10 | A |
| 3371 | | 09/12/23 | P-07 | | CH | 22.6 | 93.8 | 25.1 | 91.6 | 114.6 | 6 | 98 | 95 | 0 / 10 | A |
| 3372 | | 09/12/23 | P-07 | | CH | 22.6 | 93.8 | 24.8 | 89.4 | 111.6 | 6 | 95 | 95 | 0 / 10 | A |
| 3373 | | 09/12/23 | P-07 | | CH | 22.6 | 93.8 | 23.4 | 90.9 | 112.2 | 6 | 97 | 95 | 0 / 10 | A |
| 3374 | | 09/12/23 | P-07 | | CH | 22.6 | 93.8 | 22.8 | 89.6 | 110.0 | 6 | 96 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 3367 | Select Clay: Wall, Zone 21 | 118.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3368 | Select Clay: Wall, Zone 22 | 112.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3369 | Select Clay: Wall, Zone 22 | 113.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3370 | Select Clay: Wall, Zone 21 | 119.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3371 | Select Clay: Wall, Zone 22 | 114.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3372 | Select Clay: Wall, Zone 22 | 115.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3373 | Select Clay: Wall, Zone 21 | 120.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3374 | Select Clay: Wall, Zone 22 | 116.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 09/13/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3375 | | 09/12/23 | P-01 | | CH | 19.4 | 100.8 | 22.7 | 96.0 | 117.8 | 6 | 95 | 95 | 0 / 10 | A |
| 3376 | | 09/12/23 | P-01 | | CH | 19.4 | 100.8 | 22.2 | 99.8 | 122.0 | 6 | 99 | 95 | 0 / 10 | A |
| 3377 | | 09/12/23 | P-01 | | CH | 19.4 | 100.8 | 23.4 | 100.6 | 124.1 | 6 | 100 | 95 | 0 / 10 | A |
| 3378 | | 09/12/23 | P-01 | | CH | 19.4 | 100.8 | 21.3 | 101.2 | 122.8 | 6 | 100 | 95 | 0 / 10 | A |
| 3379 | | 09/12/23 | P-16 | | CH | 20.2 | 101.8 | 21.1 | 102.5 | 124.1 | 6 | 101 | 95 | 0 / 10 | A |
| 3380 | | 09/12/23 | P-16 | | CH | 20.2 | 101.8 | 23.2 | 101.2 | 124.7 | 6 | 99 | 95 | 0 / 10 | A |
| 3381 | | 09/12/23 | P-01 | | CH | 19.4 | 100.8 | 22.1 | 98.7 | 120.5 | 6 | 98 | 95 | 0 / 10 | A |
| 3382 | | 09/12/23 | P-02 | | CH | 22.6 | 97.7 | 23.3 | 94.1 | 116.0 | 6 | 96 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 3375 | Select Clay: Wall, Zone 60 | 146.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3376 | Select Clay: Wall, Zone 22 | 117.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3377 | Select Clay: Wall, Zone 60 | 147.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3378 | Select Clay: Wall, Zone 21 | 121.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3379 | Select Clay: Wall, Zone 22 | 118.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3380 | Select Clay: Wall, Zone 60 | 148.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3381 | Select Clay: Wall, Zone 21 | 122.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3382 | Select Clay: Wall, Zone 22 | 119.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 09/13/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3383 | | 09/12/23 | P-10 | | CH | 25.0 | 94.6 | 27.2 | 92.7 | 117.9 | 6 | 98 | 95 | 0 / 10 | A |
| 3384 | | 09/12/23 | P-10 | | CH | 25.0 | 94.6 | 25.8 | 93.1 | 117.1 | 6 | 98 | 95 | 0 / 10 | A |
| 3385 | | 09/12/23 | P-16 | | CH | 20.2 | 101.8 | 21.5 | 101.7 | 123.6 | 6 | 100 | 95 | 0 / 10 | A |
| 3386 | | 09/12/23 | P-01 | | CH | 19.4 | 100.8 | 22.9 | 98.1 | 120.6 | 6 | 97 | 95 | 0 / 10 | A |
| 3387 | | 09/12/23 | P-01 | | CH | 19.4 | 100.8 | 23.0 | 100.0 | 123.0 | 6 | 99 | 95 | 0 / 10 | A |
| 3388 | | 09/12/23 | P-01 | | CH | 19.4 | 100.8 | 22.0 | 100.7 | 122.9 | 6 | 100 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 3383 | Select Clay: Wall, Zone 60 | 149.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3384 | Select Clay: Wall, Zone 21 | 123.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3385 | Select Clay: Wall, Zone 22 | 120.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3386 | Select Clay: Wall, Zone 60 | 150.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3387 | Select Clay: Wall, Zone 21 | 124.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3388 | Select Clay: Wall, Zone 22 | 121.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Kurt Kuechle
09/13/2023

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 09/14/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3389 | | 09/13/23 | P-16 | | CH | 20.2 | 101.8 | 21.5 | 102.5 | 124.5 | 6 | 101 | 95 | 0 / 10 | A |
| 3390 | | 09/13/23 | P-03 | | CH | 20.2 | 99.3 | 25.7 | 96.7 | 121.6 | 6 | 97 | 95 | 0 / 10 | A |
| 3391 | | 09/13/23 | P-03 | | CH | 20.2 | 99.3 | 22.6 | 95.0 | 116.5 | 6 | 96 | 95 | 0 / 10 | A |
| 3392 | | 09/13/23 | P-03 | | CH | 20.2 | 99.3 | 24.2 | 97.8 | 121.5 | 6 | 98 | 95 | 0 / 10 | A |
| 3393 | | 09/13/23 | P-03 | | CH | 20.2 | 99.3 | 23.6 | 95.5 | 118.0 | 6 | 96 | 95 | 0 / 10 | A |
| 3394 | | 09/13/23 | P-03 | | CH | 20.2 | 99.3 | 22.2 | 97.2 | 118.8 | 6 | 98 | 95 | 0 / 10 | A |
| 3395 | | 09/13/23 | P-03 | | CH | 20.2 | 99.3 | 23.4 | 99.3 | 122.5 | 6 | 100 | 95 | 0 / 10 | A |
| 3396 | | 09/13/23 | P-03 | | CH | 20.2 | 99.3 | 23.0 | 99.6 | 122.5 | 6 | 100 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 3389 | Select Clay: Wall, Zone 60 | 151.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3390 | Select Clay: Wall, Zone 21 | 124.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3391 | Select Clay: Wall, Zone 22 | 121.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3392 | Select Clay: Wall, Zone 60 | 152.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3393 | Select Clay: Wall, Zone 21 | 125.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3394 | Select Clay: Wall, Zone 22 | 122.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3395 | Select Clay: Wall, Zone 60 | 153.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3396 | Select Clay: Wall, Zone 21 | 126.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

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Bismarck, ND 58504
Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 09/14/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3397 | | 09/13/23 | P-03 | | CH | 20.2 | 99.3 | 24.6 | 96.1 | 119.7 | 6 | 97 | 95 | 0 / 10 | A |
| 3398 | | 09/13/23 | P-03 | | CH | 20.2 | 99.3 | 25.3 | 97.1 | 121.7 | 6 | 98 | 95 | 0 / 10 | A |
| 3399 | | 09/13/23 | P-03 | | CH | 20.2 | 99.3 | 22.6 | 100.1 | 122.7 | 6 | 101 | 95 | 0 / 10 | A |
| 3400 | | 09/13/23 | P-03 | | CH | 20.2 | 99.3 | 24.2 | 98.9 | 122.8 | 6 | 100 | 95 | 0 / 10 | A |
| 3401 | | 09/13/23 | P-01 | | CH | 19.4 | 100.8 | 22.6 | 101.3 | 124.2 | 6 | 100 | 95 | 0 / 10 | A |
| 3402 | | 09/13/23 | P-03 | | CH | 20.2 | 99.3 | 24.6 | 95.3 | 118.7 | 6 | 96 | 95 | 0 / 10 | A |
| 3403 | | 09/13/23 | P-03 | | CH | 20.2 | 99.3 | 25.4 | 95.8 | 120.1 | 6 | 96 | 95 | 0 / 10 | A |
| 3404 | | 09/13/23 | P-03 | | CH | 20.2 | 99.3 | 23.9 | 97.9 | 121.3 | 6 | 99 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 3397 | Select Clay: Wall, Zone 22 | 123.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3398 | Select Clay: Wall, Zone 60 | 154.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3399 | Select Clay: Wall, Zone 21 | 127.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3400 | Select Clay: Wall, Zone 22 | 124.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3401 | Select Clay: Wall, Zone 60 | 155.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3402 | Select Clay: Wall, Zone 21 | 128.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3403 | Select Clay: Wall, Zone 22 | 125.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3404 | Select Clay: Wall, Zone 60 | 156.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 09/14/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3405 | | 09/13/23 | P-03 | | CH | 20.2 | 99.3 | 23.7 | 97.8 | 121.0 | 6 | 98 | 95 | 0 / 10 | A |
| 3406 | | 09/13/23 | P-03 | | CH | 20.2 | 99.3 | 24.6 | 96.1 | 119.7 | 6 | 97 | 95 | 0 / 10 | A |
| 3407 | | 09/13/23 | P-03 | | CH | 20.2 | 99.3 | 23.7 | 98.4 | 121.7 | 6 | 99 | 95 | 0 / 10 | A |
| 3408 | | 09/13/23 | P-03 | | CH | 20.2 | 99.3 | 23.4 | 97.2 | 119.9 | 6 | 98 | 95 | 0 / 10 | A |
| 3409 | | 09/13/23 | P-03 | | CH | 20.2 | 99.3 | 23.4 | 97.1 | 119.8 | 6 | 98 | 95 | 0 / 10 | A |
| 3410 | | 09/13/23 | P-07 | | CH | 22.6 | 93.8 | 24.3 | 90.6 | 112.6 | 6 | 97 | 95 | 0 / 10 | A |
| 3411 | | 09/13/23 | P-03 | | CH | 20.2 | 99.3 | 23.5 | 99.7 | 123.1 | 6 | 100 | 95 | 0 / 10 | A |
| 3412 | | 09/13/23 | P-03 | | CH | 20.2 | 99.3 | 25.2 | 95.2 | 119.2 | 6 | 96 | 95 | 0 / 10 | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 3405 | Select Clay: Wall, Zone 21 | 129.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3406 | Select Clay: Wall, Zone 22 | 126.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3407 | Select Clay: Wall, Zone 60 | 157.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3408 | Select Clay: Wall, Zone 21 | 130.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3409 | Select Clay: Wall, Zone 22 | 127.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3410 | Select Clay: Wall, Zone 60 | 158.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3411 | Select Clay: Wall, Zone 21 | 131.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3412 | Select Clay: Wall, Zone 22 | 128.0 | Lift Number | InstroTek / 3500 / 1908 / | Wenko, Steve |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Kurt Kuechle
09/14/2023

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# Field Compaction Report

**Report Date:** 10/19/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3413 | | 10/18/23 | P-10 | | CH | 25.0 | 94.6 | 25.1 | 90.4 | 113.1 | 6 | 96 | 95 | NA | A |
| 3414 | | 10/18/23 | P-01 | | CH | 19.4 | 100.8 | 20.0 | 100.3 | 120.4 | 6 | 100 | 95 | NA | A |
| 3415 | | 10/18/23 | P-14 | | CH | 27.2 | 92.4 | 13.5 | 88.2 | 100.1 | 6 | 95 | 95 | NA | A |
| 3416 | | 10/18/23 | P-10 | | CH | 25.0 | 94.6 | 13.7 | 93.6 | 106.4 | 6 | 99 | 95 | NA | A |
| 3417 | | 10/18/23 | P-07 | | CH | 22.6 | 93.8 | 16.4 | 98.3 | 114.4 | 6 | 105 | 95 | NA | A |
| 3418 | | 10/18/23 | P-07 | | CH | 22.6 | 93.8 | 14.4 | 92.4 | 105.7 | 6 | 99 | 95 | NA | A |
| 3419 | | 10/18/23 | P-03 | | CH | 20.2 | 99.3 | 21.5 | 97.4 | 118.3 | 6 | 98 | 95 | NA | A |
| 3420 | | 10/18/23 | P-16 | | CH | 20.2 | 101.8 | 17.1 | 103.7 | 121.4 | 6 | 102 | 95 | NA | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 3413 | Select Clay: Anchor, Zone 18 | 2,080.0 | Sea Level | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3414 | Select Clay: Anchor, Zone 19 | 2,080.0 | Sea Level | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3415 | Select Clay: Anchor, Zone 20 | 2,080.0 | Sea Level | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3416 | Select Clay: Anchor, Zone 52 | 2,080.0 | Sea Level | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3417 | Select Clay: Anchor, Zone 53 | 2,080.0 | Sea Level | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3418 | Select Clay: Anchor, Zone 54 | 2,080.0 | Sea Level | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3419 | Select Clay: Anchor, Zone 55 | 2,080.0 | Sea Level | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3420 | Select Clay: Anchor, Zone 56 | 2,080.0 | Sea Level | InstroTek / 3500 / 1908 / | Wenko, Steve |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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The Science You Build On.

2908 Morrison Ave.
Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

# Field Compaction Report

**Report Date:** 10/19/2023
**Test Method:** ASTM D6938

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Classification | Optimum Moisture (%) | Maximum Dry Density (pcf) | In Place Moisture (%) | In Place Dry Density (pcf) | In Place Wet Density (pcf) | Probe Depth (in) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3421 | | 10/18/23 | P-03 | | CH | 20.2 | 99.3 | 16.7 | 95.7 | 111.7 | 6 | 96 | 95 | NA | A |
| 3422 | | 10/18/23 | P-03 | | CH | 20.2 | 99.3 | 16.3 | 98.5 | 114.6 | 6 | 99 | 95 | NA | A |
| 3423 | | 10/18/23 | P-02 | | CH | 22.6 | 97.7 | 16.7 | 94.0 | 109.7 | 6 | 96 | 95 | NA | A |
| 3424 | | 10/18/23 | P-03 | | CH | 20.2 | 99.3 | 18.5 | 97.7 | 115.8 | 6 | 98 | 95 | NA | A |
| 3425 | | 10/18/23 | P-03 | | CH | 20.2 | 99.3 | 14.6 | 95.3 | 109.2 | 6 | 96 | 95 | NA | A |
| 3426 | | 10/18/23 | P-16 | | CH | 20.2 | 101.8 | 22.4 | 102.3 | 125.2 | 6 | 100 | 95 | NA | A |
| 3427 | | 10/18/23 | P-03 | | CH | 20.2 | 99.3 | 20.8 | 95.5 | 115.4 | 6 | 96 | 95 | NA | A |
| 3428 | | 10/18/23 | P-03 | | CH | 20.2 | 99.3 | 22.4 | 97.5 | 119.3 | 6 | 98 | 95 | NA | A |

## Test Information

| Test # | Test Location | Elevation | Reference | Gauge Make / Model / SN / Calibrated | Field Technician |
|---|---|---|---|---|---|
| 3421 | Select Clay: Anchor, Zone 57 | 2,080.0 | Sea Level | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3422 | Select Clay: Anchor, Zone 58 | 2,080.0 | Sea Level | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3423 | Select Clay: Anchor, Zone 59 | 2,080.0 | Sea Level | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3424 | Select Clay: Anchor, Zone 60 | 2,080.0 | Sea Level | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3425 | Select Clay: Anchor, Zone 21 | 2,080.0 | Sea Level | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3426 | Select Clay: Anchor, Zone 22 | 2,080.0 | Sea Level | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3427 | Select Clay: Anchor, Zone 23 | 2,080.0 | Sea Level | InstroTek / 3500 / 1908 / | Wenko, Steve |
| 3428 | Select Clay: Anchor, Zone 24 | 2,080.0 | Sea Level | InstroTek / 3500 / 1908 / | Wenko, Steve |

| Remarks | Comments |
|---|---|
| **A:** Test results comply with specifications | Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. |

Kurt Kuechle
10/19/2023

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

# Select Clay Field Test Results – Sand Cone

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Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

# Sand Cone

**Report Date:** 09/11/2023
**Test Method:** ASTM D1556

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Class. | Optimum Moisture (%) | Maximum Dry Density (pcf) | Volume of Test Hole (cf) | In Place Moisture (%) | In Place Wet Density (pcf) | In Place Dry Density (pcf) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | 09/01/23 | P-01 | | CH | 19.4 | 100.8 | 0.0415 | 18.3 | 119.7 | 101.2 | 100 | 95 | 0 / 10 | |

## Test Information

| Test # | Test Location | Elevation | Reference | Sand Cone ID | Calibration Volume ($cm^3$) | Bulk Sand Density ($g/cm^3$) | Moisture Method | Field Technician |
|---|---|---|---|---|---|---|---|---|
| 1 | Select Clay: Wall, Zone 55 | 2,080.0 | Sea Level | 03032 | 1,097.24 | 1.52 | ASTM D2216 | Wenko, Steve |

| Remarks | Comments | Related Tests | | |
|---|---|---|---|---|
| | | Test # | Related Test # | Test Type |

Kurt Kuechle
09/11/2023

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

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2908 Morrison Ave.
Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

# Sand Cone

**Report Date:** 09/18/2023
**Test Method:** ASTM D1556

**Client:**
Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**
B2303912
Minnkota Cell 5
<Blank>
Center, ND

## Test Results

| Test # | Retest Of | Test Date | Proctor ID | Method | Soil Class. | Optimum Moisture (%) | Maximum Dry Density (pcf) | Volume of Test Hole (cf) | In Place Moisture (%) | In Place Wet Density (pcf) | In Place Dry Density (pcf) | Percent Compaction | Min Comp. (%) | Optimum Moisture Tolerance (%) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | 1 | 09/15/23 | P-01 | | CH | 19.4 | 100.8 | 0.0478 | 20.7 | 119.4 | 99.0 | 98 | 95 | 0 / 10 | |
| 3 | | 09/15/23 | P-01 | | CH | 19.4 | 100.8 | 0.0443 | 20.5 | 117.7 | 97.7 | 97 | 95 | 0 / 10 | |

## Test Information

| Test # | Test Location | Elevation | Reference | Sand Cone ID | Calibration Volume ($cm^3$) | Bulk Sand Density ($g/cm^3$) | Moisture Method | Field Technician |
|---|---|---|---|---|---|---|---|---|
| 2 | Select Clay: Wall, Zone 55 | 2,080.0 | Sea Level | 04882 | 1,088.82 | 1.52 | ASTM D2216 | Wenko, Steve |
| 3 | Select Clay: Wall, Zone 21 | 2,080.0 | Sea Level | 04882 | 1,088.82 | 1.52 | ASTM D2216 | Wenko, Steve |

| Remarks | Comments | Related Tests | | |
|---|---|---|---|---|
| | | Test # | Related Test # | Test Type |

Kurt Kuechle
09/18/2023

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

# Select Clay Hydraulic Conductivity Test Results

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# Hydraulic Conductivity

**ASTM D5084**

11001 Hampshire Avenue S
Minneapolis, MN 55438
Phone: 952-995-2000

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2303912
Minnkota Cell 5
Center, ND

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 528764 | **Alternate ID:** | TW |
| **Boring Number:** | Z-6-A | **Sampled By:** | Drill Crew |
| **Sample Date:** | 06/02/2023 | | |
| **Received Date:** | 06/05/2023 | **Lab:** | 11001 Hampshire Ave S, Bloomington, MN |
| **Tested Date:** | 06/21/2023 | **Tested By:** | Seokaran, Kanhai |

## Laboratory Data

| | | | | |
|---|---|---|---|---|
| **Type Of Specimen:** | Intact | **Back Pressure (psi):** | 81.00 | |
| **Permeant Liquid:** | Water | **Specific Gravity:** | 2.65 | ( Assumed ) |
| **Saturation B Coefficient:** | 1.00 | **Effective Pressure (psi):** | 8.00 | |

**Method:** Method C Falling Head Rising Tailwater

| Elapsed Time (sec) | Average Test Temp. ($^{o}$C) | Influent Reading Initial (cm) | Influent Reading Final (cm) | Effluent Reading Initial (cm) | Effluent Reading Final (cm) | Average Head Loss (cm) | Hydraulic Gradient | Hydraulic Conductivity @ 20 $^{o}$C (cm/sec) |
|---|---|---|---|---|---|---|---|---|
| 25620 | 22.0 | 16.40 | 16.14 | 11.45 | 11.70 | 215.7 | 37.76 | 5.6E-09 |
| 142140 | 22.0 | 16.15 | 14.45 | 11.70 | 13.40 | 213.8 | 37.42 | 6.8E-09 |
| 28620 | 22.0 | 15.00 | 14.70 | 13.40 | 13.70 | 212.3 | 37.16 | 6.0E-09 |
| 54900 | 22.0 | 14.70 | 14.05 | 13.70 | 14.35 | 211.4 | 37.00 | 6.8E-09 |

**Average Of Last Four Hydraulic Conductivity (cm/sec):** 6.3E-09

| | Initial | Final |
|---|---|---|
| **Saturation (%)** | 91.1 | 102.9 |
| **Moisture Content (%):** | 21.3 | 25.2 |
| **Dry Density Of Specimen (pcf):** | 102.2 | 100.4 |

**Soil Classification:** CH Fat clay

## General

**Remarks:** Control parameters meet the testing requirements.

The results included in this report relate only to the items inspected or tested. Sample plan outlined in project specifications as applicable. Additionally, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without the prior written approval.

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11001 Hampshire Avenue S
Minneapolis, MN 55438
Phone: 952-995-2000

# Hydraulic Conductivity

**ASTM D5084**

| **Client:** | **Project:** |
|---|---|
| Minnkota Power Cooperative, Inc.<br>5301 32nd Ave S<br>Grand Forks, ND 58201 | B2303912<br>Minnkota Cell 5<br>Center, ND |

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 528768 | **Alternate ID:** | TW |
| **Boring Number:** | Z-26-A | **Sampled By:** | Drill Crew |
| **Sample Date:** | 06/02/2023 | | |
| **Received Date:** | 06/05/2023 | **Lab:** | 11001 Hampshire Ave S, Bloomington, MN |
| **Tested Date:** | 06/22/2023 | **Tested By:** | Seokaran, Kanhai |

## Laboratory Data

| | | | | |
|---|---|---|---|---|
| **Type Of Specimen:** | Intact | **Back Pressure (psi):** | 81.00 | |
| **Permeant Liquid:** | Water | **Specific Gravity:** | 2.65 | ( Assumed ) |
| **Saturation B Coefficient:** | 1.00 | **Effective Pressure (psi):** | 8.00 | |

**Method:** Method C Falling Head Rising Tailwater

| Elapsed Time (sec) | Average Test Temp. ($^{o}$C) | Influent Reading Initial (cm) | Influent Reading Final (cm) | Effluent Reading Initial (cm) | Effluent Reading Final (cm) | Average Head Loss (cm) | Hydraulic Gradient | Hydraulic Conductivity @ 20 $^{o}$C (cm/sec) |
|---|---|---|---|---|---|---|---|---|
| 25800 | 22.0 | 18.00 | 17.50 | 10.80 | 11.40 | 217.7 | 37.90 | 1.2E-08 |
| 141960 | 22.0 | 17.50 | 14.60 | 11.40 | 14.30 | 214.2 | 37.30 | 1.2E-08 |
| 68280 | 22.0 | 12.80 | 11.60 | 16.30 | 17.50 | 206.3 | 35.92 | 1.0E-08 |
| 11160 | 22.0 | 11.60 | 11.40 | 17.50 | 17.70 | 204.9 | 35.68 | 1.1E-08 |

**Average Of Last Four Hydraulic Conductivity (cm/sec):** 1.1E-08

| | Initial | Final |
|---|---|---|
| **Saturation (%)** | 95.3 | 100.7 |
| **Moisture Content (%):** | 21.1 | 25.2 |
| **Dry Density Of Specimen (pcf):** | 104.2 | 99.5 |

**Soil Classification:** CH Fat clay

## General

**Remarks:** Control parameters meet the testing requirements.

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# Hydraulic Conductivity

**ASTM D5084**

11001 Hampshire Avenue S
Minneapolis, MN 55438
Phone: 952-995-2000

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2303912
Minnkota Cell 5
Center, ND

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 528766 | **Alternate ID:** | TW |
| **Boring Number:** | Z-23-A | **Sampled By:** | Drill Crew |
| **Sample Date:** | 06/02/2023 | | |
| **Received Date:** | 06/05/2023 | **Lab:** | 11001 Hampshire Ave S, Bloomington, MN |
| **Tested Date:** | 06/30/2023 | **Tested By:** | Seokaran, Kanhai |

## Laboratory Data

| | | | | |
|---|---|---|---|---|
| **Type Of Specimen:** | Intact | **Back Pressure (psi):** | 81.00 | |
| **Permeant Liquid:** | Water | **Specific Gravity:** | 2.65 | ( Assumed ) |
| **Saturation B Coefficient:** | 1.00 | **Effective Pressure (psi):** | 8.00 | |

**Method:** Method C Falling Head Rising Tailwater

| Elapsed Time (sec) | Average Test Temp. ($^{o}$C) | Influent Reading Initial (cm) | Influent Reading Final (cm) | Effluent Reading Initial (cm) | Effluent Reading Final (cm) | Average Head Loss (cm) | Hydraulic Gradient | Hydraulic Conductivity @ 20 $^{o}$C (cm/sec) |
|---|---|---|---|---|---|---|---|---|
| 84120 | 22.0 | 11.90 | 11.70 | 17.50 | 17.70 | 205.2 | 36.15 | 1.4E-09 |
| 88620 | 22.0 | 11.70 | 11.50 | 17.70 | 17.90 | 204.8 | 36.08 | 1.3E-09 |
| 83700 | 22.0 | 11.50 | 11.30 | 17.90 | 18.10 | 204.4 | 36.01 | 1.4E-09 |
| 85440 | 22.0 | 11.30 | 11.10 | 18.10 | 18.30 | 204.0 | 35.94 | 1.4E-09 |

**Average Of Last Four Hydraulic Conductivity (cm/sec):** 1.4E-09

| | Initial | Final |
|---|---|---|
| **Saturation (%)** | 100.8 | 110.1 |
| **Moisture Content (%):** | 23.2 | 27 |
| **Dry Density Of Specimen (pcf):** | 102.8 | 100.2 |

**Soil Classification:** CH Fat clay

## General

**Remarks:** Control parameters meet the testing requirements.

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# Hydraulic Conductivity

**ASTM D5084**

11001 Hampshire Avenue S
Minneapolis, MN 55438
Phone: 952-995-2000

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2303912
Minnkota Cell 5
Center, ND

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 528765 | **Alternate ID:** | TW |
| **Boring Number:** | Z-16-A | **Sampled By:** | Seokaran, Kanhai |
| **Sample Date:** | 06/02/2023 | | |
| **Received Date:** | 06/05/2023 | **Lab:** | 11001 Hampshire Ave S, Bloomington, MN |
| **Tested Date:** | 06/23/2023 | **Tested By:** | Seokaran, Kanhai |

## Laboratory Data

| | | | | |
|---|---|---|---|---|
| **Type Of Specimen:** | Intact | **Back Pressure (psi):** | 81.00 | |
| **Permeant Liquid:** | Water | **Specific Gravity:** | 2.65 | ( Assumed ) |
| **Saturation B Coefficient:** | 1.00 | **Effective Pressure (psi):** | 8.00 | |

**Method:** Method C Falling Head Rising Tailwater

| Elapsed Time (sec) | Average Test Temp. ($^{o}$C) | Influent Reading Initial (cm) | Influent Reading Final (cm) | Effluent Reading Initial (cm) | Effluent Reading Final (cm) | Average Head Loss (cm) | Hydraulic Gradient | Hydraulic Conductivity @ 20 $^{o}$C (cm/sec) |
|---|---|---|---|---|---|---|---|---|
| 83100 | 22.0 | 14.40 | 14.00 | 10.00 | 10.50 | 215.0 | 35.76 | 3.2E-09 |
| 60960 | 22.0 | 14.05 | 13.75 | 10.75 | 11.05 | 214.0 | 35.60 | 3.0E-09 |
| 84420 | 22.0 | 13.55 | 13.15 | 11.60 | 12.00 | 212.6 | 35.36 | 2.9E-09 |
| 60180 | 22.0 | 13.50 | 13.15 | 11.65 | 12.00 | 212.5 | 35.35 | 3.5E-09 |

**Average Of Last Four Hydraulic Conductivity (cm/sec):** 3.2E-09

| | Initial | Final |
|---|---|---|
| **Saturation (%)** | 104.2 | 108.8 |
| **Moisture Content (%):** | 23.3 | 24.4 |
| **Dry Density Of Specimen (pcf):** | 103.8 | 103.8 |

**Soil Classification:** CH Fat clay

## General

**Remarks:** Control parameters meet the testing requirements.

The results included in this report relate only to the items inspected or tested. Sample plan outlined in project specifications as applicable. Additionally, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without the prior written approval.

# Hydraulic Conductivity

**ASTM D5084**

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11001 Hampshire Avenue S
Minneapolis, MN 55438
Phone: 952-995-2000

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2303912
Minnkota Cell 5
Center, ND

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 538829 | **Alternate ID:** | 26-A |
| **Boring Number:** | 26-A | **Sampled By:** | Drill Crew |
| **Sample Date:** | 06/30/2023 | | |
| **Received Date:** | 07/07/2023 | **Lab:** | 11001 Hampshire Ave S, Bloomington, MN |
| **Tested Date:** | 08/02/2023 | **Tested By:** | Seokaran, Kanhai |

## Laboratory Data

| | | | |
|---|---|---|---|
| **Type Of Specimen:** | Intact | **Back Pressure (psi):** | 81.00 |
| **Permeant Liquid:** | Water | **Specific Gravity:** | 2.65 |
| **Saturation B Coefficient:** | 1.00 | **Effective Pressure (psi):** | 8.00 |

**Method:** Method C Falling Head Rising Tailwater

| Elapsed Time (sec) | Average Test Temp. ($^{o}$C) | Influent Reading Initial (cm) | Influent Reading Final (cm) | Effluent Reading Initial (cm) | Effluent Reading Final (cm) | Average Head Loss (cm) | Hydraulic Gradient | Hydraulic Conductivity @ 20 $^{o}$C (cm/sec) |
|---|---|---|---|---|---|---|---|---|
| 259560 | 22.0 | 16.50 | 15.40 | 18.00 | 18.90 | 278.9 | 49.90 | 1.6E-09 |
| 87600 | 22.0 | 15.00 | 14.70 | 20.50 | 20.85 | 275.5 | 49.31 | 1.6E-09 |
| 89220 | 22.0 | 14.70 | 14.30 | 21.10 | 21.50 | 274.6 | 49.13 | 1.9E-09 |
| 89820 | 22.0 | 13.70 | 13.30 | 18.05 | 18.50 | 276.6 | 49.50 | 2.0E-09 |

**Average Of Last Four Hydraulic Conductivity (cm/sec):** 1.8E-09

**Maximum Specified:** 1E-07

| | Initial | Final |
|---|---|---|
| **Saturation (%)** | 98.7 | 103.7 |
| **Moisture Content (%):** | 24.9 | 35.9 |
| **Dry Density Of Specimen (pcf):** | 99.2 | 86.3 |

**Soil Classification:** CH Fat clay

## General

**Results:** Pass - The above test results meet the referenced specifications.

**Remarks:** Control parameters meet the testing requirements.

The results included in this report relate only to the items inspected or tested. Sample plan outlined in project specifications as applicable. Additionally, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without the prior written approval.

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# Hydraulic Conductivity

**ASTM D5084**

11001 Hampshire Avenue S
Minneapolis, MN 55438
Phone: 952-995-2000

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2303912
Minnkota Cell 5
Center, ND

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 538826 | **Alternate ID:** | 16-A |
| **Boring Number:** | 16A | **Sampled By:** | Drill Crew |
| **Sample Date:** | 06/30/2023 | | |
| **Received Date:** | 07/07/2023 | **Lab:** | 11001 Hampshire Ave S, Bloomington, MN |
| **Tested Date:** | 08/04/2023 | **Tested By:** | Seokaran, Kanhai |

## Laboratory Data

| | | | | |
|---|---|---|---|---|
| **Type Of Specimen:** | Intact | **Back Pressure (psi):** | 81.00 | |
| **Permeant Liquid:** | Water | **Specific Gravity:** | 2.65 | ( Assumed ) |
| **Saturation B Coefficient:** | 1.00 | **Effective Pressure (psi):** | 8.00 | |

**Method:** Method C Falling Head Rising Tailwater

| Elapsed Time (sec) | Average Test Temp. ($^{o}$C) | Influent Reading Initial (cm) | Influent Reading Final (cm) | Effluent Reading Initial (cm) | Effluent Reading Final (cm) | Average Head Loss (cm) | Hydraulic Gradient | Hydraulic Conductivity @ 20 $^{o}$C (cm/sec) |
|---|---|---|---|---|---|---|---|---|
| 85080 | 22.0 | 17.50 | 17.40 | 18.40 | 18.50 | 280.4 | 39.76 | 2.4E-09 |
| 90120 | 22.0 | 17.45 | 17.35 | 19.50 | 19.60 | 279.2 | 39.60 | 2.3E-09 |
| 83760 | 22.0 | 17.45 | 17.35 | 19.50 | 19.60 | 279.2 | 39.60 | 2.5E-09 |
| 84420 | 22.0 | 17.25 | 17.15 | 19.70 | 19.80 | 278.8 | 39.54 | 2.4E-09 |

**Average Of Last Four Hydraulic Conductivity (cm/sec):** 2.4E-09

**Maximum Specified:** 1E-07

| | Initial | Final |
|---|---|---|
| **Saturation (%)** | 90.9 | 100.9 |
| **Moisture Content (%):** | 23.9 | 25.2 |
| **Dry Density Of Specimen (pcf):** | 97.5 | 99.5 |

**Soil Classification:** CH Fat clay

## General

**Results:** Pass - The above test results meet the referenced specifications.

**Remarks:** Control parameters meet the testing requirements.

The results included in this report relate only to the items inspected or tested. Sample plan outlined in project specifications as applicable. Additionally, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without the prior written approval.

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# Hydraulic Conductivity

**ASTM D5084**

11001 Hampshire Avenue S
Minneapolis, MN 55438
Phone: 952-995-2000

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2303912
Minnkota Cell 5
Center, ND

## Sample Information

**Sample Number:** 542867
**Sampled By:** Drill Crew
**Boring Number:** Z-25A
**Sample Date:** 06/26/2023
**Received Date:** 06/30/2023
**Lab:** 11001 Hampshire Ave S, Bloomington, MN
**Tested Date:** 08/10/2023
**Tested By:** Seokaran, Kanhai

## Laboratory Data

**Type Of Specimen:** Intact
**Back Pressure (psi):** 81.00
**Permeant Liquid:** Water
**Specific Gravity:** 2.65 ( Assumed )
**Saturation B Coefficient:** 1.00
**Effective Pressure (psi):** 8.00
**Method:** Method C Falling Head Rising Tailwater

| Elapsed Time (sec) | Average Test Temp. ($^{o}$C) | Influent Reading Initial (cm) | Influent Reading Final (cm) | Effluent Reading Initial (cm) | Effluent Reading Final (cm) | Average Head Loss (cm) | Hydraulic Gradient | Hydraulic Conductivity @ 20 $^{o}$C (cm/sec) |
|---|---|---|---|---|---|---|---|---|
| 84600 | 22.0 | 15.40 | 15.30 | 14.45 | 14.55 | 282.2 | 40.22 | 2.5E-09 |
| 88200 | 22.0 | 9.90 | 9.80 | 13.40 | 13.50 | 277.8 | 39.58 | 2.5E-09 |
| 86280 | 22.0 | 15.80 | 15.70 | 13.60 | 13.70 | 283.5 | 40.40 | 2.5E-09 |
| 84300 | 22.0 | 15.70 | 15.60 | 13.70 | 13.80 | 283.3 | 40.37 | 2.5E-09 |

**Average Of Last Four Hydraulic Conductivity (cm/sec):** 2.5E-09

**Maximum Specified:** 1E-07

| | Initial | Final |
|---|---|---|
| **Saturation (%)** | 107.2 | 115.0 |
| **Moisture Content (%):** | 23.7 | 34.7 |
| **Dry Density Of Specimen (pcf):** | 104.4 | 91.9 |

**Soil Classification:** CH Fat clay

## General

**Results:** Pass - The above test results meet the referenced specifications.

**Remarks:** Control parameters meet the testing requirements.

The results included in this report relate only to the items inspected or tested. Sample plan outlined in project specifications as applicable. Additionally, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without the prior written approval.

BRAUN INTERTEC
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# Hydraulic Conductivity

**ASTM D5084**

11001 Hampshire Avenue S
Minneapolis, MN 55438
Phone: 952-995-2000

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2303912
Minnkota Cell 5
Center, ND

## Sample Information

**Sample Number:** 542865
**Sampled By:** Drill Crew
**Boring Number:** Z-23A
**Sample Date:** 06/26/2023
**Received Date:** 06/30/2023
**Lab:** 11001 Hampshire Ave S, Bloomington, MN
**Tested Date:** 08/10/2023
**Tested By:** Seokaran, Kanhai

## Laboratory Data

**Type Of Specimen:** Intact
**Back Pressure (psi):** 81.00
**Permeant Liquid:** Water
**Specific Gravity:** 2.65 ( Assumed )
**Saturation B Coefficient:** 1.00
**Effective Pressure (psi):** 8.00
**Method:** Method C Falling Head Rising Tailwater

| Elapsed Time (sec) | Average Test Temp. (°C) | Influent Reading Initial (cm) | Influent Reading Final (cm) | Effluent Reading Initial (cm) | Effluent Reading Final (cm) | Average Head Loss (cm) | Hydraulic Gradient | Hydraulic Conductivity @ 20 °C (cm/sec) |
|---|---|---|---|---|---|---|---|---|
| 84600 | 22.0 | 15.80 | 15.70 | 17.85 | 17.95 | 279.2 | 39.73 | 2.4E-09 |
| 339060 | 22.0 | 11.65 | 11.35 | 14.35 | 14.65 | 278.4 | 39.61 | 1.8E-09 |
| 88140 | 22.0 | 11.40 | 11.30 | 14.60 | 14.70 | 278.1 | 39.57 | 2.3E-09 |
| 86220 | 22.0 | 11.30 | 11.20 | 14.70 | 14.80 | 277.9 | 39.54 | 2.4E-09 |

**Average Of Last Four Hydraulic Conductivity (cm/sec):** 2.2E-09

**Maximum Specified:** 1E-07

| | Initial | Final |
|---|---|---|
| **Saturation (%)** | 103.2 | 108.9 |
| **Moisture Content (%):** | 23.7 | 28.2 |
| **Dry Density Of Specimen (pcf):** | 102.8 | 98.1 |

**Soil Classification:** CH Fat clay

## General

**Results:** Pass - The above test results meet the referenced specifications.

**Remarks:** Control parameters meet the testing requirements.

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# Hydraulic Conductivity

**ASTM D5084**

11001 Hampshire Avenue S
Minneapolis, MN 55438
Phone: 952-995-2000

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2303912
Minnkota Cell 5
Center, ND

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 551267 | **Alternate ID:** | Z-52-9A |
| **Boring Number:** | Z-52-9A | **Depth (ft):** | 2444.0 |
| | | **Sampled By:** | Drill Crew |
| **Sample Date:** | 09/01/2023 | | |
| **Received Date:** | 09/01/2023 | **Lab:** | 11001 Hampshire Ave S, Bloomington, MN |
| **Tested Date:** | 09/11/2023 | **Tested By:** | Seokaran, Kanhai |

## Laboratory Data

| | | | | |
|---|---|---|---|---|
| **Type Of Specimen:** | Intact | **Back Pressure (psi):** | 81.00 | |
| **Permeant Liquid:** | Water | **Specific Gravity:** | 2.65 | ( Assumed ) |
| **Saturation B Coefficient:** | 1.00 | **Effective Pressure (psi):** | 8.00 | |

**Method:** Method C Falling Head Rising Tailwater

| Elapsed Time (sec) | Average Test Temp. (°C) | Influent Reading Initial (cm) | Influent Reading Final (cm) | Effluent Reading Initial (cm) | Effluent Reading Final (cm) | Average Head Loss (cm) | Hydraulic Gradient | Hydraulic Conductivity @ 20 °C (cm/sec) |
|---|---|---|---|---|---|---|---|---|
| 78180 | 22.0 | 10.90 | 10.60 | 16.30 | 16.60 | 275.7 | 50.15 | 1.6E-09 |
| 90540 | 22.0 | 10.60 | 10.30 | 16.60 | 16.90 | 275.1 | 50.04 | 1.4E-09 |
| 22200 | 22.0 | 10.30 | 10.20 | 16.90 | 17.00 | 274.7 | 49.96 | 1.9E-09 |
| 63600 | 22.0 | 10.20 | 9.90 | 17.00 | 17.30 | 274.3 | 49.89 | 2.0E-09 |

**Average Of Last Four Hydraulic Conductivity (cm/sec):** 1.7E-09

| | Initial | Final |
|---|---|---|
| **Saturation (%)** | 95.8 | 100.5 |
| **Moisture Content (%):** | 23.8 | 35 |
| **Dry Density Of Specimen (pcf):** | 99.7 | 86.1 |

**Soil Classification:** CH Fat clay

## General

**Remarks:** Control parameters meet the testing requirements.

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# Hydraulic Conductivity

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Minneapolis, MN 55438
Phone: 952-995-2000

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2303912
Minnkota Cell 5
Center, ND

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 551271 | **Alternate ID:** | Z56-A |
| **Boring Number:** | Z56-A | **Sampled By:** | Drill Crew |
| **Sample Date:** | 08/01/2023 | | |
| **Received Date:** | 09/01/2023 | **Lab:** | 11001 Hampshire Ave S, Bloomington, MN |
| **Tested Date:** | 09/12/2023 | **Tested By:** | Seokaran, Kanhai |

## Laboratory Data

| | | | | |
|---|---|---|---|---|
| **Type Of Specimen:** | Intact | **Back Pressure (psi):** | 81.00 | |
| **Permeant Liquid:** | Water | **Specific Gravity:** | 2.65 | ( Assumed ) |
| **Saturation B Coefficient:** | 1.00 | **Effective Pressure (psi):** | 8.00 | |

**Method:** Method C Falling Head Rising Tailwater

| Elapsed Time (sec) | Average Test Temp. ($^{o}$C) | Influent Reading Initial (cm) | Influent Reading Final (cm) | Effluent Reading Initial (cm) | Effluent Reading Final (cm) | Average Head Loss (cm) | Hydraulic Gradient | Hydraulic Conductivity @ 20 $^{o}$C (cm/sec) |
|---|---|---|---|---|---|---|---|---|
| 78240 | 22.0 | 19.60 | 19.50 | 16.40 | 16.50 | 284.5 | 47.46 | 5.7E-10 |
| 90480 | 22.0 | 19.50 | 19.40 | 16.50 | 16.60 | 284.3 | 47.43 | 4.9E-10 |
| 85800 | 22.0 | 19.40 | 19.30 | 16.60 | 16.70 | 284.1 | 47.40 | 5.2E-10 |
| 86220 | 22.0 | 19.30 | 19.20 | 16.70 | 16.80 | 283.9 | 47.36 | 5.2E-10 |

**Average Of Last Four Hydraulic Conductivity (cm/sec):** 5.3E-10

| | Initial | Final |
|---|---|---|
| **Saturation (%)** | 102.2 | 100.9 |
| **Moisture Content (%):** | 25.5 | 28.4 |
| **Dry Density Of Specimen (pcf):** | 99.6 | 94.8 |

**Soil Classification:** CH Fat clay

## General

**Remarks:** Control parameters meet the testing requirements.

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# Hydraulic Conductivity

**ASTM D5084**

11001 Hampshire Avenue S
Minneapolis, MN 55438
Phone: 952-995-2000

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2303912
Minnkota Cell 5
Center, ND

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 551268 | **Alternate ID:** | Z-54-10A |
| **Boring Number:** | Z-54-10A | **Depth (ft):** | 2041.5 |
| | | **Sampled By:** | Drill Crew |
| **Sample Date:** | 08/01/2023 | | |
| **Received Date:** | 09/01/2023 | **Lab:** | 11001 Hampshire Ave S, Bloomington, MN |
| **Tested Date:** | 09/12/2023 | **Tested By:** | Seokaran, Kanhai |

## Laboratory Data

| | | | | |
|---|---|---|---|---|
| **Type Of Specimen:** | Intact | **Back Pressure (psi):** | 81.00 | |
| **Permeant Liquid:** | Water | **Specific Gravity:** | 2.65 | ( Assumed ) |
| **Saturation B Coefficient:** | 1.00 | **Effective Pressure (psi):** | 8.00 | |

**Method:** Method C Falling Head Rising Tailwater

| Elapsed Time (sec) | Average Test Temp. (°C) | Influent Reading Initial (cm) | Influent Reading Final (cm) | Effluent Reading Initial (cm) | Effluent Reading Final (cm) | Average Head Loss (cm) | Hydraulic Gradient | Hydraulic Conductivity @ 20 °C (cm/sec) |
|---|---|---|---|---|---|---|---|---|
| 88800 | 22.0 | 18.20 | 18.10 | 16.50 | 16.60 | 283.0 | 40.19 | 2.5E-09 |
| 77880 | 22.0 | 18.10 | 18.00 | 16.60 | 16.70 | 282.8 | 40.16 | 2.8E-09 |
| 90960 | 22.0 | 18.00 | 17.90 | 16.70 | 16.80 | 282.6 | 40.13 | 2.4E-09 |
| 85740 | 22.0 | 17.90 | 17.80 | 16.80 | 16.90 | 282.4 | 40.10 | 2.5E-09 |

**Average Of Last Four Hydraulic Conductivity (cm/sec):** 2.6E-09

| | Initial | Final |
|---|---|---|
| **Saturation (%)** | 100.0 | 102.0 |
| **Moisture Content (%):** | 26.4 | 34.2 |
| **Dry Density Of Specimen (pcf):** | 97.3 | 87.6 |

**Soil Classification:** CH Fat clay

## General

**Remarks:** Control parameters meet the testing requirements.

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Phone: 952-995-2000

# Hydraulic Conductivity

**ASTM D5084**

| **Client:** | **Project:** |
|---|---|
| Minnkota Power Cooperative, Inc.<br>5301 32nd Ave S<br>Grand Forks, ND 58201 | B2303912<br>Minnkota Cell 5<br>Center, ND |

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 551269 | **Alternate ID:** | Z-59A |
| **Boring Number:** | Z-59A | **Sampled By:** | Drill Crew |
| **Sample Date:** | 08/01/2023 | | |
| **Received Date:** | 09/01/2023 | **Lab:** | 11001 Hampshire Ave S, Bloomington, MN |
| **Tested Date:** | 09/12/2023 | **Tested By:** | Seokaran, Kanhai |

## Laboratory Data

| | | | | |
|---|---|---|---|---|
| **Type Of Specimen:** | Intact | **Back Pressure (psi):** | 81.00 | |
| **Permeant Liquid:** | Water | **Specific Gravity:** | 2.65 | ( Assumed ) |
| **Saturation B Coefficient:** | 1.00 | **Effective Pressure (psi):** | 8.00 | |

**Method:** Method C Falling Head Rising Tailwater

| Elapsed Time (sec) | Average Test Temp. ($^{o}$C) | Influent Reading Initial (cm) | Influent Reading Final (cm) | Effluent Reading Initial (cm) | Effluent Reading Final (cm) | Average Head Loss (cm) | Hydraulic Gradient | Hydraulic Conductivity @ 20 $^{o}$C (cm/sec) |
|---|---|---|---|---|---|---|---|---|
| 62640 | 22.0 | 20.70 | 20.60 | 4.55 | 4.65 | 297.4 | 41.77 | 3.4E-09 |
| 48780 | 22.0 | 20.60 | 20.50 | 4.65 | 4.75 | 297.2 | 41.74 | 4.3E-09 |
| 65700 | 22.0 | 20.50 | 20.35 | 4.75 | 4.90 | 297.0 | 41.71 | 4.8E-09 |
| 140100 | 22.0 | 20.35 | 20.10 | 4.90 | 5.20 | 296.5 | 41.65 | 4.2E-09 |

**Average Of Last Four Hydraulic Conductivity (cm/sec):** 4.2E-09

| | Initial | Final |
|---|---|---|
| **Saturation (%)** | 97.6 | 101.0 |
| **Moisture Content (%):** | 20.8 | 24.1 |
| **Dry Density Of Specimen (pcf):** | 105.8 | 101.3 |

**Soil Classification:** CH Fat clay

## General

**Remarks:** Control parameters meet the testing requirements.

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Phone: 952-995-2000

# Hydraulic Conductivity

**ASTM D5084**

| **Client:** | **Project:** |
|---|---|
| Minnkota Power Cooperative, Inc.<br>5301 32nd Ave S<br>Grand Forks, ND 58201 | B2303912<br>Minnkota Cell 5<br>Center, ND |

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 551270 | **Alternate ID:** | Z-54A |
| **Boring Number:** | Z-54A | **Sampled By:** | Drill Crew |
| **Sample Date:** | 08/01/2023 | | |
| **Received Date:** | 09/01/2023 | **Lab:** | 11001 Hampshire Ave S, Bloomington, MN |
| **Tested Date:** | 09/11/2023 | **Tested By:** | Seokaran, Kanhai |

## Laboratory Data

| | | | | |
|---|---|---|---|---|
| **Type Of Specimen:** | Intact | **Back Pressure (psi):** | 81.00 | |
| **Permeant Liquid:** | Water | **Specific Gravity:** | 2.65 | ( Assumed ) |
| **Saturation B Coefficient:** | 1.00 | **Effective Pressure (psi):** | 8.00 | |

**Method:** Method C Falling Head Rising Tailwater

| Elapsed Time (sec) | Average Test Temp. ($^{o}$C) | Influent Reading Initial (cm) | Influent Reading Final (cm) | Effluent Reading Initial (cm) | Effluent Reading Final (cm) | Average Head Loss (cm) | Hydraulic Gradient | Hydraulic Conductivity @ 20 $^{o}$C (cm/sec) |
|---|---|---|---|---|---|---|---|---|
| 88920 | 22.0 | 21.00 | 20.90 | 13.70 | 13.80 | 288.6 | 41.08 | 2.4E-09 |
| 78300 | 22.0 | 20.90 | 20.80 | 13.80 | 13.90 | 288.4 | 41.05 | 2.8E-09 |
| 90420 | 22.0 | 20.80 | 20.70 | 13.90 | 14.00 | 288.2 | 41.02 | 2.4E-09 |
| 85800 | 22.0 | 20.70 | 20.60 | 14.00 | 14.10 | 288.0 | 41.00 | 2.5E-09 |

**Average Of Last Four Hydraulic Conductivity (cm/sec):** 2.5E-09

| | Initial | Final |
|---|---|---|
| **Saturation (%)** | 102.1 | 102.8 |
| **Moisture Content (%):** | 27.2 | 33.5 |
| **Dry Density Of Specimen (pcf):** | 97.0 | 88.8 |

**Soil Classification:** CH Fat clay

## General

**Remarks:** Control parameters meet the testing requirements.

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# Hydraulic Conductivity

**ASTM D5084**

**Report #:**

11001 Hampshire Avenue S
Minneapolis, MN 55438
Phone: 952-995-2000

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2303912
Minnkota Cell 5
Center, ND

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 552342 | **Alternate ID:** | Z-18-A |
| **Sampling Method:** | | **Source:** | |
| **Sample From:** | | **Depth (ft):** | |
| **Boring Number:** | Z-18-A | **Sampled By:** | Drill Crew |
| **Sample Location :** | | | |
| **Specification:** | | | |
| **Sample Date:** | 08/17/2023 | **Material:** | |
| **Received Date:** | 08/31/2023 | **Lab:** | 11001 Hampshire Ave S, Bloomington, MN |
| **Tested Date:** | 09/14/2023 | **Tested By:** | Seokaran, Kanhai |

## Laboratory Data

| | | | | |
|---|---|---|---|---|
| **Type Of Specimen:** | Intact | **Back Pressure (psi):** | 81.00 | |
| **Permeant Liquid:** | Water | **Specific Gravity:** | 2.65 | ( Assumed ) |
| **Saturation B Coefficient:** | 1.00 | **Effective Pressure (psi):** | 8.00 | |

**Method:** Method C Falling Head Rising Tailwater

| Elapsed Time (sec) | Average Test Temp. (°C) | Influent Reading Initial (cm) | Influent Reading Final (cm) | Effluent Reading Initial (cm) | Effluent Reading Final (cm) | Average Head Loss (cm) | Hydraulic Gradient | Hydraulic Conductivity @ 20 °C (cm/sec) |
|---|---|---|---|---|---|---|---|---|
| 85800 | 22.0 | 11.50 | 11.35 | 14.50 | 14.65 | 278.2 | 39.42 | 3.9E-09 |
| 168900 | 22.0 | 11.35 | 11.10 | 14.65 | 14.90 | 277.8 | 39.37 | 3.3E-09 |
| 87000 | 22.0 | 11.10 | 11.00 | 14.90 | 15.00 | 277.5 | 39.32 | 2.5E-09 |
| 88440 | 22.0 | 11.00 | 10.85 | 15.00 | 15.15 | 277.2 | 39.28 | 3.8E-09 |

**Average Of Last Four Hydraulic Conductivity (cm/sec):** 3.4E-09

**Minimum Specified:**

**Maximum Specified:**

| | Initial | Final |
|---|---|---|
| **Saturation (%)** | 97.7 | 107.2 |
| **Moisture Content (%):** | 21.3 | 24.6 |
| **Dry Density Of Specimen (pcf):** | 104.9 | 102.9 |

**Soil Classification:** CH Fat clay

## General

**Results:**

**Remarks:** Control parameters meet the testing requirements.

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# Hydraulic Conductivity

**ASTM D5084**

**Report #:**

11001 Hampshire Avenue S
Minneapolis, MN 55438
Phone: 952-995-2000

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2303912
Minnkota Cell 5
Center, ND

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 552341 | **Alternate ID:** | Z-54-A |
| **Sampling Method:** | | **Source:** | |
| **Sample From:** | | **Depth (ft):** | |
| **Boring Number:** | Z-54-A | **Sampled By:** | Drill Crew |
| **Sample Location :** | | | |
| **Specification:** | | | |
| **Sample Date:** | 08/17/2023 | **Material:** | |
| **Received Date:** | 08/31/2023 | **Lab:** | 11001 Hampshire Ave S, Bloomington, MN |
| **Tested Date:** | 09/14/2023 | **Tested By:** | Seokaran, Kanhai |

## Laboratory Data

| | | | | |
|---|---|---|---|---|
| **Type Of Specimen:** | Intact | **Back Pressure (psi):** | 81.00 | |
| **Permeant Liquid:** | Water | **Specific Gravity:** | 2.65 | ( Assumed ) |
| **Saturation B Coefficient:** | 1.00 | **Effective Pressure (psi):** | 8.00 | |

**Method:** Method C Falling Head Rising Tailwater

| Elapsed Time (sec) | Average Test Temp. (°C) | Influent Reading Initial (cm) | Influent Reading Final (cm) | Effluent Reading Initial (cm) | Effluent Reading Final (cm) | Average Head Loss (cm) | Hydraulic Gradient | Hydraulic Conductivity @ 20 °C (cm/sec) |
|---|---|---|---|---|---|---|---|---|
| 171900 | 22.0 | 17.15 | 16.95 | 12.80 | 13.00 | 285.5 | 40.34 | 2.5E-09 |
| 169200 | 22.0 | 17.00 | 16.75 | 13.00 | 13.20 | 285.1 | 40.29 | 2.8E-09 |
| 87000 | 22.0 | 16.70 | 16.60 | 13.20 | 13.30 | 284.8 | 40.24 | 2.5E-09 |
| 88500 | 22.0 | 16.60 | 16.50 | 13.35 | 13.45 | 284.5 | 40.20 | 2.4E-09 |

**Average Of Last Four Hydraulic Conductivity (cm/sec):** 2.6E-09

**Minimum Specified:**

**Maximum Specified:**

| | Initial | Final |
|---|---|---|
| **Saturation (%)** | 96.2 | 103.6 |
| **Moisture Content (%):** | 21.6 | 24.4 |
| **Dry Density Of Specimen (pcf):** | 103.8 | 101.9 |

**Soil Classification:** CH Fat clay

## General

**Results:**

**Remarks:** Control parameters meet the testing requirements.

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# Hydraulic Conductivity

**ASTM D5084**

**Report #:**

11001 Hampshire Avenue S
Minneapolis, MN 55438
Phone: 952-995-2000

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2303912
Minnkota Cell 5
Center, ND

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 552340 | **Alternate ID:** | Z-56-A |
| **Sampling Method:** | | **Source:** | |
| **Sample From:** | | **Depth (ft):** | |
| **Boring Number:** | Z-56-A | **Sampled By:** | Drill Crew |
| **Sample Location :** | | | |
| **Specification:** | | | |
| **Sample Date:** | 08/17/2023 | **Material:** | |
| **Received Date:** | 08/31/2023 | **Lab:** | 11001 Hampshire Ave S, Bloomington, MN |
| **Tested Date:** | 09/14/2023 | **Tested By:** | Seokaran, Kanhai |

## Laboratory Data

| | | | | |
|---|---|---|---|---|
| **Type Of Specimen:** | Intact | **Back Pressure (psi):** | 81.00 | |
| **Permeant Liquid:** | Water | **Specific Gravity:** | 2.65 | ( Assumed ) |
| **Saturation B Coefficient:** | 1.00 | **Effective Pressure (psi):** | 8.00 | |

**Method:** Method C Falling Head Rising Tailwater

| Elapsed Time (sec) | Average Test Temp. (°C) | Influent Reading Initial (cm) | Influent Reading Final (cm) | Effluent Reading Initial (cm) | Effluent Reading Final (cm) | Average Head Loss (cm) | Hydraulic Gradient | Hydraulic Conductivity @ 20 °C (cm/sec) |
|---|---|---|---|---|---|---|---|---|
| 85800 | 22.0 | 9.65 | 9.50 | 15.15 | 15.30 | 275.7 | 39.31 | 3.9E-09 |
| 169200 | 22.0 | 16.10 | 15.85 | 15.00 | 15.30 | 282.2 | 40.24 | 3.6E-09 |
| 87000 | 22.0 | 15.85 | 15.70 | 15.30 | 15.45 | 281.8 | 40.18 | 3.8E-09 |
| 88200 | 22.0 | 15.70 | 15.55 | 15.45 | 15.60 | 281.5 | 40.13 | 3.8E-09 |

**Average Of Last Four Hydraulic Conductivity (cm/sec):** 3.8E-09

**Minimum Specified:**

**Maximum Specified:**

| | Initial | Final |
|---|---|---|
| **Saturation (%)** | 93.7 | 104.8 |
| **Moisture Content (%):** | 20.6 | 24.9 |
| **Dry Density Of Specimen (pcf):** | 104.5 | 101.6 |

**Soil Classification:** CH Fat clay

## General

**Results:**

**Remarks:** Control parameters meet the testing requirements.

The results included in this report relate only to the items inspected or tested. Sample plan outlined in project specifications as applicable. Additionally, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without the prior written approval.

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The Science You Build On.

11001 Hampshire Avenue S
Minneapolis, MN 55438
Phone: 952-995-2000

# Hydraulic Conductivity

**ASTM D5084**

| **Client:** | **Project:** |
|---|---|
| Minnkota Power Cooperative, Inc.<br>5301 32nd Ave S<br>Grand Forks, ND 58201 | B2303912<br>Minnkota Cell 5<br>Center, ND |

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 557179 | **Depth (ft):** | 2022' |
| **Boring Number:** | Z-28A | **Sampled By:** | Drill Crew |
| **Sample Date:** | 09/12/2023 | | |
| **Received Date:** | 09/18/2023 | **Lab:** | 11001 Hampshire Ave S, Bloomington, MN |
| **Tested Date:** | 10/03/2023 | **Tested By:** | Seokaran, Kanhai |

## Laboratory Data

| | | | | |
|---|---|---|---|---|
| **Type Of Specimen:** | Intact | **Back Pressure (psi):** | 90.00 | |
| **Permeant Liquid:** | Water | **Specific Gravity:** | 2.65 | ( Assumed ) |
| **Saturation B Coefficient:** | 1.00 | **Effective Pressure (psi):** | 9.00 | |

**Method:** Method C Falling Head Rising Tailwater

| Elapsed Time (sec) | Average Test Temp. ($^{o}$C) | Influent Reading Initial (cm) | Influent Reading Final (cm) | Effluent Reading Initial (cm) | Effluent Reading Final (cm) | Average Head Loss (cm) | Hydraulic Gradient | Hydraulic Conductivity @ 20 $^{o}$C (cm/sec) |
|---|---|---|---|---|---|---|---|---|
| 82800 | 22.0 | 11.50 | 11.40 | 17.60 | 17.70 | 345.5 | 48.96 | 2.2E-09 |
| 87780 | 22.0 | 11.40 | 11.30 | 17.70 | 17.80 | 345.3 | 48.94 | 2.0E-09 |
| 86220 | 22.0 | 11.30 | 11.20 | 17.80 | 17.90 | 345.1 | 48.91 | 2.1E-09 |
| 259140 | 22.0 | 11.20 | 10.95 | 17.90 | 18.15 | 344.7 | 48.86 | 1.7E-09 |

**Average Of Last Four Hydraulic Conductivity (cm/sec):** 2.0E-09

| | Initial | Final |
|---|---|---|
| **Saturation (%)** | 102.1 | 103.8 |
| **Moisture Content (%):** | 24 | 24.8 |
| **Dry Density Of Specimen (pcf):** | 102.0 | 101.3 |

**Soil Classification:** CH Fat clay

## General

**Remarks:** Control parameters meet the testing requirements.

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11001 Hampshire Avenue S
Minneapolis, MN 55438
Phone: 952-995-2000

# Hydraulic Conductivity

**ASTM D5084**

| **Client:** | **Project:** |
|---|---|
| Minnkota Power Cooperative, Inc.<br>5301 32nd Ave S<br>Grand Forks, ND 58201 | B2303912<br>Minnkota Cell 5<br>Center, ND |

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 558927 | **Depth (ft):** | 2057 |
| **Boring Number:** | Z-56A | **Sampled By:** | Drill Crew |
| **Sample Date:** | 07/18/2023 | | |
| **Received Date:** | 09/12/2023 | **Lab:** | 11001 Hampshire Ave S, Bloomington, MN |
| **Tested Date:** | 10/10/2023 | **Tested By:** | Seokaran, Kanhai |

## Laboratory Data

| | | | | |
|---|---|---|---|---|
| **Type Of Specimen:** | Intact | **Back Pressure (psi):** | 90.00 | |
| **Permeant Liquid:** | Water | **Specific Gravity:** | 2.65 | ( Assumed ) |
| **Saturation B Coefficient:** | 1.00 | **Effective Pressure (psi):** | 9.00 | |

**Method:** Method C Falling Head Rising Tailwater

| Elapsed Time (sec) | Average Test Temp. ($^{o}$C) | Influent Reading Initial (cm) | Influent Reading Final (cm) | Effluent Reading Initial (cm) | Effluent Reading Final (cm) | Average Head Loss (cm) | Hydraulic Gradient | Hydraulic Conductivity @ 20 $^{o}$C (cm/sec) |
|---|---|---|---|---|---|---|---|---|
| 83640 | 22.0 | 20.00 | 19.90 | 11.00 | 11.10 | 360.6 | 50.86 | 1.9E-09 |
| 80700 | 22.0 | 19.90 | 19.80 | 11.10 | 11.20 | 360.4 | 50.83 | 2.0E-09 |
| 92160 | 22.0 | 19.80 | 19.65 | 11.20 | 11.35 | 360.1 | 50.80 | 2.6E-09 |
| 172740 | 22.0 | 19.65 | 19.40 | 11.35 | 11.60 | 359.7 | 50.74 | 2.3E-09 |

**Average Of Last Four Hydraulic Conductivity (cm/sec):** 2.2E-09

| | Initial | Final |
|---|---|---|
| **Saturation (%)** | 98.3 | 101.9 |
| **Moisture Content (%):** | 21.9 | 23.1 |
| **Dry Density Of Specimen (pcf):** | 104.0 | 103.4 |

**Soil Classification:** CH Fat clay

## General

**Remarks:** Control parameters meet the testing requirements.

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Minneapolis, MN 55438
Phone: 952-995-2000

# Hydraulic Conductivity

**ASTM D5084**

| **Client:** | **Project:** |
|---|---|
| Minnkota Power Cooperative, Inc.<br>5301 32nd Ave S<br>Grand Forks, ND 58201 | B2303912<br>Minnkota Cell 5<br>Center, ND |

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 560174 | **Depth (ft):** | 2022 |
| **Boring Number:** | Z-36A | **Sampled By:** | Drill Crew |
| **Sample Date:** | 09/12/2023 | | |
| **Received Date:** | 09/19/2023 | **Lab:** | 11001 Hampshire Ave S, Bloomington, MN |
| **Tested Date:** | 10/13/2023 | **Tested By:** | Seokaran, Kanhai |

## Laboratory Data

| | | | | |
|---|---|---|---|---|
| **Type Of Specimen:** | Intact | **Back Pressure (psi):** | 90.00 | |
| **Permeant Liquid:** | Water | **Specific Gravity:** | 2.65 | ( Assumed ) |
| **Saturation B Coefficient:** | 1.00 | **Effective Pressure (psi):** | 9.00 | |

**Method:** Method C Falling Head Rising Tailwater

| Elapsed Time (sec) | Average Test Temp. ($^{o}$C) | Influent Reading Initial (cm) | Influent Reading Final (cm) | Effluent Reading Initial (cm) | Effluent Reading Final (cm) | Average Head Loss (cm) | Hydraulic Gradient | Hydraulic Conductivity @ 20 $^{o}$C (cm/sec) |
|---|---|---|---|---|---|---|---|---|
| 84780 | 22.0 | 18.85 | 18.70 | 12.00 | 12.15 | 358.4 | 50.81 | 3.0E-09 |
| 83700 | 22.0 | 18.75 | 18.60 | 12.15 | 12.30 | 358.1 | 50.77 | 3.0E-09 |
| 94200 | 22.0 | 18.60 | 18.40 | 12.30 | 12.50 | 357.8 | 50.72 | 3.6E-09 |
| 81180 | 22.0 | 18.40 | 18.25 | 12.50 | 12.65 | 357.4 | 50.67 | 3.1E-09 |

**Average Of Last Four Hydraulic Conductivity (cm/sec):** 3.2E-09

| | Initial | Final |
|---|---|---|
| **Saturation (%)** | 96.5 | 100.7 |
| **Moisture Content (%):** | 23.9 | 26.7 |
| **Dry Density Of Specimen (pcf):** | 99.9 | 97.1 |

**Soil Classification:** CH Fat clay

## General

**Remarks:** Control parameters meet the testing requirements.

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# Hydraulic Conductivity

**ASTM D5084**

11001 Hampshire Avenue S
Minneapolis, MN 55438
Phone: 952-995-2000

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2303912
Minnkota Cell 5
Center, ND

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 558925 | **Depth (ft):** | 2080 |
| **Boring Number:** | Z-56A | **Sampled By:** | Drill Crew |
| **Sample Date:** | 08/25/2023 | | |
| **Received Date:** | 09/12/2023 | **Lab:** | 11001 Hampshire Ave S, Bloomington, MN |
| **Tested Date:** | 10/13/2023 | **Tested By:** | Seokaran, Kanhai |

## Laboratory Data

| | | | | |
|---|---|---|---|---|
| **Type Of Specimen:** | Intact | **Back Pressure (psi):** | 90.00 | |
| **Permeant Liquid:** | Water | **Specific Gravity:** | 2.65 | ( Assumed ) |
| **Saturation B Coefficient:** | 1.00 | **Effective Pressure (psi):** | 9.00 | |

**Method:** Method C Falling Head Rising Tailwater

| Elapsed Time (sec) | Average Test Temp. ($^{o}$C) | Influent Reading Initial (cm) | Influent Reading Final (cm) | Effluent Reading Initial (cm) | Effluent Reading Final (cm) | Average Head Loss (cm) | Hydraulic Gradient | Hydraulic Conductivity @ 20 $^{o}$C (cm/sec) |
|---|---|---|---|---|---|---|---|---|
| 172680 | 22.0 | 19.70 | 19.50 | 17.30 | 17.50 | 353.9 | 49.82 | 2.0E-09 |
| 84720 | 22.0 | 19.50 | 19.40 | 17.50 | 17.60 | 353.6 | 49.77 | 2.0E-09 |
| 87240 | 22.0 | 19.40 | 19.30 | 17.60 | 17.70 | 353.4 | 49.75 | 2.0E-09 |
| 90660 | 22.0 | 19.30 | 19.20 | 17.70 | 17.80 | 353.2 | 49.72 | 1.9E-09 |

**Average Of Last Four Hydraulic Conductivity (cm/sec):** 2.0E-09

| | Initial | Final |
|---|---|---|
| **Saturation (%)** | 95.6 | 101.5 |
| **Moisture Content (%):** | 24.2 | 27.4 |
| **Dry Density Of Specimen (pcf):** | 99.1 | 96.5 |

**Soil Classification:** CH Fat clay

## General

**Remarks:** Control parameters meet the testing requirements.

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# Hydraulic Conductivity

**ASTM D5084**

11001 Hampshire Avenue S
Minneapolis, MN 55438
Phone: 952-995-2000

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2303912
Minnkota Cell 5
Center, ND

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 561257 | **Depth (ft):** | 2022 |
| **Boring Number:** | Z-32A | **Sampled By:** | Drill Crew |
| **Sample Date:** | 09/12/2023 | | |
| **Received Date:** | 09/25/2023 | **Lab:** | 11001 Hampshire Ave S, Bloomington, MN |
| **Tested Date:** | 10/18/2023 | **Tested By:** | Seokaran, Kanhai |

## Laboratory Data

| | | | | |
|---|---|---|---|---|
| **Type Of Specimen:** | Intact | **Back Pressure (psi):** | 90.00 | |
| **Permeant Liquid:** | Water | **Specific Gravity:** | 2.65 | ( Assumed ) |
| **Saturation B Coefficient:** | 1.00 | **Effective Pressure (psi):** | 9.00 | |

**Method:** Method C Falling Head Rising Tailwater

| Elapsed Time (sec) | Average Test Temp. ($^{o}$C) | Influent Reading Initial (cm) | Influent Reading Final (cm) | Effluent Reading Initial (cm) | Effluent Reading Final (cm) | Average Head Loss (cm) | Hydraulic Gradient | Hydraulic Conductivity @ 20 $^{o}$C (cm/sec) |
|---|---|---|---|---|---|---|---|---|
| 83460 | 22.0 | 13.40 | 13.30 | 11.10 | 11.20 | 353.9 | 50.08 | 2.1E-09 |
| 94440 | 22.0 | 13.30 | 13.20 | 11.20 | 11.30 | 353.7 | 50.06 | 1.9E-09 |
| 80700 | 22.0 | 13.20 | 13.10 | 11.40 | 11.50 | 353.4 | 50.01 | 2.2E-09 |
| 346680 | 22.0 | 13.10 | 12.60 | 11.50 | 12.00 | 352.8 | 49.93 | 2.5E-09 |

**Average Of Last Four Hydraulic Conductivity (cm/sec):** 2.2E-09

| | Initial | Final |
|---|---|---|
| **Saturation (%)** | 94.8 | 100.1 |
| **Moisture Content (%):** | 23.6 | 26.6 |
| **Dry Density Of Specimen (pcf):** | 99.7 | 97.0 |

**Soil Classification:** CH Fat clay

## General

**Remarks:** Control parameters meet the testing requirements.

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# Hydraulic Conductivity

**ASTM D5084**

11001 Hampshire Avenue S
Minneapolis, MN 55438
Phone: 952-995-2000

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2303912
Minnkota Cell 5
Center, ND

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 561256 | **Depth (ft):** | 2078 |
| **Boring Number:** | Z-18A | **Sampled By:** | Drill Crew |
| **Sample Date:** | 08/25/2023 | | |
| **Received Date:** | 09/25/2023 | **Lab:** | 11001 Hampshire Ave S, Bloomington, MN |
| **Tested Date:** | 10/18/2023 | **Tested By:** | Seokaran, Kanhai |

## Laboratory Data

| | | | | |
|---|---|---|---|---|
| **Type Of Specimen:** | Intact | **Back Pressure (psi):** | 90.00 | |
| **Permeant Liquid:** | Water | **Specific Gravity:** | 2.65 | ( Assumed ) |
| **Saturation B Coefficient:** | 1.00 | **Effective Pressure (psi):** | 9.00 | |

**Method:** Method C Falling Head Rising Tailwater

| Elapsed Time (sec) | Average Test Temp. ($^{o}$C) | Influent Reading Initial (cm) | Influent Reading Final (cm) | Effluent Reading Initial (cm) | Effluent Reading Final (cm) | Average Head Loss (cm) | Hydraulic Gradient | Hydraulic Conductivity @ 20 $^{o}$C (cm/sec) |
|---|---|---|---|---|---|---|---|---|
| 84600 | 22.0 | 16.90 | 16.80 | 17.10 | 17.20 | 351.4 | 50.28 | 2.1E-09 |
| 85260 | 22.0 | 16.80 | 16.70 | 17.20 | 17.30 | 351.2 | 50.25 | 2.0E-09 |
| 92520 | 22.0 | 16.70 | 16.60 | 17.30 | 17.40 | 351.0 | 50.22 | 1.9E-09 |
| 81000 | 22.0 | 16.60 | 16.50 | 17.40 | 17.50 | 350.8 | 50.19 | 2.2E-09 |

**Average Of Last Four Hydraulic Conductivity (cm/sec):** 2.0E-09

| | Initial | Final |
|---|---|---|
| **Saturation (%)** | 99.9 | 102.1 |
| **Moisture Content (%):** | 22.3 | 26.9 |
| **Dry Density Of Specimen (pcf):** | 104.0 | 97.4 |

**Soil Classification:** CH Fat clay

## General

**Remarks:** Control parameters meet the testing requirements.

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# Hydraulic Conductivity

**ASTM D5084**

11001 Hampshire Avenue S
Minneapolis, MN 55438
Phone: 952-995-2000

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2303912
Minnkota Cell 5
Center, ND

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 557224 | **Depth (ft):** | 2085.5 |
| **Boring Number:** | Z-59A | **Sampled By:** | Drill Crew |
| **Sample Date:** | 08/25/2023 | | |
| **Received Date:** | 09/18/2023 | **Lab:** | 11001 Hampshire Ave S, Bloomington, MN |
| **Tested Date:** | 10/03/2023 | **Tested By:** | Seokaran, Kanhai |

## Laboratory Data

| | | | | |
|---|---|---|---|---|
| **Type Of Specimen:** | Intact | **Back Pressure (psi):** | 90.00 | |
| **Permeant Liquid:** | Water | **Specific Gravity:** | 2.65 | ( Assumed ) |
| **Saturation B Coefficient:** | 1.00 | **Effective Pressure (psi):** | -1.00 | |

**Method:** Method C Falling Head Rising Tailwater

| Elapsed Time (sec) | Average Test Temp. ($^{o}$C) | Influent Reading Initial (cm) | Influent Reading Final (cm) | Effluent Reading Initial (cm) | Effluent Reading Final (cm) | Average Head Loss (cm) | Hydraulic Gradient | Hydraulic Conductivity @ 20 $^{o}$C (cm/sec) |
|---|---|---|---|---|---|---|---|---|
| 87840 | 22.0 | 16.40 | 16.30 | 15.10 | 15.20 | 282.6 | 39.02 | 2.5E-09 |
| 86040 | 22.0 | 16.30 | 16.20 | 15.20 | 15.30 | 282.4 | 38.99 | 2.5E-09 |
| 258720 | 22.0 | 16.20 | 15.95 | 15.30 | 15.55 | 282.0 | 38.95 | 2.1E-09 |
| 84600 | 22.0 | 16.00 | 15.90 | 15.50 | 15.60 | 281.8 | 38.91 | 2.6E-09 |

**Average Of Last Four Hydraulic Conductivity (cm/sec):** 2.4E-09

| | Initial | Final |
|---|---|---|
| **Saturation (%)** | 101.2 | 102.8 |
| **Moisture Content (%):** | 21 | 22.5 |
| **Dry Density Of Specimen (pcf):** | 106.8 | 104.7 |

**Soil Classification:** CH Fat clay

## General

**Remarks:** Control parameters meet the testing requirements.

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# Hydraulic Conductivity

**ASTM D5084**

11001 Hampshire Avenue S
Minneapolis, MN 55438
Phone: 952-995-2000

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2303912
Minnkota Cell 5
Center, ND

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 557227 | **Depth (ft):** | 2080 |
| **Boring Number:** | Z-58A | **Sampled By:** | Drill Crew |
| **Sample Date:** | 08/18/2023 | | |
| **Received Date:** | 09/18/2023 | **Lab:** | 11001 Hampshire Ave S, Bloomington, MN |
| **Tested Date:** | 10/06/2023 | **Tested By:** | Seokaran, Kanhai |

## Laboratory Data

| | | | | |
|---|---|---|---|---|
| **Type Of Specimen:** | Intact | **Back Pressure (psi):** | 90.00 | |
| **Permeant Liquid:** | Water | **Specific Gravity:** | 2.65 | ( Assumed ) |
| **Saturation B Coefficient:** | 1.00 | **Effective Pressure (psi):** | 9.00 | |

**Method:** Method C Falling Head Rising Tailwater

| Elapsed Time (sec) | Average Test Temp. ($^{o}$C) | Influent Reading Initial (cm) | Influent Reading Final (cm) | Effluent Reading Initial (cm) | Effluent Reading Final (cm) | Average Head Loss (cm) | Hydraulic Gradient | Hydraulic Conductivity @ 20 $^{o}$C (cm/sec) |
|---|---|---|---|---|---|---|---|---|
| 91680 | 22.0 | 17.45 | 17.35 | 12.80 | 12.90 | 356.2 | 50.22 | 1.9E-09 |
| 94320 | 22.0 | 17.35 | 17.25 | 12.90 | 13.00 | 356.0 | 50.20 | 1.8E-09 |
| 83760 | 22.0 | 17.20 | 17.10 | 13.00 | 13.10 | 355.8 | 50.16 | 2.0E-09 |
| 96180 | 22.0 | 17.10 | 17.00 | 13.10 | 13.20 | 355.6 | 50.13 | 1.8E-09 |

**Average Of Last Four Hydraulic Conductivity (cm/sec):** 1.9E-09

| | Initial | Final |
|---|---|---|
| **Saturation (%)** | 96.9 | 106.1 |
| **Moisture Content (%):** | 23.6 | 25.2 |
| **Dry Density Of Specimen (pcf):** | 100.5 | 101.5 |

**Soil Classification:** CH Fat clay

## General

**Remarks:** Control parameters meet the testing requirements.

The results included in this report relate only to the items inspected or tested. Sample plan outlined in project specifications as applicable. Additionally, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without the prior written approval.

# Appendix E

## Drainage Layer Material

### Drainage Layer Material Tests
### Drainage Layer Hydraulic Conductivity Test Results

# Drainage Layer Material Tests

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# Sieve Analysis Of Soil

**ASTM D6913**

08/31/2023

11001 Hampshire Avenue S
Minneapolis, MN 55438
Phone: 952-995-2000

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2303912
Minnkota Cell 5
Center, ND

## Sample Information

**Sample Number:** 541608
**Alternate ID:** Bottom Ash-1
**Sampled By:** Drill Crew
**Sample Date:** 07/28/2023
**Received Date:** 07/31/2023
**Lab:** 11001 Hampshire Ave S, Bloomington, MN
**Tested Date:** 08/07/2023
**Tested By:** Seokaran, Kanhai

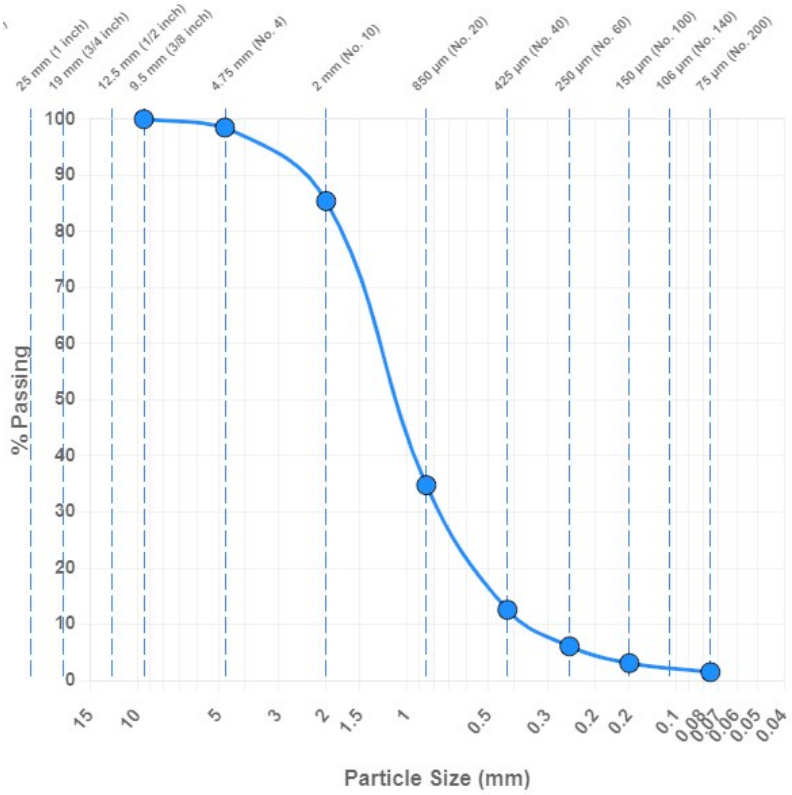
## Laboratory Data

| Sieve Size | Passing (%) | Specification |
|---|---|---|
| 9.5 mm (3/8 inch) | 100.0 | |
| 4.75 mm (No. 4) | 98.5 | |
| 2 mm (No. 10) | 85.4 | |
| 850 µm (No. 20) | 34.8 | |
| 425 µm (No. 40) | 12.6 | |
| 250 µm (No. 60) | 6.1 | |
| 150 µm (No. 100) | 3.1 | |
| 75 µm (No. 200) | 1.5 | |

| Gravel (%) | Sand (%) | Silt & Clay (%) |
|---|---|---|
| 1.5 | 97.0 | 1.5 |

| D10 | D30 | D60 |
|---|---|---|
| 0.355 | 0.758 | 1.423 |

| $C_U$ | $C_C$ |
|---|---|
| 4.01 | 1.14 |




**Classification:** Bottom Ash
**Test Method:** Method A (Composite Sieving)

## General

**Results:** The test is for informational purposes.

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

# Sieve Analysis Of Aggregate

**ASTM C136**

09/07/2023

2908 Morrison Ave.
Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

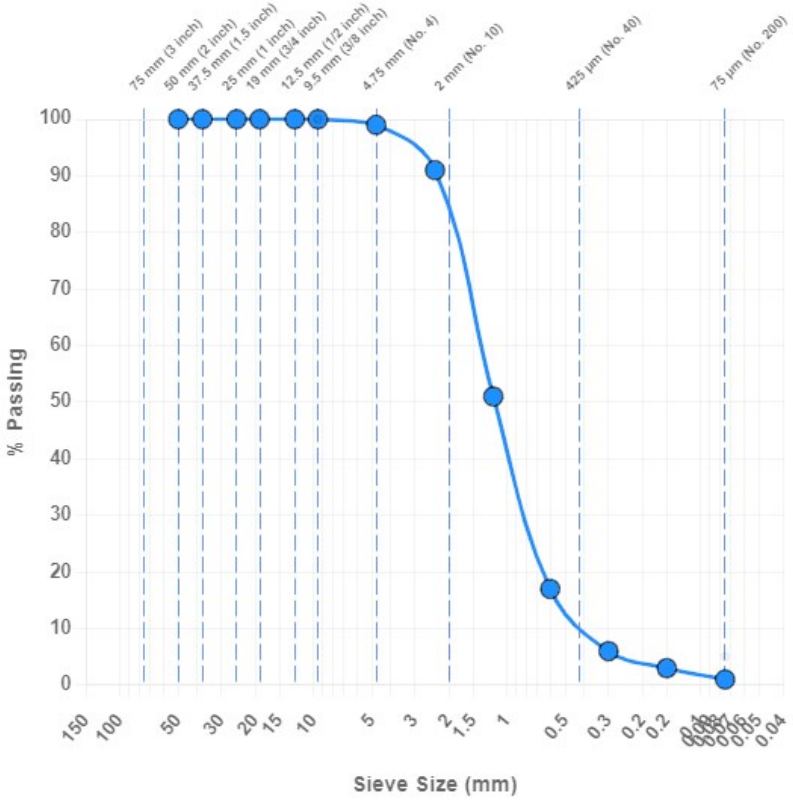
B2303912
Minnkota Cell 5
Center, ND

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 550259 | **Alternate ID:** | sample #2 |
| **Sample From:** | Stockpile | **Sampled By:** | Wenko, Steve |
| **Location Details:** | Bottom Ash #2 | | |
| **Specification:** | B2303912 - Project Spec | | |
| **Sample Date:** | 08/30/2023 | | |
| **Received Date:** | 09/06/2023 | **Lab:** | 11001 Hampshire Ave S, Bloomington, MN |
| **Tested Date:** | 09/07/2023 | **Tested By:** | Limley, Jason |

## Laboratory Data

| Sieve Size | Passing (%) | Specification |
|---|---|---|
| 9.5 mm (3/8 inch) | 100 | 100 |
| 4.75 mm (No. 4) | 99 | |
| 2.36 mm (No. 8) | 91 | |
| 1.18 mm (No. 16) | 51 | |
| 600 µm (No. 30) | 17 | |
| 300 µm (No. 50) | 6 | |
| 150 µm (No. 100) | 3 | |
| 75 µm (No. 200) | 1.4 | 0 - 5 |




| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Gravel (%):** | 0.7 | **Sand (%):** | 97.9 | **Silt & Clay (%):** | 1.4 | | | | |
| **$D_{60}$ (mm):** | 1.45 | **$D_{30}$ (mm):** | 0.82 | **$D_{10}$ (mm):** | 0.41 | **$C_U$:** | 3.54 | **$C_C$:** | 1.13 |

## General

**Results:** Pass - The above test results meet the referenced specifications.

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BRAUN INTERTEC
The Science You Build On.

# Sieve Analysis Of Aggregate

**ASTM C136**

09/07/2023

2908 Morrison Ave.
Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

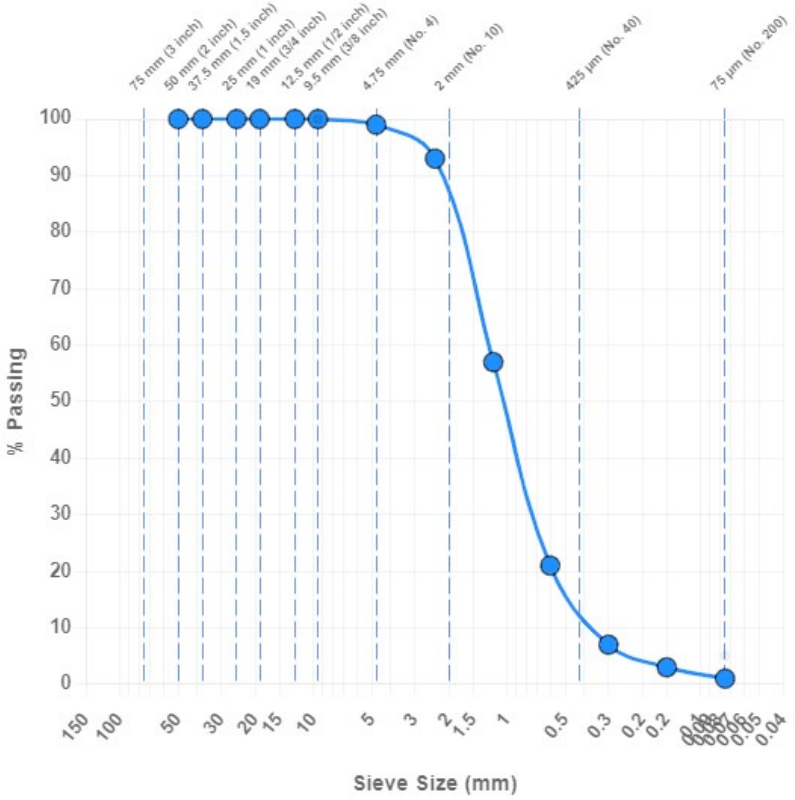
B2303912
Minnkota Cell 5
Center, ND

## Sample Information

**Sample Number:** 550260
**Alternate ID:** sample #3
**Sample From:** Stockpile
**Sampled By:** Wenko, Steve
**Location Details:** Bottom Ash #3
**Sample Date:** 08/30/2023
**Received Date:** 09/06/2023
**Lab:** 11001 Hampshire Ave S, Bloomington, MN
**Tested Date:** 09/07/2023
**Tested By:** Limley, Jason

## Laboratory Data

| Sieve Size | Passing (%) | Specification |
|---|---|---|
| 9.5 mm (3/8 inch) | 100 | 100 |
| 4.75 mm (No. 4) | 99 | |
| 2.36 mm (No. 8) | 93 | |
| 1.18 mm (No. 16) | 57 | |
| 600 µm (No. 30) | 21 | |
| 300 µm (No. 50) | 7 | |
| 150 µm (No. 100) | 3 | |
| 75 µm (No. 200) | 1.4 | 0 - 5 |




**Gravel (%):** 0.6 **Sand (%):** 98.0 **Silt & Clay (%):** 1.4

**$D_{60}$ (mm):** 1.28 **$D_{30}$ (mm):** 0.75 **$D_{10}$ (mm):** 0.36 **$C_U$:** 3.56 **$C_C$:** 1.22

## General

**Results:** Pass - The above test results meet the referenced specifications.

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# Sieve Analysis Of Aggregate

**ASTM C136**

09/14/2023

2908 Morrison Ave.
Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

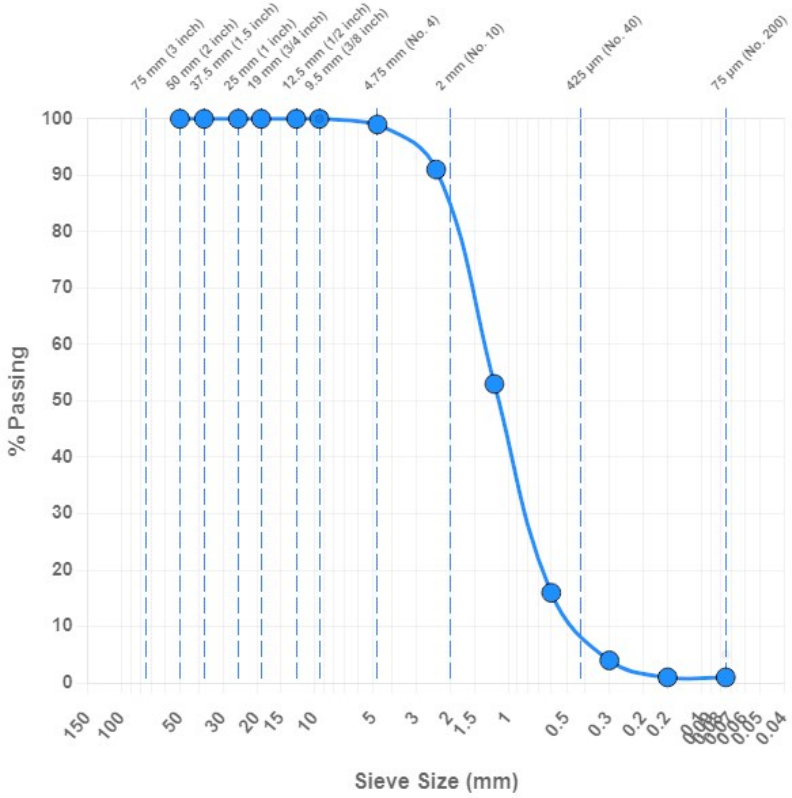
B2303912
Minnkota Cell 5
Center, ND

## Sample Information

**Sample Number:** 552597
**Sampled By:** Wenko, Steve
**Location Details:** Bottom Ash 4
**Specification:** B2303912 Project Spec
**Sample Date:** 09/12/2023
**Received Date:** 09/14/2023
**Lab:** 11001 Hampshire Ave S, Bloomington, MN
**Tested Date:** 09/14/2023
**Tested By:** Kalahar, Mitch

## Laboratory Data

| Sieve Size | Passing (%) | Specification |
|---|---|---|
| 25 mm (1 inch) | 100 | |
| 19 mm (3/4 inch) | 100 | |
| 12.5 mm (1/2 inch) | 100 | |
| 9.5 mm (3/8 inch) | 100 | 100 |
| 4.75 mm (No. 4) | 99 | |
| 2.36 mm (No. 8) | 91 | |
| 1.18 mm (No. 16) | 53 | |
| 600 µm (No. 30) | 16 | |
| 300 µm (No. 50) | 4 | |
| 150 µm (No. 100) | 1 | |
| 75 µm (No. 200) | 0.8 | 0 - 5 |




**Gravel (%):** 0.8 **Sand (%):** 98.4 **Silt & Clay (%):** 0.8

**$D_{60}$ (mm):** 1.40 **$D_{30}$ (mm):** 0.82 **$D_{10}$ (mm):** 0.45 **$C_U$:** 3.11 **$C_C$:** 1.07

## General

**Results:** Pass - The above test results meet the referenced specifications.

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BRAUN INTERTEC
The Science You Build On.

# Sieve Analysis Of Aggregate

**ASTM C136**

09/14/2023

2908 Morrison Ave.
Suite 3
Bismarck, ND 58504
Phone: 701-255-7180

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

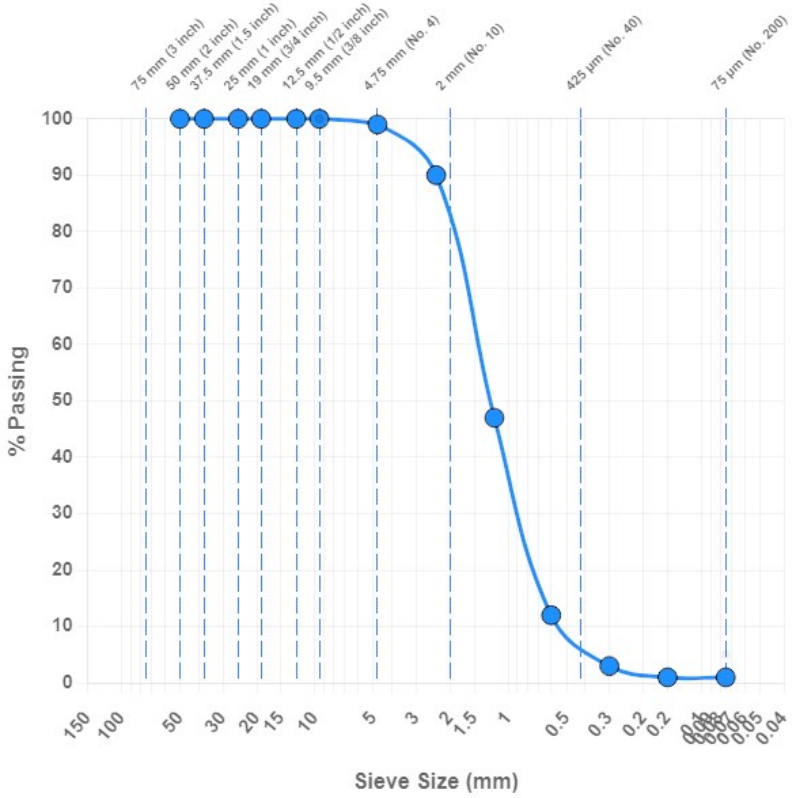
B2303912
Minnkota Cell 5
Center, ND

## Sample Information

**Sample Number:** 552598
**Sampled By:** Wenko, Steve
**Location Details:** Bottom Ash 5
**Specification:** B2303912 Project Spec
**Sample Date:** 09/12/2023
**Received Date:** 09/14/2023
**Lab:** 11001 Hampshire Ave S, Bloomington, MN
**Tested Date:** 09/14/2023
**Tested By:** Kalahar, Mitch

## Laboratory Data

| Sieve Size | Passing (%) | Specification |
|---|---|---|
| 25 mm (1 inch) | 100 | |
| 19 mm (3/4 inch) | 100 | |
| 12.5 mm (1/2 inch) | 100 | |
| 9.5 mm (3/8 inch) | 100 | 100 |
| 4.75 mm (No. 4) | 99 | |
| 2.36 mm (No. 8) | 90 | |
| 1.18 mm (No. 16) | 47 | |
| 600 µm (No. 30) | 12 | |
| 300 µm (No. 50) | 3 | |
| 150 µm (No. 100) | 1 | |
| 75 µm (No. 200) | 0.9 | 0 - 5 |




**Gravel (%):** 0.8 **Sand (%):** 98.3 **Silt & Clay (%):** 0.9

**$D_{60}$ (mm):** 1.54 **$D_{30}$ (mm):** 0.90 **$D_{10}$ (mm):** 0.53 **$C_U$:** 2.91 **$C_C$:** 0.99

## General

**Results:** Pass - The above test results meet the referenced specifications.

Uncertainty was not taken into account in determining whether the test results meet the requirements. The results included in this report relate only to the items inspected or tested. Sampled per project specifications or industry standards. Also, this report is for the exclusive use of the addressed parties. We assume no responsibility to other parties regarding this report. The information indicated in this report shall not be reproduced, except in full, without prior written approval.

# Drainage Layer Hydraulic Conductivity Test Results

BRAUN INTERTEC
The Science You Build On.

# Permeability Of Granular Soil

**ASTM D2434**

08/31/2023

11001 Hampshire Avenue S
Minneapolis, MN 55438
Phone: 952-995-2000

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2303912
Minnkota Cell 5
Center, ND

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 541608 | **Alternate ID:** | Bottom Ash-1 |
| | | **Sampled By:** | Drill Crew |
| **Sample Date:** | 07/28/2023 | | |
| **Received Date**: | 07/31/2023 | **Lab:** | 11001 Hampshire Ave S, Bloomington, MN |
| **Tested Date:** | 08/07/2023 | **Tested By:** | Seokaran, Kanhai |

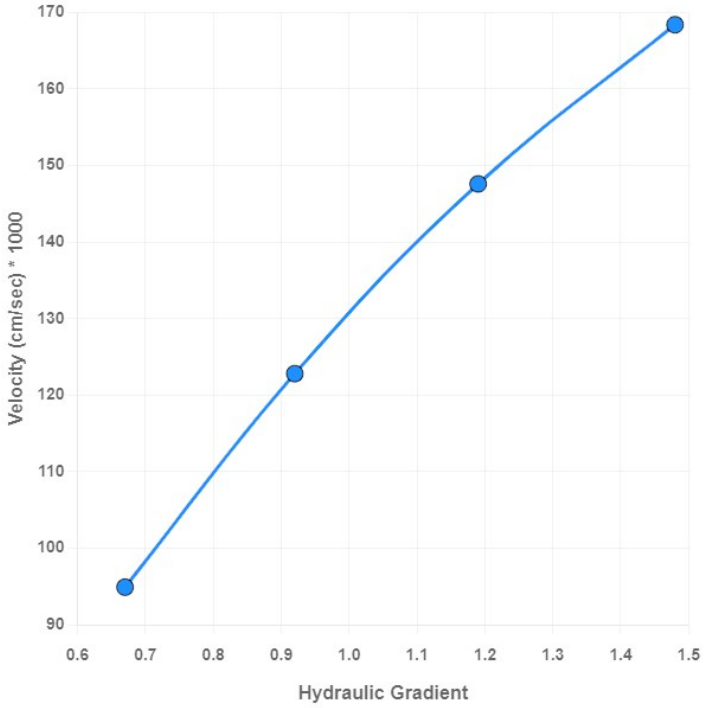
## Laboratory Data

| | | | |
|---|---|---|---|
| **Sample Type:** | Remolded | **Type Of Permeant:** | Tap Water |
| **Dry Unit Weight (pcf):** | 97.1 | **Relative Density (%):** | 95.3 |
| **Void Ratio:** | 0.70 | **Maximum Density (pcf):** | 101.9 |
| **Soil Classification:** | Bottom Ash | | |

**Permeability Data**

| Water Temp (°C) | Head Difference (cm) | Hydraulic Gradient | Velocity (cm/sec) | Coefficient Of Permeability |
|---|---|---|---|---|
| 18.3 | 5.1 | 0.67 | 0.0949 | 1.5E -01 |
| 18.3 | 7.0 | 0.92 | 0.1228 | 1.4E -01 |
| 18.2 | 9.1 | 1.19 | 0.1476 | 1.3E -01 |
| 18.3 | 11.3 | 1.48 | 0.1684 | 1.2E -01 |

| | | Specifications Minimum | Maximum |
|---|---|---|---|
| **Average Coefficient Of Permeability (cm/sec)** | 1.3E -01 | 1E -03 | |




## General

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BRAUN INTERTEC
The Science You Build On.

# Permeability Of Granular Soil

**ASTM D2434**

09/12/2023

11001 Hampshire Avenue S
Minneapolis, MN 55438
Phone: 952-995-2000

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2303912
Minnkota Cell 5
Center, ND

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 550259 | **Alternate ID:** | sample #2 |
| **Sample From:** | Stockpile | **Sampled By:** | Wenko, Steve |
| **Location Details:** | Bottom Ash #2 | | |
| **Sample Date:** | 08/30/2023 | | |
| **Received Date**: | 09/06/2023 | **Lab:** | 11001 Hampshire Ave S, Bloomington, MN |
| **Tested Date:** | 09/12/2023 | **Tested By:** | Seokaran, Kanhai |

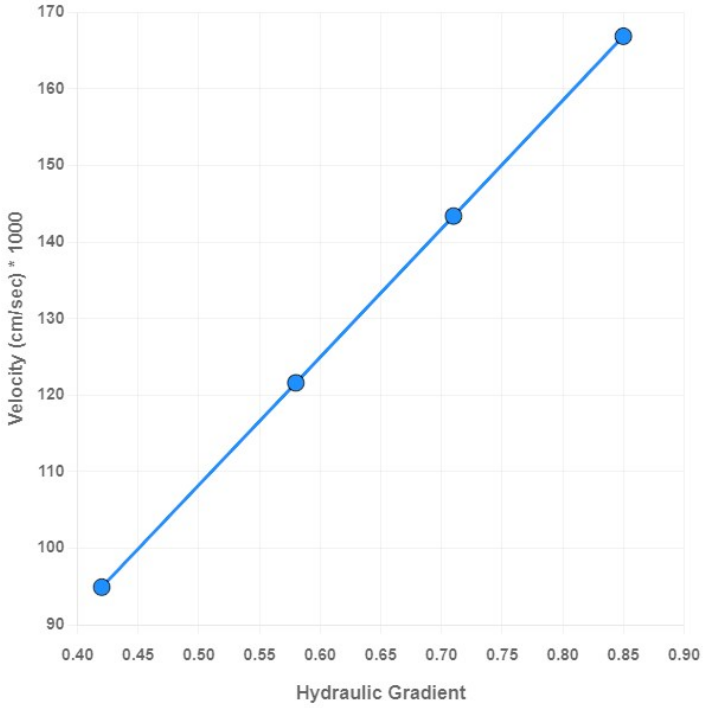
## Laboratory Data

| | | | |
|---|---|---|---|
| **Sample Type:** | Remolded | **Type Of Permeant:** | Tap Water |
| **Dry Unit Weight (pcf):** | 97.3 | **Relative Density (%):** | 95.1 |
| **Void Ratio:** | 0.70 | **Maximum Density (pcf):** | 102.3 |
| **Soil Classification:** | BA Bottom ash | | |

**Permeability Data**

| Water Temp ($^{o}$C) | Head Difference (cm) | Hydraulic Gradient | Velocity (cm/sec) | Coefficient Of Permeability |
|---|---|---|---|---|
| 17.9 | 3.2 | 0.42 | 0.0949 | 2.4E -01 |
| 17.9 | 4.4 | 0.58 | 0.1216 | 2.2E -01 |
| 17.6 | 5.4 | 0.71 | 0.1434 | 2.2E -01 |
| 17.7 | 6.5 | 0.85 | 0.1669 | 2.1E -01 |

| | | Specifications Minimum | Maximum |
|---|---|---|---|
| **Average Coefficient Of Permeability (cm/sec)** | 2.2E -01 | 1E -03 | |




## General

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The Science You Build On.

# Permeability Of Granular Soil

**ASTM D2434**

09/12/2023

11001 Hampshire Avenue S
Minneapolis, MN 55438
Phone: 952-995-2000

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2303912
Minnkota Cell 5
Center, ND

## Sample Information

| | | | |
|---|---|---|---|
| **Sample Number:** | 550260 | **Alternate ID:** | sample #3 |
| **Sample From:** | Stockpile | **Sampled By:** | Wenko, Steve |
| **Location Details:** | Bottom Ash #3 | | |
| **Sample Date:** | 08/30/2023 | | |
| **Received Date**: | 09/06/2023 | **Lab:** | 11001 Hampshire Ave S, Bloomington, MN |
| **Tested Date:** | 09/12/2023 | **Tested By:** | Seokaran, Kanhai |

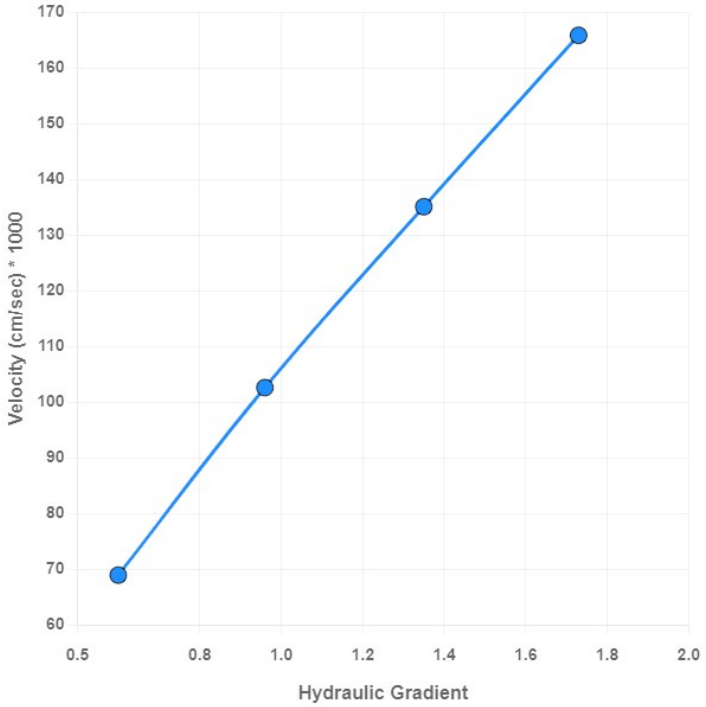
## Laboratory Data

| | | | |
|---|---|---|---|
| **Sample Type:** | Remolded | **Type Of Permeant:** | Tap Water |
| **Dry Unit Weight (pcf):** | 99.6 | **Relative Density (%):** | 94.8 |
| **Void Ratio:** | 0.66 | **Maximum Density (pcf):** | 105.1 |
| **Soil Classification:** | BA Bottom ash | | |

**Permeability Data**

| Water Temp ($^{o}$C) | Head Difference (cm) | Hydraulic Gradient | Velocity (cm/sec) | Coefficient Of Permeability |
|---|---|---|---|---|
| 18.0 | 4.6 | 0.60 | 0.0689 | 1.2E -01 |
| 17.7 | 7.3 | 0.96 | 0.1026 | 1.1E -01 |
| 17.6 | 10.3 | 1.35 | 0.1351 | 1.1E -01 |
| 17.6 | 13.2 | 1.73 | 0.1659 | 1.0E -01 |

| | | Specifications Minimum | Maximum |
|---|---|---|---|
| **Average Coefficient Of Permeability (cm/sec)** | 1.1E -01 | 1E -03 | |

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BRAUN INTERTEC
The Science You Build On.

# Permeability Of Granular Soil

**ASTM D2434**

09/18/2023

11001 Hampshire Avenue S
Minneapolis, MN 55438
Phone: 952-995-2000

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2303912
Minnkota Cell 5
Center, ND

## Sample Information

**Sample Number:** 552597
**Sampled By:** Wenko, Steve
**Location Details:** Bottom Ash 4
**Sample Date:** 09/12/2023
**Received Date:** 09/14/2023
**Lab:** 11001 Hampshire Ave S, Bloomington, MN
**Tested Date:** 09/18/2023
**Tested By:** Seokaran, Kanhai

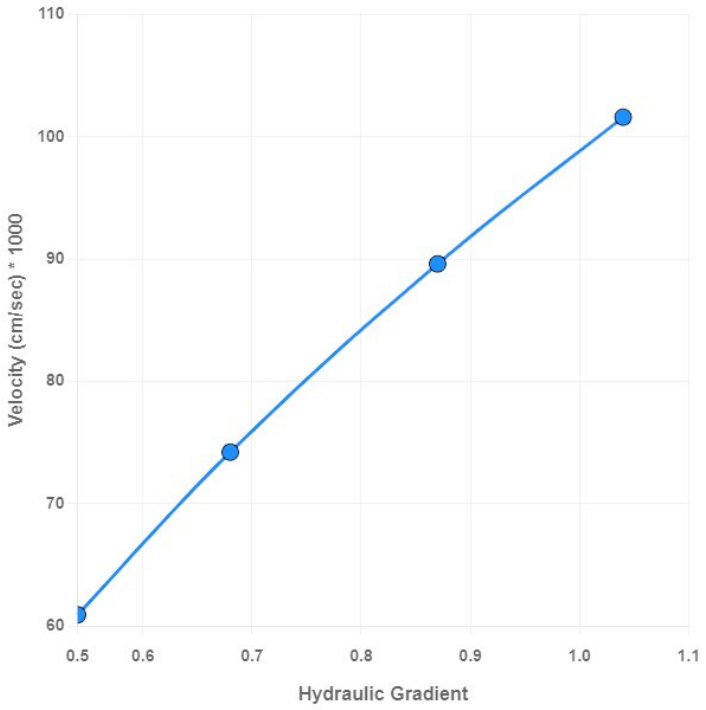
## Laboratory Data

**Sample Type:** Remolded
**Type Of Permeant:** Tap Water
**Dry Unit Weight (pcf):** 100.5
**Relative Density (%):** 95.2
**Void Ratio:** 0.65
**Maximum Density (pcf):** 105.6
**Soil Classification:** Bottom Ash

### Permeability Data

| Water Temp (°C) | Head Difference (cm) | Hydraulic Gradient | Velocity (cm/sec) | Coefficient Of Permeability |
|---|---|---|---|---|
| 18.9 | 6.6 | 0.54 | 0.0609 | 1.2E -01 |
| 18.7 | 8.4 | 0.68 | 0.0742 | 1.1E -01 |
| 18.6 | 10.7 | 0.87 | 0.0896 | 1.1E -01 |
| 18.4 | 12.8 | 1.04 | 0.1016 | 1.0E -01 |

| | | Specifications Minimum | Maximum |
|---|---|---|---|
| **Average Coefficient Of Permeability (cm/sec)** | 1.1E -01 | 1E -03 | |




## General

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The Science You Build On.

# Permeability Of Granular Soil

**ASTM D2434**

09/18/2023

11001 Hampshire Avenue S
Minneapolis, MN 55438
Phone: 952-995-2000

**Client:**

Minnkota Power Cooperative, Inc.
5301 32nd Ave S
Grand Forks, ND 58201

**Project:**

B2303912
Minnkota Cell 5
Center, ND

## Sample Information

**Sample Number:** 552598
**Sampled By:** Wenko, Steve
**Location Details:** Bottom Ash 5
**Sample Date:** 09/12/2023
**Received Date:** 09/14/2023
**Lab:** 11001 Hampshire Ave S, Bloomington, MN
**Tested Date:** 09/18/2023
**Tested By:** Seokaran, Kanhai

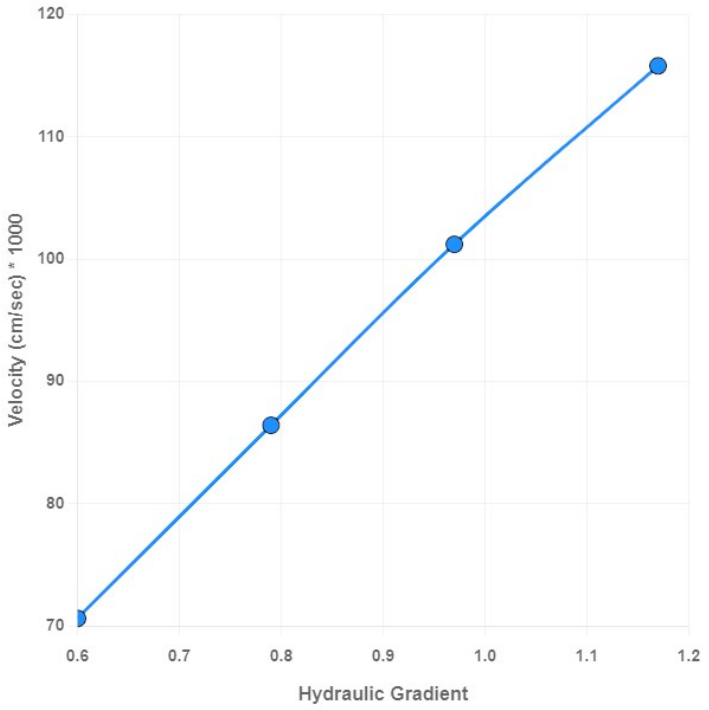
## Laboratory Data

**Sample Type:** Remolded
**Type Of Permeant:** Tap Water
**Dry Unit Weight (pcf):** 102.0
**Relative Density (%):** 95.1
**Maximum Density (pcf):** 107.2
**Soil Classification:** Bottom Ash

### Permeability Data

| Water Temp (°C) | Head Difference (cm) | Hydraulic Gradient | Velocity (cm/sec) | Coefficient Of Permeability |
|---|---|---|---|---|
| 18.7 | 4.6 | 0.60 | 0.0706 | 1.2E -01 |
| 18.6 | 6.0 | 0.79 | 0.0864 | 1.1E -01 |
| 18.4 | 7.4 | 0.97 | 0.1012 | 1.1E -01 |
| 18.2 | 8.9 | 1.17 | 0.1158 | 1.0E -01 |

| | | Specifications Minimum | Maximum |
|---|---|---|---|
| **Average Coefficient Of Permeability (cm/sec)** | 1.1E -01 | 1E -03 | |




## General

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# Appendix F

## Drainage Aggregate Material Tests

**GEOSERV, INC.** *Testing - Exploration - Engineering*
*Construction Materials Testing, Geotechnical, Geosynthetics, Geoenvironmental, Drilling*

**TO:** Mr. Joe Kessel
Baranko Bros, Inc
PO Box 0820
Dickinson, ND 58602

**DATE:** May 25, 2023

**PROJECT NO:** GEO-052310

**COPY:**

**PROJECT:** Minnkota FGD Pond – Cell 5 Phase 1B
Center, ND

## DRAINAGE AGGREGATE

**SAMPLE NUMBER:** 2
**LOCATION SAMPLED:** On Site - Stockpile
**PIT OWNER:**

| MECHANICAL ANALYSIS: | | | PROJECT SPECIFICATIONS |
|---|---|---|---|
| Passing | **1 1/2"** | 100 | 100 |
| | **1** | 94 | |
| | **3/4** | 75 | 35-80 |
| | **5/8** | 59 | |
| | **1/2** | 39 | |
| | **3/8** | 35 | 15-40 |
| | **#4** | 15 | 5-25 |
| | **8** | 3.3 | |
| | **10** | 3.1 | 0-10 |
| | **16** | 2.3 | |
| | **20** | 1.9 | |
| | **30** | 1.7 | |
| | **40** | 1.5 | |
| | **50** | 1.4 | |
| | **80** | 1.3 | |
| | **100** | 1.2 | 0-5 |
| | **200** | 1.0 | |

**REMARKS:** The above sample meets the gradation spec shown above. Sample was obtained & submitted to the lab by Baranko Brothers on 5-22-23

**GEOSERV, INC.**

3100 EAST BROADWAY AVENUE • BISMARCK, ND 58501
P.O. BOX 3159 • BISMARCK, ND 58502-3159
PHONE 701-223-6149
FAX 701-223-2372

**GEOSERV, INC.** *Testing - Exploration - Engineering*
*Construction Materials Testing, Geotechnical, Geosynthetics, Geoenvironmental, Drilling*

**TO:** Mr. Joe Kessel
Baranko Bros, Inc
PO Box 0820
Dickinson, ND 58602

**DATE:** August 10, 2023

**PROJECT NO:** GEO-052310

**COPY:**

**PROJECT:** Minnkota FGD Pond – Cell 5 Phase 1B
Center, ND

---

## DRAINAGE AGGREGATE

**SAMPLE NUMBER:** 3
**LOCATION SAMPLED:** On Site – Stockpile (West)
**PIT OWNER:**

| MECHANICAL ANALYSIS: | | | PROJECT SPECIFICATIONS |
|---|---|---|---|
| Passing | **1 1/2"** | 100 | 100 |
| | **1** | 98 | |
| | **3/4** | 79 | 35-80 |
| | **5/8** | 71 | |
| | **1/2** | 52 | |
| | **3/8** | 37 | 15-40 |
| | **#4** | 18 | 5-25 |
| | **8** | 3.2 | |
| | **10** | 2.5 | 0-10 |
| | **16** | 1.8 | |
| | **20** | 1.6 | |
| | **30** | 1.5 | |
| | **40** | 1.4 | |
| | **50** | 1.3 | |
| | **80** | 1.2 | |
| | **100** | 1.2 | 0-5 |
| | **200** | 1.0 | |

**REMARKS:** The above sample meets the gradation spec shown above. Sample was obtained & submitted to the lab by Baranko Brothers on 8-10-23

**GEOSERV, INC.**

3100 EAST BROADWAY AVENUE • BISMARCK, ND 58501
P.O. BOX 3159 • BISMARCK, ND 58502-3159
PHONE 701-223-6149
FAX 701-223-2372

**GEOSERV, INC.** *Testing - Exploration - Engineering*
*Construction Materials Testing, Geotechnical, Geosynthetics, Geoenvironmental, Drilling*

**TO:** Mr. Joe Kessel
Baranko Bros, Inc
PO Box 0820
Dickinson, ND 58602

**DATE:** August 10, 2023

**PROJECT NO:** GEO-052310

**COPY:**

**PROJECT:** Minnkota FGD Pond – Cell 5 Phase 1B
Center, ND

---

## DRAINAGE AGGREGATE

**SAMPLE NUMBER:** 4
**LOCATION SAMPLED:** On Site – Stockpile (East)
**PIT OWNER:**

| MECHANICAL ANALYSIS: | | | PROJECT SPECIFICATIONS |
|---|---|---|---|
| Passing | **1 1/2"** | 100 | 100 |
| | **1** | 93 | |
| | **3/4** | 67 | 35-80 |
| | **5/8** | 45 | |
| | **1/2** | 20 | |
| | **3/8** | 16 | 15-40 |
| | **#4** | 5.0 | 5-25 |
| | **8** | 1.5 | |
| | **10** | 1.3 | 0-10 |
| | **16** | 1.1 | |
| | **20** | 1.0 | |
| | **30** | 1.0 | |
| | **40** | 0.9 | |
| | **50** | 0.8 | |
| | **80** | 0.8 | |
| | **100** | 0.7 | 0-5 |
| | **200** | 0.6 | |

**REMARKS:** The above sample meets the gradation spec shown above. Sample was obtained & submitted to the lab by Baranko Brothers on 8-10-23

**GEOSERV, INC.**

3100 EAST BROADWAY AVENUE • BISMARCK, ND 58501
P.O. BOX 3159 • BISMARCK, ND 58502-3159
PHONE 701-223-6149
FAX 701-223-2372

**GEOSERV, INC.** *Testing - Exploration - Engineering*
*Construction Materials Testing, Geotechnical, Geosynthetics, Geoenvironmental, Drilling*

**TO:** Mr. Joe Kessel
Baranko Bros, Inc
PO Box 0820
Dickinson, ND 58602

**DATE:** October 25, 2023

**PROJECT NO:** GEO-052310

**COPY:**

**PROJECT:** Minnkota FGD Pond – Cell 5 Phase 1B
Center, ND

---

## DRAINAGE AGGREGATE

**SAMPLE NUMBER:** 5
**LOCATION SAMPLED:** On Site – Stockpile (South)
**PIT OWNER:**

| MECHANICAL ANALYSIS: | | | PROJECT SPECIFICATIONS |
|---|---|---|---|
| Passing | **1 1/2"** | 100 | 100 |
| | **1** | 93 | |
| | **3/4** | 66 | 35-80 |
| | **5/8** | 45 | |
| | **1/2** | 24 | |
| | **3/8** | 20 | 15-40 |
| | **#4** | 7.8 | 5-25 |
| | **8** | 1.7 | |
| | **10** | 1.5 | 0-10 |
| | **16** | 1.2 | |
| | **20** | 1.1 | |
| | **30** | 1.0 | |
| | **40** | 1.0 | |
| | **50** | 0.9 | |
| | **80** | 0.8 | |
| | **100** | 0.8 | 0-5 |
| | **200** | 0.7 | |

**REMARKS:** The above sample meets the gradation spec shown above. Sample was obtained & submitted to the lab by Geoserv, Inc on 10-23-23

**GEOSERV, INC.**

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P.O. BOX 3159 • BISMARCK, ND 58502-3159
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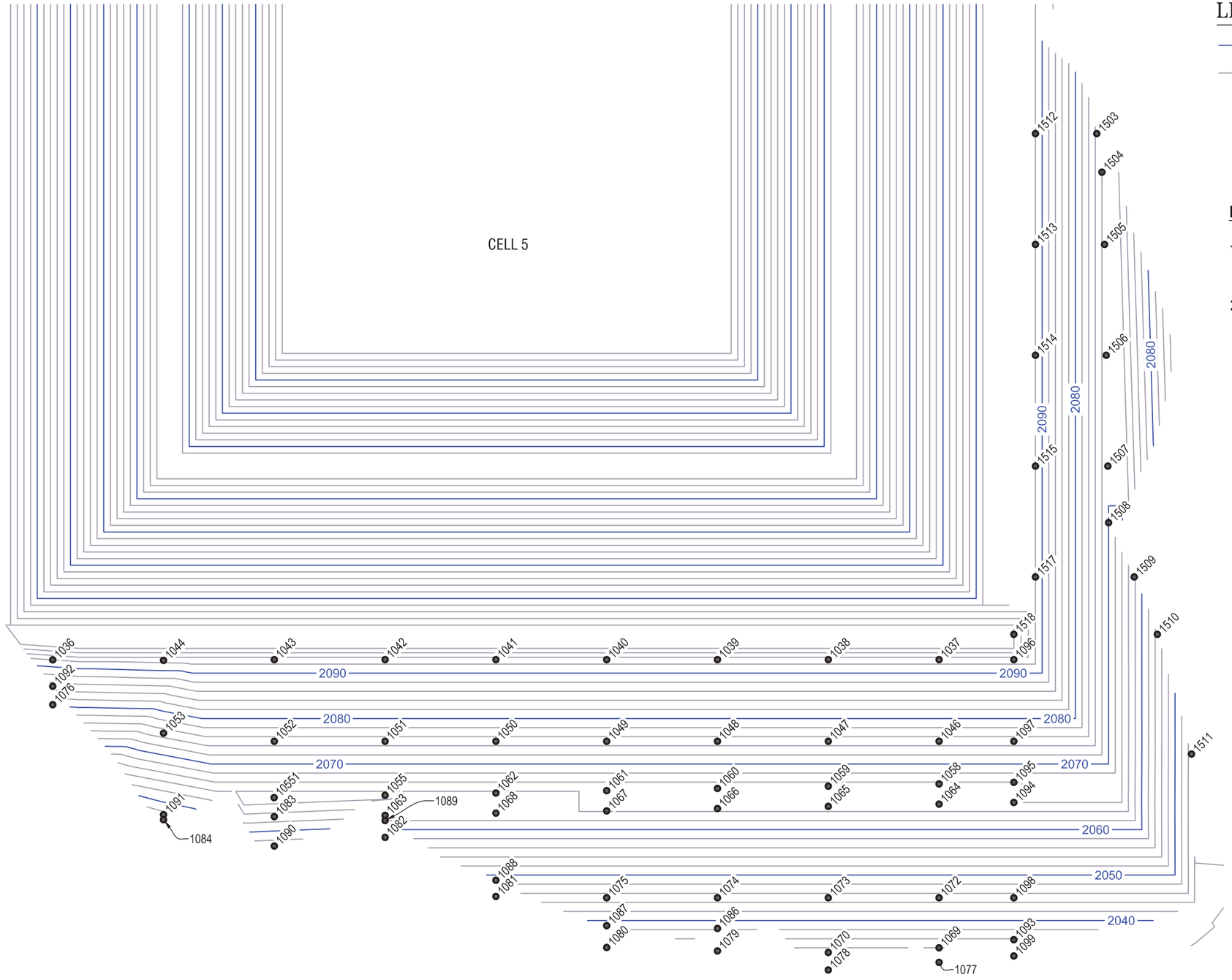
# Appendix G

## Survey Verification Data




## LEGEND

- DESIGNED FG MAJOR
- DESIGNED FG MINOR
- ● POINT # ASBUILT SURVEY POINT

INTERSTATE ENGINEERING SURVEY NOTES:

1. Basis of Bearings: NAD27, North Dakota State Plane, South Zone (US Survey Feet)
2. Located in Section 5, Township 141 North, Range 83 West, 5th P.M., Oliver County, North Dakota

0 50' 100'
HORIZONTAL SCALE IN FEET

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PRELIMINARY

| Rev No | Date | By | Description |
|---|---|---|---|
| | | | |

Cell 5 Phase 1A
Baranko Brothers
Minnkota - Milton Young Station

# Embankment Asbuilt Verification Plan

Drawn By: C. KNOLL
Checked By: MKT
Surveyed By: LPB
Designed By: MKT
Project No: CR22-08-027
Date: 11/22/22


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SECTION 070
1
SHEET NO.

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| Barr Verification Points (Designed) | | | | |
|---|---|---|---|---|
| Point # | Northing | Easting | Elevation | Location |
| 1036 | 506007.19 | 1819674.58 | 2092.00 | A |
| 1037 | 505207.19 | 1819674.85 | 2092.97 | A |
| 1038 | 505307.19 | 1819674.85 | 2092.97 | A |
| 1039 | 505407.19 | 1819674.85 | 2092.97 | A |
| 1040 | 505507.19 | 1819674.85 | 2092.97 | A |
| 1041 | 505607.19 | 1819674.85 | 2092.97 | A |
| 1042 | 505707.19 | 1819674.85 | 2092.97 | A |
| 1043 | 505807.19 | 1819674.85 | 2092.97 | A |
| 1044 | 505907.19 | 1819674.16 | 2092.62 | A |
| 1046 | 505207.19 | 1819601.18 | 2075.00 | B |
| 1047 | 505307.19 | 1819601.18 | 2075.00 | B |
| 1048 | 505407.19 | 1819601.18 | 2075.00 | B |
| 1049 | 505507.19 | 1819601.18 | 2075.00 | B |
| 1050 | 505607.19 | 1819601.18 | 2075.00 | B |
| 1051 | 505707.19 | 1819601.18 | 2075.00 | B |
| 1052 | 505807.19 | 1819601.18 | 2075.00 | B |
| 1053 | 505907.19 | 1819608.51 | 2075.00 | B |
| 1055 | 505707.19 | 1819552.50 | 2063.12 | C |
| 1058 | 505207.19 | 1819562.75 | 2065.62 | C |
| 1059 | 505307.19 | 1819560.70 | 2065.12 | C |
| 1060 | 505407.19 | 1819558.65 | 2064.62 | C |
| 1061 | 505507.19 | 1819556.60 | 2064.12 | C |
| 1062 | 505607.19 | 1819554.55 | 2063.62 | C |
| 1063 | 505707.19 | 1819534.30 | 2063.12 | D |
| 1064 | 505207.19 | 1819544.55 | 2065.62 | D |
| 1065 | 505307.19 | 1819542.50 | 2065.12 | D |
| 1066 | 505407.19 | 1819540.45 | 2064.62 | D |
| 1067 | 505507.19 | 1819538.40 | 2064.12 | D |
| 1068 | 505607.19 | 1819536.35 | 2063.62 | D |
| 1069 | 505207.19 | 1819414.89 | 2034.00 | F |
| 1070 | 505307.19 | 1819410.69 | 2032.98 | F |
| 1072 | 505207.19 | 1819459.99 | 2045.00 | E |
| 1073 | 505307.19 | 1819459.99 | 2045.00 | E |
| 1074 | 505407.19 | 1819459.99 | 2045.00 | E |
| 1075 | 505507.19 | 1819459.99 | 2045.00 | E |
| ** 1076 | 506007.19 | 1819634.22 | 2083.90 | G |
| ** 1077 | 505207.19 | 1819401.72 | 2034.39 | G |
| ** 1078 | 505307.19 | 1819394.89 | 2032.72 | G |
| ** 1079 | 505407.19 | 1819412.04 | 2036.91 | G |
| ** 1080 | 505507.19 | 1819415.19 | 2037.68 | G |
| ** 1081 | 505607.19 | 1819461.21 | 2048.90 | G |
| ** 1082 | 505707.19 | 1819514.48 | 2061.89 | G |
| 1083 | 505807.19 | 1819533.22 | 2070.43 | G |
| ** 1084 | 505907.19 | 1819530.49 | 2059.79 | G |
| 1086 | 505407.19 | 1819432.36 | 2038.26 | F |
| 1087 | 505507.19 | 1819434.90 | 2038.88 | F |
| 1088 | 505607.19 | 1819475.81 | 2048.86 | F |
| 1089 | 505707.19 | 1819529.70 | 2062.00 | F |
| ** 1090 | 505807.19 | 1819506.76 | 2073.28 | F |
| 1091 | 505907.19 | 1819534.96 | 2057.28 | F |
| 1092 | 506007.19 | 1819650.85 | 2085.01 | F |
| 1093 | 505139.75 | 1819422.23 | 2035.79 | F |
| 1094 | 505139.75 | 1819545.93 | 2065.96 | D |
| 1095 | 505139.75 | 1819564.13 | 2065.96 | C |
| 1096 | 505139.75 | 1819674.85 | 2092.97 | A |
| 1097 | 505139.75 | 1819601.18 | 2075.00 | B |
| 1098 | 505139.75 | 1819459.99 | 2045.00 | E |
| ** 1099 | 505139.75 | 1819407.53 | 2035.81 | G |

| Asbuilt Top of Random Fill | | | |
|---|---|---|---|
| Point # | As-Built Elevation | Description | |
| 81036 | 2091.74 | CHK*RF 10-28-22 | |
| 81037 | 2092.74 | CHK*RF 10-28-22 | |
| 81038 | 2092.75 | CHK*RF 10-28-22 | |
| 81039 | 2092.71 | CHK*RF 10-28-22 | |
| 81040 | 2092.77 | CHK*RF 10-28-22 | |
| 81041 | 2092.77 | CHK*RF 10-28-22 | |
| 81042 | 2092.72 | CHK*RF 10-28-22 | |
| 81043 | 2092.75 | CHK*RF 10-28-22 | |
| 81044 | 2092.44 | CHK*RF 10-28-22 | |
| 81046 | 2074.81 | CHK*RF 10-28-22 | |
| 81047 | 2074.74 | CHK*RF 10-28-22 | |
| 81048 | 2074.83 | CHK*RF 10-28-22 | |
| 81049 | 2074.83 | CHK*RF 10-28-22 | |
| 81050 | 2074.75 | CHK*RF 10-28-22 | |
| 81051 | 2074.78 | CHK*RF 10-28-22 | |
| 81052 | 2074.79 | CHK*RF 10-28-22 | |
| 81053 | 2074.88 | CHK*RF 10-28-22 | |
| 81055 | 2063.05 | CHK*RF 10-20-2022 | |
| 81058 | 2065.46 | CHK*RF 10-20-2022 | |
| 81059 | 2065.01 | CHK*RF 10-20-2022 | |
| 81060 | 2064.52 | CHK*RF 10-20-2022 | |
| 81061 | 2063.96 | CHK*RF 10-20-2022 | |
| 81062 | 2063.55 | CHK*RF 10-20-2022 | |
| 81063 | 2062.98 | CHK*RF 10-20-2022 | |
| 81064 | 2065.54 | CHK*RF 10-20-2022 | |
| 81065 | 2064.95 | CHK*RF 10-20-2022 | |
| 81066 | 2064.41 | CHK*RF 10-20-2022 | |
| 81067 | 2063.93 | CHK*RF 10-20-2022 | |
| 81068 | 2063.47 | CHK*RF 10-20-2022 | |
| 81069 | 2033.80 | CHK*RF 10-20-2022 | |
| 81070 | 2032.81 | CHK*RF 10-20-2022 | |
| 81072 | 2044.78 | CHK*RF 10-20-2022 | |
| 81073 | 2044.83 | CHK*RF 10-20-2022 | |
| 81074 | 2044.80 | CHK*RF 10-20-2022 | |
| 81075 | 2044.83 | CHK*RF 10-20-2022 | |
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| 81083 | 2066.81 | CHK*RF 10-20-2022 | |
| | | | |
| 81086 | 2038.03 | CHK*RF 10-20-2022 | |
| 81087 | 2038.70 | CHK*RF 10-20-2022 | |
| 81088 | 2048.70 | CHK*RF 10-20-2022 | |
| 81089 | 2061.86 | CHK*RF 10-20-2022 | |
| | | | |
| 81091 | 2057.23 | CHK*RF 10-20-2022 | |
| 81092 | 2084.80 | CHK*RF 10-28-22 | |
| 81093 | 2035.70 | CHK*RF 10-20-2022 | |
| 81094 | 2065.81 | CHK*RF 10-20-2022 | |
| 81095 | 2065.81 | CHK*RF 10-20-2022 | |
| 81096 | 2092.81 | CHK*RF 10-28-22 | |
| 81097 | 2074.71 | CHK*RF 10-28-22 | |
| 81098 | 2044.74 | CHK*RF 10-20-2022 | |
| | | | |

| Asbuilt Top of Subsoil | | | |
|---|---|---|---|
| Point # | As-Built Elevation | Description | Layer Depth |
| 71036 | 2094.52 | CHK*SS 10-31-2022 | 2.78 |
| 71037 | 2095.46 | CHK*SS 10-31-2022 | 2.72 |
| 71038 | 2095.50 | CHK*SS 10-31-2022 | 2.75 |
| 71039 | 2095.48 | CHK*SS 10-31-2022 | 2.77 |
| 71040 | 2095.48 | CHK*SS 10-31-2022 | 2.72 |
| 71041 | 2095.44 | CHK*SS 10-31-2022 | 2.67 |
| 71042 | 2095.42 | CHK*SS 10-31-2022 | 2.70 |
| 71043 | 2095.41 | CHK*SS 10-31-2022 | 2.66 |
| 71044 | 2095.05 | CHK*SS 10-31-2022 | 2.60 |
| 71046 | 2077.46 | CHK*SS 10-31-2022 | 2.64 |
| 71048 | 2077.41 | CHK*SS 10-31-2022 | 2.67 |
| 71049 | 2077.48 | CHK*SS 10-31-2022 | 2.65 |
| 71050 | 2077.45 | CHK*SS 10-31-2022 | 2.62 |
| 71051 | 2077.46 | CHK*SS 10-31-2022 | 2.71 |
| 71052 | 2077.48 | CHK*SS 10-31-2022 | 2.71 |
| 71053 | 2077.48 | CHK*SS 10-31-2022 | 2.69 |
| 71054 | 2077.40 | CHK*SS 10-31-2022 | 2.53 |
| 71055 | 2065.60 | CHK*SS 10-28-22 | 2.55 |
| 71058 | 2068.10 | CHK*SS 10-28-22 | 2.64 |
| 71059 | 2067.59 | CHK*SS 10-28-22 | 2.58 |
| 71060 | 2067.09 | CHK*SS 10-28-22 | 2.57 |
| 71061 | 2066.57 | CHK*SS 10-28-22 | 2.60 |
| 71062 | 2066.08 | CHK*SS 10-28-22 | 2.53 |
| 71063 | 2065.61 | CHK*SS 10-28-22 | 2.63 |
| 71064 | 2068.09 | CHK*SS 10-28-22 | 2.55 |
| 71065 | 2067.60 | CHK*SS 10-28-22 | 2.65 |
| 71066 | 2067.05 | CHK*SS 10-28-22 | 2.64 |
| 71067 | 2066.57 | CHK*SS 10-28-22 | 2.64 |
| 71068 | 2066.08 | CHK*SS 10-28-22 | 2.61 |
| 71069 | 2036.45 | CHK*SS 10-28-22 | 2.65 |
| 71070 | 2035.37 | CHK*SS 10-28-22 | 2.56 |
| 71072 | 2047.42 | CHK*SS 10-28-22 | 2.64 |
| 71073 | 2047.47 | CHK*SS 10-28-22 | 2.64 |
| 71074 | 2047.46 | CHK*SS 10-28-22 | 2.65 |
| 71075 | 2047.48 | CHK*SS 10-28-22 | 2.65 |
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| 71083 | 2069.38 | CHK*SS 10-28-22 | 2.57 |
| | | | |
| 71086 | 2040.70 | CHK*SS 10-28-22 | 2.67 |
| 71087 | 2041.33 | CHK*SS 10-28-22 | 2.62 |
| 71088 | 2051.31 | CHK*SS 10-28-22 | 2.61 |
| 71089 | 2064.52 | CHK*SS 10-28-22 | 2.66 |
| | | | 0.00 |
| 71091 | 2059.75 | CHK*SS 10-28-22 | 2.52 |
| 71092 | 2087.50 | CHK*SS 10-31-2022 | 2.69 |
| 71093 | 2038.27 | CHK*SS 10-28-22 | 2.57 |
| 71094 | 2068.39 | CHK*SS 10-28-22 | 2.58 |
| 71095 | 2068.44 | CHK*SS 10-28-22 | 2.63 |
| 71096 | 2095.44 | CHK*SS 10-31-2022 | 2.63 |
| 71097 | 2077.43 | CHK*SS 10-31-2022 | 2.71 |
| 71098 | 2047.51 | CHK*SS 10-28-22 | 2.77 |
| | | | |

| Asbuilt Top of Topsoil | | | |
|---|---|---|---|
| Point # | As-Built Elevation | Description | Layer Depth |
| 61036 | 2095.64 | CHK*TS 11-04-2022 | 1.12 |
| 61037 | 2096.62 | CHK*TS 11-04-2022 | 1.17 |
| 61038 | 2096.58 | CHK*TS 11-04-2022 | 1.08 |
| 61039 | 2096.61 | CHK*TS 11-04-2022 | 1.13 |
| 61040 | 2096.61 | CHK*TS 11-04-2022 | 1.12 |
| 61041 | 2096.63 | CHK*TS 11-04-2022 | 1.20 |
| 61042 | 2096.58 | CHK*TS 11-04-2022 | 1.16 |
| 61043 | 2096.60 | CHK*TS 11-04-2022 | 1.19 |
| 61044 | 2096.24 | CHK*TS 11-04-2022 | 1.19 |
| 61046 | 2078.61 | CHK*TS 11-04-2022 | 1.15 |
| 61047 | 2078.67 | CHK*TS 11-04-2022 | 1.27 |
| 61048 | 2078.62 | CHK*TS 11-04-2022 | 1.14 |
| 61049 | 2078.61 | CHK*TS 11-04-2022 | 1.16 |
| 61050 | 2078.63 | CHK*TS 11-04-2022 | 1.17 |
| 61051 | 2078.63 | CHK*TS 11-04-2022 | 1.15 |
| 61052 | 2078.67 | CHK*TS 11-04-2022 | 1.19 |
| 61053 | 2078.61 | CHK*TS 11-04-2022 | 1.21 |
| 61055 | 2066.72 | CHK*TS 11-04-2022 | 1.12 |
| 61058 | 2069.44 | CHK*TS 11-04-2022 | 1.34 |
| 61059 | 2068.77 | CHK*TS 11-04-2022 | 1.18 |
| 61060 | 2068.17 | CHK*TS 11-04-2022 | 1.07 |
| 61061 | 2067.71 | CHK*TS 11-04-2022 | 1.14 |
| 61062 | 2067.16 | CHK*TS 11-04-2022 | 1.08 |
| 61063 | 2066.68 | CHK*TS 11-04-2022 | 1.07 |
| 61064 | 2069.18 | CHK*TS 11-04-2022 | 1.09 |
| 61065 | 2068.72 | CHK*TS 11-04-2022 | 1.12 |
| 61066 | 2068.19 | CHK*TS 11-04-2022 | 1.14 |
| 61067 | 2067.68 | CHK*TS 11-04-2022 | 1.11 |
| 61068 | 2067.18 | CHK*TS 11-04-2022 | 1.10 |
| 61069 | 2037.62 | CHK*TS 11-04-2022 | 1.17 |
| 61070 | 2036.63 | CHK*TS 11-04-2022 | 1.27 |
| 61072 | 2048.69 | CHK*TS 11-04-2022 | 1.26 |
| 61073 | 2048.64 | CHK*TS 11-04-2022 | 1.17 |
| 61074 | 2048.68 | CHK*TS 11-04-2022 | 1.23 |
| 61075 | 2048.61 | CHK*TS 11-04-2022 | 1.13 |
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| | | | |
| 61083 | 2070.69 | CHK*TS 11-04-2022 | 1.31 |
| | | | |
| 61086 | 2041.92 | CHK*TS 11-04-2022 | 1.23 |
| 61087 | 2042.52 | CHK*TS 11-04-2022 | 1.19 |
| 61088 | 2052.50 | CHK*TS 11-04-2022 | 1.19 |
| 61089 | 2065.66 | CHK*TS 11-04-2022 | 1.14 |
| | | | 0.00 |
| 61091 | 2060.91 | CHK*TS 11-04-2022 | 1.16 |
| 61092 | 2088.66 | CHK*TS 11-04-2022 | 1.17 |
| 61093 | 2039.49 | CHK*TS 11-04-2022 | 1.23 |
| 61094 | 2069.53 | CHK*TS 11-04-2022 | 1.15 |
| 61095 | 2069.93 | CHK*TS 11-04-2022 | 1.49 |
| 61096 | 2096.62 | CHK*TS 11-04-2022 | 1.18 |
| 61097 | 2078.64 | CHK*TS 11-04-2022 | 1.21 |
| 61098 | 2048.65 | CHK*TS 11-04-2022 | 1.14 |

| Rev No | Date | By | Description |
|---|---|---|---|
| | | | |

Cell 5 Phase 1A
Baranko Brothers
Minnkota - Milton Young Station

# Embankment Asbuilt Verification Point Table

Drawn By: C. KNOLL
Checked By: MKT
Surveyed By: LPB
Designed By: MKT
Project No: CR22-08-027
Date: 11/22/22


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2610 Old Red Trail, Suite B
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PRELIMINARY

SECTION 070
2
SHEET NO.

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| | Barr Verification Points (Designed) | | | | |
|---|---|---|---|---|---|
| | Point # | Northing | Easting | Elevation | Location |
| * | 10551 | 505807.39 | 1819550.40 | 2062.62 | CHK*RF |
| ** | 1503 | 1820149.41 | 505064.88 | 2073.54 | RF-Q |
| | 1504 | 1820114.59 | 505060.18 | 2071.98 | RF-Q |
| | 1505 | 1820049.41 | 505057.79 | 2071.18 | RF-Q |
| | 1506 | 1819949.41 | 505056.29 | 2070.68 | RF-Q |
| | 1507 | 1819849.41 | 505054.79 | 2070.18 | RF-Q |
| | 1508 | 1819798.40 | 505054.26 | 2070.00 | RF-Q |
| | 1509 | 1819749.41 | 505031.06 | 2062.27 | RF-Q |
| | 1510 | 1819697.67 | 505010.24 | 2055.33 | RF-Q |
| | 1511 | 1819589.69 | 504979.30 | 2045.01 | RF-Q |
| | 1512 | 1820149.41 | 505120.26 | 2092.00 | RF-A |
| | 1513 | 1820049.41 | 505120.26 | 2092.00 | RF-A |
| | 1514 | 1819949.41 | 505120.26 | 2092.00 | RF-A |
| | 1515 | 1819849.41 | 505120.26 | 2092.00 | RF-A |
| | 1517 | 1819749.41 | 505120.26 | 2092.00 | RF-A |
| | 1518 | 1819697.67 | 505139.75 | 2098.00 | RF-A |

| Asbuilt Top of Random Fill | | | |
|---|---|---|---|
| Point # | As-Built Elevation | Description | |
| 810551 | 2062.62 | CHK*RF 10-20-2022 | |
| | | | |
| 81504 | 2071.94 | CHK*RF 10-28-22 | |
| 81505 | 2071.16 | CHK*RF 10-28-22 | |
| 81506 | 2070.64 | CHK*RF 10-28-22 | |
| 81507 | 2070.10 | CHK*RF 10-28-22 | |
| 81508 | 2069.88 | CHK*RF 10-28-22 | |
| 81509 | 2062.12 | CHK*RF 10-28-22 | |
| 81510 | 2055.19 | CHK*RF 10-28-22 | |
| 81511 | 2044.96 | CHK*RF 10-28-22 | |
| 81512 | 2091.93 | CHK*RF 10-28-22 | |
| 81513 | 2091.83 | CHK*RF 10-28-22 | |
| 81514 | 2091.79 | CHK*RF 10-28-22 | |
| 81515 | 2091.83 | CHK*RF 10-28-22 | |
| 81517 | 2092.01 | CHK*RF 10-28-22 | |
| 81518 | 2097.77 | CHK*RF 10-28-22 | |

| Asbuilt Top of Subsoil | | | |
|---|---|---|---|
| Point # | As-Built Elevation | Description | Layer Depth |
| 710551 | 2065.16 | CHK*SS 10-28-22 | 2.54 |

| Asbuilt Top of Topsoil | | | |
|---|---|---|---|
| Point # | As-Built Elevation | Description | Layer Depth |
| 610551 | 2066.54 | CHK*TS 11-04-2022 | 1.38 |

* LOCATION ADDED IN THE FIELD FOR VERIFICATION

** LOCATION NOT VERIFIED DUE TO POINT BEING BEYOND CONSTRUCTION AREA

THIS DOCUMENT IS PRELIMINARY AND IS NOT INTENDED FOR CONSTRUCTION, RECORDING, OR IMPLEMENTATION PURPOSES.

PRELIMINARY

| Rev No | Date | By | Description |
|---|---|---|---|
| | | | |

Cell 5 Phase 1A
Baranko Brothers
Minnkota - Milton Young Station

# Embankment Asbuilt Verification Point Table

Drawn By: C. KNOLL
Checked By: MKT
Surveyed By: LPB
Designed By: MKT
Project No: CR22-08-027
Date: 11/22/22

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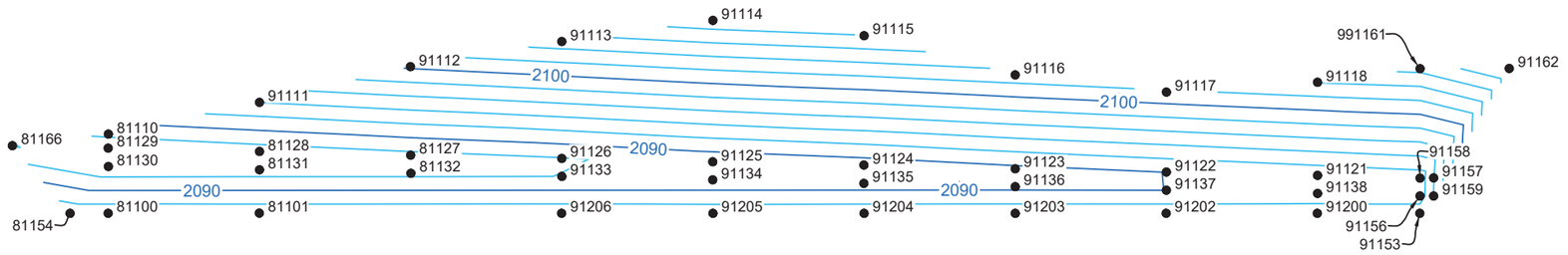


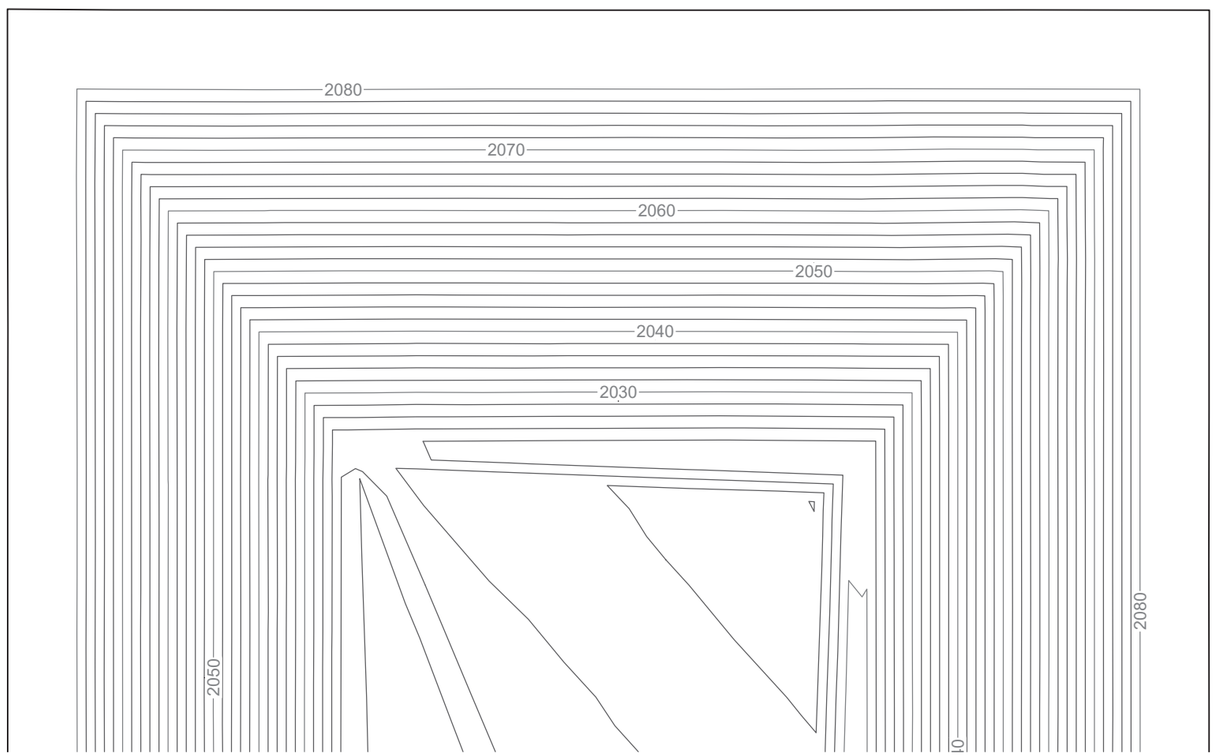


## LEGEND

- ASBUILT FG MAJOR
- ASBUILT FG MINOR
- ● POINT # — ASBUILT VERIFICATION POINT

INTERSTATE ENGINEERING SURVEY NOTES:

1. Basis of Bearings: NAD27, North Dakota State Plane, South Zone (US Survey Feet)
2. Located in Section 5, Township 141 North, Range 83 West, 5th P.M., Oliver County, North Dakota

0 50' 100'
HORIZONTAL SCALE IN FEET

MATTHEW WEEKS
REGISTERED LAND SURVEYOR
L.S. 3626
NORTH DAKOTA

| Rev No | Date | By | Description |
|---|---|---|---|
| | | | |

Cell 5 Phase 1B
Baranko Brothers
Minnkota - Milton Young Station

# Embankment Random Fill Asbuilt

Drawn By: C. KNOLL
Checked By: MKT
Surveyed By: LPB
Designed By: MKT
Project No: CR22-08-027.01
Date: 11/28/23


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2610 Old Red Trail, Suite B
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Mandan, ND 58554
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## Embankment Random Fill Verification Points

| Point # | Northing | Easting | Elevation | Location |
|---|---|---|---|---|
| 81100 | 506024.30 | 1821704.02 | 2093.38 | CHK* RF 11-15-23 ELW |
| 81101 | 505924.27 | 1821704.07 | 2093.32 | CHK* RF 11-15-23 ELW |
| 81110 | 506024.17 | 1821756.43 | 2088.42 | CHK* RF 11-15-23 ELW |
| 81127 | 505824.21 | 1821742.52 | 2087.48 | CHK* RF 11-15-23 ELW |
| 81128 | 505924.19 | 1821744.89 | 2086.97 | CHK* RF 11-15-23 ELW |
| 81129 | 506024.26 | 1821747.16 | 2086.53 | CHK* RF 11-15-23 ELW |
| 81130 | 506024.15 | 1821735.00 | 2086.48 | CHK* RF 11-15-23 ELW |
| 81131 | 505924.17 | 1821732.84 | 2087.00 | CHK* RF 11-15-23 ELW |
| 81132 | 505824.07 | 1821730.53 | 2087.50 | CHK* RF 11-15-23 ELW |
| 81154 | 506049.51 | 1821703.91 | 2093.40 | CHK* RF 11-15-23 ELW |
| 81166 | 506087.71 | 1821748.79 | 2085.96 | CHK* RF 11-15-23 ELW |
| 91111 | 505924.20 | 1821777.48 | 2093.99 | CHK*RF 2023-10-06 |
| 91112 | 505824.28 | 1821801.12 | 2100.26 | CHK*RF 2023-10-06 |
| 91113 | 505724.18 | 1821817.73 | 2105.04 | CHK*RF 2023-10-06 |
| 91114 | 505624.24 | 1821831.72 | 2109.26 | CHK*RF 2023-10-06 |
| 91115 | 505524.21 | 1821821.63 | 2107.91 | CHK*RF 2023-10-06 |
| 91116 | 505424.25 | 1821795.68 | 2103.20 | CHK*RF 2023-10-06 |
| 91117 | 505324.16 | 1821784.22 | 2101.67 | CHK*RF 2023-10-06 |
| 91118 | 505224.22 | 1821790.72 | 2104.04 | CHK*RF 2023-10-06 |
| 91121 | 505224.13 | 1821729.10 | 2090.54 | CHK*RF 2023-10-06 |
| 91122 | 505324.21 | 1821731.31 | 2090.01 | CHK*RF 2023-10-06 |
| 91123 | 505424.23 | 1821733.50 | 2089.52 | CHK*RF 2023-10-06 |
| 91124 | 505524.27 | 1821735.94 | 2088.94 | CHK*RF 2023-10-06 |
| 91125 | 505624.30 | 1821738.05 | 2088.52 | CHK*RF 2023-10-06 |
| 91126 | 505724.23 | 1821740.35 | 2087.89 | CHK*RF 2023-10-06 |
| 91133 | 505724.14 | 1821728.39 | 2088.03 | CHK*RF 2023-10-06 |
| 91134 | 505624.34 | 1821726.18 | 2088.53 | CHK*RF 2023-10-06 |
| 91135 | 505524.39 | 1821723.83 | 2089.01 | CHK*RF 2023-10-06 |
| 91136 | 505424.18 | 1821721.57 | 2089.55 | CHK*RF 2023-10-06 |
| 91137 | 505324.25 | 1821719.26 | 2090.01 | CHK*RF 2023-10-06 |
| 91138 | 505224.14 | 1821717.14 | 2090.53 | CHK*RF 2023-10-06 |
| 91153 | 505156.50 | 1821704.02 | 2093.35 | CHK*RF 2023-10-11 |
| 91156 | 505156.43 | 1821715.40 | 2090.83 | CHK*RF 2023-10-11 |
| 91157 | 505147.38 | 1821727.42 | 2093.96 | CHK*RF 2023-10-11 |
| 91158 | 505156.36 | 1821727.27 | 2090.80 | CHK*RF 2023-10-11 |
| 91159 | 505147.40 | 1821715.43 | 2094.04 | CHK*RF 2023-10-11 |
| 91162 | 505097.41 | 1821799.90 | 2109.72 | CHK*RF 2023-10-11 |
| 91200 | 505224.30 | 1821703.97 | 2093.40 | CHK*RF 1108 2023-10-09 |
| 91202 | 505324.30 | 1821704.00 | 2093.34 | CHK*RF 1107 2023-10-09 |
| 91203 | 505424.14 | 1821703.95 | 2093.36 | CHK*RF 1106 2023-10-09 |
| 91204 | 505524.22 | 1821703.93 | 2093.35 | CHK*RF 1105 2023-10-09 |
| 91205 | 505624.18 | 1821703.99 | 2093.30 | CHK*RF 1104 2023-10-09 |
| 91206 | 505724.26 | 1821704.02 | 2093.37 | CHK*RF 1103 2023-10-09 |
| 991161 | 505156.33 | 1821799.81 | 2106.55 | CHK*RF 2023-10-11 |

## Embankment Subsoil Verification Points

| Point # | Elevation | Location | Layer Depth |
|---|---|---|---|
| 981100 | 2096.15 | CHK*SS 2023-11-20 | 2.77 |
| 981101 | 2095.95 | CHK*SS 2023-11-20 | 2.63 |
| 981110 | 2090.95 | CHK*SS 2023-11-20 | 2.53 |
| 981127 | 2090.16 | CHK*SS 2023-11-20 | 2.68 |
| 981128 | 2089.67 | CHK*SS 2023-11-20 | 2.71 |
| 981129 | 2089.32 | CHK*SS 2023-11-20 | 2.79 |
| 981130 | 2089.06 | CHK*SS 2023-11-20 | 2.58 |
| 981131 | 2089.92 | CHK*SS 2023-11-20 | 2.92 |
| 981132 | 2090.36 | CHK*SS 2023-11-20 | 2.86 |
| 981154 | 2096.08 | CHK*SS 2023-11-20 | 2.69 |
| 981166 | 2088.59 | CHK*SS 2023-11-20 | 2.63 |
| 991111 | 2096.66 | CHK*SS 2023-11-20 | 2.67 |
| 991112 | 2102.81 | CHK*SS 2023-11-20 | 2.55 |
| 991113 | 2107.60 | CHK*SS 2023-11-20 | 2.56 |
| 991114 | 2111.81 | CHK*SS 2023-11-20 | 2.55 |
| 991115 | 2110.65 | CHK*SS 2023-11-20 | 2.74 |
| 991116 | 2106.02 | CHK*SS 2023-11-20 | 2.82 |
| 991117 | 2104.38 | CHK*SS 2023-11-20 | 2.71 |
| 991118 | 2106.58 | CHK*SS 2023-11-20 | 2.54 |
| 991121 | 2093.29 | CHK*SS 2023-11-20 | 2.76 |
| 991122 | 2092.90 | CHK*SS 2023-11-20 | 2.89 |
| 991123 | 2092.38 | CHK*SS 2023-11-20 | 2.86 |
| 991124 | 2091.71 | CHK*SS 2023-11-20 | 2.78 |
| 991125 | 2091.32 | CHK*SS 2023-11-20 | 2.81 |
| 991126 | 2090.65 | CHK*SS 2023-11-20 | 2.76 |
| 991133 | 2090.91 | CHK*SS 2023-11-20 | 2.88 |
| 991134 | 2091.22 | CHK*SS 2023-11-20 | 2.69 |
| 991135 | 2091.76 | CHK*SS 2023-11-20 | 2.74 |
| 991136 | 2092.34 | CHK*SS 2023-11-20 | 2.79 |
| 991137 | 2092.65 | CHK*SS 2023-11-20 | 2.64 |
| 991138 | 2093.38 | CHK*SS 2023-11-20 | 2.85 |
| 991153 | 2095.89 | CHK*SS 2023-11-20 | 2.54 |
| 991156 | 2093.73 | CHK*SS 2023-11-20 | 2.89 |
| 991157 | 2096.66 | CHK*SS 2023-11-20 | 2.71 |
| 991158 | 2093.80 | CHK*SS 2023-11-20 | 3.00 |
| 991159 | 2096.85 | CHK*SS 2023-11-20 | 2.81 |
| 991162 | 2112.24 | CHK*SS 2023-11-20 | 2.51 |
| 991200 | 2095.97 | CHK*SS 2023-11-20 | 2.57 |
| 991202 | 2096.04 | CHK*SS 2023-11-20 | 2.70 |
| 991203 | 2095.99 | CHK*SS 2023-11-20 | 2.63 |
| 991204 | 2095.88 | CHK*SS 2023-11-20 | 2.54 |
| 991205 | 2095.89 | CHK*SS 2023-11-20 | 2.59 |
| 991206 | 2095.94 | CHK*SS 2023-11-20 | 2.58 |
| 9991161 | 2109.11 | CHK*SS 2023-11-20 | 2.55 |

MATTHEW WEEKS
REGISTERED
LAND
SURVEYOR
L.S. 3626
NORTH DAKOTA

| Rev No | Date | By | Description |
|---|---|---|---|
| | | | |

Cell 5 Phase 1B
Baranko Brothers
Minnkota - Milton Young Station

# Embankment Verification Tables

Drawn By: C. KNOLL
Checked By: MKT
Surveyed By: LPB
Designed By: MKT
Project No: CR22-08-027.01
Date: 11/28/23

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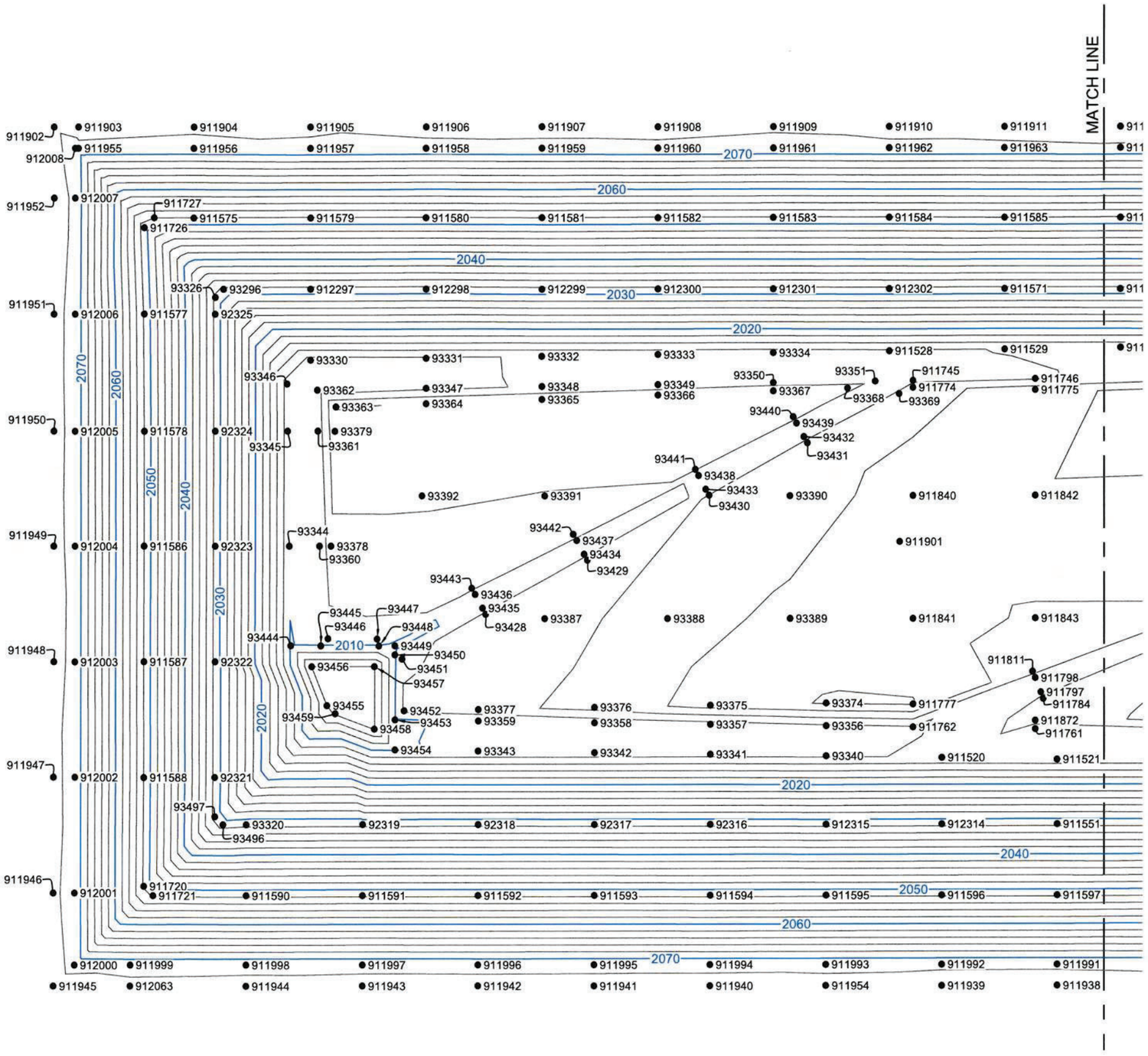


## LEGEND

- ASBUILT FG MAJOR
- ASBUILT FG MINOR
- ● POINT # — ASBUILT VERIFICATION POINT

INTERSTATE ENGINEERING SURVEY NOTES:

1. Basis of Bearings: NAD27, North Dakota State Plane, South Zone (US Survey Feet)
2. Located in Section 5, Township 141 North, Range 83 West, 5th P.M., Oliver County, North Dakota

0 50' 100'
HORIZONTAL SCALE IN FEET

MATTHEW WEEKS
REGISTERED LAND SURVEYOR
L.S. 3626
10 OCTOBER 2023
NORTH DAKOTA

| Rev No | Date | By | Description |
|---|---|---|---|
| | | | |

Cell 5 Phase 1B
Baranko Brothers
Minnkota - Milton Young Station

Top of Random Fill Asbuilt

Drawn By: ___ Surveyed By: LPB Project No: CR22-08-027.01
Checked By: MKT Designed By: MKT Date: 10/06/23

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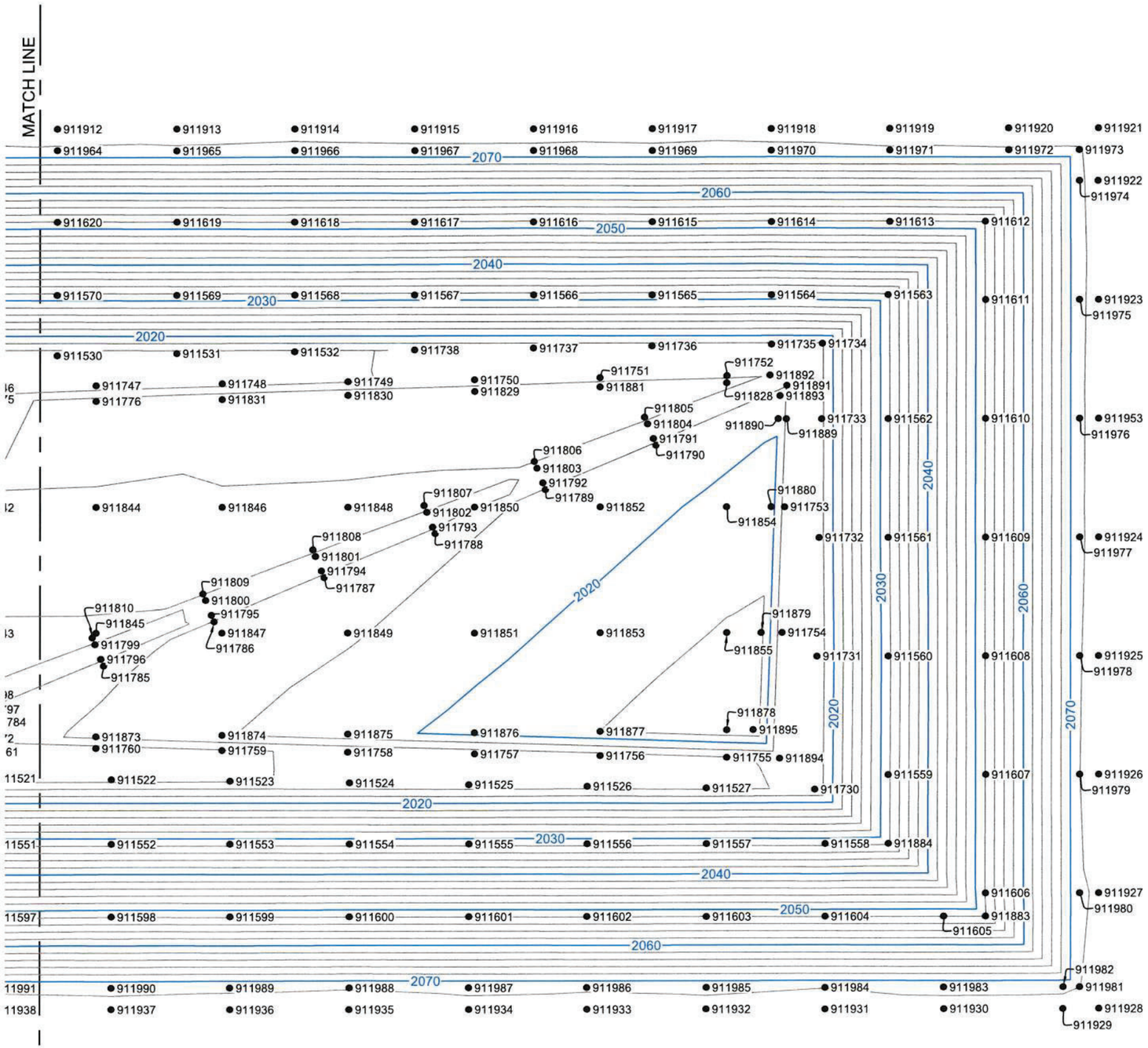


## LEGEND

- ASBUILT FG MAJOR
- ASBUILT FG MINOR
- ● POINT # ASBUILT VERIFICATION POINT

INTERSTATE ENGINEERING SURVEY NOTES:

1. Basis of Bearings: NAD27, North Dakota State Plane, South Zone (US Survey Feet)
2. Located in Section 5, Township 141 North, Range 83 West, 5th P.M., Oliver County, North Dakota

0 50' 100'
HORIZONTAL SCALE IN FEET

MATTHEW WEEKS
REGISTERED
LAND
SURVEYOR
L.S. 3626
10 OCTOBER 2023
NORTH DAKOTA

| Rev No. | Date | By | Description |
|---|---|---|---|
| | | | |

Cell 5 Phase 1B
Baranko Brothers
Minnkota - Milton Young Station

# Top of Random Fill Asbuilt

Drawn By: C. KNOLL | Surveyed By: LPB | Project No: CR22-08-027.01
Checked By: MKT | Designed By: MKT | Date: 10/06/23


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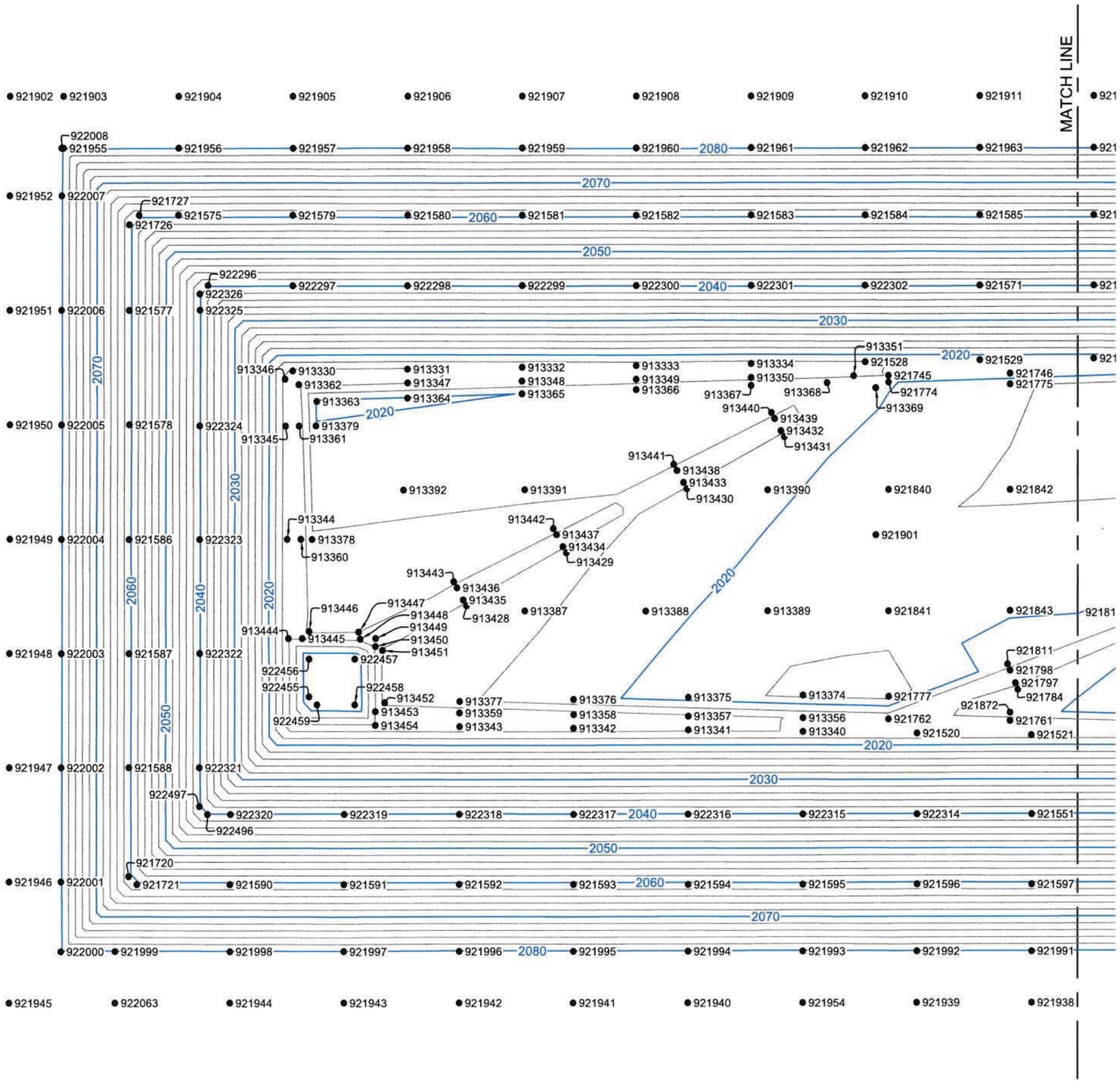


## LEGEND

- ASBUILT FG MAJOR
- ASBUILT FG MINOR
- ● POINT # ASBUILT VERIFICATION POINT

INTERSTATE ENGINEERING SURVEY NOTES:

1. Basis of Bearings: NAD27, North Dakota State Plane, South Zone (US Survey Feet)
2. Located in Section 5, Township 141 North, Range 83 West, 5th P.M., Oliver County, North Dakota

0 50' 100'
HORIZONTAL SCALE IN FEET

MATTHEW WEEKS
REGISTERED LAND SURVEYOR
L.S. 3626
10 OCTOBER 2023
NORTH DAKOTA

| Rev No | Date | By | Description |
|---|---|---|---|
| | | | |

Cell 5 Phase 1B
Baranko Brothers
Minnkota - Milton Young Station

# Top of Select Clay Asbuilt

Drawn By: C. KNOLL | Surveyed By: LPB | Project No: CR22-08-027.01
Checked By: MKT | Designed By: MKT | Date: 10/06/23


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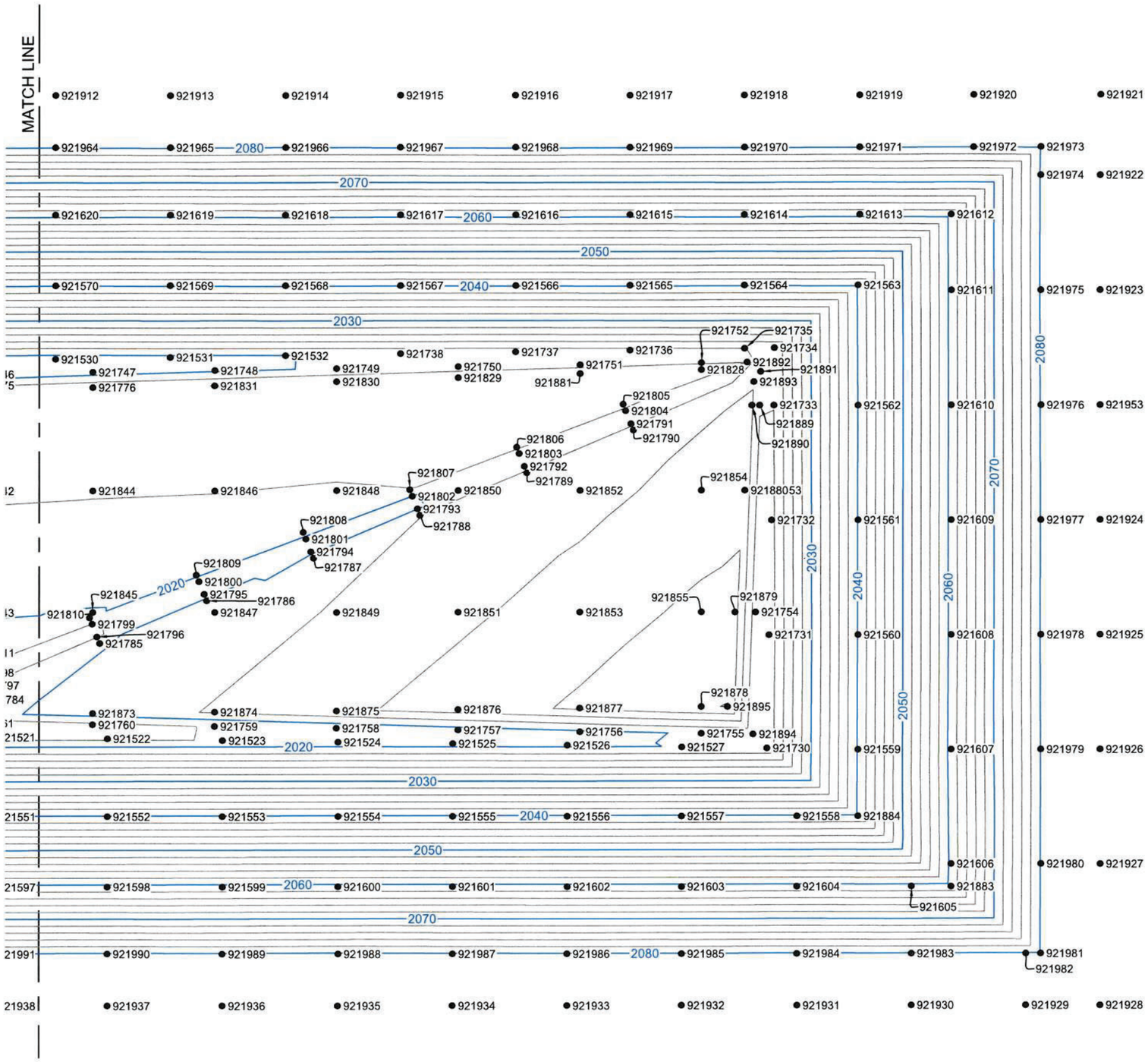


## LEGEND

- ASBUILT FG MAJOR
- ASBUILT FG MINOR
- ● POINT # ASBUILT VERIFICATION POINT

INTERSTATE ENGINEERING SURVEY NOTES:

1. Basis of Bearings: NAD27, North Dakota State Plane, South Zone (US Survey Feet)
2. Located in Section 5, Township 141 North, Range 83 West, 5th P.M., Oliver County, North Dakota

MATTHEW WEEKS
REGISTERED LAND SURVEYOR
L.S. 3626
10 October 2023
NORTH DAKOTA

| Rev No | Date | By | Description |
|---|---|---|---|
| | | | |

Cell 5 Phase 1B
Baranko Brothers
Minnkota - Milton Young Station

# Top of Select Clay Asbuilt

Drawn By: C. KNOLL | Surveyed By: LPB | Project No: CR22-08-027.01
Checked By: MKT | Designed By: MKT | Date: 10/06/23


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| Barr RF Verification Points (Designed) | | | | |
|---|---|---|---|---|
| Point # | Northing | Easting | Elevation | Location |
| 11520 | 505423.79 | 1820549.41 | 2012.36 | G |
| 11521 | 505422.29 | 1820649.28 | 2012.86 | G |
| 11522 | 505420.79 | 1820749.46 | 2013.36 | G |
| 11523 | 505419.29 | 1820849.29 | 2013.86 | G |
| 11524 | 505417.78 | 1820949.91 | 2014.36 | G |
| 11525 | 505416.29 | 1821049.78 | 2014.86 | G |
| 11526 | 505414.79 | 1821149.41 | 2015.36 | G |
| 11527 | 505413.29 | 1821249.28 | 2015.86 | G |
| 11528 | 505775.06 | 1820503.92 | 2013.71 | G |
| 11529 | 505776.56 | 1820603.89 | 2014.21 | G |
| 11530 | 505778.06 | 1820703.82 | 2014.71 | G |
| 11531 | 505779.56 | 1820803.88 | 2015.21 | G |
| 11532 | 505781.06 | 1820903.77 | 2015.70 | G |
| 11551 | 505366.18 | 1820649.31 | 2031.57 | F |
| 11552 | 505366.18 | 1820749.45 | 2031.57 | F |
| 11553 | 505366.18 | 1820849.32 | 2031.57 | F |
| 11554 | 505366.18 | 1820949.91 | 2031.57 | F |
| 11555 | 505366.18 | 1821049.81 | 2031.57 | F |
| 11556 | 505366.18 | 1821149.41 | 2031.57 | F |
| 11557 | 505366.18 | 1821249.31 | 2031.57 | F |
| 11558 | 505366.18 | 1821349.36 | 2031.57 | F |
| 11559 | 505424.23 | 1821402.35 | 2031.75 | F |
| 11560 | 505524.23 | 1821402.35 | 2031.75 | F |
| 11561 | 505624.23 | 1821402.35 | 2031.75 | F |
| 11562 | 505724.23 | 1821402.35 | 2031.75 | F |
| 11563 | 505828.65 | 1821402.35 | 2031.75 | F |
| 11564 | 505828.65 | 1821303.92 | 2031.57 | F |
| 11565 | 505828.65 | 1821203.92 | 2031.57 | F |
| 11566 | 505828.65 | 1821104.12 | 2031.57 | F |
| 11567 | 505828.65 | 1821003.99 | 2031.57 | F |
| 11568 | 505828.65 | 1820903.81 | 2031.57 | F |
| 11569 | 505828.65 | 1820803.88 | 2031.57 | F |
| 11570 | 505828.65 | 1820703.84 | 2031.57 | F |
| 11571 | 505828.65 | 1820603.89 | 2031.57 | F |
| 11575 | 505890.04 | 1819903.92 | 2052.03 | E |
| 11577 | 505807.19 | 1819861.03 | 2052.03 | E |
| 11578 | 505707.19 | 1819861.03 | 2052.03 | E |
| 11579 | 505890.04 | 1820003.92 | 2052.03 | E |
| 11580 | 505890.04 | 1820103.92 | 2052.03 | E |
| 11581 | 505890.04 | 1820203.92 | 2052.03 | E |
| 11582 | 505890.05 | 1820303.92 | 2052.03 | E |
| 11583 | 505890.05 | 1820403.92 | 2052.03 | E |
| 11584 | 505890.04 | 1820503.92 | 2052.03 | E |
| 11585 | 505890.04 | 1820603.89 | 2052.03 | E |
| 11586 | 505606.96 | 1819861.03 | 2052.03 | E |
| 11587 | 505507.17 | 1819861.03 | 2052.03 | E |
| 11588 | 505407.19 | 1819861.03 | 2052.03 | E |
| 11590 | 505304.78 | 1819949.35 | 2052.03 | E |
| 11591 | 505304.78 | 1820049.35 | 2052.03 | E |
| 11592 | 505304.78 | 1820149.41 | 2052.03 | E |
| 11593 | 505304.78 | 1820249.35 | 2052.03 | E |
| 11594 | 505304.78 | 1820349.41 | 2052.03 | E |
| 11595 | 505304.78 | 1820449.41 | 2052.03 | E |
| 11596 | 505304.78 | 1820549.41 | 2052.03 | E |
| 11597 | 505304.78 | 1820649.35 | 2052.03 | E |

| Asbuilt Verified Top of Random Fill | | |
|---|---|---|
| Point # | Asbuilt Elevation | Description |
| 911520 | 2012.30 | CHK*RF 2023-07-27 |
| 911521 | 2012.78 | CHK*RF 2023-07-27 |
| 911522 | 2013.29 | CHK*RF 2023-07-27 |
| 911523 | 2013.82 | CHK*RF 2023-07-27 |
| 911524 | 2014.31 | CHK*RF 2023-07-27 |
| 911525 | 2014.69 | CHK*RF 2023-07-27 |
| 911526 | 2015.31 | CHK*RF 2023-07-27 |
| 911527 | 2015.67 | CHK*RF 2023-07-27 |
| 911528 | 2013.69 | CHK*RF 04-27-2023 |
| 911529 | 2014.06 | CHK*RF 2023-07-20 |
| 911530 | 2014.54 | CHK*RF 2023-07-20 |
| 911531 | 2015.17 | CHK*RF 2023-07-20 |
| 911532 | 2015.62 | CHK*RF 2023-07-20 |
| 911551 | 2031.51 | CHK*RF 2023-07-24 |
| 911552 | 2031.50 | CHK*RF 2023-07-24 |
| 911553 | 2031.49 | CHK*RF 2023-07-24 |
| 911554 | 2031.49 | CHK*RF 2023-07-24 |
| 911555 | 2031.53 | CHK*RF 2023-07-24 |
| 911556 | 2031.46 | CHK*RF 2023-07-24 |
| 911557 | 2031.48 | CHK*RF 2023-07-24 |
| 911558 | 2031.45 | CHK*RF 2023-07-24 |
| 911559 | 2031.61 | CHK*RF 2023-07-24 |
| 911560 | 2031.49 | CHK*RF 2023-07-24 |
| 911561 | 2031.70 | CHK*RF 2023-07-24 |
| 911562 | 2031.67 | CHK*RF 2023-07-24 |
| 911563 | 2031.71 | CHK*RF 2023-07-24 |
| 911564 | 2031.25 | CHK*RF 2023-07-20 |
| 911565 | 2031.35 | CHK*RF 2023-07-20 |
| 911566 | 2031.40 | CHK*RF 2023-07-20 |
| 911567 | 2031.42 | CHK*RF 2023-07-20 |
| 911568 | 2031.57 | CHK*RF 2023-07-20 |
| 911569 | 2031.55 | CHK*RF 2023-07-20 |
| 911570 | 2031.48 | CHK*RF 2023-07-20 |
| 911571 | 2031.49 | CHK*RF 2023-07-20 |
| 911575 | 2051.91 | CHK*RF 05-05-2023 |
| 911577 | 2051.72 | CHK*RF 04-25-2023 |
| 911578 | 2051.90 | CHK*RF 04-25-2023 |
| 911579 | 2051.79 | CHK*RF 05-05-2023 |
| 911580 | 2051.82 | CHK*RF 05-05-2023 |
| 911581 | 2051.95 | CHK*RF 05-05-2023 |
| 911582 | 2051.82 | CHK*RF 05-05-2023 |
| 911583 | 2051.81 | CHK*RF 2023-07-20 |
| 911584 | 2051.87 | CHK*RF 2023-07-20 |
| 911585 | 2051.99 | CHK*RF 2023-07-20 |
| 911586 | 2051.95 | CHK*RF 04-25-2023 |
| 911587 | 2051.89 | CHK*RF 04-25-2023 |
| 911588 | 2051.94 | CHK*RF 04-25-2023 |
| 911590 | 2051.61 | CHK*RF 2023-06-13 |
| 911591 | 2051.69 | CHK*RF 2023-06-13 |
| 911592 | 2051.68 | CHK*RF 2023-06-13 |
| 911593 | 2051.70 | CHK*RF 2023-06-13 |
| 911594 | 2051.55 | CHK*RF 2023-06-13 |
| 911595 | 2051.66 | CHK*RF 2023-06-13 |
| 911596 | 2051.67 | CHK*RF 2023-06-13 |
| 911597 | 2051.65 | CHK*RF 2023-06-13 |

| Barr SC Verification Points (Designed) | | | | |
|---|---|---|---|---|
| Point # | Northing | Easting | Elevation | Location |
| 21520 | 505437.08 | 1820549.41 | 2016.37 | G |
| 21521 | 505435.58 | 1820649.27 | 2016.86 | G |
| 21522 | 505434.08 | 1820749.47 | 2017.37 | G |
| 21523 | 505432.58 | 1820849.28 | 2017.86 | G |
| 21524 | 505431.07 | 1820949.91 | 2018.37 | G |
| 21525 | 505429.57 | 1821049.77 | 2018.87 | G |
| 21526 | 505428.08 | 1821149.41 | 2019.37 | G |
| 21527 | 505426.58 | 1821249.27 | 2019.87 | G |
| 21528 | 505761.77 | 1820503.94 | 2017.71 | G |
| 21529 | 505763.27 | 1820603.89 | 2018.21 | G |
| 21530 | 505764.77 | 1820703.82 | 2018.71 | G |
| 21531 | 505766.27 | 1820803.88 | 2019.21 | G |
| 21532 | 505767.77 | 1820903.77 | 2019.70 | G |
| 21551 | 505366.18 | 1820649.31 | 2040.00 | F |
| 21552 | 505366.18 | 1820749.45 | 2040.00 | F |
| 21553 | 505366.18 | 1820849.32 | 2040.00 | F |
| 21554 | 505366.18 | 1820949.91 | 2040.00 | F |
| 21555 | 505366.18 | 1821049.81 | 2040.00 | F |
| 21556 | 505366.18 | 1821149.41 | 2040.00 | F |
| 21557 | 505366.18 | 1821249.31 | 2040.00 | F |
| 21558 | 505366.18 | 1821349.36 | 2040.00 | F |
| 21559 | 505424.23 | 1821402.35 | 2040.00 | F |
| 21560 | 505524.23 | 1821402.35 | 2040.00 | F |
| 21561 | 505624.23 | 1821402.35 | 2040.00 | F |
| 21562 | 505724.23 | 1821402.35 | 2040.00 | F |
| 21563 | 505828.65 | 1821402.35 | 2040.00 | F |
| 21564 | 505828.65 | 1821303.92 | 2040.00 | F |
| 21565 | 505828.65 | 1821203.92 | 2040.00 | F |
| 21566 | 505828.65 | 1821104.12 | 2040.00 | F |
| 21567 | 505828.65 | 1821003.99 | 2040.00 | F |
| 21568 | 505828.65 | 1820903.81 | 2040.00 | F |
| 21569 | 505828.65 | 1820803.88 | 2040.00 | F |
| 21570 | 505828.65 | 1820703.84 | 2040.00 | F |
| 21571 | 505828.65 | 1820603.89 | 2040.00 | F |
| 21575 | 505890.04 | 1819903.92 | 2060.46 | E |
| 21577 | 505807.19 | 1819861.03 | 2060.46 | E |
| 21578 | 505707.19 | 1819861.03 | 2060.46 | E |
| 21579 | 505890.04 | 1820003.92 | 2060.46 | E |
| 21580 | 505890.04 | 1820103.92 | 2060.46 | E |
| 21581 | 505890.04 | 1820203.92 | 2060.46 | E |
| 21582 | 505890.05 | 1820303.92 | 2060.46 | E |
| 21583 | 505890.05 | 1820403.92 | 2060.46 | E |
| 21584 | 505890.04 | 1820503.92 | 2060.46 | E |
| 21585 | 505890.04 | 1820603.89 | 2060.46 | E |
| 21586 | 505606.96 | 1819861.03 | 2060.46 | E |
| 21587 | 505507.17 | 1819861.03 | 2060.46 | E |
| 21588 | 505407.19 | 1819861.03 | 2060.46 | E |
| 21590 | 505304.78 | 1819949.35 | 2060.46 | E |
| 21591 | 505304.78 | 1820049.35 | 2060.46 | E |
| 21592 | 505304.78 | 1820149.41 | 2060.46 | E |
| 21593 | 505304.78 | 1820249.35 | 2060.46 | E |
| 21594 | 505304.78 | 1820349.41 | 2060.46 | E |
| 21595 | 505304.78 | 1820449.41 | 2060.46 | E |
| 21596 | 505304.78 | 1820549.41 | 2060.46 | E |
| 21597 | 505304.78 | 1820649.35 | 2060.46 | E |

| Asbuilt Verified Select Clay | | | |
|---|---|---|---|
| Point # | Asbuilt Elevation | Description | Select Clay Depth |
| 921520 | 2016.50 | CHK*SC 2023-09-29 | 4.20 |
| 921521 | 2017.15 | CHK*SC 2023-09-29 | 4.37 |
| 921522 | 2017.58 | CHK*SC 2023-09-29 | 4.29 |
| 921523 | 2018.14 | CHK*SC 2023-09-29 | 4.32 |
| 921524 | 2018.65 | CHK*SC 2023-09-29 | 4.34 |
| 921525 | 2019.08 | CHK*SC 2023-09-29 | 4.39 |
| 921526 | 2019.50 | CHK*SC 2023-09-29 | 4.19 |
| 921527 | 2020.11 | CHK*SC 2023-09-29 | 4.44 |
| 921528 | 2017.88 | CHK*SC 2023-06-15 | 4.19 |
| 921529 | 2018.53 | CHK*SC 2023-08-28 | 4.47 |
| 921530 | 2018.91 | CHK*SC 2023-08-28 | 4.37 |
| 921531 | 2019.49 | CHK*SC 2023-08-28 | 4.32 |
| 921532 | 2019.95 | CHK*SC 2023-08-28 | 4.33 |
| 921551 | 2040.14 | CHK*SC 2023-09-15 | 8.63 |
| 921552 | 2040.15 | CHK*SC 2023-09-15 | 8.65 |
| 921553 | 2040.18 | CHK*SC 2023-09-15 | 8.69 |
| 921554 | 2040.22 | CHK*SC 2023-09-15 | 8.73 |
| 921555 | 2040.25 | CHK*SC 2023-09-11 | 8.72 |
| 921556 | 2040.24 | CHK*SC 2023-09-11 | 8.78 |
| 921557 | 2040.18 | CHK*SC 2023-09-11 | 8.70 |
| 921558 | 2040.21 | CHK*SC 2023-09-11 | 8.76 |
| 921559 | 2040.25 | CHK*SC 2023-09-11 | 8.64 |
| 921560 | 2040.18 | CHK*SC 2023-09-11 | 8.69 |
| 921561 | 2040.18 | CHK*SC 2023-09-11 | 8.48 |
| 921562 | 2040.13 | CHK*SC 2023-09-11 | 8.46 |
| 921563 | 2040.25 | CHK*SC 2023-08-28 | 8.54 |
| 921564 | 2040.18 | CHK*SC 2023-08-28 | 8.93 |
| 921565 | 2040.25 | CHK*SC 2023-08-28 | 8.90 |
| 921566 | 2040.16 | CHK*SC 2023-08-28 | 8.76 |
| 921567 | 2040.16 | CHK*SC 2023-08-28 | 8.74 |
| 921568 | 2040.23 | CHK*SC 2023-08-28 | 8.66 |
| 921569 | 2040.21 | CHK*SC 2023-08-28 | 8.66 |
| 921570 | 2040.14 | CHK*SC 2023-08-28 | 8.66 |
| 921571 | 2040.20 | CHK*SC 2023-08-28 | 8.71 |
| 921575 | 2060.62 | CHK*SC 2023-07-14 | 8.71 |
| 921577 | 2060.61 | CHK*SC 2023-07-14 | 8.89 |
| 921578 | 2060.60 | CHK*SC 2023-07-14 | 8.70 |
| 921579 | 2060.57 | CHK*SC 2023-07-14 | 8.78 |
| 921580 | 2060.64 | CHK*SC 2023-07-14 | 8.82 |
| 921581 | 2060.54 | CHK*SC 2023-07-14 | 8.59 |
| 921582 | 2060.52 | CHK*SC 2023-08-28 | 8.70 |
| 921583 | 2060.53 | CHK*SC 2023-08-28 | 8.72 |
| 921584 | 2060.54 | CHK*SC 2023-08-28 | 8.67 |
| 921585 | 2060.68 | CHK*SC 2023-08-28 | 8.69 |
| 921586 | 2060.51 | CHK*SC 2023-07-14 | 8.56 |
| 921587 | 2060.61 | CHK*SC 2023-07-14 | 8.72 |
| 921588 | 2060.56 | CHK*SC 2023-07-14 | 8.62 |
| 921590 | 2060.58 | CHK*SC 2023-07-14 | 8.97 |
| 921591 | 2060.58 | CHK*SC 2023-07-14 | 8.89 |
| 921592 | 2060.55 | CHK*SC 2023-07-14 | 8.87 |
| 921593 | 2060.54 | CHK*SC 2023-09-15 | 8.84 |
| 921594 | 2060.61 | CHK*SC 2023-09-15 | 9.06 |
| 921595 | 2060.49 | CHK*SC 2023-09-15 | 8.83 |
| 921596 | 2060.60 | CHK*SC 2023-09-15 | 8.93 |
| 921597 | 2060.62 | CHK*SC 2023-09-15 | 8.97 |

MATTHEW WEEKS
REGISTERED
LAND
SURVEYOR
L.S. 3626
NORTH DAKOTA
10 October 2023

| Rev No | Date | By | Description |
|---|---|---|---|
| | | | |

Cell 5 Phase 1B
Baranko Brothers
Minnkota - Milton Young Station

Verification Tables

Drawn By: C. KNOLL | Surveyed By: LPB | Project No: CR22-08-027.01
Checked By: MKT | Designed By: MKT | Date: 10/06/23

Interstate Engineering
2610 Old Red Trail, Suite B
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(701) 663.5455
www.interstateeng.com

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5
SHEET NO.

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Q:\2027\CR\08\CR22-08-027.01-Baranko-Cell5_Phase1B_ASBUILT\20230924_CR208027.01_Phase 1B Asbuilt.dwg 10/10/2023

| Barr RF Verification Points (Designed) | | | | |
|---|---|---|---|---|
| Point # | Northing | Easting | Elevation | Location |
| 11598 | 505304.78 | 1820749.44 | 2052.03 | E |
| 11599 | 505304.78 | 1820849.36 | 2052.03 | E |
| 11600 | 505304.78 | 1820949.91 | 2052.03 | E |
| 11601 | 505304.78 | 1821049.85 | 2052.03 | E |
| 11602 | 505304.78 | 1821149.41 | 2052.03 | E |
| 11603 | 505304.78 | 1821249.35 | 2052.03 | E |
| 11604 | 505304.78 | 1821349.36 | 2052.03 | E |
| 11605 | 505304.78 | 1821449.30 | 2052.03 | E |
| 11606 | 505324.23 | 1821484.19 | 2052.21 | E |
| 11607 | 505424.23 | 1821484.19 | 2052.21 | E |
| 11608 | 505524.23 | 1821484.19 | 2052.21 | E |
| 11609 | 505624.23 | 1821484.19 | 2052.21 | E |
| 11610 | 505724.23 | 1821484.19 | 2052.21 | E |
| 11611 | 505824.23 | 1821484.19 | 2052.21 | E |
| 11612 | 505890.04 | 1821484.19 | 2052.21 | E |
| 11613 | 505890.04 | 1821403.84 | 2052.03 | E |
| 11614 | 505890.04 | 1821303.92 | 2052.03 | E |
| 11615 | 505890.04 | 1821203.92 | 2052.03 | E |
| 11616 | 505890.04 | 1821104.07 | 2052.03 | E |
| 11617 | 505890.04 | 1821003.99 | 2052.03 | E |
| 11618 | 505890.04 | 1820903.83 | 2052.03 | E |
| 11619 | 505890.04 | 1820803.88 | 2052.03 | E |
| 11620 | 505890.04 | 1820703.86 | 2052.03 | E |
| 11720 | 505311.85 | 1819861.03 | 2052.03 | E |
| 11721 | 505304.78 | 1819868.10 | 2052.03 | E |
| 11726 | 505881.63 | 1819861.03 | 2052.03 | E |
| 11727 | 505890.04 | 1819869.54 | 2052.03 | E |
| 11730 | 505411.92 | 1821340.54 | 2016.32 | G-T |
| 11731 | 505524.23 | 1821342.24 | 2016.73 | G |
| 11732 | 505624.23 | 1821344.24 | 2017.23 | G |
| 11733 | 505724.23 | 1821346.24 | 2017.73 | G |
| 11734 | 505787.71 | 1821347.03 | 2017.93 | G-T |
| 11735 | 505787.06 | 1821303.92 | 2017.70 | G |
| 11736 | 505785.56 | 1821203.92 | 2017.20 | G |
| 11737 | 505784.07 | 1821104.16 | 2016.71 | G |
| 11738 | 505782.56 | 1821003.99 | 2016.21 | G |
| 11745 | 505749.42 | 1820524.39 | 2013.81 | H |
| 11746 | 505751.01 | 1820630.40 | 2014.33 | H |
| 11747 | 505752.60 | 1820736.39 | 2014.86 | H |
| 11748 | 505754.19 | 1820842.37 | 2015.39 | H |
| 11749 | 505755.78 | 1820948.36 | 2015.92 | H |
| 11750 | 505757.37 | 1821054.37 | 2016.45 | H |
| 11751 | 505758.96 | 1821160.35 | 2016.98 | H |
| 11752 | 505760.55 | 1821266.31 | 2017.51 | H |
| 11753 | 505650.18 | 1821315.00 | 2017.36 | H |
| 11754 | 505544.18 | 1821312.88 | 2016.83 | H |
| 11755 | 505438.97 | 1821266.32 | 2015.95 | H |
| 11756 | 505440.56 | 1821160.36 | 2015.42 | H |
| 11757 | 505442.15 | 1821054.37 | 2014.89 | H |
| 11758 | 505443.74 | 1820948.36 | 2014.36 | H |
| 11759 | 505445.33 | 1820842.38 | 2013.83 | H |
| 11760 | 505446.92 | 1820736.39 | 2013.30 | H |
| 11761 | 505448.51 | 1820630.41 | 2012.77 | H |
| 11762 | 505450.29 | 1820524.40 | 2012.21 | H-T |

| Asbuilt Verified Top of Random Fill | | |
|---|---|---|
| Point # | Asbuilt Elevation | Description |
| 911598 | 2051.90 | CHK*RF 2023-07-24 |
| 911599 | 2051.85 | CHK*RF 2023-07-24 |
| 911600 | 2051.96 | CHK*RF 2023-07-24 |
| 911601 | 2051.97 | CHK*RF 2023-07-24 |
| 911602 | 2051.89 | CHK*RF 2023-07-24 |
| 911603 | 2052.01 | CHK*RF 2023-07-24 |
| 911604 | 2051.94 | CHK*RF 2023-07-24 |
| 911605 | 2051.95 | CHK*RF 2023-07-24 |
| 911606 | 2052.17 | CHK*RF 2023-07-24 |
| 911607 | 2052.15 | CHK*RF 2023-07-24 |
| 911608 | 2052.18 | CHK*RF 2023-07-24 |
| 911609 | 2052.17 | CHK*RF 2023-07-24 |
| 911610 | 2052.12 | CHK*RF 2023-07-24 |
| 911611 | 2052.10 | CHK*RF 2023-07-24 |
| 911612 | 2052.10 | CHK*RF 2023-07-24 |
| 911613 | 2051.83 | CHK*RF 2023-07-20 |
| 911614 | 2051.69 | CHK*RF 2023-07-20 |
| 911615 | 2051.89 | CHK*RF 2023-07-20 |
| 911616 | 2051.72 | CHK*RF 2023-07-20 |
| 911617 | 2051.95 | CHK*RF 2023-07-20 |
| 911618 | 2051.99 | CHK*RF 2023-07-20 |
| 911619 | 2051.92 | CHK*RF 2023-07-20 |
| 911620 | 2051.86 | CHK*RF 2023-07-20 |
| 911720 | 2051.75 | CHK*RF 2023-06-13 |
| 911721 | 2051.69 | CHK*RF 2023-06-13 |
| 911726 | 2050.86 | CHK*RF 05-05-2023 |
| 911727 | 2051.99 | CHK*RF 05-05-2023 |
| 911730 | 2016.24 | CHK*RF 2023-07-27 |
| 911731 | 2016.45 | CHK*RF 2023-07-27 |
| 911732 | 2017.12 | CHK*RF 2023-07-24 |
| 911733 | 2017.62 | CHK*RF 2023-07-24 |
| 911734 | 2017.83 | CHK*RF 2023-07-24 |
| 911735 | 2017.64 | CHK*RF 2023-07-24 |
| 911736 | 2017.16 | CHK*RF 2023-07-20 |
| 911737 | 2016.60 | CHK*RF 2023-07-20 |
| 911738 | 2016.19 | CHK*RF 2023-07-20 |
| 911745 | 2013.57 | CHK*RF 2023-07-20 |
| 911746 | 2013.81 | CHK*RF 2023-07-20 |
| 911747 | 2014.77 | CHK*RF 2023-07-20 |
| 911748 | 2015.32 | CHK*RF 2023-07-20 |
| 911749 | 2015.90 | CHK*RF 2023-07-20 |
| 911750 | 2016.38 | CHK*RF 2023-07-20 |
| 911751 | 2016.96 | CHK*RF 2023-07-20 |
| 911752 | 2017.31 | CHK*RF 2023-07-20 |
| 911753 | 2017.30 | CHK*RF 2023-07-24 |
| 911754 | 2016.74 | CHK*RF 2023-07-27 |
| 911755 | 2015.88 | CHK*RF 2023-07-27 |
| 911756 | 2015.26 | CHK*RF 2023-07-27 |
| 911757 | 2014.73 | CHK*RF 2023-07-27 |
| 911758 | 2014.29 | CHK*RF 2023-07-27 |
| 911759 | 2013.80 | CHK*RF 2023-07-27 |
| 911760 | 2013.25 | CHK*RF 2023-07-27 |
| 911761 | 2012.66 | CHK*RF 2023-07-27 |
| 911762 | 2011.87 | CHK*RF 2023-07-27 |

| Barr SC Verification Points (Designed) | | | | |
|---|---|---|---|---|
| Point # | Northing | Easting | Elevation | Location |
| 21598 | 505304.78 | 1820749.44 | 2060.46 | E |
| 21599 | 505304.78 | 1820849.36 | 2060.46 | E |
| 21600 | 505304.78 | 1820949.91 | 2060.46 | E |
| 21601 | 505304.78 | 1821049.85 | 2060.46 | E |
| 21602 | 505304.78 | 1821149.41 | 2060.46 | E |
| 21603 | 505304.78 | 1821249.35 | 2060.46 | E |
| 21604 | 505304.78 | 1821349.36 | 2060.46 | E |
| 21605 | 505304.78 | 1821449.30 | 2060.46 | E |
| 21606 | 505324.23 | 1821484.19 | 2060.46 | E |
| 21607 | 505424.23 | 1821484.19 | 2060.46 | E |
| 21608 | 505524.23 | 1821484.19 | 2060.46 | E |
| 21609 | 505624.23 | 1821484.19 | 2060.46 | E |
| 21610 | 505724.23 | 1821484.19 | 2060.46 | E |
| 21611 | 505824.23 | 1821484.19 | 2060.46 | E |
| 21612 | 505890.04 | 1821484.19 | 2060.46 | E |
| 21613 | 505890.04 | 1821403.84 | 2060.46 | E |
| 21614 | 505890.04 | 1821303.92 | 2060.46 | E |
| 21615 | 505890.04 | 1821203.92 | 2060.46 | E |
| 21616 | 505890.04 | 1821104.07 | 2060.46 | E |
| 21617 | 505890.04 | 1821003.99 | 2060.46 | E |
| 21618 | 505890.04 | 1820903.83 | 2060.46 | E |
| 21619 | 505890.04 | 1820803.88 | 2060.46 | E |
| 21620 | 505890.04 | 1820703.86 | 2060.46 | E |
| 21720 | 505311.85 | 1819861.03 | 2060.46 | E |
| 21721 | 505304.78 | 1819868.10 | 2060.46 | E |
| 21726 | 505881.63 | 1819861.03 | 2060.46 | E |
| 21727 | 505890.04 | 1819869.54 | 2060.46 | E |
| 21730 | 505425.47 | 1821323.29 | 2020.24 | G-T |
| 21731 | 505524.23 | 1821325.27 | 2020.73 | G |
| 21732 | 505624.23 | 1821327.27 | 2021.23 | G |
| 21733 | 505724.23 | 1821329.27 | 2021.73 | G |
| 21734 | 505774.15 | 1821329.69 | 2021.84 | G-T |
| 21735 | 505773.77 | 1821303.92 | 2021.71 | G |
| 21736 | 505772.27 | 1821203.92 | 2021.21 | G |
| 21737 | 505770.77 | 1821104.16 | 2020.71 | G |
| 21738 | 505769.27 | 1821003.99 | 2020.21 | G |
| 21745 | 505750.07 | 1820524.39 | 2017.81 | H |
| 21746 | 505751.66 | 1820630.40 | 2018.34 | H |
| 21747 | 505753.25 | 1820736.39 | 2018.87 | H |
| 21748 | 505754.84 | 1820842.37 | 2019.40 | H |
| 21749 | 505756.43 | 1820948.36 | 2019.93 | H |
| 21750 | 505758.02 | 1821054.37 | 2020.46 | H |
| 21751 | 505759.61 | 1821160.35 | 2020.99 | H |
| 21752 | 505761.20 | 1821266.31 | 2021.52 | H |
| 21753 | 505650.18 | 1821315.65 | 2021.36 | H |
| 21754 | 505544.18 | 1821313.53 | 2020.83 | H |
| 21755 | 505438.33 | 1821266.32 | 2019.95 | H |
| 21756 | 505439.92 | 1821160.36 | 2019.42 | H |
| 21757 | 505441.51 | 1821054.37 | 2018.89 | H |
| 21758 | 505443.10 | 1820948.36 | 2018.36 | H |
| 21759 | 505444.69 | 1820842.38 | 2017.83 | H |
| 21760 | 505446.28 | 1820736.39 | 2017.30 | H |
| 21761 | 505447.87 | 1820630.41 | 2016.77 | H |
| 21762 | 505449.46 | 1820524.40 | 2016.24 | H-T |

| Asbuilt Verified Select Clay | | | |
|---|---|---|---|
| Point # | Asbuilt Elevation | Description | Select Clay Depth |
| 921598 | 2060.60 | CHK*SC 2023-09-15 | 8.70 |
| 921599 | 2060.68 | CHK*SC 2023-09-15 | 8.83 |
| 921600 | 2060.67 | CHK*SC 2023-09-15 | 8.71 |
| 921601 | 2060.70 | CHK*SC 2023-09-11 | 8.73 |
| 921602 | 2060.69 | CHK*SC 2023-09-11 | 8.80 |
| 921603 | 2060.67 | CHK*SC 2023-09-11 | 8.66 |
| 921604 | 2060.69 | CHK*SC 2023-09-11 | 8.75 |
| 921605 | 2060.61 | CHK*SC 2023-09-11 | 8.66 |
| 921606 | 2060.52 | CHK*SC 2023-09-11 | 8.35 |
| 921607 | 2060.80 | CHK*SC 2023-09-11 | 8.65 |
| 921608 | 2060.68 | CHK*SC 2023-09-11 | 8.50 |
| 921609 | 2060.70 | CHK*SC 2023-09-11 | 8.53 |
| 921610 | 2060.70 | CHK*SC 2023-09-11 | 8.58 |
| 921611 | 2060.72 | CHK*SC 2023-09-11 | 8.62 |
| 921612 | 2060.76 | CHK*SC 2023-08-28 | 8.66 |
| 921613 | 2060.65 | CHK*SC 2023-08-28 | 8.82 |
| 921614 | 2060.71 | CHK*SC 2023-08-28 | 9.02 |
| 921615 | 2060.69 | CHK*SC 2023-08-28 | 8.80 |
| 921616 | 2060.70 | CHK*SC 2023-08-28 | 8.98 |
| 921617 | 2060.64 | CHK*SC 2023-08-28 | 8.69 |
| 921618 | 2060.74 | CHK*SC 2023-08-28 | 8.75 |
| 921619 | 2060.67 | CHK*SC 2023-08-28 | 8.75 |
| 921620 | 2060.69 | CHK*SC 2023-08-28 | 8.83 |
| 921720 | 2060.66 | CHK*SC 2023-07-14 | 8.91 |
| 921721 | 2060.57 | CHK*SC 2023-07-14 | 8.88 |
| 921726 | 2060.61 | CHK*SC 2023-07-14 | 9.75 |
| 921727 | 2060.63 | CHK*SC 2023-07-14 | 8.64 |
| 921730 | 2020.54 | CHK*SC 2023-09-29 | 4.30 |
| 921731 | 2020.79 | CHK*SC 2023-09-11 | 4.34 |
| 921732 | 2021.41 | CHK*SC 2023-09-11 | 4.29 |
| 921733 | 2022.03 | CHK*SC 2023-09-11 | 4.41 |
| 921734 | 2022.26 | CHK*SC 2023-08-28 | 4.43 |
| 921735 | 2021.98 | CHK*SC 2023-08-28 | 4.34 |
| 921736 | 2021.47 | CHK*SC 2023-08-28 | 4.31 |
| 921737 | 2020.95 | CHK*SC 2023-08-28 | 4.35 |
| 921738 | 2020.49 | CHK*SC 2023-08-28 | 4.30 |
| 921745 | 2018.05 | CHK*SC 2023-08-30 | 4.48 |
| 921746 | 2018.54 | CHK*SC 2023-08-28 | 4.73 |
| 921747 | 2019.14 | CHK*SC 2023-08-28 | 4.37 |
| 921748 | 2019.64 | CHK*SC 2023-08-28 | 4.32 |
| 921749 | 2020.18 | CHK*SC 2023-08-28 | 4.28 |
| 921750 | 2020.73 | CHK*SC 2023-08-28 | 4.35 |
| 921751 | 2021.14 | CHK*SC 2023-08-28 | 4.18 |
| 921752 | 2021.77 | CHK*SC 2023-08-28 | 4.46 |
| 921753 | 2021.62 | CHK*SC 2023-09-11 | 4.32 |
| 921754 | 2021.04 | CHK*SC 2023-09-11 | 4.30 |
| 921755 | 2020.12 | CHK*SC 2023-09-29 | 4.24 |
| 921756 | 2019.69 | CHK*SC 2023-09-29 | 4.43 |
| 921757 | 2019.20 | CHK*SC 2023-09-29 | 4.47 |
| 921758 | 2018.64 | CHK*SC 2023-09-29 | 4.35 |
| 921759 | 2018.08 | CHK*SC 2023-09-29 | 4.28 |
| 921760 | 2017.53 | CHK*SC 2023-09-29 | 4.28 |
| 921761 | 2016.99 | CHK*SC 2023-09-29 | 4.33 |
| 921762 | 2016.36 | CHK*SC 2023-09-29 | 4.49 |

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NORTH DAKOTA

| Rev No | Date | By | Description |
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Cell 5 Phase 1B
Baranko Brothers
Minnkota - Milton Young Station

Verification Tables

Drawn By: C. KNOLL | Surveyed By: LPB | Project No: CR22-08-027.01
Checked By: MKT | Designed By: MKT | Date: 10/06/23

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SECTION 070

6
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| Barr RF Verification Points (Designed) | | | | |
|---|---|---|---|---|
| Point # | Northing | Easting | Elevation | Location |
| 11774 | 505743.49 | 1820524.39 | 2015.76 | I |
| 11775 | 505741.49 | 1820630.40 | 2017.49 | I |
| 11776 | 505739.49 | 1820736.39 | 2019.22 | I |
| 11777 | 505469.93 | 1820524.40 | 2018.34 | I |
| 11784 | 505474.64 | 1820637.49 | 2014.95 | P |
| 11785 | 505516.64 | 1820742.71 | 2015.69 | P |
| 11786 | 505553.71 | 1820835.58 | 2016.35 | P |
| 11787 | 505590.80 | 1820928.45 | 2017.01 | P |
| 11788 | 505627.88 | 1821021.32 | 2017.66 | P |
| 11789 | 505664.97 | 1821114.19 | 2018.32 | P |
| 11790 | 505702.05 | 1821207.06 | 2018.97 | P |
| 11791 | 505707.66 | 1821204.82 | 2016.97 | O |
| 11792 | 505670.58 | 1821111.95 | 2016.31 | O |
| 11793 | 505633.49 | 1821019.08 | 2015.66 | O |
| 11794 | 505596.41 | 1820926.21 | 2015.00 | O |
| 11795 | 505559.33 | 1820833.34 | 2014.35 | O |
| 11796 | 505522.24 | 1820740.47 | 2013.69 | O |
| 11797 | 505480.23 | 1820635.25 | 2012.95 | O |
| 11798 | 505492.58 | 1820630.32 | 2012.95 | N |
| 11799 | 505534.60 | 1820735.54 | 2013.69 | N |
| 11800 | 505571.69 | 1820828.41 | 2014.35 | N |
| 11801 | 505608.77 | 1820921.28 | 2015.00 | N |
| 11802 | 505645.86 | 1821014.15 | 2015.66 | N |
| 11803 | 505682.94 | 1821107.01 | 2016.31 | N |
| 11804 | 505720.03 | 1821199.88 | 2016.97 | N |
| 11805 | 505725.64 | 1821197.64 | 2018.97 | M |
| 11806 | 505688.55 | 1821104.77 | 2018.32 | M |
| 11807 | 505651.47 | 1821011.91 | 2017.66 | M |
| 11808 | 505614.38 | 1820919.04 | 2017.01 | M |
| 11809 | 505577.30 | 1820826.17 | 2016.35 | M |
| 11810 | 505540.21 | 1820733.30 | 2015.70 | M |
| 11811 | 505498.20 | 1820628.08 | 2014.95 | M |
| 11828 | 505754.58 | 1821266.31 | 2019.50 | I |
| 11829 | 505747.81 | 1821054.37 | 2019.64 | I |
| 11830 | 505744.42 | 1820948.36 | 2019.71 | I |
| 11831 | 505741.03 | 1820842.37 | 2019.78 | I |
| 11840 | 505650.18 | 1820524.39 | 2017.10 | J |
| 11841 | 505544.18 | 1820524.40 | 2017.29 | J |
| 11842 | 505650.18 | 1820630.40 | 2018.15 | J |
| 11843 | 505544.18 | 1820630.41 | 2015.93 | J |
| 11844 | 505650.18 | 1820736.39 | 2018.01 | J |
| 11845 | 505544.18 | 1820736.39 | 2015.79 | J |
| 11846 | 505650.18 | 1820842.37 | 2017.87 | J |
| 11847 | 505544.18 | 1820842.38 | 2016.61 | J |
| 11848 | 505650.18 | 1820948.36 | 2017.73 | J |
| 11849 | 505544.18 | 1820948.36 | 2018.04 | J |
| 11850 | 505650.18 | 1821054.37 | 2015.91 | J |
| 11851 | 505544.18 | 1821054.37 | 2019.47 | J |
| 11852 | 505650.18 | 1821160.35 | 2019.19 | J |
| 11853 | 505544.18 | 1821160.35 | 2020.90 | J |
| 11854 | 505650.18 | 1821266.32 | 2020.62 | J |
| 11855 | 505544.18 | 1821266.32 | 2022.33 | J |
| 11872 | 505455.73 | 1820630.41 | 2015.17 | I |
| 11873 | 505456.80 | 1820736.39 | 2016.59 | I |
| 11874 | 505457.86 | 1820842.38 | 2018.00 | I |

| Asbuilt Verified Top of Random Fill | | | |
|---|---|---|---|
| Point # | Asbuilt Elevation | Description |
| 911774 | 2015.14 | CHK*RF 2023-07-20 |
| 911775 | 2017.09 | CHK*RF |
| 911776 | 2018.89 | CHK*RF 2023-07-20 |
| 911777 | 2018.09 | CHK*RF 2023-07-27 |
| 911784 | 2014.93 | CHK*RF 2023-08-30 |
| 911785 | 2015.62 | CHK*RF 2023-08-30 |
| 911786 | 2016.25 | CHK*RF 2023-08-30 |
| 911787 | 2016.84 | CHK*RF 2023-08-30 |
| 911788 | 2017.48 | CHK*RF 2023-08-30 |
| 911789 | 2018.19 | CHK*RF 2023-08-28 |
| 911790 | 2018.63 | CHK*RF 2023-08-28 |
| 911791 | 2016.88 | CHK*RF 2023-08-28 |
| 911792 | 2016.29 | CHK*RF 2023-08-28 |
| 911793 | 2015.43 | CHK*RF 2023-08-30 |
| 911794 | 2014.92 | CHK*RF 2023-08-30 |
| 911795 | 2014.12 | CHK*RF 2023-08-30 |
| 911796 | 2013.51 | CHK*RF 2023-08-30 |
| 911797 | 2012.89 | CHK*RF 2023-08-30 |
| 911798 | 2012.67 | CHK*RF 2023-08-30 |
| 911799 | 2013.58 | CHK*RF 2023-08-30 |
| 911800 | 2014.11 | CHK*RF 2023-08-30 |
| 911801 | 2014.91 | CHK*RF 2023-08-30 |
| 911802 | 2015.62 | CHK*RF 2023-08-30 |
| 911803 | 2016.13 | CHK*RF 2023-08-28 |
| 911804 | 2016.88 | CHK*RF 2023-08-28 |
| 911805 | 2018.95 | CHK*RF 2023-08-28 |
| 911806 | 2018.10 | CHK*RF 2023-08-28 |
| 911807 | 2017.35 | CHK*RF 2023-08-30 |
| 911808 | 2016.90 | CHK*RF 2023-08-30 |
| 911809 | 2016.19 | CHK*RF 2023-08-30 |
| 911810 | 2015.61 | CHK*RF 2023-08-30 |
| 911811 | 2014.91 | CHK*RF 2023-08-30 |
| 911828 | 2019.46 | CHK*RF 2023-07-24 |
| 911829 | 2019.45 | CHK*RF 2023-07-20 |
| 911830 | 2019.58 | CHK*RF 2023-07-20 |
| 911831 | 2019.65 | CHK*RF 2023-07-20 |
| 911840 | 2017.01 | CHK*RF 2023-08-28 |
| 911841 | 2017.00 | CHK*RF 2023-08-28 |
| 911842 | 2017.83 | CHK*RF 2023-08-28 |
| 911843 | 2015.72 | CHK*RF 2023-08-28 |
| 911844 | 2017.78 | CHK*RF 2023-08-28 |
| 911845 | 2015.71 | CHK*RF 2023-08-30 |
| 911846 | 2017.59 | CHK*RF 2023-08-28 |
| 911847 | 2016.54 | CHK*RF 2023-08-30 |
| 911848 | 2017.49 | CHK*RF 2023-08-28 |
| 911849 | 2017.77 | CHK*RF 2023-08-30 |
| 911850 | 2015.69 | CHK*RF 2023-08-28 |
| 911851 | 2019.26 | CHK*RF 2023-08-30 |
| 911852 | 2018.97 | CHK*RF 2023-08-28 |
| 911853 | 2020.73 | CHK*RF 2023-08-30 |
| 911854 | 2020.55 | CHK*RF 2023-08-28 |
| 911855 | 2022.20 | CHK*RF 2023-08-28 |
| 911872 | 2015.01 | CHK*RF 2023-07-27 |
| 911873 | 2016.34 | CHK*RF 2023-07-27 |
| 911874 | 2017.86 | CHK*RF 2023-07-27 |

| Barr SC Verification Points (Designed) | | | | |
|---|---|---|---|---|
| Point # | Northing | Easting | Elevation | Location |
| 21774 | 505744.17 | 1820524.39 | 2019.77 | I |
| 21775 | 505742.17 | 1820630.40 | 2021.50 | I |
| 21776 | 505740.17 | 1820736.39 | 2023.23 | I |
| 21777 | 505469.22 | 1820524.40 | 2022.36 | I |
| 21784 | 505475.26 | 1820637.24 | 2018.95 | P |
| 21785 | 505517.28 | 1820742.46 | 2019.69 | P |
| 21786 | 505554.36 | 1820835.33 | 2020.35 | P |
| 21787 | 505591.44 | 1820928.20 | 2021.01 | P |
| 21788 | 505628.52 | 1821021.07 | 2021.66 | P |
| 21789 | 505665.61 | 1821113.94 | 2022.32 | P |
| 21790 | 505702.69 | 1821206.81 | 2022.97 | P |
| 21791 | 505708.26 | 1821204.58 | 2020.97 | O |
| 21792 | 505671.18 | 1821111.71 | 2020.32 | O |
| 21793 | 505634.10 | 1821018.84 | 2019.66 | O |
| 21794 | 505597.01 | 1820925.97 | 2019.01 | O |
| 21795 | 505559.93 | 1820833.10 | 2018.35 | O |
| 21796 | 505522.85 | 1820740.23 | 2017.69 | O |
| 21797 | 505480.83 | 1820635.01 | 2016.95 | O |
| 21798 | 505491.98 | 1820630.56 | 2016.95 | N |
| 21799 | 505534.00 | 1820735.78 | 2017.69 | N |
| 21800 | 505571.08 | 1820828.65 | 2018.35 | N |
| 21801 | 505608.17 | 1820921.52 | 2019.01 | N |
| 21802 | 505645.25 | 1821014.39 | 2019.66 | N |
| 21803 | 505682.34 | 1821107.26 | 2020.32 | N |
| 21804 | 505719.42 | 1821200.12 | 2020.97 | N |
| 21805 | 505725.00 | 1821197.90 | 2022.97 | M |
| 21806 | 505687.91 | 1821105.03 | 2022.32 | M |
| 21807 | 505650.83 | 1821012.16 | 2021.66 | M |
| 21808 | 505613.74 | 1820919.29 | 2021.01 | M |
| 21809 | 505576.66 | 1820826.42 | 2020.35 | M |
| 21810 | 505539.57 | 1820733.55 | 2019.70 | M |
| 21811 | 505497.55 | 1820628.34 | 2018.95 | M |
| 21828 | 505755.21 | 1821266.31 | 2023.51 | I |
| 21829 | 505748.43 | 1821054.37 | 2023.65 | I |
| 21830 | 505745.04 | 1820948.36 | 2023.72 | I |
| 21831 | 505741.65 | 1820842.37 | 2023.79 | I |
| 21840 | 505650.18 | 1820524.39 | 2021.10 | J |
| 21841 | 505544.18 | 1820524.40 | 2021.30 | J |
| 21842 | 505650.18 | 1820630.40 | 2022.16 | J |
| 21843 | 505544.18 | 1820630.41 | 2019.93 | J |
| 21844 | 505650.18 | 1820736.39 | 2022.01 | J |
| 21845 | 505544.18 | 1820736.39 | 2019.79 | J |
| 21846 | 505650.18 | 1820842.37 | 2021.87 | J |
| 21847 | 505544.18 | 1820842.38 | 2020.61 | J |
| 21848 | 505650.18 | 1820948.36 | 2021.73 | J |
| 21849 | 505544.18 | 1820948.36 | 2022.04 | J |
| 21850 | 505650.18 | 1821054.37 | 2019.92 | J |
| 21851 | 505544.18 | 1821054.37 | 2023.47 | J |
| 21852 | 505650.18 | 1821160.35 | 2023.19 | J |
| 21853 | 505544.18 | 1821160.35 | 2024.90 | J |
| 21854 | 505650.18 | 1821266.32 | 2024.62 | J |
| 21855 | 505544.18 | 1821266.32 | 2026.33 | J |
| 21872 | 505455.12 | 1820630.41 | 2019.19 | I |
| 21873 | 505456.18 | 1820736.39 | 2020.60 | I |
| 21874 | 505457.24 | 1820842.38 | 2022.01 | I |

| Asbuilt Verified Select Clay | | | |
|---|---|---|---|
| Point # | Asbuilt Elevation | Description | Select Clay Depth |
| 921774 | 2019.86 | CHK*SC 2023-08-30 | 4.72 |
| 921775 | 2021.61 | CHK*SC 2023-08-30 | 4.52 |
| 921776 | 2023.44 | CHK*SC 2023-08-30 | 4.55 |
| 921777 | 2022.70 | CHK*SC 2023-09-29 | 4.61 |
| 921784 | 2019.19 | CHK*SC 2023-09-11 | 4.26 |
| 921785 | 2019.85 | CHK*SC 2023-09-11 | 4.23 |
| 921786 | 2020.61 | CHK*SC 2023-09-11 | 4.36 |
| 921787 | 2021.27 | CHK*SC 2023-09-11 | 4.43 |
| 921788 | 2021.97 | CHK*SC 2023-09-11 | 4.49 |
| 921789 | 2022.59 | CHK*SC 2023-09-11 | 4.40 |
| 921790 | 2023.24 | CHK*SC 2023-09-11 | 4.61 |
| 921791 | 2021.28 | CHK*SC 2023-09-11 | 4.40 |
| 921792 | 2020.64 | CHK*SC 2023-09-11 | 4.35 |
| 921793 | 2019.95 | CHK*SC 2023-09-11 | 4.52 |
| 921794 | 2019.28 | CHK*SC 2023-09-11 | 4.36 |
| 921795 | 2018.64 | CHK*SC 2023-09-11 | 4.52 |
| 921796 | 2017.96 | CHK*SC 2023-09-11 | 4.45 |
| 921797 | 2017.16 | CHK*SC 2023-09-11 | 4.27 |
| 921798 | 2017.19 | CHK*SC 2023-09-11 | 4.52 |
| 921799 | 2017.94 | CHK*SC 2023-09-11 | 4.36 |
| 921800 | 2018.60 | CHK*SC 2023-09-11 | 4.49 |
| 921801 | 2019.28 | CHK*SC 2023-09-11 | 4.37 |
| 921802 | 2019.96 | CHK*SC 2023-09-11 | 4.34 |
| 921803 | 2020.60 | CHK*SC 2023-09-11 | 4.47 |
| 921804 | 2021.18 | CHK*SC 2023-09-11 | 4.30 |
| 921805 | 2023.20 | CHK*SC 2023-09-11 | 4.25 |
| 921806 | 2022.57 | CHK*SC 2023-09-11 | 4.47 |
| 921807 | 2021.96 | CHK*SC 2023-09-11 | 4.61 |
| 921808 | 2021.28 | CHK*SC 2023-09-11 | 4.38 |
| 921809 | 2020.57 | CHK*SC 2023-09-11 | 4.38 |
| 921810 | 2019.89 | CHK*SC 2023-09-11 | 4.28 |
| 921811 | 2019.13 | CHK*SC 2023-09-11 | 4.22 |
| 921828 | 2023.63 | CHK*SC 2023-08-30 | 4.17 |
| 921829 | 2023.78 | CHK*SC 2023-08-30 | 4.33 |
| 921830 | 2023.91 | CHK*SC 2023-08-30 | 4.33 |
| 921831 | 2024.02 | CHK*SC 2023-08-30 | 4.37 |
| 921840 | 2021.20 | CHK*SC 2023-09-11 | 4.19 |
| 921841 | 2021.39 | CHK*SC 2023-09-11 | 4.39 |
| 921842 | 2022.27 | CHK*SC 2023-09-11 | 4.44 |
| 921843 | 2020.15 | CHK*SC 2023-09-11 | 4.43 |
| 921844 | 2022.14 | CHK*SC 2023-09-11 | 4.36 |
| 921845 | 2019.91 | CHK*SC 2023-09-11 | 4.20 |
| 921846 | 2022.05 | CHK*SC 2023-09-11 | 4.46 |
| 921847 | 2020.81 | CHK*SC 2023-09-11 | 4.27 |
| 921848 | 2021.84 | CHK*SC 2023-09-11 | 4.35 |
| 921849 | 2022.19 | CHK*SC 2023-09-11 | 4.42 |
| 921850 | 2020.23 | CHK*SC 2023-09-11 | 4.54 |
| 921851 | 2023.58 | CHK*SC 2023-09-11 | 4.32 |
| 921852 | 2023.31 | CHK*SC 2023-09-11 | 4.34 |
| 921853 | 2024.96 | CHK*SC 2023-09-11 | 4.23 |
| 921854 | 2024.74 | CHK*SC 2023-09-11 | 4.19 |
| 921855 | 2026.45 | CHK*SC 2023-09-11 | 4.25 |
| 921872 | 2019.41 | CHK*SC 2023-09-11 | 4.40 |
| 921873 | 2020.81 | CHK*SC 2023-09-11 | 4.47 |
| 921874 | 2022.17 | CHK*SC 2023-09-11 | 4.31 |

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NORTH DAKOTA
10 OCTOBER 2023

| Rev No. | Date | By | Description |
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| | | | |

Cell 5 Phase 1B
Baranko Brothers
Minnkota - Milton Young Station

Verification Tables

Drawn By: C. KNOLL | Surveyed By: LPB | Project No: CR22-08-027.01
Checked By: MKT | Designed By: MKT | Date: 10/06/23


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SECTION 070
7
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| Barr RF Verification Points (Designed) | | | | |
|---|---|---|---|---|
| Point # | Northing | Easting | Elevation | Location |
| 11875 | 505458.93 | 1820948.36 | 2019.42 | I |
| 11876 | 505459.99 | 1821054.37 | 2020.83 | I |
| 11877 | 505461.06 | 1821160.36 | 2022.24 | I |
| 11878 | 505462.12 | 1821266.32 | 2023.66 | I |
| 11879 | 505544.18 | 1821295.17 | 2022.72 | I |
| 11880 | 505650.18 | 1821303.68 | 2021.13 | I |
| 11881 | 505751.19 | 1821160.35 | 2019.57 | I |
| 11883 | 505304.78 | 1821484.19 | 2052.03 | E |
| 11884 | 505366.18 | 1821402.35 | 2031.77 | F-T |
| 11889 | 505724.23 | 1821316.48 | 2017.73 | H |
| 11890 | 505724.23 | 1821309.63 | 2020.01 | I |
| 11891 | 505752.47 | 1821317.05 | 2017.87 | H |
| 11892 | 505761.10 | 1821302.74 | 2017.69 | H-T |
| 11893 | 505743.63 | 1821311.18 | 2019.70 | I |
| 11894 | 505438.30 | 1821310.76 | 2016.23 | H |
| 11895 | 505462.34 | 1821288.61 | 2023.95 | I-T |
| 11901 | 505610.50 | 1820512.93 | 2017.47 | I |
| 11902 | 505968.30 | 1819782.77 | 2072.39 | B |
| 11903 | 505968.30 | 1819803.92 | 2072.39 | B |
| 11904 | 505968.30 | 1819903.92 | 2072.39 | B |
| 11905 | 505968.30 | 1820003.92 | 2072.39 | B |
| 11906 | 505968.30 | 1820103.92 | 2072.39 | B |
| 11907 | 505968.30 | 1820203.92 | 2072.39 | B |
| 11908 | 505968.30 | 1820303.92 | 2072.39 | B |
| 11909 | 505968.30 | 1820403.92 | 2072.39 | B |
| 11910 | 505968.30 | 1820503.92 | 2072.39 | B |
| 11911 | 505968.30 | 1820603.89 | 2072.39 | B |
| 11912 | 505968.30 | 1820703.86 | 2072.39 | B |
| 11913 | 505968.30 | 1820803.88 | 2072.39 | B |
| 11914 | 505968.30 | 1820903.84 | 2072.39 | B |
| 11915 | 505968.30 | 1821003.99 | 2072.39 | B |
| 11916 | 505968.30 | 1821104.06 | 2072.39 | B |
| 11917 | 505968.30 | 1821203.92 | 2072.39 | B |
| 11918 | 505968.30 | 1821303.92 | 2072.39 | B |
| 11919 | 505968.30 | 1821403.84 | 2072.39 | B |
| 11920 | 505968.30 | 1821503.92 | 2072.39 | B |
| 11921 | 505968.30 | 1821579.66 | 2072.39 | B |
| 11922 | 505924.23 | 1821579.23 | 2072.34 | B |
| 11923 | 505824.23 | 1821579.45 | 2072.34 | B |
| 11924 | 505624.22 | 1821579.46 | 2072.34 | B |
| 11925 | 505524.23 | 1821579.46 | 2072.34 | B |
| 11926 | 505424.23 | 1821579.46 | 2072.34 | B |
| 11927 | 505324.23 | 1821579.46 | 2072.34 | B |
| 11928 | 505226.54 | 1821579.66 | 2072.39 | B |
| 11929 | 505226.54 | 1821549.41 | 2072.39 | B |
| 11930 | 505226.54 | 1821449.29 | 2072.39 | B |
| 11931 | 505226.54 | 1821349.36 | 2072.39 | B |
| 11932 | 505226.54 | 1821249.34 | 2072.39 | B |
| 11933 | 505226.54 | 1821149.41 | 2072.39 | B |
| 11934 | 505226.54 | 1821049.83 | 2072.39 | B |
| 11935 | 505226.54 | 1820949.91 | 2072.39 | B |
| 11936 | 505226.54 | 1820849.35 | 2072.39 | B |
| 11937 | 505226.54 | 1820749.44 | 2072.39 | B |
| 11938 | 505226.54 | 1820649.34 | 2072.39 | B |
| 11939 | 505226.54 | 1820549.41 | 2072.39 | B |

| Asbuilt Verified Top of Random Fill | | | |
|---|---|---|---|
| Point # | Asbuilt Elevation | Description |
| 911875 | 2019.24 | CHK*RF 2023-07-27 |
| 911876 | 2020.63 | CHK*RF 2023-07-27 |
| 911877 | 2022.01 | CHK*RF 2023-07-27 |
| 911878 | 2023.52 | CHK*RF 2023-07-27 |
| 911879 | 2022.48 | CHK*RF 2023-07-27 |
| 911880 | 2020.83 | CHK*RF 2023-07-24 |
| 911881 | 2019.43 | CHK*RF 2023-07-20 |
| 911883 | 2051.92 | CHK*RF 2023-07-27 |
| 911884 | 2031.70 | CHK*RF 2023-07-27 |
| 911889 | 2017.67 | CHK*RF 2023-07-24 |
| 911890 | 2019.79 | CHK*RF 2023-07-24 |
| 911891 | 2017.76 | CHK*RF 2023-07-24 |
| 911892 | 2017.65 | CHK*RF 2023-07-24 |
| 911893 | 2019.54 | CHK*RF 2023-07-24 |
| 911894 | 2016.13 | CHK*RF 2023-07-27 |
| 911895 | 2023.73 | CHK*RF 2023-07-27 |
| 911901 | 2017.39 | CHK*RF 2023-08-28 |
| 911902 | 2072.13 | CHK*RF 2023-06-27 |
| 911903 | 2072.32 | CHK*RF 2023-06-27 |
| 911904 | 2072.18 | CHK*RF 2023-06-27 |
| 911905 | 2072.12 | CHK*RF 2023-06-27 |
| 911906 | 2072.35 | CHK*RF 2023-06-27 |
| 911907 | 2072.30 | CHK*RF 2023-06-27 |
| 911908 | 2072.30 | CHK*RF 2023-06-27 |
| 911909 | 2072.14 | CHK*RF 2023-06-27 |
| 911910 | 2072.23 | CHK*RF 2023-08-15 |
| 911911 | 2072.33 | CHK*RF 2023-08-15 |
| 911912 | 2072.27 | CHK*RF 2023-08-15 |
| 911913 | 2072.36 | CHK*RF 2023-08-15 |
| 911914 | 2072.28 | CHK*RF 2023-08-15 |
| 911915 | 2072.34 | CHK*RF 2023-08-15 |
| 911916 | 2072.34 | CHK*RF 2023-08-15 |
| 911917 | 2072.26 | CHK*RF 2023-08-15 |
| 911918 | 2072.33 | CHK*RF 2023-08-15 |
| 911919 | 2072.36 | CHK*RF 2023-08-15 |
| 911920 | 2072.27 | CHK*RF 2023-08-15 |
| 911921 | 2072.33 | CHK*RF 2023-08-15 |
| 911922 | 2072.26 | CHK*RF 2023-08-15 |
| 911923 | 2072.31 | CHK*RF 2023-08-15 |
| 911924 | 2072.26 | CHK*RF 2023-08-15 |
| 911925 | 2072.30 | CHK*RF 2023-08-15 |
| 911926 | 2072.31 | CHK*RF 2023-08-15 |
| 911927 | 2072.08 | CHK*RF 2023-08-15 |
| 911928 | 2072.23 | CHK*RF 2023-08-15 |
| 911929 | 2072.36 | CHK*RF 2023-08-15 |
| 911930 | 2072.29 | CHK*RF 2023-08-15 |
| 911931 | 2072.34 | CHK*RF 2023-08-15 |
| 911932 | 2072.23 | CHK*RF 2023-08-15 |
| 911933 | 2072.31 | CHK*RF 2023-08-15 |
| 911934 | 2072.21 | CHK*RF 2023-08-15 |
| 911935 | 2072.35 | CHK*RF 2023-08-15 |
| 911936 | 2072.35 | CHK*RF 2023-08-15 |
| 911937 | 2072.30 | CHK*RF 2023-08-15 |
| 911938 | 2072.36 | CHK*RF 2023-08-15 |
| 911939 | 2072.38 | CHK*RF 2023-08-15 |

| Barr SC Verification Points (Designed) | | | | |
|---|---|---|---|---|
| Point # | Northing | Easting | Elevation | Location |
| 21875 | 505458.30 | 1820948.36 | 2023.43 | I |
| 21876 | 505459.37 | 1821054.37 | 2024.84 | I |
| 21877 | 505460.43 | 1821160.36 | 2026.26 | I |
| 21878 | 505461.49 | 1821266.32 | 2027.67 | I |
| 21879 | 505544.18 | 1821295.82 | 2026.73 | I |
| 21880 | 505650.18 | 1821304.32 | 2025.14 | I |
| 21881 | 505751.82 | 1821160.35 | 2023.58 | I |
| 21883 | 505304.78 | 1821484.19 | 2060.46 | E |
| 21884 | 505366.18 | 1821402.35 | 2040.00 | F |
| 21889 | 505724.23 | 1821317.13 | 2021.73 | H |
| 21890 | 505724.23 | 1821310.26 | 2024.02 | I |
| 21891 | 505753.44 | 1821317.71 | 2021.87 | H |
| 21892 | 505761.80 | 1821306.25 | 2021.72 | H-T |
| 21893 | 505744.65 | 1821311.90 | 2023.71 | I |
| 21894 | 505437.65 | 1821311.39 | 2020.24 | H |
| 21895 | 505461.72 | 1821289.20 | 2027.97 | I-T |
| 21901 | 505610.58 | 1820513.10 | 2021.48 | I |
| 21902 | 505993.82 | 1819757.25 | 2080.90 | B |
| 21903 | 505993.84 | 1819803.92 | 2080.90 | B |
| 21904 | 505993.82 | 1819903.92 | 2080.90 | B |
| 21905 | 505993.82 | 1820003.92 | 2080.90 | B |
| 21906 | 505993.82 | 1820103.92 | 2080.90 | B |
| 21907 | 505993.82 | 1820203.92 | 2080.90 | B |
| 21908 | 505993.82 | 1820303.92 | 2080.90 | B |
| 21909 | 505993.82 | 1820403.92 | 2080.90 | B |
| 21910 | 505993.82 | 1820503.92 | 2080.90 | B |
| 21911 | 505993.82 | 1820603.89 | 2080.90 | B |
| 21912 | 505993.82 | 1820703.89 | 2080.90 | B |
| 21913 | 505993.82 | 1820803.88 | 2080.90 | B |
| 21914 | 505993.82 | 1820903.88 | 2080.90 | B |
| 21915 | 505993.82 | 1821003.99 | 2080.90 | B |
| 21916 | 505993.82 | 1821103.99 | 2080.90 | B |
| 21917 | 505993.82 | 1821203.92 | 2080.90 | B |
| 21918 | 505993.82 | 1821303.92 | 2080.90 | B |
| 21919 | 505993.82 | 1821403.84 | 2080.90 | B |
| 21920 | 505993.82 | 1821503.92 | 2080.90 | B |
| 21921 | 505993.84 | 1821614.25 | 2081.04 | B |
| 21922 | 505924.23 | 1821613.69 | 2081.04 | B |
| 21923 | 505824.23 | 1821613.69 | 2081.04 | B |
| 21924 | 505624.23 | 1821613.69 | 2081.04 | B |
| 21925 | 505524.23 | 1821613.69 | 2081.04 | B |
| 21926 | 505424.23 | 1821613.69 | 2081.04 | B |
| 21927 | 505324.23 | 1821613.69 | 2081.04 | B |
| 21928 | 505201.01 | 1821613.69 | 2080.90 | B |
| 21929 | 505201.01 | 1821549.41 | 2080.90 | B |
| 21930 | 505201.01 | 1821449.36 | 2080.90 | B |
| 21931 | 505201.01 | 1821349.36 | 2080.90 | B |
| 21932 | 505201.01 | 1821249.41 | 2080.90 | B |
| 21933 | 505201.01 | 1821149.41 | 2080.90 | B |
| 21934 | 505201.01 | 1821049.91 | 2080.90 | B |
| 21935 | 505201.01 | 1820949.91 | 2080.90 | B |
| 21936 | 505201.01 | 1820849.42 | 2080.90 | B |
| 21937 | 505201.01 | 1820749.42 | 2080.90 | B |
| 21938 | 505201.01 | 1820649.41 | 2080.90 | B |
| 21939 | 505200.99 | 1820549.41 | 2080.90 | B |

| Asbuilt Verified Select Clay | | | |
|---|---|---|---|
| Point # | Asbuilt Elevation | Description | Select Clay Depth |
| 921875 | 2023.54 | CHK*SC 2023-09-11 | 4.30 |
| 921876 | 2024.91 | CHK*SC 2023-09-11 | 4.28 |
| 921877 | 2026.31 | CHK*SC 2023-09-11 | 4.30 |
| 921878 | 2027.86 | CHK*SC 2023-09-11 | 4.34 |
| 921879 | 2026.75 | CHK*SC 2023-09-11 | 4.27 |
| 921880 | 2025.28 | CHK*SC 2023-09-11 | 4.45 |
| 921881 | 2023.73 | CHK*SC 2023-08-30 | 4.30 |
| 921883 | 2060.73 | CHK*SC 2023-09-29 | 8.81 |
| 921884 | 2040.28 | CHK*SC 2023-09-29 | 8.58 |
| 921889 | 2022.06 | CHK*SC 2023-09-11 | 4.39 |
| 921890 | 2024.22 | CHK*SC 2023-09-11 | 4.43 |
| 921891 | 2022.20 | CHK*SC 2023-08-28 | 4.44 |
| 921892 | 2021.93 | CHK*SC 2023-08-28 | 4.28 |
| 921893 | 2023.88 | CHK*SC 2023-09-11 | 4.34 |
| 921894 | 2020.41 | CHK*SC 2023-09-29 | 4.28 |
| 921895 | 2028.05 | CHK*SC 2023-09-11 | 4.32 |
| 921901 | 2021.57 | CHK*SC 2023-09-11 | 4.18 |
| 921902 | 2081.13 | CHK*SC 2023-07-14 | 9.00 |
| 921903 | 2080.96 | CHK*SC 2023-07-14 | 8.64 |
| 921904 | 2081.05 | CHK*SC 2023-07-14 | 8.87 |
| 921905 | 2081.14 | CHK*SC 2023-07-14 | 9.02 |
| 921906 | 2081.15 | CHK*SC 2023-08-28 | 8.80 |
| 921907 | 2081.05 | CHK*SC 2023-08-28 | 8.75 |
| 921908 | 2081.13 | CHK*SC 2023-08-28 | 8.83 |
| 921909 | 2081.14 | CHK*SC 2023-08-28 | 9.00 |
| 921910 | 2081.16 | CHK*SC 2023-08-28 | 8.93 |
| 921911 | 2081.16 | CHK*SC 2023-08-28 | 8.83 |
| 921912 | 2081.15 | CHK*SC 2023-08-28 | 8.88 |
| 921913 | 2081.14 | CHK*SC 2023-08-28 | 8.78 |
| 921914 | 2081.20 | CHK*SC 2023-08-28 | 8.92 |
| 921915 | 2081.18 | CHK*SC 2023-08-28 | 8.84 |
| 921916 | 2081.20 | CHK*SC 2023-08-28 | 8.86 |
| 921917 | 2081.22 | CHK*SC 2023-08-28 | 8.96 |
| 921918 | 2081.24 | CHK*SC 2023-08-28 | 8.91 |
| 921919 | 2081.14 | CHK*SC 2023-08-28 | 8.78 |
| 921920 | 2081.08 | CHK*SC 2023-08-28 | 8.81 |
| 921921 | 2081.31 | CHK*SC 2023-09-29 | 8.97 |
| 921922 | 2081.13 | CHK*SC 2023-09-11 | 8.87 |
| 921923 | 2081.22 | CHK*SC 2023-09-11 | 8.91 |
| 921924 | 2081.35 | CHK*SC 2023-09-11 | 9.09 |
| 921925 | 2081.24 | CHK*SC 2023-09-11 | 8.94 |
| 921926 | 2081.17 | CHK*SC 2023-09-11 | 8.86 |
| 921927 | 2081.29 | CHK*SC 2023-09-11 | 9.21 |
| 921928 | 2081.33 | CHK*SC 2023-09-29 | 9.10 |
| 921929 | 2081.12 | CHK*SC 2023-09-29 | 8.76 |
| 921930 | 2081.09 | CHK*SC 2023-09-29 | 8.80 |
| 921931 | 2081.18 | CHK*SC 2023-09-29 | 8.84 |
| 921932 | 2081.09 | CHK*SC 2023-09-29 | 8.86 |
| 921933 | 2081.16 | CHK*SC 2023-09-29 | 8.85 |
| 921934 | 2081.10 | CHK*SC 2023-09-29 | 8.89 |
| 921935 | 2081.15 | CHK*SC 2023-09-29 | 8.80 |
| 921936 | 2081.15 | CHK*SC 2023-09-29 | 8.80 |
| 921937 | 2081.11 | CHK*SC 2023-09-29 | 8.81 |
| 921938 | 2081.06 | CHK*SC 2023-09-29 | 8.70 |
| 921939 | 2081.05 | CHK*SC 2023-09-29 | 8.67 |

MATTHEW WEEKS
REGISTERED
LAND
SURVEYOR
L.S. 3626
NORTH DAKOTA
10 October 2023

| Rev No | Date | By | Description |
|---|---|---|---|
| | | | |

Cell 5 Phase 1B
Baranko Brothers
Minnkota - Milton Young Station

Verification Tables

Drawn By: C. KNOLL | Surveyed By: LPB | Project No: CR22-08-027.01
Checked By: MKT | Designed By: MKT | Date: 10/06/23

Interstate Engineering
2610 Old Red Trail, Suite B
PO Box 1254
Mandan, ND 58554
(701) 663.5455
www.interstateeng.com

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SECTION 070
8
SHEET NO.

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Q:\2022\CR\08\CR22-08-027.01-Baranko-Cell5_Phase1B_ASBUILT\20230924_CR2208027.01_Phase 1B Asbuilt.dwg 10/10/2023

## Barr RF Verification Points (Designed)

| Point # | Northing | Easting | Elevation | Location |
|---|---|---|---|---|
| 11940 | 505226.54 | 1820349.41 | 2072.39 | B |
| 11941 | 505226.54 | 1820249.33 | 2072.39 | B |
| 11942 | 505226.54 | 1820149.41 | 2072.39 | B |
| 11943 | 505226.54 | 1820049.34 | 2072.39 | B |
| 11944 | 505226.54 | 1819949.34 | 2072.39 | B |
| 11945 | 505226.54 | 1819782.77 | 2072.39 | B |
| 11946 | 505307.19 | 1819782.77 | 2072.39 | B |
| 11947 | 505407.19 | 1819782.77 | 2072.39 | B |
| 11948 | 505507.14 | 1819782.77 | 2072.39 | B |
| 11949 | 505606.96 | 1819782.77 | 2072.39 | B |
| 11950 | 505707.19 | 1819782.77 | 2072.39 | B |
| 11951 | 505807.19 | 1819782.77 | 2072.39 | B |
| 11952 | 505907.19 | 1819782.77 | 2072.39 | B |
| 11953 | 505724.23 | 1821579.46 | 2072.34 | B |
| 11954 | 505226.54 | 1820449.33 | 2072.39 | B |
| 11955 | 505950.03 | 1819803.92 | 2072.03 | C |
| 11956 | 505950.03 | 1819903.92 | 2072.03 | C |
| 11957 | 505950.03 | 1820003.92 | 2072.03 | C |
| 11958 | 505950.03 | 1820103.91 | 2072.03 | C |
| 11959 | 505950.03 | 1820203.92 | 2072.03 | C |
| 11960 | 505950.03 | 1820303.92 | 2072.03 | C |
| 11961 | 505950.03 | 1820403.92 | 2072.03 | C |
| 11962 | 505950.03 | 1820503.92 | 2072.03 | C |
| 11963 | 505950.03 | 1820603.89 | 2072.03 | C |
| 11964 | 505950.03 | 1820703.86 | 2072.03 | C |
| 11965 | 505950.03 | 1820803.88 | 2072.03 | C |
| 11966 | 505950.03 | 1820903.83 | 2072.03 | C |
| 11967 | 505950.03 | 1821003.99 | 2072.03 | C |
| 11968 | 505950.03 | 1821104.07 | 2072.03 | C |
| 11969 | 505950.03 | 1821203.92 | 2072.03 | C |
| 11970 | 505950.03 | 1821303.92 | 2072.03 | C |
| 11971 | 505950.03 | 1821403.84 | 2072.03 | C |
| 11972 | 505950.03 | 1821503.92 | 2072.03 | C |
| 11973 | 505950.03 | 1821563.42 | 2072.03 | C |
| 11974 | 505924.23 | 1821563.42 | 2072.01 | C |
| 11975 | 505824.23 | 1821563.42 | 2072.01 | C |
| 11976 | 505724.23 | 1821563.42 | 2072.01 | C |
| 11977 | 505624.21 | 1821563.42 | 2072.01 | C |
| 11978 | 505524.23 | 1821563.42 | 2072.01 | C |
| 11979 | 505424.23 | 1821563.42 | 2072.01 | C |
| 11980 | 505324.23 | 1821563.42 | 2072.01 | C |
| 11981 | 505244.80 | 1821563.42 | 2072.03 | C |
| 11982 | 505244.80 | 1821549.41 | 2072.03 | C |
| 11983 | 505244.80 | 1821449.28 | 2072.03 | C |
| 11984 | 505244.80 | 1821349.36 | 2072.03 | C |
| 11985 | 505244.80 | 1821249.33 | 2072.03 | C |
| 11986 | 505244.80 | 1821149.41 | 2072.03 | C |
| 11987 | 505244.80 | 1821049.83 | 2072.03 | C |
| 11988 | 505244.80 | 1820949.91 | 2072.03 | C |
| 11989 | 505244.80 | 1820849.34 | 2072.03 | C |
| 11990 | 505244.80 | 1820749.44 | 2072.03 | C |
| 11991 | 505244.80 | 1820649.34 | 2072.03 | C |
| 11992 | 505244.80 | 1820549.41 | 2072.03 | C |
| 11993 | 505244.80 | 1820449.33 | 2072.03 | C |
| 11994 | 505244.80 | 1820349.41 | 2072.03 | C |

## Asbuilt Verified Top of Random Fill

| Point # | Asbuilt Elevation | Description |
|---|---|---|
| 911940 | 2072.32 | CHK*RF 2023-06-27 |
| 911941 | 2072.30 | CHK*RF 2023-06-27 |
| 911942 | 2072.28 | CHK*RF 2023-06-27 |
| 911943 | 2072.28 | CHK*RF 2023-06-27 |
| 911944 | 2072.29 | CHK*RF 2023-06-27 |
| 911945 | 2072.22 | CHK*RF 2023-06-27 |
| 911946 | 2072.10 | CHK*RF 2023-06-27 |
| 911947 | 2072.17 | CHK*RF 2023-06-27 |
| 911948 | 2072.33 | CHK*RF 2023-06-27 |
| 911949 | 2072.23 | CHK*RF 2023-06-27 |
| 911950 | 2072.28 | CHK*RF 2023-06-27 |
| 911951 | 2072.29 | CHK*RF 2023-06-27 |
| 911952 | 2072.33 | CHK*RF 2023-06-27 |
| 911953 | 2072.29 | CHK*RF 2023-08-15 |
| 911954 | 2072.24 | CHK*RF 2023-08-15 |
| 911955 | 2071.80 | CHK*RF 2023-06-27 |
| 911956 | 2071.65 | CHK*RF 2023-06-27 |
| 911957 | 2071.86 | CHK*RF 2023-06-27 |
| 911958 | 2071.67 | CHK*RF 2023-06-27 |
| 911959 | 2071.74 | CHK*RF 2023-06-27 |
| 911960 | 2071.81 | CHK*RF 2023-06-27 |
| 911961 | 2071.64 | CHK*RF 2023-06-27 |
| 911962 | 2071.84 | CHK*RF 2023-08-15 |
| 911963 | 2071.84 | CHK*RF 2023-08-15 |
| 911964 | 2071.93 | CHK*RF 2023-08-15 |
| 911965 | 2071.88 | CHK*RF 2023-08-15 |
| 911966 | 2071.79 | CHK*RF 2023-08-15 |
| 911967 | 2071.83 | CHK*RF 2023-08-15 |
| 911968 | 2071.82 | CHK*RF 2023-08-15 |
| 911969 | 2071.87 | CHK*RF 2023-08-15 |
| 911970 | 2071.79 | CHK*RF 2023-08-15 |
| 911971 | 2071.92 | CHK*RF 2023-08-15 |
| 911972 | 2071.96 | CHK*RF 2023-08-15 |
| 911973 | 2071.94 | CHK*RF 2023-08-15 |
| 911974 | 2071.90 | CHK*RF 2023-08-15 |
| 911975 | 2071.85 | CHK*RF 2023-08-15 |
| 911976 | 2071.89 | CHK*RF 2023-08-15 |
| 911977 | 2071.91 | CHK*RF 2023-08-15 |
| 911978 | 2071.97 | CHK*RF 2023-08-15 |
| 911979 | 2071.99 | CHK*RF 2023-08-15 |
| 911980 | 2071.92 | CHK*RF 2023-08-15 |
| 911981 | 2071.99 | CHK*RF 2023-08-15 |
| 911982 | 2071.83 | CHK*RF 2023-08-15 |
| 911983 | 2071.82 | CHK*RF 2023-08-15 |
| 911984 | 2071.99 | CHK*RF 2023-08-15 |
| 911985 | 2071.87 | CHK*RF 2023-08-15 |
| 911986 | 2071.92 | CHK*RF 2023-08-15 |
| 911987 | 2071.88 | CHK*RF 2023-08-15 |
| 911988 | 2071.97 | CHK*RF 2023-08-15 |
| 911989 | 2071.90 | CHK*RF 2023-08-15 |
| 911990 | 2071.83 | CHK*RF 2023-08-15 |
| 911991 | 2071.88 | CHK*RF 2023-08-15 |
| 911992 | 2071.86 | CHK*RF 2023-08-15 |
| 911993 | 2071.82 | CHK*RF 2023-08-15 |
| 911994 | 2071.79 | CHK*RF 2023-06-27 |

## Barr SC Verification Points (Designed)

| Point # | Northing | Easting | Elevation | Location |
|---|---|---|---|---|
| 21940 | 505200.99 | 1820349.41 | 2080.90 | B |
| 21941 | 505201.01 | 1820249.41 | 2080.90 | B |
| 21942 | 505200.99 | 1820149.41 | 2080.90 | B |
| 21943 | 505201.01 | 1820049.41 | 2080.90 | B |
| 21944 | 505201.01 | 1819949.41 | 2080.90 | B |
| 21945 | 505201.01 | 1819757.25 | 2080.90 | B |
| 21946 | 505307.19 | 1819757.25 | 2080.90 | B |
| 21947 | 505407.19 | 1819757.25 | 2080.90 | B |
| 21948 | 505507.19 | 1819757.25 | 2080.90 | B |
| 21949 | 505607.19 | 1819757.25 | 2080.90 | B |
| 21950 | 505707.19 | 1819757.25 | 2080.90 | B |
| 21951 | 505807.19 | 1819757.25 | 2080.90 | B |
| 21952 | 505907.19 | 1819757.25 | 2080.90 | B |
| 21953 | 505724.23 | 1821613.69 | 2081.04 | B |
| 21954 | 505201.01 | 1820449.41 | 2080.90 | B |
| 21955 | 505948.65 | 1819803.92 | 2080.00 | C |
| 21956 | 505948.65 | 1819903.92 | 2080.00 | C |
| 21957 | 505948.65 | 1820003.92 | 2080.00 | C |
| 21958 | 505948.65 | 1820103.92 | 2080.00 | C |
| 21959 | 505948.65 | 1820203.92 | 2080.00 | C |
| 21960 | 505948.65 | 1820303.92 | 2080.00 | C |
| 21961 | 505948.65 | 1820403.92 | 2080.00 | C |
| 21962 | 505948.65 | 1820503.92 | 2080.00 | C |
| 21963 | 505948.65 | 1820603.89 | 2080.00 | C |
| 21964 | 505948.65 | 1820703.88 | 2080.00 | C |
| 21965 | 505948.65 | 1820803.88 | 2080.00 | C |
| 21966 | 505948.65 | 1820903.86 | 2080.00 | C |
| 21967 | 505948.65 | 1821003.99 | 2080.00 | C |
| 21968 | 505948.65 | 1821104.03 | 2080.00 | C |
| 21969 | 505948.65 | 1821203.92 | 2080.00 | C |
| 21970 | 505948.65 | 1821303.92 | 2080.00 | C |
| 21971 | 505948.65 | 1821403.84 | 2080.00 | C |
| 21972 | 505948.65 | 1821503.92 | 2080.00 | C |
| 21973 | 505948.65 | 1821562.35 | 2080.00 | C |
| 21974 | 505924.23 | 1821562.35 | 2080.00 | C |
| 21975 | 505824.23 | 1821562.35 | 2080.00 | C |
| 21976 | 505724.23 | 1821562.35 | 2080.00 | C |
| 21977 | 505624.23 | 1821562.35 | 2080.00 | C |
| 21978 | 505524.23 | 1821562.35 | 2080.00 | C |
| 21979 | 505424.23 | 1821562.35 | 2080.00 | C |
| 21980 | 505324.23 | 1821562.35 | 2080.00 | C |
| 21981 | 505246.18 | 1821562.35 | 2080.00 | C |
| 21982 | 505246.18 | 1821549.41 | 2080.00 | C |
| 21983 | 505246.18 | 1821449.33 | 2080.00 | C |
| 21984 | 505246.18 | 1821349.36 | 2080.00 | C |
| 21985 | 505246.18 | 1821249.38 | 2080.00 | C |
| 21986 | 505246.18 | 1821149.41 | 2080.00 | C |
| 21987 | 505246.18 | 1821049.88 | 2080.00 | C |
| 21988 | 505246.18 | 1820949.91 | 2080.00 | C |
| 21989 | 505246.18 | 1820849.39 | 2080.00 | C |
| 21990 | 505246.18 | 1820749.43 | 2080.00 | C |
| 21991 | 505246.18 | 1820649.38 | 2080.00 | C |
| 21992 | 505246.18 | 1820549.41 | 2080.00 | C |
| 21993 | 505246.18 | 1820449.41 | 2080.00 | C |
| 21994 | 505246.18 | 1820349.41 | 2080.00 | C |

## Asbuilt Verified Select Clay

| Point # | Asbuilt Elevation | Description | Select Clay Depth |
|---|---|---|---|
| 921940 | 2080.97 | CHK*SC 2023-09-29 | 8.65 |
| 921941 | 2081.16 | CHK*SC 2023-09-29 | 8.86 |
| 921942 | 2081.02 | CHK*SC 2023-09-29 | 8.74 |
| 921943 | 2081.00 | CHK*SC 2023-07-14 | 8.72 |
| 921944 | 2081.13 | CHK*SC 2023-07-14 | 8.84 |
| 921945 | 2081.15 | CHK*SC 2023-07-14 | 8.93 |
| 921946 | 2081.07 | CHK*SC 2023-07-14 | 8.97 |
| 921947 | 2080.97 | CHK*SC 2023-07-14 | 8.80 |
| 921948 | 2081.00 | CHK*SC 2023-07-14 | 8.67 |
| 921949 | 2081.06 | CHK*SC 2023-07-14 | 8.83 |
| 921950 | 2081.08 | CHK*SC 2023-07-14 | 8.80 |
| 921951 | 2081.09 | CHK*SC 2023-07-14 | 8.80 |
| 921952 | 2081.03 | CHK*SC 2023-07-14 | 8.70 |
| 921953 | 2081.22 | CHK*SC 2023-09-11 | 8.93 |
| 921954 | 2081.05 | CHK*SC 2023-09-29 | 8.81 |
| 921955 | 2080.14 | CHK*SC 2023-07-14 | 8.34 |
| 921956 | 2080.09 | CHK*SC 2023-07-14 | 8.44 |
| 921957 | 2080.03 | CHK*SC 2023-07-14 | 8.17 |
| 921958 | 2080.01 | CHK*SC 2023-08-28 | 8.34 |
| 921959 | 2080.16 | CHK*SC 2023-08-28 | 8.42 |
| 921960 | 2080.15 | CHK*SC 2023-08-28 | 8.34 |
| 921961 | 2080.16 | CHK*SC 2023-08-28 | 8.52 |
| 921962 | 2080.15 | CHK*SC 2023-08-28 | 8.31 |
| 921963 | 2080.08 | CHK*SC 2023-08-28 | 8.24 |
| 921964 | 2080.14 | CHK*SC 2023-08-28 | 8.21 |
| 921965 | 2080.22 | CHK*SC 2023-08-28 | 8.34 |
| 921966 | 2080.04 | CHK*SC 2023-08-28 | 8.25 |
| 921967 | 2080.16 | CHK*SC 2023-08-28 | 8.33 |
| 921968 | 2080.30 | CHK*SC 2023-08-28 | 8.48 |
| 921969 | 2080.17 | CHK*SC 2023-08-28 | 8.30 |
| 921970 | 2080.18 | CHK*SC 2023-08-28 | 8.39 |
| 921971 | 2080.12 | CHK*SC 2023-08-28 | 8.20 |
| 921972 | 2080.07 | CHK*SC 2023-08-28 | 8.11 |
| 921973 | 2080.21 | CHK*SC 2023-09-11 | 8.27 |
| 921974 | 2080.23 | CHK*SC 2023-09-11 | 8.33 |
| 921975 | 2080.27 | CHK*SC 2023-09-11 | 8.42 |
| 921976 | 2080.23 | CHK*SC 2023-09-11 | 8.34 |
| 921977 | 2080.18 | CHK*SC 2023-09-11 | 8.27 |
| 921978 | 2080.23 | CHK*SC 2023-09-11 | 8.26 |
| 921979 | 2080.13 | CHK*SC 2023-09-11 | 8.14 |
| 921980 | 2080.19 | CHK*SC 2023-09-11 | 8.27 |
| 921981 | 2080.20 | CHK*SC 2023-09-29 | 8.21 |
| 921982 | 2080.21 | CHK*SC 2023-09-29 | 8.38 |
| 921983 | 2080.11 | CHK*SC 2023-09-11 | 8.29 |
| 921984 | 2080.16 | CHK*SC 2023-09-11 | 8.17 |
| 921985 | 2080.12 | CHK*SC 2023-09-11 | 8.25 |
| 921986 | 2080.12 | CHK*SC 2023-09-11 | 8.20 |
| 921987 | 2080.16 | CHK*SC 2023-09-11 | 8.28 |
| 921988 | 2080.25 | CHK*SC 2023-09-15 | 8.28 |
| 921989 | 2080.16 | CHK*SC 2023-09-15 | 8.26 |
| 921990 | 2080.20 | CHK*SC 2023-09-15 | 8.37 |
| 921991 | 2080.15 | CHK*SC 2023-09-15 | 8.27 |
| 921992 | 2080.10 | CHK*SC 2023-09-15 | 8.24 |
| 921993 | 2080.24 | CHK*SC 2023-09-15 | 8.42 |
| 921994 | 2080.20 | CHK*SC 2023-09-15 | 8.41 |

MATTHEW WEEKS
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NORTH DAKOTA
10 OCTOBER 2023

| Rev No | Date | By | Description |
|---|---|---|---|
| | | | |

Cell 5 Phase 1B
Barnako Brothers
Minnkota - Milton Young Station

# Verification Tables

Drawn By: C. KNOLL | Surveyed By: LPB | Project No: CR22-08-027.01
Checked By: MKT | Designed By: MKT | Date: 10/06/23


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2610 Old Red Trail, Suite B
PO Box 1254
Mandan, ND 58554
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SECTION 070
9
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Q:\2022\(CR)\08\CR22-08-027.01-Barnako-Cell5_Phase1B_ASBUILT\20230924_CR2208027.01_Phase 1B Asbuilt.dwg 10/10/2023

| Barr RF Verification Points (Designed) | | | | |
|---|---|---|---|---|
| Point # | Northing | Easting | Elevation | Location |
| 11995 | 505244.80 | 1820249.33 | 2072.03 | C |
| 11996 | 505244.80 | 1820149.41 | 2072.03 | C |
| 11997 | 505244.80 | 1820049.34 | 2072.03 | C |
| 11998 | 505244.80 | 1819949.33 | 2072.03 | C |
| 11999 | 505244.80 | 1819849.41 | 2072.03 | C |
| 12000 | 505244.80 | 1819801.04 | 2072.03 | C |
| 12001 | 505307.19 | 1819801.04 | 2072.03 | C |
| 12002 | 505407.19 | 1819801.04 | 2072.03 | C |
| 12003 | 505507.12 | 1819801.04 | 2072.03 | C |
| 12004 | 505606.96 | 1819801.04 | 2072.03 | C |
| 12005 | 505707.19 | 1819801.04 | 2072.03 | C |
| 12006 | 505807.19 | 1819801.04 | 2072.03 | C |
| 12007 | 505907.19 | 1819801.04 | 2072.03 | C |
| 12008 | 505950.03 | 1819801.04 | 2072.03 | C |
| 12063 | 505226.54 | 1819849.41 | 2072.39 | B |
| 12296 | 505828.65 | 1819929.49 | 2031.57 | F |
| 12297 | 505828.65 | 1820003.92 | 2031.57 | F |
| 12298 | 505828.65 | 1820103.92 | 2031.57 | F |
| 12299 | 505828.65 | 1820203.92 | 2031.57 | F |
| 12300 | 505828.65 | 1820303.92 | 2031.57 | F |
| 12301 | 505828.65 | 1820403.92 | 2031.57 | F |
| 12302 | 505828.65 | 1820503.92 | 2031.57 | F |
| 12314 | 505366.18 | 1820549.41 | 2031.57 | F |
| 12315 | 505366.18 | 1820449.41 | 2031.57 | F |
| 12316 | 505366.18 | 1820349.41 | 2031.57 | F |
| 12317 | 505366.18 | 1820249.41 | 2031.57 | F |
| 12318 | 505366.18 | 1820149.41 | 2031.57 | F |
| 12319 | 505366.18 | 1820049.41 | 2031.57 | F |
| 12320 | 505366.18 | 1819949.41 | 2031.57 | F |
| 12321 | 505407.19 | 1819922.42 | 2031.57 | F |
| 12322 | 505507.16 | 1819922.43 | 2031.57 | F |
| 12323 | 505606.96 | 1819922.43 | 2031.57 | F |
| 12324 | 505706.23 | 1819922.43 | 2031.57 | F |
| 12325 | 505807.19 | 1819922.43 | 2031.57 | F |
| 12326 | 505821.58 | 1819922.42 | 2031.57 | F |
| 12330 | 505767.57 | 1820003.88 | 2011.20 | G |
| 12331 | 505769.08 | 1820103.92 | 2011.71 | G |
| 12332 | 505770.57 | 1820203.92 | 2012.21 | G |
| 12333 | 505772.07 | 1820303.92 | 2012.71 | G |
| 12334 | 505773.57 | 1820403.92 | 2013.21 | G |
| 12340 | 505425.28 | 1820449.41 | 2011.87 | G |
| 12341 | 505426.78 | 1820349.41 | 2011.37 | G |
| 12342 | 505428.28 | 1820249.41 | 2010.87 | G |
| 12343 | 505429.78 | 1820149.41 | 2010.36 | G |
| 12344 | 505606.96 | 1819985.81 | 2010.43 | G |
| 12345 | 505706.23 | 1819984.33 | 2010.93 | G |
| 12346 | 505746.98 | 1819983.72 | 2011.13 | G |
| 12347 | 505743.12 | 1820103.92 | 2011.70 | H |
| 12348 | 505744.62 | 1820203.92 | 2012.20 | H |
| 12349 | 505746.12 | 1820303.92 | 2012.70 | H |
| 12350 | 505747.62 | 1820403.92 | 2013.20 | H |
| 12351 | 505748.93 | 1820491.66 | 2013.55 | H-T |
| 12356 | 505451.23 | 1820449.42 | 2011.86 | H |
| 12357 | 505452.73 | 1820349.41 | 2011.36 | H |
| 12358 | 505454.23 | 1820249.41 | 2010.86 | H |

| Asbuilt Verified Top of Random Fill | | | |
|---|---|---|---|
| Point # | Asbuilt Elevation | Description |
| 911995 | 2071.79 | CHK*RF 2023-06-27 |
| 911996 | 2071.78 | CHK*RF 2023-06-27 |
| 911997 | 2071.80 | CHK*RF 2023-06-27 |
| 911998 | 2071.74 | CHK*RF 2023-06-27 |
| 911999 | 2071.66 | CHK*RF 2023-06-27 |
| 912000 | 2071.84 | CHK*RF 2023-06-27 |
| 912001 | 2071.78 | CHK*RF 2023-06-27 |
| 912002 | 2071.76 | CHK*RF 2023-06-27 |
| 912003 | 2071.73 | CHK*RF 2023-06-27 |
| 912004 | 2071.76 | CHK*RF 2023-06-27 |
| 912005 | 2071.72 | CHK*RF 2023-06-27 |
| 912006 | 2071.66 | CHK*RF 2023-06-27 |
| 912007 | 2071.85 | CHK*RF 2023-06-27 |
| 912008 | 2071.68 | CHK*RF 2023-06-27 |
| 912063 | 2072.26 | CHK*RF 07-14-2023 |
| 93296 | 2031.46 | CHK*RF 04-27-2023 |
| 912297 | 2031.41 | CHK*RF 04-25-2023 |
| 912298 | 2031.28 | CHK*RF 04-25-2023 |
| 912299 | 2031.49 | CHK*RF 04-25-2023 |
| 912300 | 2031.50 | CHK*RF 04-25-2023 |
| 912301 | 2031.48 | CHK*RF 04-25-2023 |
| 912302 | 2031.56 | CHK*RF 04-25-2023 |
| 912314 | 2031.48 | CHK*RF 2023-07-24 |
| 912315 | 2031.39 | CHK*RF 04-25-2023 |
| 92316 | 2031.53 | CHK*RF 04-25-2023 |
| 92317 | 2031.53 | CHK*RF 04-25-2023 |
| 92318 | 2031.55 | CHK*RF 04-25-2023 |
| 92319 | 2031.48 | CHK*RF 04-25-2023 |
| 93320 | 2031.43 | CHK*RF 05-05-2023 |
| 92321 | 2031.45 | CHK*RF 04-25-2023 |
| 92322 | 2031.43 | CHK*RF 04-25-2023 |
| 92323 | 2031.45 | CHK*RF 04-25-2023 |
| 92324 | 2031.49 | CHK*RF 04-25-2023 |
| 92325 | 2031.51 | CHK*RF 04-25-2023 |
| 93326 | 2031.47 | CHK*RF 04-27-2023 |
| 93330 | 2011.14 | CHK*RF 04-27-2023 |
| 93331 | 2011.69 | CHK*RF 04-27-2023 |
| 93332 | 2012.17 | CHK*RF 04-27-2023 |
| 93333 | 2012.67 | CHK*RF 04-27-2023 |
| 93334 | 2013.08 | CHK*RF 04-27-2023 |
| 93340 | 2011.66 | CHK*RF 04-27-2023 |
| 93341 | 2011.30 | CHK*RF 04-27-2023 |
| 93342 | 2010.73 | CHK*RF 04-27-2023 |
| 93343 | 2010.25 | CHK*RF 04-27-2023 |
| 93344 | 2010.41 | CHK*RF 04-27-2023 |
| 93345 | 2010.92 | CHK*RF 04-27-2023 |
| 93346 | 2011.11 | CHK*RF 04-27-2023 |
| 93347 | 2011.61 | CHK*RF 04-27-2023 |
| 93348 | 2012.16 | CHK*RF 04-27-2023 |
| 93349 | 2012.66 | CHK*RF 04-27-2023 |
| 93350 | 2013.18 | CHK*RF 04-27-2023 |
| 93351 | 2013.46 | CHK*RF 04-27-2023 |
| 93356 | 2011.70 | CHK*RF 04-27-2023 |
| 93357 | 2011.25 | CHK*RF 04-27-2023 |
| 93358 | 2010.81 | CHK*RF 04-27-2023 |

| Barr SC Verification Points (Designed) | | | | |
|---|---|---|---|---|
| Point # | Northing | Easting | Elevation | Location |
| 21995 | 505246.18 | 1820249.38 | 2080.00 | C |
| 21996 | 505246.18 | 1820149.41 | 2080.00 | C |
| 21997 | 505246.18 | 1820049.38 | 2080.00 | C |
| 21998 | 505246.18 | 1819949.38 | 2080.00 | C |
| 21999 | 505246.18 | 1819849.41 | 2080.00 | C |
| 22000 | 505246.18 | 1819802.42 | 2080.00 | C |
| 22001 | 505307.19 | 1819802.42 | 2080.00 | C |
| 22002 | 505407.19 | 1819802.42 | 2080.00 | C |
| 22003 | 505507.19 | 1819802.42 | 2080.00 | C |
| 22004 | 505607.19 | 1819802.42 | 2080.00 | C |
| 22005 | 505707.19 | 1819802.42 | 2080.00 | C |
| 22006 | 505807.19 | 1819802.42 | 2080.00 | C |
| 22007 | 505907.19 | 1819802.42 | 2080.00 | C |
| 22008 | 505948.65 | 1819802.42 | 2080.00 | C |
| 22063 | 505201.01 | 1819849.41 | 2080.90 | B |
| 22296 | 505828.65 | 1819929.49 | 2040.00 | F |
| 22297 | 505828.65 | 1820003.92 | 2040.00 | F |
| 22298 | 505828.65 | 1820103.92 | 2040.00 | F |
| 22299 | 505828.65 | 1820203.92 | 2040.00 | F |
| 22300 | 505828.65 | 1820303.92 | 2040.00 | F |
| 22301 | 505828.65 | 1820403.92 | 2040.00 | F |
| 22302 | 505828.65 | 1820503.92 | 2040.00 | F |
| 22314 | 505366.18 | 1820549.41 | 2040.00 | F |
| 22315 | 505366.18 | 1820449.41 | 2040.00 | F |
| 22316 | 505366.18 | 1820349.41 | 2040.00 | F |
| 22317 | 505366.18 | 1820249.41 | 2040.00 | F |
| 22318 | 505366.18 | 1820149.41 | 2040.00 | F |
| 22319 | 505366.18 | 1820049.41 | 2040.00 | F |
| 22320 | 505366.18 | 1819949.41 | 2040.00 | F |
| 22321 | 505407.19 | 1819922.42 | 2040.00 | F |
| 22322 | 505507.16 | 1819922.43 | 2040.00 | F |
| 22323 | 505606.96 | 1819922.43 | 2040.00 | F |
| 22324 | 505706.23 | 1819922.43 | 2040.00 | F |
| 22325 | 505807.19 | 1819922.43 | 2040.00 | F |
| 22326 | 505821.58 | 1819922.42 | 2040.00 | F |
| 22330 | 505754.27 | 1820003.88 | 2015.20 | G |
| 22331 | 505755.77 | 1820103.92 | 2015.71 | G |
| 22332 | 505757.27 | 1820203.92 | 2016.21 | G |
| 22333 | 505758.77 | 1820303.92 | 2016.71 | G |
| 22334 | 505760.27 | 1820403.92 | 2017.21 | G |
| 22340 | 505438.58 | 1820449.41 | 2015.87 | G |
| 22341 | 505440.08 | 1820349.41 | 2015.37 | G |
| 22342 | 505441.58 | 1820249.41 | 2014.87 | G |
| 22343 | 505443.08 | 1820149.41 | 2014.36 | G |
| 22344 | 505606.96 | 1819999.12 | 2014.43 | G |
| 22345 | 505706.23 | 1819997.63 | 2014.93 | G |
| 22346 | 505746.98 | 1819997.02 | 2015.13 | G |
| 22347 | 505743.76 | 1820103.92 | 2015.70 | H |
| 22348 | 505745.27 | 1820203.92 | 2016.20 | H |
| 22349 | 505746.77 | 1820303.92 | 2016.70 | H |
| 22350 | 505748.27 | 1820403.92 | 2017.20 | H |
| 22351 | 505749.61 | 1820493.80 | 2017.65 | H-T |
| 22356 | 505450.58 | 1820449.41 | 2015.86 | H |
| 22357 | 505452.08 | 1820349.41 | 2015.36 | H |
| 22358 | 505453.58 | 1820249.41 | 2014.86 | H |

| Asbuilt Verified Select Clay | | | |
|---|---|---|---|
| Point # | Asbuilt Elevation | Description | Select Clay Depth |
| 921995 | 2080.15 | CHK*SC 2023-09-15 | 8.36 |
| 921996 | 2080.17 | CHK*SC 2023-09-15 | 8.39 |
| 921997 | 2080.04 | CHK*SC 2023-07-14 | 8.24 |
| 921998 | 2080.10 | CHK*SC 2023-07-14 | 8.36 |
| 921999 | 2080.19 | CHK*SC 2023-07-14 | 8.53 |
| 922000 | 2080.24 | CHK*SC 2023-07-14 | 8.40 |
| 922001 | 2080.17 | CHK*SC 2023-07-14 | 8.39 |
| 922002 | 2080.13 | CHK*SC 2023-07-14 | 8.37 |
| 922003 | 2080.19 | CHK*SC 2023-07-14 | 8.46 |
| 922004 | 2080.16 | CHK*SC 2023-07-14 | 8.40 |
| 922005 | 2080.20 | CHK*SC 2023-07-14 | 8.48 |
| 922006 | 2080.17 | CHK*SC 2023-07-14 | 8.51 |
| 922007 | 2080.14 | CHK*SC 2023-07-14 | 8.29 |
| 922008 | 2080.24 | CHK*SC 2023-07-14 | 8.56 |
| 922063 | 2081.09 | CHK*SC 2023-07-14 | 8.83 |
| 922296 | 2040.23 | CHK*SC 2023-07-14 | 8.77 |
| 922297 | 2040.12 | CHK*SC 2023-07-14 | 8.71 |
| 922298 | 2040.14 | CHK*SC 2023-07-14 | 8.86 |
| 922299 | 2040.17 | CHK*SC 2023-07-14 | 8.68 |
| 922300 | 2040.13 | CHK*SC 2023-07-14 | 8.63 |
| 922301 | 2040.26 | CHK*SC 2023-08-28 | 8.78 |
| 922302 | 2040.26 | CHK*SC 2023-08-28 | 8.70 |
| 922314 | 2040.13 | CHK*SC 2023-09-15 | 8.65 |
| 922315 | 2040.14 | CHK*SC 2023-09-15 | 8.75 |
| 922316 | 2040.15 | CHK*SC 2023-07-14 | 8.62 |
| 922317 | 2040.10 | CHK*SC 2023-07-14 | 8.57 |
| 922318 | 2040.14 | CHK*SC 2023-07-14 | 8.59 |
| 922319 | 2040.11 | CHK*SC 2023-07-14 | 8.63 |
| 922320 | 2040.14 | CHK*SC 2023-07-14 | 8.71 |
| 922321 | 2040.13 | CHK*SC 2023-07-14 | 8.68 |
| 922322 | 2040.10 | CHK*SC 2023-07-14 | 8.67 |
| 922323 | 2040.20 | CHK*SC 2023-07-14 | 8.75 |
| 922324 | 2040.10 | CHK*SC 2023-07-14 | 8.61 |
| 922325 | 2040.10 | CHK*SC 2023-07-14 | 8.59 |
| 922326 | 2040.17 | CHK*SC 2023-07-14 | 8.70 |
| 913330 | 2015.48 | CHK*SC 2023-06-15 | 4.34 |
| 913331 | 2015.81 | CHK*SC 2023-06-15 | 4.12 |
| 913332 | 2016.40 | CHK*SC 2023-06-15 | 4.23 |
| 913333 | 2016.99 | CHK*SC 2023-06-15 | 4.32 |
| 913334 | 2017.28 | CHK*SC 2023-06-15 | 4.20 |
| 913340 | 2016.09 | CHK*SC 2023-06-15 | 4.43 |
| 913341 | 2015.64 | CHK*SC 2023-06-15 | 4.34 |
| 913342 | 2015.00 | CHK*SC 2023-06-15 | 4.27 |
| 913343 | 2014.54 | CHK*SC 2023-06-15 | 4.29 |
| 913344 | 2014.55 | CHK*SC 2023-06-15 | 4.14 |
| 913345 | 2015.16 | CHK*SC 2023-06-15 | 4.24 |
| 913346 | 2015.29 | CHK*SC 2023-06-15 | 4.18 |
| 913347 | 2015.88 | CHK*SC 2023-06-15 | 4.27 |
| 913348 | 2016.39 | CHK*SC 2023-06-15 | 4.23 |
| 913349 | 2016.83 | CHK*SC 2023-06-15 | 4.17 |
| 913350 | 2017.31 | CHK*SC 2023-06-15 | 4.13 |
| 913351 | 2017.72 | CHK*SC 2023-06-15 | 4.26 |
| 913356 | 2016.09 | CHK*SC 2023-06-15 | 4.39 |
| 913357 | 2015.57 | CHK*SC 2023-06-15 | 4.32 |
| 913358 | 2015.02 | CHK*SC 2023-06-15 | 4.21 |

MATTHEW WEEKS
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SURVEYOR
L.S. 3626
NORTH DAKOTA
10 OCTOBER 2023

| Rev No | Date | By | Description |
|---|---|---|---|
| | | | |

Cell 5 Phase 1B
Baranko Brothers
Minnkota - Milton Young Station

Verification Tables

Drawn By: C. KNOLL | Surveyed By: LPB | Project No. CR22-08-027.01
Checked By: MKT | Designed By: MKT | Date: 10/06/23

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SECTION 070
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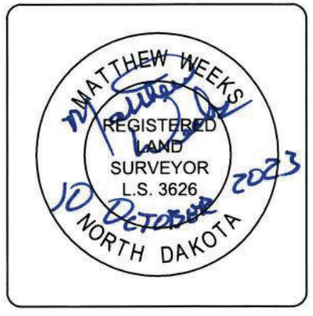
Q:\2022\CR\08\CR22-08-027.01-Baranko-Cell5_Phase1B_ASBUILT\20230924_CR2208027.01_Phase 1B Asbuilt.dwg 10/10/2023

| Barr RF Verification Points (Designed) | | | | | Asbuilt Verified Top of Random Fill | | | Barr SC Verification Points (Designed) | | | | | Asbuilt Verified Select Clay | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Point # | Northing | Easting | Elevation | Location | Point # | Asbuilt Elevation | Description | Point # | Northing | Easting | Elevation | Location | Point # | Asbuilt Elevation | Description | Select Clay Depth |
| 12359 | 505455.73 | 1820149.42 | 2010.36 | H | 93359 | 2010.29 | CHK*RF 04-27-2023 | 22359 | 505455.08 | 1820149.41 | 2014.36 | H | 913359 | 2014.58 | CHK*SC 2023-06-15 | 4.29 |
| 12360 | 505606.99 | 1820011.77 | 2010.43 | H | 93360 | 2010.31 | CHK*RF 04-27-2023 | 22360 | 505606.96 | 1820011.12 | 2014.43 | H | 913360 | 2014.55 | CHK*SC 2023-06-15 | 4.24 |
| 12361 | 505706.23 | 1820010.28 | 2010.93 | H | 93361 | 2010.90 | CHK*RF 04-27-2023 | 22361 | 505706.23 | 1820009.63 | 2014.93 | H | 913361 | 2015.05 | CHK*SC 2023-06-15 | 4.15 |
| 12362 | 505741.70 | 1820009.75 | 2011.17 | H | 93362 | 2010.98 | CHK*RF 04-27-2023 | 22362 | 505742.34 | 1820009.09 | 2015.17 | H | 913362 | 2015.55 | CHK*SC 2023-06-14 | 4.57 |
| 12363 | 505727.03 | 1820025.72 | 2016.29 | I | 93363 | 2016.08 | CHK*RF 04-27-2023 | 22363 | 505727.62 | 1820025.09 | 2020.30 | I | 913363 | 2020.33 | CHK*SC 2023-06-14 | 4.25 |
| 12364 | 505729.85 | 1820103.92 | 2016.13 | I | 93364 | 2015.92 | CHK*RF 04-27-2023 | 22364 | 505730.46 | 1820103.92 | 2020.14 | I | 913364 | 2020.19 | CHK*SC 2023-06-14 | 4.27 |
| 12365 | 505733.46 | 1820203.92 | 2015.92 | I | 93365 | 2015.71 | CHK*RF 04-27-2023 | 22365 | 505734.07 | 1820203.92 | 2019.93 | I | 913365 | 2019.99 | CHK*SC 2023-06-14 | 4.28 |
| 12366 | 505737.07 | 1820303.92 | 2015.72 | I | 93366 | 2015.46 | CHK*RF 04-27-2023 | 22366 | 505737.68 | 1820303.92 | 2019.73 | I | 913366 | 2019.76 | CHK*SC 2023-06-14 | 4.30 |
| 12367 | 505740.68 | 1820403.92 | 2015.52 | I | 93367 | 2015.49 | CHK*RF 04-27-2023 | 22367 | 505741.28 | 1820403.92 | 2019.53 | I | 913367 | 2019.75 | CHK*SC 2023-06-14 | 4.26 |
| 12368 | 505742.97 | 1820467.64 | 2015.39 | I | 93368 | 2014.85 | CHK*RF 04-27-2023 | 22368 | 505743.68 | 1820470.43 | 2019.40 | I | 913368 | 2019.42 | CHK*SC 2023-06-14 | 4.57 |
| 12369 | 505738.08 | 1820512.41 | 2015.66 | I | 93369 | 2014.53 | CHK*RF 04-27-2023 | 22369 | 505739.23 | 1820513.11 | 2019.66 | I | 913369 | 2019.68 | CHK*SC 2023-06-14 | 5.15 |
| 12374 | 505470.94 | 1820449.41 | 2018.43 | I | 93374 | 2018.17 | CHK*RF 04-27-2023 | 22374 | 505470.32 | 1820449.41 | 2022.44 | I | 913374 | 2022.52 | CHK*SC 2023-06-14 | 4.35 |
| 12375 | 505469.20 | 1820349.41 | 2016.85 | I | 93375 | 2016.76 | CHK*RF 04-27-2023 | 22375 | 505468.58 | 1820349.41 | 2020.86 | I | 913375 | 2020.92 | CHK*SC 2023-06-14 | 4.16 |
| 12376 | 505467.47 | 1820249.41 | 2015.28 | I | 93376 | 2014.71 | CHK*RF 04-27-2023 | 22376 | 505466.85 | 1820249.41 | 2019.29 | I | 913376 | 2019.34 | CHK*SC 2023-06-14 | 4.63 |
| 12377 | 505465.74 | 1820149.40 | 2013.70 | I | 93377 | 2013.21 | CHK*RF 04-27-2023 | 22377 | 505465.12 | 1820149.41 | 2017.71 | I | 913377 | 2017.74 | CHK*SC 2023-06-14 | 4.53 |
| 12378 | 505606.96 | 1820021.72 | 2013.75 | I | 93378 | 2013.45 | CHK*RF 04-27-2023 | 22378 | 505606.96 | 1820021.08 | 2017.75 | I | 913378 | 2017.85 | CHK*SC 2023-06-14 | 4.40 |
| 12379 | 505706.23 | 1820025.03 | 2015.85 | I | 93379 | 2015.40 | CHK*RF 04-27-2023 | 22379 | 505706.23 | 1820024.38 | 2019.85 | I | 913379 | 2019.93 | CHK*SC 2023-06-14 | 4.53 |
| 12387 | 505544.18 | 1820206.42 | 2013.50 | J | 93387 | 2013.07 | CHK*RF 05-05-2023 | 22387 | 505544.18 | 1820206.42 | 2017.50 | J | 913387 | 2017.54 | CHK*SC 2023-06-14 | 4.47 |
| 12388 | 505544.18 | 1820312.42 | 2015.20 | J | 93388 | 2015.05 | CHK*RF 05-05-2023 | 22388 | 505544.18 | 1820312.42 | 2019.20 | J | 913388 | 2019.34 | CHK*SC 2023-06-14 | 4.29 |
| 12389 | 505544.18 | 1820418.42 | 2016.90 | J | 93389 | 2016.52 | CHK*RF 05-05-2023 | 22389 | 505544.18 | 1820418.42 | 2020.90 | J | 913389 | 2021.00 | CHK*SC 2023-06-14 | 4.48 |
| 12390 | 505650.18 | 1820418.42 | 2015.40 | J | 93390 | 2014.88 | CHK*RF 05-05-2023 | 22390 | 505650.18 | 1820418.42 | 2019.40 | J | 913390 | 2019.55 | CHK*SC 2023-06-14 | 4.67 |
| 12391 | 505650.18 | 1820206.42 | 2014.15 | J | 93391 | 2013.92 | CHK*RF 05-05-2023 | 22391 | 505650.18 | 1820206.42 | 2018.15 | J | 913391 | 2018.27 | CHK*SC 2023-06-14 | 4.35 |
| 12392 | 505650.18 | 1820100.42 | 2014.45 | J | 93392 | 2014.31 | CHK*RF 05-05-2023 | 22392 | 505650.18 | 1820100.42 | 2018.45 | J | 913392 | 2018.56 | CHK*SC 2023-06-14 | 4.25 |
| 12428 | 505548.06 | 1820155.72 | 2012.62 | M | 93428 | 2012.56 | CHK*RF 05-05-2023 | 22428 | 505548.66 | 1820155.40 | 2016.62 | M | 913428 | 2016.90 | CHK*SC 2023-06-14 | 4.34 |
| 12429 | 505594.55 | 1820242.99 | 2013.37 | M | 93429 | 2012.97 | CHK*RF 05-05-2023 | 22429 | 505595.15 | 1820242.67 | 2017.36 | M | 913429 | 2017.48 | CHK*SC 2023-06-14 | 4.51 |
| 12430 | 505650.60 | 1820348.20 | 2014.26 | M | 93430 | 2014.07 | CHK*RF 05-05-2023 | 22430 | 505651.22 | 1820347.91 | 2018.26 | M | 913430 | 2018.35 | CHK*SC 2023-06-14 | 4.28 |
| 12431 | 505695.85 | 1820433.13 | 2014.99 | M | 93431 | 2014.81 | CHK*RF 05-05-2023 | 22431 | 505696.45 | 1820432.81 | 2018.98 | M | 913431 | 2019.15 | CHK*SC 2023-06-14 | 4.34 |
| 12432 | 505701.18 | 1820430.29 | 2012.98 | N | 93432 | 2012.88 | CHK*RF 05-05-2023 | 22432 | 505701.74 | 1820429.99 | 2016.98 | N | 913432 | 2017.16 | CHK*SC 2023-06-14 | 4.28 |
| 12433 | 505655.92 | 1820345.36 | 2012.26 | N | 93433 | 2012.11 | CHK*RF 05-05-2023 | 22433 | 505656.51 | 1820345.09 | 2016.26 | N | 913433 | 2016.41 | CHK*SC 2023-06-14 | 4.30 |
| 12434 | 505599.87 | 1820240.15 | 2011.36 | N | 93434 | 2011.35 | CHK*RF 05-05-2023 | 22434 | 505600.45 | 1820239.85 | 2015.36 | N | 913434 | 2015.59 | CHK*SC 2023-06-14 | 4.24 |
| 12435 | 505553.38 | 1820152.88 | 2010.62 | N | 93435 | 2010.57 | CHK*RF 05-05-2023 | 22435 | 505553.95 | 1820152.58 | 2014.62 | N | 913435 | 2014.86 | CHK*SC 2023-06-14 | 4.29 |
| 12436 | 505565.12 | 1820146.63 | 2010.62 | O | 93436 | 2010.57 | CHK*RF 05-05-2023 | 22436 | 505564.54 | 1820146.94 | 2014.62 | O | 913436 | 2014.91 | CHK*SC 2023-06-14 | 4.34 |
| 12437 | 505611.61 | 1820233.90 | 2011.36 | O | 93437 | 2011.29 | CHK*RF 05-05-2023 | 22437 | 505611.04 | 1820234.21 | 2015.36 | O | 913437 | 2015.55 | CHK*SC 2023-06-14 | 4.26 |
| 12438 | 505667.66 | 1820339.11 | 2012.26 | O | 93438 | 2012.10 | CHK*RF 05-05-2023 | 22438 | 505667.10 | 1820339.44 | 2016.26 | O | 913438 | 2016.47 | CHK*SC 2023-06-14 | 4.37 |
| 12439 | 505712.91 | 1820424.04 | 2012.98 | O | 93439 | 2012.94 | CHK*RF 05-05-2023 | 22439 | 505712.33 | 1820424.35 | 2016.98 | O | 913439 | 2017.16 | CHK*SC 2023-06-14 | 4.22 |
| 12440 | 505718.24 | 1820421.20 | 2014.99 | P | 93440 | 2014.94 | CHK*RF 05-05-2023 | 22440 | 505717.63 | 1820421.52 | 2018.98 | P | 913440 | 2019.11 | CHK*SC 2023-06-14 | 4.17 |
| 12441 | 505672.99 | 1820336.27 | 2014.27 | P | 93441 | 2014.17 | CHK*RF 05-05-2023 | 22441 | 505672.40 | 1820336.62 | 2018.26 | P | 913441 | 2018.47 | CHK*SC 2023-06-14 | 4.30 |
| 12442 | 505616.94 | 1820231.06 | 2013.37 | P | 93442 | 2013.30 | CHK*RF 05-05-2023 | 22442 | 505616.33 | 1820231.38 | 2017.36 | P | 913442 | 2017.47 | CHK*SC 2023-06-14 | 4.17 |
| 12443 | 505570.45 | 1820143.79 | 2012.62 | P | 93443 | 2012.43 | CHK*RF 05-05-2023 | 22443 | 505569.84 | 1820144.12 | 2016.62 | P | 913443 | 2016.68 | CHK*SC 2023-06-14 | 4.25 |
| 12444 | 505520.83 | 1819987.12 | 2010.00 | S1 | 93444 | 2009.86 | CHK*RF 04-27-2023 | 22444 | 505520.18 | 1820000.42 | 2014.00 | S1 | 913444 | 2014.16 | CHK*SC 2023-06-14 | 4.30 |
| 12445 | 505520.83 | 1820013.06 | 2010.00 | S2 | 93445 | 2009.87 | CHK*RF 04-27-2023 | 22445 | 505520.17 | 1820012.42 | 2014.00 | S2 | 913445 | 2014.18 | CHK*SC 2023-06-14 | 4.31 |
| 12446 | 505527.01 | 1820019.06 | 2012.07 | S3 | 93446 | 2011.18 | CHK*RF 04-27-2023 | 22446 | 505526.33 | 1820018.40 | 2016.05 | S3 | 913446 | 2016.30 | CHK*SC 2023-06-14 | 5.12 |
| 12447 | 505526.59 | 1820061.47 | 2011.92 | S4 | 93447 | 2011.53 | CHK*RF 04-27-2023 | 22447 | 505525.95 | 1820061.73 | 2015.92 | S4 | 913447 | 2015.99 | CHK*SC 2023-06-14 | 4.46 |
| 12448 | 505520.60 | 1820063.06 | 2009.91 | S5 | 93448 | 2009.81 | CHK*RF 04-27-2023 | 22448 | 505519.91 | 1820063.16 | 2013.91 | S5 | 913448 | 2014.43 | CHK*SC 2023-06-14 | 4.62 |
| 12449 | 505520.83 | 1820077.07 | 2010.00 | S6 | 93449 | 2009.41 | CHK*RF 04-27-2023 | 22449 | 505520.18 | 1820076.42 | 2014.00 | S6 | 913449 | 2014.10 | CHK*SC 2023-06-14 | 4.69 |
| 12450 | 505512.97 | 1820077.00 | 2009.98 | S7 | 93450 | 2009.68 | CHK*RF 04-27-2023 | 22450 | 505513.34 | 1820076.35 | 2013.98 | S7 | 913450 | 2014.20 | CHK*SC 2023-06-14 | 4.52 |
| 12451 | 505509.35 | 1820083.08 | 2012.00 | S8 | 93451 | 2011.64 | CHK*RF 04-27-2023 | 22451 | 505509.78 | 1820082.43 | 2016.00 | S8 | 913451 | 2016.25 | CHK*SC 2023-06-14 | 4.61 |
| 12452 | 505464.62 | 1820085.12 | 2012.68 | S9 | 93452 | 2012.38 | CHK*RF 04-27-2023 | 22452 | 505463.99 | 1820084.47 | 2016.68 | S9 | 913452 | 2016.73 | CHK*SC 2023-06-14 | 4.35 |
| 12453 | 505456.82 | 1820077.08 | 2010.00 | S10 | 93453 | 2009.80 | CHK*RF 04-27-2023 | 22453 | 505456.18 | 1820076.42 | 2014.00 | S10 | 913453 | 2014.11 | CHK*SC 2023-06-15 | 4.31 |
| 12454 | 505430.87 | 1820077.05 | 2010.01 | S11 | 93454 | 2009.88 | CHK*RF 04-27-2023 | 22454 | 505444.18 | 1820076.42 | 2014.00 | S11 | 913454 | 2014.23 | CHK*SC 2023-06-15 | 4.35 |
| 12455 | 505469.25 | 1820018.42 | 2004.00 | S12 | 93455 | 2003.95 | CHK*RF 04-27-2023 | 22455 | 505469.25 | 1820018.42 | 2008.00 | S12 | 922455 | 2008.37 | CHK*SC 2023-07-20 | 4.42 |
| 12456 | 505502.83 | 1820005.12 | 2004.00 | S13 | 93456 | 2003.96 | CHK*RF 04-27-2023 | 22456 | 505502.18 | 1820018.42 | 2008.00 | S13 | 922456 | 2008.26 | CHK*SC 2023-07-20 | 4.30 |
| 12457 | 505502.83 | 1820059.07 | 2004.00 | S14 | 93457 | 2003.94 | CHK*RF 04-27-2023 | 22457 | 505502.18 | 1820058.42 | 2008.00 | S14 | 922457 | 2008.25 | CHK*SC 2023-07-20 | 4.31 |
| 12458 | 505448.88 | 1820059.07 | 2004.00 | S15 | 93458 | 2003.90 | CHK*RF 04-27-2023 | 22458 | 505462.18 | 1820058.42 | 2008.00 | S15 | 922458 | 2008.01 | CHK*SC 2023-07-20 | 4.11 |
| 12459 | 505462.18 | 1820025.49 | 2004.00 | S16 | 93459 | 2003.75 | CHK*RF 04-27-2023 | 22459 | 505462.18 | 1820025.49 | 2008.00 | S16 | 922459 | 2008.26 | CHK*SC 2023-07-20 | 4.51 |
| 12496 | 505366.18 | 1819929.49 | 2031.57 | F | 93496 | 2031.05 | CHK*RF 05-05-2023 | 22496 | 505366.18 | 1819929.49 | 2040.00 | F | 922496 | 2040.14 | CHK*SC 2023-07-14 | 9.09 |
| 12497 | 505373.25 | 1819922.42 | 2031.57 | F | 93497 | 2031.30 | CHK*RF 05-05-2023 | 22497 | 505373.25 | 1819922.42 | 2040.00 | F | 922497 | 2040.21 | CHK*SC 2023-07-14 | 8.91 |




| Rev No | Date | By | Description |
|---|---|---|---|
| | | | |

Cell 5 Phase 1B
Baranko Brothers
Minnkota - Milton Young Station

Verification Tables

Drawn By: C. KNOLL | Surveyed By: LPB | Project No: CR22-08-027.01
Checked By: MKT | Designed By: MKT | Date: 10/06/23


Interstate Engineering
2610 Old Red Trail, Suite B
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SECTION 070

11
SHEET NO.

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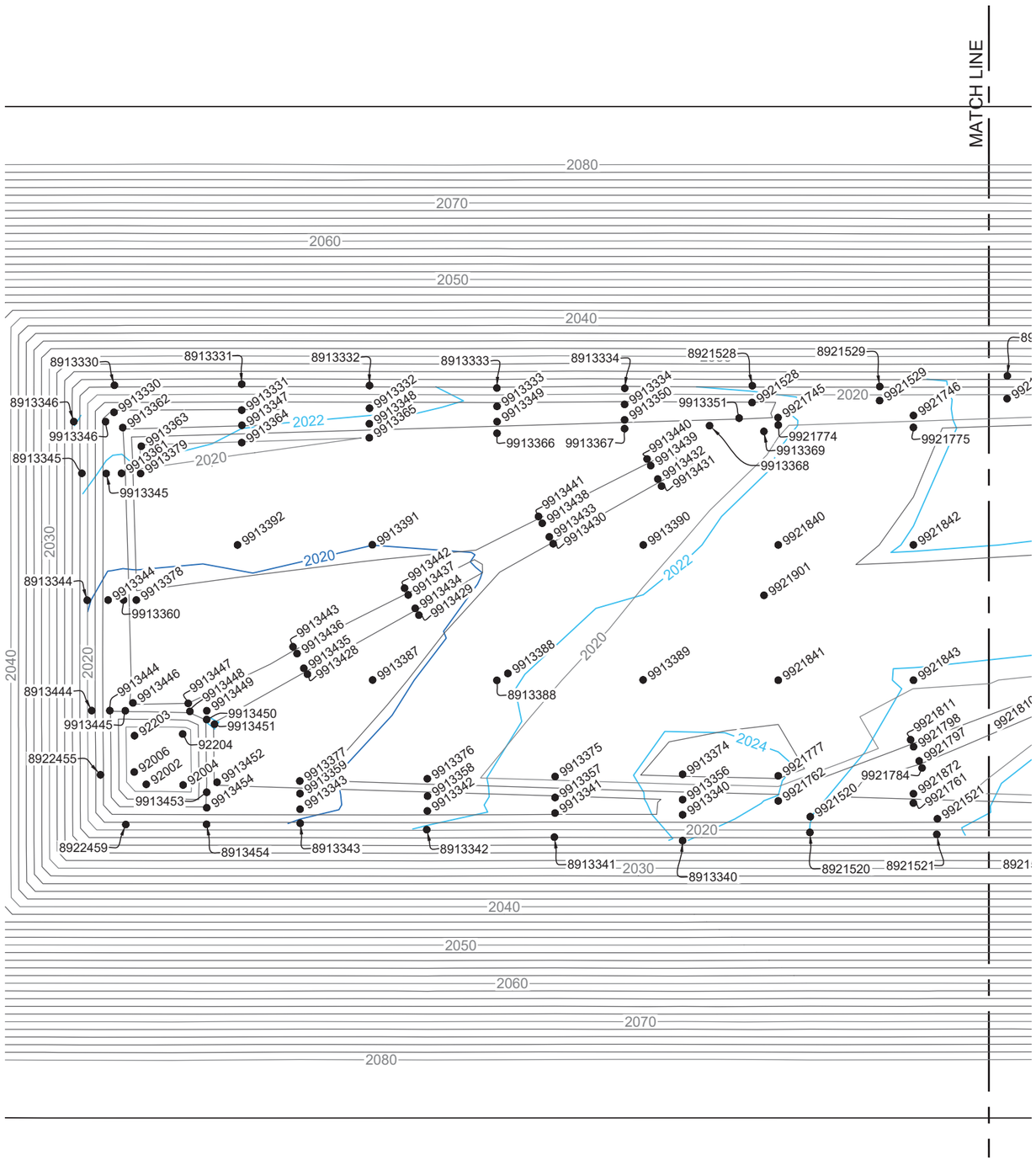


## LEGEND

- ASBUILT FG MAJOR
- ASBUILT FG MINOR
- ● POINT # — ASBUILT VERIFICATION POINT

INTERSTATE ENGINEERING SURVEY NOTES:

1. Basis of Bearings: NAD27, North Dakota State Plane, South Zone (US Survey Feet)
2. Located in Section 5, Township 141 North, Range 83 West, 5th P.M., Oliver County, North Dakota

0 50' 100'
HORIZONTAL SCALE IN FEET

MATTHEW WEEKS
REGISTERED LAND SURVEYOR
L.S. 3626
NORTH DAKOTA

| Rev No | Date | By | Description |
|---|---|---|---|
| | | | |

Cell 5 Phase 1B
Baranko Brothers
Minnkota - Milton Young Station

# Top of Bottom Ash Asbuilt

Project No: CR22-08-027.01
Surveyed By: LPB — Date: 10/28/23
Designed By: MKT
Drawn By: C. KNOLL
Checked By: MKT


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SECTION 070
22
SHEET NO.

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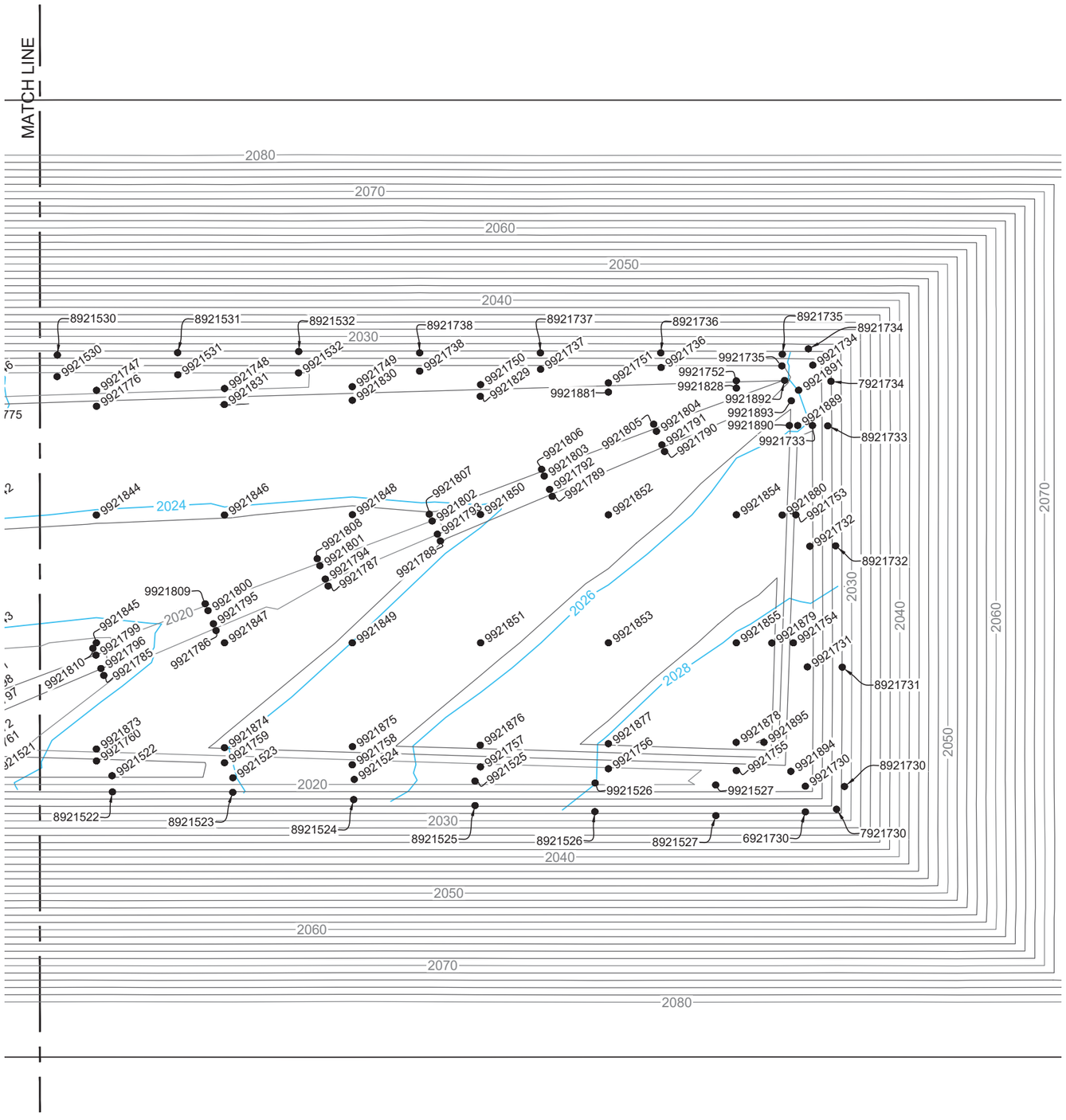


## LEGEND

- ASBUILT FG MAJOR
- ASBUILT FG MINOR
- ● POINT # — ASBUILT VERIFICATION POINT

INTERSTATE ENGINEERING SURVEY NOTES:

1. Basis of Bearings: NAD27, North Dakota State Plane, South Zone (US Survey Feet)
2. Located in Section 5, Township 141 North, Range 83 West, 5th P.M., Oliver County, North Dakota

0 50' 100'
HORIZONTAL SCALE IN FEET

MATTHEW WEEKS
REGISTERED LAND SURVEYOR
L.S. 3626
NORTH DAKOTA

| Rev No | Date | By | Description |
|---|---|---|---|
| | | | |

Cell 5 Phase 1B
Baranko Brothers
Minnkota - Milton Young Station

# Top of Bottom Ash Asbuilt

Drawn By: C. KNOLL | Surveyed By: LPB | Project No: CR22-08-027.01
Checked By: MKT | Designed By: MKT | Date: 10/26/23


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SECTION 070
23
SHEET NO.

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| Asbuilt Verified Select Clay | | Asbuilt Top of Bottom Ash | | | | | |
|---|---|---|---|---|---|---|---|
| Point # | Asbuilt Elevation | Point # | Northing | Easting | Elevation | Description | Layer Depth |
| 921520 | 2016.50 | 9921520 | 505437.10 | 1820549.55 | 2022.02 | CHK*ASH 2023-10-25 | 5.52 |
| 921521 | 2017.15 | 9921521 | 505435.52 | 1820649.18 | 2021.43 | CHK*ASH 2023-10-25 | 4.29 |
| 921522 | 2017.58 | 9921522 | 505434.09 | 1820749.30 | 2022.68 | CHK*ASH 2023-10-25 | 5.10 |
| 921523 | 2018.14 | 9921523 | 505432.42 | 1820849.34 | 2023.96 | CHK*ASH 2023-10-25 | 5.82 |
| 921524 | 2018.65 | 9921524 | 505431.01 | 1820949.83 | 2025.33 | CHK*ASH 2023-10-25 | 6.68 |
| 921525 | 2019.08 | 9921525 | 505429.61 | 1821049.91 | 2026.62 | CHK*ASH 2023-10-25 | 7.54 |
| 921526 | 2019.50 | 9921526 | 505428.10 | 1821149.37 | 2027.99 | CHK*ASH 2023-10-25 | 8.48 |
| 921527 | 2020.11 | 9921527 | 505426.42 | 1821249.25 | 2029.33 | CHK*ASH 2023-10-25 | 9.23 |
| 921528 | 2017.88 | 9921528 | 505761.73 | 1820503.88 | 2021.41 | CHK*ASH 2023-10-13 | 3.52 |
| 921529 | 2018.53 | 9921529 | 505763.25 | 1820603.92 | 2023.01 | CHK*ASH 2023-10-13 | 4.48 |
| 921530 | 2018.91 | 9921530 | 505764.76 | 1820703.81 | 2024.75 | CHK*ASH 2023-10-13 | 5.84 |
| 921531 | 2019.49 | 9921531 | 505766.28 | 1820803.78 | 2025.43 | CHK*ASH 2023-10-13 | 5.94 |
| 921532 | 2019.95 | 9921532 | 505767.84 | 1820903.72 | 2025.89 | CHK*ASH 2023-10-13 | 5.94 |
| 921730 | 2020.54 | 9921730 | 505425.40 | 1821323.43 | 2029.76 | CHK*ASH 2023-10-25 | 9.22 |
| 921731 | 2020.79 | 9921731 | 505524.23 | 1821325.17 | 2028.80 | CHK*ASH 2023-10-23 | 8.01 |
| 921732 | 2021.41 | 9921732 | 505624.17 | 1821327.25 | 2027.39 | CHK*ASH 2023-10-23 | 5.98 |
| 921733 | 2022.03 | 9921733 | 505724.22 | 1821329.35 | 2026.07 | CHK*ASH 2023-10-23 | 4.04 |
| 921734 | 2022.26 | 9921734 | 505774.27 | 1821329.60 | 2027.01 | CHK*ASH 2023-10-23 | 4.75 |
| 921735 | 2021.98 | 9921735 | 505773.63 | 1821304.08 | 2025.70 | CHK*ASH 2023-10-23 | 3.72 |
| 921736 | 2021.47 | 9921736 | 505772.30 | 1821203.98 | 2025.56 | CHK*ASH 2023-10-13 | 4.09 |
| 921737 | 2020.95 | 9921737 | 505770.80 | 1821104.16 | 2025.60 | CHK*ASH 2023-10-13 | 4.65 |
| 921738 | 2020.49 | 9921738 | 505769.28 | 1821004.02 | 2025.72 | CHK*ASH 2023-10-13 | 5.22 |
| 921745 | 2018.05 | 9921745 | 505750.00 | 1820524.28 | 2021.84 | CHK*ASH 2023-10-13 | 3.79 |
| 921746 | 2018.54 | 9921746 | 505751.60 | 1820630.47 | 2023.49 | CHK*ASH 2023-10-13 | 4.95 |
| 921747 | 2019.14 | 9921747 | 505753.38 | 1820736.38 | 2025.30 | CHK*ASH 2023-10-13 | 6.16 |
| 921748 | 2019.64 | 9921748 | 505754.90 | 1820842.49 | 2025.79 | CHK*ASH 2023-10-13 | 6.15 |
| 921749 | 2020.18 | 9921749 | 505756.38 | 1820948.23 | 2025.72 | CHK*ASH 2023-10-13 | 5.54 |
| 921750 | 2020.73 | 9921750 | 505758.11 | 1821054.48 | 2025.61 | CHK*ASH 2023-10-13 | 4.88 |
| 921751 | 2021.14 | 9921751 | 505759.61 | 1821160.33 | 2025.69 | CHK*ASH 2023-10-13 | 4.55 |
| 921752 | 2021.77 | 9921752 | 505761.21 | 1821266.29 | 2025.27 | CHK*ASH 2023-10-23 | 3.50 |
| 921753 | 2021.62 | 9921753 | 505650.24 | 1821315.60 | 2026.93 | CHK*ASH 2023-10-23 | 5.31 |
| 921754 | 2021.04 | 9921754 | 505544.13 | 1821313.52 | 2028.46 | CHK*ASH 2023-10-23 | 7.41 |
| 921755 | 2020.12 | 9921755 | 505438.31 | 1821266.35 | 2029.69 | CHK*ASH 2023-10-25 | 9.57 |
| 921756 | 2019.69 | 9921756 | 505439.85 | 1821160.32 | 2028.21 | CHK*ASH 2023-10-25 | 8.52 |
| 921757 | 2019.20 | 9921757 | 505441.39 | 1821054.36 | 2026.60 | CHK*ASH 2023-10-25 | 7.40 |
| 921758 | 2018.64 | 9921758 | 505443.12 | 1820948.22 | 2025.39 | CHK*ASH 2023-10-25 | 6.75 |
| 921759 | 2018.08 | 9921759 | 505444.84 | 1820842.40 | 2023.89 | CHK*ASH 2023-10-25 | 5.80 |
| 921760 | 2017.53 | 9921760 | 505446.28 | 1820736.37 | 2022.61 | CHK*ASH 2023-10-25 | 5.08 |
| 921761 | 2016.99 | 9921761 | 505447.88 | 1820630.36 | 2021.12 | CHK*ASH 2023-10-25 | 4.13 |
| 921762 | 2016.36 | 9921762 | 505449.52 | 1820524.44 | 2023.92 | CHK*ASH 2023-10-25 | 7.56 |
| 921774 | 2019.86 | 9921774 | 505744.14 | 1820524.41 | 2021.76 | CHK*ASH 2023-10-13 | 1.90 |
| 921775 | 2021.61 | 9921775 | 505742.26 | 1820630.39 | 2023.43 | CHK*ASH 2023-10-13 | 1.82 |
| 921776 | 2023.44 | 9921776 | 505740.16 | 1820736.39 | 2025.23 | CHK*ASH 2023-10-13 | 1.79 |
| 921777 | 2022.70 | 9921777 | 505469.19 | 1820524.42 | 2024.28 | CHK*ASH 2023-10-25 | 1.58 |

INTERSTATE ENGINEERING SURVEY NOTES:

1. See Drawings 70-5 through 70-11 for reference to Select Clay asbuilt coordinates.

MATTHEW WEEKS
REGISTERED LAND SURVEYOR
L.S. 3626
NORTH DAKOTA

| Rev No | Date | By | Description |
|---|---|---|---|
| | | | |

Cell 5 Phase 1B
Baranko Brothers
Minnkota - Milton Young Station

Bottom Ash Verification Tables

Drawn By: C. KNOLL
Checked By: MKT
Surveyed By: LPB
Designed By: MKT
Project No: CR22-08-027.01
Date: 10/28/23

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SECTION 070
24
SHEET NO.

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| Asbuilt Verified Select Clay | | Asbuilt Top of Bottom Ash | | | | | |
|---|---|---|---|---|---|---|---|
| Point # | Asbuilt Elevation | Point # | Northing | Easting | Elevation | Description | Layer Depth |
| 921784 | 2019.19 | 9921784 | 505475.28 | 1820637.16 | 2020.95 | CHK*ASH 2023-10-25 | 1.76 |
| 921785 | 2019.85 | 9921785 | 505517.22 | 1820742.47 | 2021.65 | CHK*ASH 2023-10-25 | 1.80 |
| 921786 | 2020.61 | 9921786 | 505554.32 | 1820835.44 | 2022.43 | CHK*ASH 2023-10-25 | 1.82 |
| 921787 | 2021.27 | 9921787 | 505591.28 | 1820928.27 | 2023.08 | CHK*ASH 2023-10-25 | 1.81 |
| 921788 | 2021.97 | 9921788 | 505628.50 | 1821021.18 | 2023.82 | CHK*ASH 2023-10-23 | 1.85 |
| 921789 | 2022.59 | 9921789 | 505665.48 | 1821113.86 | 2024.37 | CHK*ASH 2023-10-23 | 1.78 |
| 921790 | 2023.24 | 9921790 | 505702.69 | 1821206.89 | 2025.08 | CHK*ASH 2023-10-23 | 1.84 |
| 921791 | 2021.28 | 9921791 | 505708.19 | 1821204.62 | 2025.04 | CHK*ASH 2023-10-23 | 3.76 |
| 921792 | 2020.64 | 9921792 | 505671.28 | 1821111.67 | 2024.35 | CHK*ASH 2023-10-23 | 3.71 |
| 921793 | 2019.95 | 9921793 | 505634.19 | 1821018.80 | 2023.69 | CHK*ASH 2023-10-23 | 3.74 |
| 921794 | 2019.28 | 9921794 | 505597.01 | 1820925.91 | 2023.05 | CHK*ASH 2023-10-25 | 3.77 |
| 921795 | 2018.64 | 9921795 | 505559.99 | 1820833.18 | 2022.47 | CHK*ASH 2023-10-25 | 3.83 |
| 921796 | 2017.96 | 9921796 | 505522.93 | 1820740.14 | 2021.58 | CHK*ASH 2023-10-25 | 3.62 |
| 921797 | 2017.16 | 9921797 | 505480.82 | 1820634.96 | 2020.88 | CHK*ASH 2023-10-25 | 3.72 |
| 921798 | 2017.19 | 9921798 | 505491.92 | 1820630.49 | 2020.82 | CHK*ASH 2023-10-25 | 3.63 |
| 921799 | 2017.94 | 9921799 | 505533.98 | 1820735.93 | 2021.65 | CHK*ASH 2023-10-25 | 3.71 |
| 921800 | 2018.60 | 9921800 | 505570.89 | 1820828.77 | 2022.34 | CHK*ASH 2023-10-25 | 3.74 |
| 921801 | 2019.28 | 9921801 | 505608.08 | 1820921.46 | 2023.13 | CHK*ASH 2023-10-25 | 3.85 |
| 921802 | 2019.96 | 9921802 | 505645.09 | 1821014.40 | 2023.64 | CHK*ASH 2023-10-23 | 3.68 |
| 921803 | 2020.60 | 9921803 | 505682.38 | 1821107.21 | 2024.32 | CHK*ASH 2023-10-23 | 3.72 |
| 921804 | 2021.18 | 9921804 | 505719.42 | 1821200.13 | 2024.80 | CHK*ASH 2023-10-23 | 3.62 |
| 921805 | 2023.20 | 9921805 | 505725.32 | 1821197.86 | 2025.06 | CHK*ASH 2023-10-23 | 1.86 |
| 921806 | 2022.57 | 9921806 | 505687.87 | 1821105.00 | 2024.41 | CHK*ASH 2023-10-23 | 1.84 |
| 921807 | 2021.96 | 9921807 | 505650.78 | 1821012.08 | 2023.81 | CHK*ASH 2023-10-23 | 1.85 |
| 921808 | 2021.28 | 9921808 | 505613.89 | 1820919.20 | 2023.17 | CHK*ASH 2023-10-25 | 1.89 |
| 921809 | 2020.57 | 9921809 | 505576.58 | 1820826.43 | 2022.48 | CHK*ASH 2023-10-25 | 1.91 |
| 921810 | 2019.89 | 9921810 | 505539.62 | 1820733.48 | 2021.65 | CHK*ASH 2023-10-25 | 1.76 |
| 921811 | 2019.13 | 9921811 | 505497.44 | 1820628.27 | 2020.79 | CHK*ASH 2023-10-25 | 1.66 |
| 921828 | 2023.63 | 9921828 | 505755.23 | 1821266.33 | 2025.38 | CHK*ASH 2023-10-23 | 1.75 |
| 921829 | 2023.78 | 9921829 | 505748.35 | 1821054.29 | 2025.68 | CHK*ASH 2023-10-13 | 1.90 |
| 921830 | 2023.91 | 9921830 | 505745.08 | 1820948.31 | 2025.74 | CHK*ASH 2023-10-13 | 1.83 |
| 921831 | 2024.02 | 9921831 | 505741.63 | 1820842.27 | 2025.84 | CHK*ASH 2023-10-13 | 1.82 |
| 921840 | 2021.20 | 9921840 | 505650.18 | 1820524.42 | 2022.92 | CHK*ASH 2023-10-23 | 1.72 |
| 921841 | 2021.39 | 9921841 | 505544.07 | 1820524.45 | 2023.17 | CHK*ASH 2023-10-25 | 1.78 |
| 921842 | 2022.27 | 9921842 | 505650.20 | 1820630.40 | 2024.11 | CHK*ASH 2023-10-23 | 1.84 |
| 921843 | 2020.15 | 9921843 | 505544.08 | 1820630.48 | 2021.78 | CHK*ASH 2023-10-25 | 1.63 |
| 921844 | 2022.14 | 9921844 | 505650.12 | 1820736.30 | 2023.94 | CHK*ASH 2023-10-23 | 1.80 |
| 921845 | 2019.91 | 9921845 | 505544.22 | 1820736.32 | 2021.53 | CHK*ASH 2023-10-25 | 1.62 |
| 921846 | 2022.05 | 9921846 | 505650.10 | 1820842.40 | 2023.86 | CHK*ASH 2023-10-23 | 1.81 |
| 921847 | 2020.81 | 9921847 | 505544.23 | 1820842.41 | 2022.53 | CHK*ASH 2023-10-25 | 1.72 |
| 921848 | 2021.84 | 9921848 | 505650.30 | 1820948.33 | 2023.68 | CHK*ASH 2023-10-23 | 1.84 |
| 921849 | 2022.19 | 9921849 | 505544.13 | 1820948.27 | 2024.01 | CHK*ASH 2023-10-25 | 1.82 |
| 921850 | 2020.23 | 9921850 | 505650.52 | 1821054.37 | 2023.85 | CHK*ASH 2023-10-23 | 3.62 |

INTERSTATE ENGINEERING SURVEY NOTES:

1. See Drawings 70-5 through 70-11 for reference to Select Clay asbuilt coordinates.

MATTHEW WEEKS
REGISTERED LAND SURVEYOR
L.S. 3626
NORTH DAKOTA

| Rev No | Date | By | Description |
|---|---|---|---|
| | | | |

Cell 5 Phase 1B
Baranko Brothers
Minnkota - Milton Young Station

Bottom Ash Verification Tables

Drawn By: C. KNOLL | Surveyed By: LPB | Project No: CR22-08-027.01
Checked By: MKT | Designed By: MKT | Date: 10/26/23

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SECTION 070
25
SHEET NO.

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| Asbuilt Verified Select Clay | | Asbuilt Top of Bottom Ash | | | | | |
|---|---|---|---|---|---|---|---|
| Point # | Asbuilt Elevation | Point # | Northing | Easting | Elevation | Description | Layer Depth |
| 921851 | 2023.58 | 9921851 | 505544.22 | 1821054.51 | 2025.31 | CHK*ASH 2023-10-25 | 1.73 |
| 921852 | 2023.31 | 9921852 | 505650.24 | 1821160.35 | 2025.06 | CHK*ASH 2023-10-23 | 1.75 |
| 921853 | 2024.96 | 9921853 | 505544.24 | 1821160.42 | 2026.78 | CHK*ASH 2023-10-25 | 1.82 |
| 921854 | 2024.74 | 9921854 | 505650.28 | 1821266.33 | 2026.50 | CHK*ASH 2023-10-23 | 1.76 |
| 921855 | 2026.45 | 9921855 | 505544.23 | 1821266.28 | 2028.14 | CHK*ASH 2023-10-23 | 1.69 |
| 921872 | 2019.41 | 9921872 | 505455.16 | 1820630.45 | 2021.18 | CHK*ASH 2023-10-25 | 1.77 |
| 921873 | 2020.81 | 9921873 | 505456.23 | 1820736.34 | 2022.62 | CHK*ASH 2023-10-25 | 1.81 |
| 921874 | 2022.17 | 9921874 | 505457.30 | 1820842.44 | 2023.96 | CHK*ASH 2023-10-25 | 1.79 |
| 921875 | 2023.54 | 9921875 | 505458.16 | 1820948.41 | 2025.34 | CHK*ASH 2023-10-25 | 1.80 |
| 921876 | 2024.91 | 9921876 | 505459.44 | 1821054.23 | 2026.74 | CHK*ASH 2023-10-25 | 1.83 |
| 921877 | 2026.31 | 9921877 | 505460.63 | 1821160.30 | 2028.12 | CHK*ASH 2023-10-25 | 1.81 |
| 921878 | 2027.86 | 9921878 | 505461.70 | 1821266.25 | 2029.71 | CHK*ASH 2023-10-25 | 1.85 |
| 921879 | 2026.75 | 9921879 | 505544.02 | 1821295.74 | 2028.52 | CHK*ASH 2023-10-23 | 1.77 |
| 921880 | 2025.28 | 9921880 | 505650.11 | 1821304.31 | 2027.00 | CHK*ASH 2023-10-23 | 1.72 |
| 921881 | 2023.73 | 9921881 | 505751.90 | 1821160.32 | 2025.60 | CHK*ASH 2023-10-13 | 1.87 |
| 921889 | 2022.06 | 9921889 | 505724.17 | 1821317.12 | 2025.93 | CHK*ASH 2023-10-23 | 3.87 |
| 921890 | 2024.22 | 9921890 | 505724.20 | 1821310.25 | 2025.94 | CHK*ASH 2023-10-23 | 1.72 |
| 921891 | 2022.20 | 9921891 | 505753.46 | 1821317.92 | 2026.02 | CHK*ASH 2023-10-23 | 3.82 |
| 921892 | 2021.93 | 9921892 | 505761.60 | 1821306.29 | 2025.85 | CHK*ASH 2023-10-23 | 3.92 |
| 921893 | 2023.88 | 9921893 | 505744.70 | 1821311.86 | 2025.63 | CHK*ASH 2023-10-23 | 1.75 |
| 921894 | 2020.41 | 9921894 | 505437.68 | 1821311.44 | 2029.84 | CHK*ASH 2023-10-25 | 9.43 |
| 921895 | 2028.05 | 9921895 | 505461.73 | 1821289.19 | 2029.86 | CHK*ASH 2023-10-25 | 1.81 |
| 921901 | 2021.57 | 9921901 | 505610.64 | 1820513.25 | 2023.38 | CHK*ASH 2023-10-25 | 1.81 |
| 922455 | 2008.37 | 92006 | 505472.14 | 1820019.52 | 2018.63 | CHK*ASH 2023-10-25 | 10.26 |
| 922456 | 2008.26 | 92203 | 505500.65 | 1820019.75 | 2018.25 | CHK*ASH 2023-10-13 | 9.99 |
| 922457 | 2008.25 | 92204 | 505501.94 | 1820057.52 | 2018.24 | CHK*ASH 2023-10-13 | 9.99 |
| 922458 | 2008.01 | 92004 | 505461.98 | 1820057.79 | 2018.62 | CHK*ASH 2023-10-25 | 10.61 |
| 922459 | 2008.26 | 92002 | 505462.53 | 1820028.95 | 2018.80 | CHK*ASH 2023-10-25 | 10.54 |
| 913330 | 2015.48 | 9913330 | 505754.15 | 1820003.65 | 2022.67 | CHK*ASH 2023-10-23 | 7.19 |
| 913331 | 2015.81 | 9913331 | 505755.80 | 1820103.82 | 2022.33 | CHK*ASH 2023-10-13 | 6.52 |
| 913332 | 2016.40 | 9913332 | 505757.35 | 1820204.01 | 2022.15 | CHK*ASH 2023-10-13 | 5.75 |
| 913333 | 2016.99 | 9913333 | 505758.81 | 1820303.95 | 2021.89 | CHK*ASH 2023-10-13 | 4.90 |
| 913334 | 2017.28 | 9913334 | 505760.32 | 1820403.99 | 2021.55 | CHK*ASH 2023-10-13 | 4.27 |
| 913340 | 2016.09 | 9913340 | 505438.61 | 1820449.48 | 2024.37 | CHK*ASH 2023-10-25 | 8.28 |
| 913341 | 2015.64 | 9913341 | 505439.99 | 1820349.41 | 2022.83 | CHK*ASH 2023-10-25 | 7.19 |
| 913342 | 2015.00 | 9913342 | 505441.62 | 1820249.33 | 2021.25 | CHK*ASH 2023-10-25 | 6.25 |
| 913343 | 2014.54 | 9913343 | 505443.02 | 1820149.56 | 2019.45 | CHK*ASH 2023-10-25 | 4.91 |
| 913344 | 2014.55 | 9913344 | 505606.98 | 1819999.05 | 2019.47 | CHK*ASH 2023-10-13 | 4.92 |
| 913345 | 2015.16 | 9913345 | 505706.14 | 1819997.57 | 2021.79 | CHK*ASH 2023-10-23 | 6.63 |
| 913346 | 2015.29 | 9913346 | 505746.78 | 1819997.07 | 2022.62 | CHK*ASH 2023-10-23 | 7.33 |
| 913347 | 2015.88 | 9913347 | 505743.90 | 1820103.93 | 2022.03 | CHK*ASH 2023-10-13 | 6.15 |
| 913348 | 2016.39 | 9913348 | 505745.15 | 1820203.88 | 2021.83 | CHK*ASH 2023-10-13 | 5.44 |
| 913349 | 2016.83 | 9913349 | 505746.82 | 1820304.02 | 2021.75 | CHK*ASH 2023-10-13 | 4.92 |
| 913350 | 2017.31 | 9913350 | 505748.23 | 1820403.99 | 2021.56 | CHK*ASH 2023-10-13 | 4.25 |

INTERSTATE ENGINEERING SURVEY NOTES:

1. See Drawings 70-5 through 70-11 for reference to Select Clay asbuilt coordinates.

MATTHEW WEEKS
REGISTERED LAND SURVEYOR
L.S. 3626
NORTH DAKOTA

| Rev No | Date | By | Description |
|---|---|---|---|
| | | | |

Cell 5 Phase 1B
Baranko Brothers
Minnkota - Milton Young Station

Bottom Ash Verification Tables

Drawn By: C. KNOLL
Checked By: MKT
Surveyed By: LPB
Designed By: MKT
Project No: CR22-08-027.01
Date: 10/26/23

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SECTION 070
26
SHEET NO.

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| Asbuilt Verified Select Clay | | Asbuilt Top of Bottom Ash | | | | | |
|---|---|---|---|---|---|---|---|
| Point # | Asbuilt Elevation | Point # | Northing | Easting | Elevation | Description | Layer Depth |
| 913351 | 2017.72 | 9913351 | 505749.58 | 1820493.81 | 2021.40 | CHK*ASH 2023-10-13 | 3.68 |
| 913356 | 2016.09 | 9913356 | 505450.56 | 1820449.46 | 2024.46 | CHK*ASH 2023-10-25 | 8.37 |
| 913357 | 2015.57 | 9913357 | 505452.20 | 1820349.41 | 2022.93 | CHK*ASH 2023-10-25 | 7.36 |
| 913358 | 2015.02 | 9913358 | 505453.35 | 1820249.44 | 2021.13 | CHK*ASH 2023-10-25 | 6.11 |
| 913359 | 2014.58 | 9913359 | 505455.23 | 1820149.43 | 2019.47 | CHK*ASH 2023-10-25 | 4.89 |
| 913360 | 2014.55 | 9913360 | 505606.99 | 1820011.14 | 2019.42 | CHK*ASH 2023-10-13 | 4.87 |
| 913361 | 2015.05 | 9913361 | 505706.27 | 1820009.53 | 2021.77 | CHK*ASH 2023-10-23 | 6.72 |
| 913362 | 2015.55 | 9913362 | 505742.17 | 1820010.49 | 2022.31 | CHK*ASH 2023-10-23 | 6.76 |
| 913363 | 2020.33 | 9913363 | 505727.56 | 1820025.09 | 2022.29 | CHK*ASH 2023-10-23 | 1.96 |
| 913364 | 2020.19 | 9913364 | 505730.39 | 1820103.80 | 2021.88 | CHK*ASH 2023-10-13 | 1.69 |
| 913365 | 2019.99 | 9913365 | 505734.19 | 1820203.83 | 2021.79 | CHK*ASH 2023-10-13 | 1.80 |
| 913366 | 2019.76 | 9913366 | 505737.68 | 1820303.91 | 2021.56 | CHK*ASH 2023-10-13 | 1.80 |
| 913367 | 2019.75 | 9913367 | 505741.30 | 1820403.99 | 2021.26 | CHK*ASH 2023-10-13 | 1.51 |
| 913368 | 2019.42 | 9913368 | 505743.60 | 1820470.54 | 2021.18 | CHK*ASH 2023-10-13 | 1.76 |
| 913369 | 2019.68 | 9913369 | 505739.17 | 1820513.19 | 2021.52 | CHK*ASH 2023-10-13 | 1.84 |
| 913374 | 2022.52 | 9913374 | 505470.37 | 1820449.45 | 2024.66 | CHK*ASH 2023-10-25 | 2.13 |
| 913375 | 2020.92 | 9913375 | 505468.58 | 1820349.52 | 2022.95 | CHK*ASH 2023-10-25 | 2.03 |
| 913376 | 2019.34 | 9913376 | 505466.89 | 1820249.27 | 2021.17 | CHK*ASH 2023-10-25 | 1.83 |
| 913377 | 2017.74 | 9913377 | 505465.11 | 1820149.32 | 2019.61 | CHK*ASH 2023-10-25 | 1.87 |
| 913378 | 2017.85 | 9913378 | 505606.94 | 1820021.13 | 2019.44 | CHK*ASH 2023-10-13 | 1.59 |
| 913379 | 2019.93 | 9913379 | 505706.12 | 1820024.44 | 2021.78 | CHK*ASH 2023-10-23 | 1.85 |
| 913387 | 2017.54 | 9913387 | 505544.26 | 1820206.41 | 2019.35 | CHK*ASH 2023-10-25 | 1.81 |
| 913388 | 2019.34 | 9913388 | 505549.41 | 1820312.40 | 2021.83 | CHK*ASH 2023-10-25 | 2.49 |
| 913389 | 2021.00 | 9913389 | 505544.39 | 1820418.51 | 2023.21 | CHK*ASH 2023-10-25 | 2.21 |
| 913390 | 2019.55 | 9913390 | 505650.11 | 1820418.59 | 2021.29 | CHK*ASH 2023-10-25 | 1.74 |
| 913391 | 2018.27 | 9913391 | 505650.24 | 1820206.21 | 2020.01 | CHK*ASH 2023-10-23 | 1.74 |
| 913392 | 2018.56 | 9913392 | 505650.14 | 1820100.47 | 2020.29 | CHK*ASH 2023-10-23 | 1.73 |
| 913428 | 2016.90 | 9913428 | 505548.76 | 1820155.36 | 2018.71 | CHK*ASH 2023-10-25 | 1.80 |
| 913429 | 2017.48 | 9913429 | 505595.11 | 1820242.70 | 2019.30 | CHK*ASH 2023-10-23 | 1.82 |
| 913430 | 2018.35 | 9913430 | 505651.11 | 1820347.96 | 2020.91 | CHK*ASH 2023-10-25 | 2.56 |
| 913431 | 2019.15 | 9913431 | 505696.26 | 1820432.91 | 2021.02 | CHK*ASH 2023-10-23 | 1.87 |
| 913432 | 2017.16 | 9913432 | 505701.74 | 1820430.02 | 2020.86 | CHK*ASH 2023-10-23 | 3.70 |
| 913433 | 2016.41 | 9913433 | 505656.45 | 1820344.97 | 2020.79 | CHK*ASH 2023-10-25 | 4.38 |
| 913434 | 2015.59 | 9913434 | 505600.41 | 1820239.84 | 2019.22 | CHK*ASH 2023-10-23 | 3.63 |
| 913435 | 2014.86 | 9913435 | 505553.44 | 1820152.43 | 2018.81 | CHK*ASH 2023-10-25 | 3.95 |
| 913436 | 2014.91 | 9913436 | 505565.03 | 1820147.16 | 2018.55 | CHK*ASH 2023-10-25 | 3.64 |
| 913437 | 2015.55 | 9913437 | 505611.03 | 1820234.34 | 2019.28 | CHK*ASH 2023-10-23 | 3.73 |
| 913438 | 2016.47 | 9913438 | 505667.20 | 1820339.38 | 2020.83 | CHK*ASH 2023-10-25 | 4.36 |
| 913439 | 2017.16 | 9913439 | 505712.34 | 1820424.47 | 2020.94 | CHK*ASH 2023-10-23 | 3.77 |
| 913440 | 2019.11 | 9913440 | 505717.54 | 1820421.56 | 2020.91 | CHK*ASH 2023-10-23 | 1.80 |
| 913441 | 2018.47 | 9913441 | 505672.46 | 1820336.49 | 2020.68 | CHK*ASH 2023-10-25 | 2.21 |
| 913442 | 2017.47 | 9913442 | 505616.28 | 1820231.47 | 2019.32 | CHK*ASH 2023-10-23 | 1.85 |
| 913443 | 2016.68 | 9913443 | 505570.30 | 1820144.06 | 2019.23 | CHK*ASH 2023-10-25 | 2.55 |
| 913444 | 2014.16 | 9913444 | 505520.28 | 1820000.37 | 2017.99 | CHK*ASH 2023-10-13 | 3.83 |
| 913445 | 2014.18 | 9913445 | 505520.21 | 1820012.50 | 2018.18 | CHK*ASH 2023-10-13 | 4.00 |
| 913446 | 2016.30 | 9913446 | 505526.35 | 1820018.48 | 2018.00 | CHK*ASH 2023-10-13 | 1.70 |
| 913447 | 2015.99 | 9913447 | 505525.98 | 1820061.86 | 2018.21 | CHK*ASH 2023-10-13 | 2.22 |
| 913448 | 2014.43 | 9913448 | 505519.70 | 1820063.13 | 2018.30 | CHK*ASH 2023-10-13 | 3.87 |
| 913449 | 2014.10 | 9913449 | 505520.21 | 1820076.42 | 2018.04 | CHK*ASH 2023-10-25 | 3.94 |
| 913450 | 2014.20 | 9913450 | 505513.23 | 1820076.31 | 2017.98 | CHK*ASH 2023-10-25 | 3.78 |
| 913451 | 2016.25 | 9913451 | 505509.60 | 1820082.42 | 2017.97 | CHK*ASH 2023-10-25 | 1.72 |
| 913452 | 2016.73 | 9913452 | 505464.11 | 1820084.43 | 2018.39 | CHK*ASH 2023-10-25 | 1.66 |
| 913453 | 2014.11 | 9913453 | 505456.28 | 1820076.33 | 2018.55 | CHK*ASH 2023-10-25 | 4.44 |
| 913454 | 2014.23 | 9913454 | 505444.18 | 1820076.39 | 2018.45 | CHK*ASH 2023-10-25 | 4.22 |

INTERSTATE ENGINEERING SURVEY NOTES:

1. See Drawings 70-5 through 70-11 for reference to Select Clay asbuilt coordinates.

MATTHEW WEEKS
REGISTERED LAND SURVEYOR
L.S. 3626
NORTH DAKOTA

| Rev No | Date | By | Description |
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Cell 5 Phase 1B
Baranko Brothers
Minnkota - Milton Young Station

# Bottom Ash Verification Tables

Drawn By: C. KNOLL | Surveyed By: LPB | Project No: CR22-08-027.01
Checked By: MKT | Designed By: MKT | Date: 10/28/23

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| Asbuilt Bottom Ash @ Edge | | | | |
|---|---|---|---|---|
| Point # | Northing | Easting | Elevation | Description |
| 6921730 | 505404.12 | 1821323.46 | 2029.48 | CHK*ASH EXTENT 2023-10-25 |
| 7921730 | 505406.35 | 1821349.27 | 2029.49 | CHK*ASH EXTENT 2023-10-25 |
| 7921734 | 505760.82 | 1821344.69 | 2026.93 | CHK*ASH EXTENT 2023-10-23 |
| 8913330 | 505775.32 | 1820003.97 | 2023.35 | CHK*ASH EXTENT 2023-10-23 |
| 8913331 | 505776.18 | 1820103.78 | 2022.64 | CHK*ASH EXTENT 2023-10-13 |
| 8913332 | 505775.15 | 1820204.00 | 2022.31 | CHK*ASH EXTENT 2023-10-13 |
| 8913333 | 505773.16 | 1820303.87 | 2021.71 | CHK*ASH EXTENT 2023-10-13 |
| 8913334 | 505773.00 | 1820404.04 | 2021.64 | CHK*ASH EXTENT 2023-10-13 |
| 8913340 | 505418.37 | 1820449.44 | 2024.10 | CHK*ASH EXTENT 2023-10-25 |
| 8913341 | 505421.09 | 1820348.89 | 2023.20 | CHK*ASH EXTENT 2023-10-25 |
| 8913342 | 505426.94 | 1820248.87 | 2022.22 | CHK*ASH EXTENT 2023-10-25 |
| 8913343 | 505431.98 | 1820149.70 | 2020.23 | CHK*ASH EXTENT 2023-10-25 |
| 8913344 | 505606.84 | 1819982.65 | 2020.11 | CHK*ASH EXTENT 2023-10-13 |
| 8913345 | 505706.29 | 1819978.47 | 2022.36 | CHK*ASH EXTENT 2023-10-23 |
| 8913346 | 505746.86 | 1819972.14 | 2024.14 | CHK*ASH EXTENT 2023-10-23 |
| 8913388 | 505544.03 | 1820303.87 | 2021.29 | CHK*ASH 2023-10-25 |
| 8913444 | 505520.27 | 1819986.15 | 2019.03 | CHK*ASH EXTENT 2023-10-13 |
| 8913454 | 505431.20 | 1820076.25 | 2018.46 | CHK*ASH EXTENT 2023-10-25 |
| 8921520 | 505424.73 | 1820549.27 | 2021.97 | CHK*ASH EXTENT 2023-10-25 |
| 8921521 | 505423.25 | 1820648.73 | 2021.82 | CHK*ASH EXTENT 2023-10-25 |
| 8921522 | 505420.68 | 1820749.58 | 2022.62 | CHK*ASH EXTENT 2023-10-25 |
| 8921523 | 505420.34 | 1820849.30 | 2023.85 | CHK*ASH EXTENT 2023-10-25 |

| Asbuilt Bottom Ash @ Edge | | | | |
|---|---|---|---|---|
| Point # | Northing | Easting | Elevation | Description |
| 8921524 | 505414.31 | 1820949.40 | 2025.50 | CHK*ASH EXTENT 2023-10-25 |
| 8921525 | 505409.41 | 1821049.94 | 2027.15 | CHK*ASH EXTENT 2023-10-25 |
| 8921526 | 505404.35 | 1821149.14 | 2028.32 | CHK*ASH EXTENT 2023-10-25 |
| 8921527 | 505401.06 | 1821249.40 | 2029.42 | CHK*ASH EXTENT 2023-10-25 |
| 8921528 | 505774.94 | 1820504.05 | 2022.28 | CHK*ASH EXTENT 2023-10-13 |
| 8921529 | 505774.30 | 1820604.00 | 2023.12 | CHK*ASH EXTENT 2023-10-13 |
| 8921530 | 505782.62 | 1820703.99 | 2024.79 | CHK*ASH EXTENT 2023-10-13 |
| 8921531 | 505784.58 | 1820803.62 | 2025.43 | CHK*ASH EXTENT 2023-10-13 |
| 8921532 | 505785.52 | 1820903.85 | 2025.76 | CHK*ASH EXTENT 2023-10-13 |
| 8921730 | 505425.17 | 1821355.87 | 2029.66 | CHK*ASH EXTENT 2023-10-25 |
| 8921731 | 505523.99 | 1821354.06 | 2029.32 | CHK*ASH EXTENT 2023-10-23 |
| 8921732 | 505624.55 | 1821348.55 | 2027.34 | CHK*ASH EXTENT 2023-10-23 |
| 8921733 | 505723.95 | 1821342.02 | 2026.28 | CHK*ASH EXTENT 2023-10-23 |
| 8921734 | 505787.76 | 1821326.00 | 2027.13 | CHK*ASH EXTENT 2023-10-23 |
| 8921735 | 505783.31 | 1821304.39 | 2025.51 | CHK*ASH EXTENT 2023-10-23 |
| 8921736 | 505784.40 | 1821203.75 | 2025.56 | CHK*ASH EXTENT 2023-10-13 |
| 8921737 | 505784.36 | 1821104.01 | 2025.49 | CHK*ASH EXTENT 2023-10-13 |
| 8921738 | 505784.42 | 1821003.99 | 2025.45 | CHK*ASH EXTENT 2023-10-13 |
| 8922455 | 505469.95 | 1819993.08 | 2018.45 | CHK*ASH EXTENT 2023-10-25 |
| 8922459 | 505431.00 | 1820012.92 | 2019.20 | CHK*ASH EXTENT 2023-10-25 |

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Cell 5 Phase 1B
Baranko Brothers
Minnkota - Milton Young Station

Bottom Ash Verification Tables

Drawn By: C. KNOLL
Checked By: MKT
Surveyed By: LPB
Designed By: MKT
Project No: CR22-08-027.01
Date: 10/28/23

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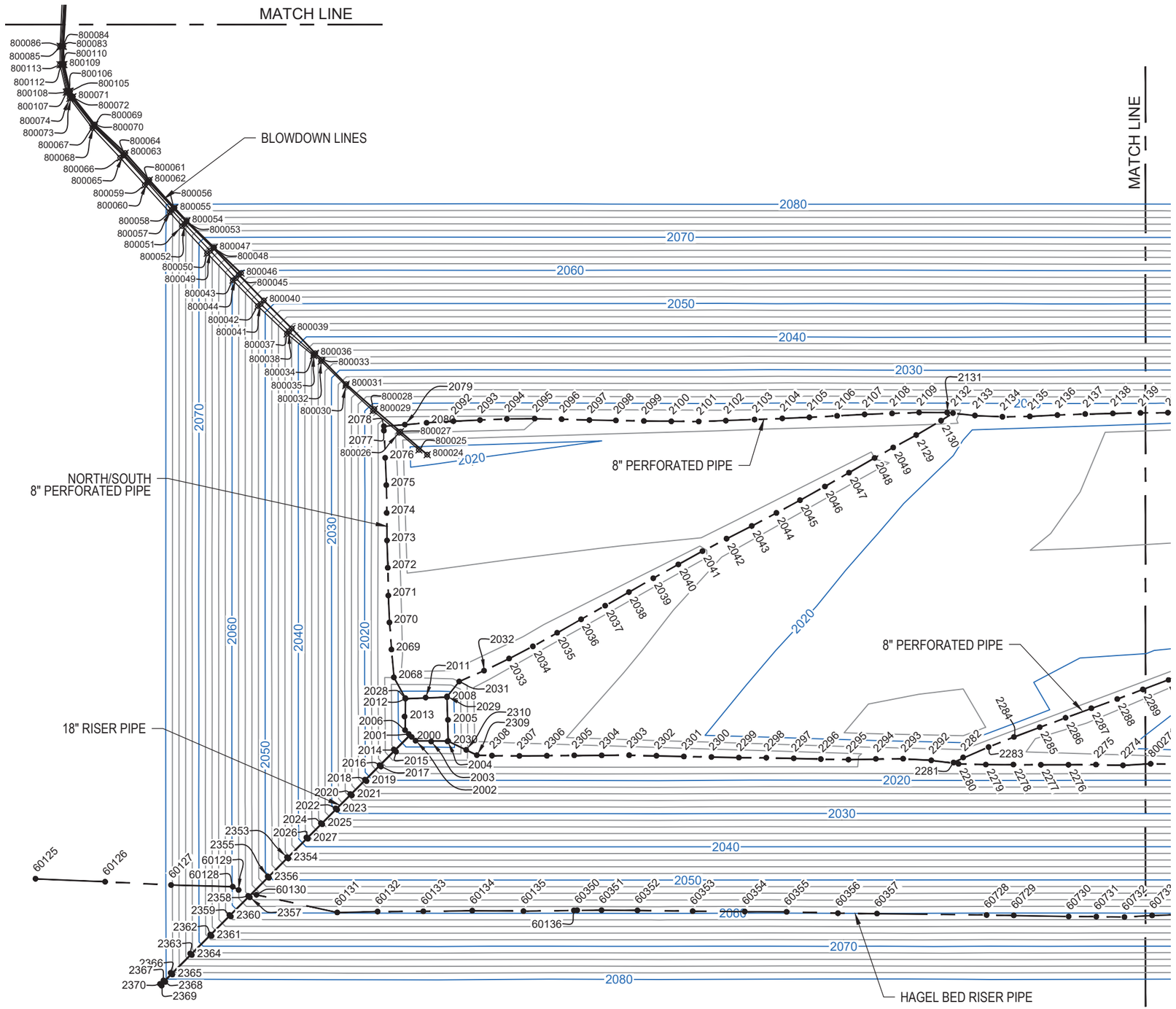


## LEGEND

- ASBUILT FG MAJOR
- ASBUILT FG MINOR
- ● POINT # — ASBUILT VERIFICATION POINT

INTERSTATE ENGINEERING SURVEY NOTES:

1. Basis of Bearings: NAD27, North Dakota State Plane, South Zone (US Survey Feet)
2. Located in Section 5, Township 141 North, Range 83 West, 5th P.M., Oliver County, North Dakota

0 50' 100'
HORIZONTAL SCALE IN FEET

MATTHEW WEEKS
REGISTERED LAND SURVEYOR
L.S. 3626
NORTH DAKOTA

| Rev No | Date | By | Description |
|---|---|---|---|
| | | | |

Cell 5 Phase 1B
Baranko Brothers
Minnkota - Milton Young Station

# Pipe Verifications

Project No: CR22-08-027.01
Surveyed By: LPB — Date: 10/08/23
Designed By: MKT
Drawn By: C. KNOLL
Checked By: MKT

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## LEGEND

- ASBUILT FG MAJOR
- ASBUILT FG MINOR
- ● POINT # — ASBUILT VERIFICATION POINT

INTERSTATE ENGINEERING SURVEY NOTES:

1. Basis of Bearings: NAD27, North Dakota State Plane, South Zone (US Survey Feet)
2. Located in Section 5, Township 141 North, Range 83 West, 5th P.M., Oliver County, North Dakota

N

0 50' 100'
HORIZONTAL SCALE IN FEET

MATTHEW WEEKS
REGISTERED LAND SURVEYOR
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NORTH DAKOTA

| Rev No | Date | By | Description |
|---|---|---|---|
| | | | |

Cell 5 Phase 1B
Baranko Brothers
Minnkota - Milton Young Station

Pipe Verifications

Drawn By: C. KNOLL | Surveyed By: LPB | Project No: CR22-08-027.01
Checked By: MKT | Designed By: MKT | Date: 10/08/23


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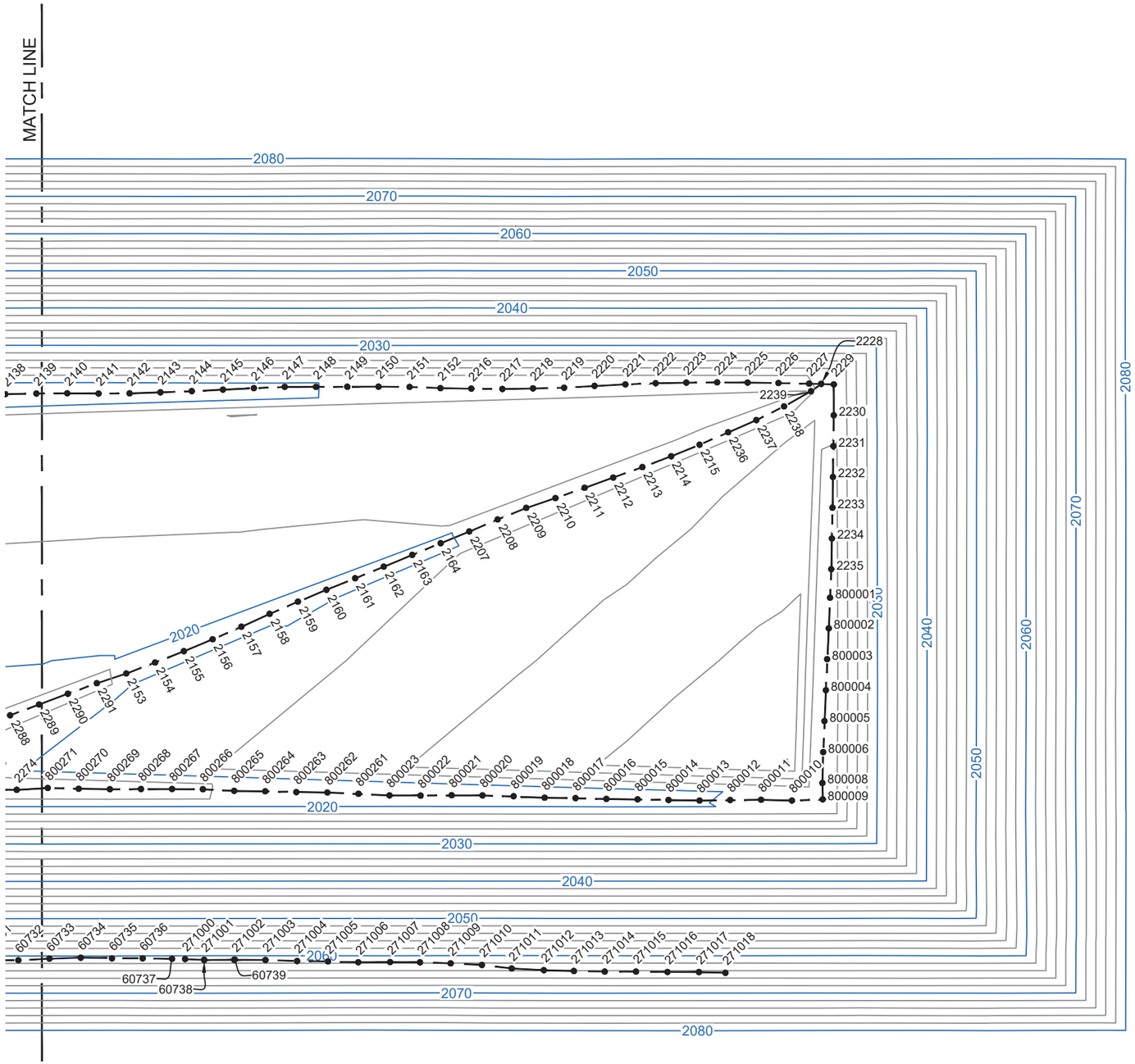


## LEGEND

- ASBUILT FG MAJOR
- ASBUILT FG MINOR
- ● POINT # — ASBUILT VERIFICATION POINT

INTERSTATE ENGINEERING SURVEY NOTES:

1. Basis of Bearings: NAD27, North Dakota State Plane, South Zone (US Survey Feet)
2. Located in Section 5, Township 141 North, Range 83 West, 5th P.M., Oliver County, North Dakota

0 50' 100'
HORIZONTAL SCALE IN FEET

MATTHEW WEEKS
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NORTH DAKOTA

| Rev No | Date | By | Description |
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| | | | |

Cell 5 Phase 1B
Baranko Brothers
Minnkota - Milton Young Station

# Pipe Verifications

Drawn By: C. KNOLL
Checked By: MKT
Surveyed By: LPB
Designed By: MKT
Project No: CR22-08-027.01
Date: 10/26/23


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| 8" Perforated Pipe Verification Points | | | | | Rock Coverage Verification Points | | | | | Rock Depth |
|---|---|---|---|---|---|---|---|---|---|---|
| Point # | Northing | Easting | Elevation | Description | Point # | Northing | Easting | Elevation | Description | |
| 2000 | 505465.89 | 1820025.44 | 2010.13 | PIPE*TEE-18.5IN TO INV | 2206 | 505467.09 | 1820024.00 | 2016.08 | CHK*ROCK 2023-10-06 | 5.954 |
| 2001 | 505468.64 | 1820022.82 | 2010.06 | PIPE*TEE-18.5IN TO INV | | | | | | |
| 2002 | 505462.54 | 1820028.97 | 2010.23 | PIPE*45-18.5IN TO INV | | | | | | |
| 2003 | 505461.83 | 1820043.17 | 2010.25 | PIPE*18.5IN TO INV | | | | | | |
| 2004 | 505461.93 | 1820057.91 | 2010.25 | PIPE*90-18.5IN TO INV | 2205 | 505461.89 | 1820058.01 | 2016.15 | CHK*ROCK 2023-10-06 | 5.896 |
| 2005 | 505481.44 | 1820058.26 | 2010.39 | PIPE*18.5IN TO INV | | | | | | |
| 2006 | 505472.15 | 1820019.46 | 2010.17 | PIPE*45-18.5IN TO INV | | | | | | |
| 2008 | 505501.98 | 1820057.42 | 2010.42 | PIPE*90-18.5IN TO INV | 2204 | 505501.95 | 1820057.49 | 2016.09 | CHK*ROCK 2023-10-06 | 5.672 |
| 2011 | 505501.60 | 1820038.07 | 2010.27 | PIPE*18.5IN TO INV | | | | | | |
| 2012 | 505500.63 | 1820019.83 | 2010.27 | PIPE*90-18.5IN TO INV | 2203 | 505500.59 | 1820019.77 | 2016.16 | CHK*ROCK 2023-10-06 | 5.885 |
| 2013 | 505484.47 | 1820019.01 | 2010.18 | PIPE*18.5IN TO INV | | | | | | |
| 2014 | 505454.60 | 1820009.29 | 2014.09 | PIPE*18.5IN TO INV | | | | | | |
| 2015 | 505452.60 | 1820011.27 | 2014.13 | PIPE*18.5IN TO INV | | | | | | |
| 2016 | 505440.53 | 1819996.40 | 2018.63 | PIPE*18.5IN TO INV | | | | | | |
| 2017 | 505439.23 | 1819997.71 | 2018.53 | PIPE*18.5IN TO INV | | | | | | |
| 2018 | 505427.28 | 1819983.11 | 2022.97 | PIPE*18.5IN TO INV | | | | | | |
| 2019 | 505425.99 | 1819984.54 | 2022.90 | PIPE*18.5IN TO INV | | | | | | |
| 2020 | 505414.24 | 1819969.97 | 2027.33 | PIPE*18.5IN TO INV | | | | | | |
| 2021 | 505413.14 | 1819971.31 | 2027.30 | PIPE*18.5IN TO INV | | | | | | |
| 2022 | 505401.30 | 1819956.72 | 2031.55 | PIPE*18.5IN TO INV | | | | | | |
| 2023 | 505400.16 | 1819958.01 | 2031.54 | PIPE*18.5IN TO INV | | | | | | |
| 2024 | 505387.89 | 1819943.28 | 2036.14 | PIPE*18.5IN TO INV | | | | | | |
| 2025 | 505386.91 | 1819944.50 | 2036.07 | PIPE*18.5IN TO INV | | | | | | |
| 2026 | 505374.88 | 1819930.12 | 2040.49 | PIPE*18.5IN TO INV | | | | | | |
| 2027 | 505373.76 | 1819931.54 | 2040.39 | PIPE*18.5IN TO INV | | | | | | |
| 2028 | 505501.15 | 1820019.65 | 2009.78 | PIPE*8IN-TIE IN | | | | | | |
| 2029 | 505502.56 | 1820057.40 | 2010.63 | PIPE*8IN-TIE IN | | | | | | |
| 2030 | 505462.26 | 1820058.44 | 2010.10 | PIPE*8IN-TIE IN | | | | | | |
| 2031 | 505516.20 | 1820068.44 | 2014.62 | PIPE*8IN TOP | 2067 | 505516.25 | 1820068.48 | 2016.32 | CHK*ROCK 2023-09-15 | 1.70 |
| 2032 | 505525.95 | 1820090.95 | 2015.19 | PIPE*8IN TOP | 2066 | 505526.11 | 1820090.92 | 2016.72 | CHK*ROCK 2023-09-15 | 1.53 |
| 2033 | 505536.89 | 1820113.59 | 2015.24 | PIPE*8IN TOP | 2065 | 505536.90 | 1820113.51 | 2016.88 | CHK*ROCK 2023-09-15 | 1.64 |
| 2034 | 505547.96 | 1820135.17 | 2015.46 | PIPE*8IN TOP | 2064 | 505547.94 | 1820135.10 | 2017.14 | CHK*ROCK 2023-09-15 | 1.68 |
| 2035 | 505560.20 | 1820157.14 | 2015.59 | PIPE*8IN TOP | 2063 | 505560.28 | 1820157.04 | 2017.42 | CHK*ROCK 2023-09-15 | 1.83 |
| 2036 | 505572.45 | 1820178.79 | 2015.87 | PIPE*8IN TOP | 2062 | 505572.52 | 1820178.82 | 2017.57 | CHK*ROCK 2023-09-15 | 1.70 |
| 2037 | 505584.81 | 1820200.53 | 2016.02 | PIPE*8IN TOP | 2061 | 505584.76 | 1820200.53 | 2017.72 | CHK*ROCK 2023-09-15 | 1.70 |
| 2038 | 505597.07 | 1820222.04 | 2016.23 | PIPE*8IN TOP | 2060 | 505597.17 | 1820222.10 | 2017.75 | CHK*ROCK 2023-09-15 | 1.52 |
| 2039 | 505609.64 | 1820244.10 | 2016.41 | PIPE*8IN TOP | 2059 | 505609.70 | 1820243.98 | 2017.92 | CHK*ROCK 2023-09-15 | 1.51 |
| 2040 | 505622.17 | 1820266.83 | 2016.59 | PIPE*8IN TOP | 2058 | 505622.32 | 1820266.83 | 2018.14 | CHK*ROCK 2023-09-15 | 1.55 |
| 2041 | 505634.14 | 1820288.66 | 2016.86 | PIPE*8IN TOP | 2057 | 505634.25 | 1820288.63 | 2018.42 | CHK*ROCK 2023-09-15 | 1.56 |
| 2042 | 505645.38 | 1820310.43 | 2016.95 | PIPE*8IN TOP | 2056 | 505645.51 | 1820310.42 | 2018.49 | CHK*ROCK 2023-09-15 | 1.54 |
| 2043 | 505656.92 | 1820333.19 | 2017.19 | PIPE*8IN TOP | 2055 | 505656.91 | 1820333.20 | 2018.75 | CHK*ROCK 2023-09-15 | 1.56 |
| 2044 | 505668.70 | 1820355.52 | 2017.45 | PIPE*8IN TOP | 2054 | 505668.75 | 1820355.50 | 2019.08 | CHK*ROCK 2023-09-15 | 1.63 |
| 2045 | 505680.27 | 1820376.96 | 2017.57 | PIPE*8IN TOP | 2053 | 505680.42 | 1820377.12 | 2019.14 | CHK*ROCK 2023-09-15 | 1.57 |
| 2046 | 505692.68 | 1820399.43 | 2017.86 | PIPE*8IN TOP | 2052 | 505692.75 | 1820399.41 | 2019.41 | CHK*ROCK 2023-09-15 | 1.55 |
| 2047 | 505705.18 | 1820421.19 | 2018.16 | PIPE*8IN TOP | 2051 | 505705.12 | 1820421.13 | 2019.77 | CHK*ROCK 2023-09-15 | 1.61 |
| 2048 | 505718.51 | 1820444.49 | 2018.30 | PIPE*8IN TOP | 2050 | 505718.52 | 1820444.42 | 2019.93 | CHK*ROCK 2023-09-15 | 1.63 |
| 2049 | 505727.99 | 1820461.31 | 2018.60 | PIPE*8IN TOP | 2165 | 505728.00 | 1820461.23 | 2020.15 | CHK*ROCK 2023-10-06 | 1.55 |
| 2068 | 505519.92 | 1820009.34 | 2014.81 | PIPE*8IN TOP | 2202 | 505519.97 | 1820009.30 | 2016.84 | CHK*ROCK 2023-10-06 | 2.03 |
| 2069 | 505545.05 | 1820007.18 | 2015.28 | PIPE*8IN TOP | 2091 | 505545.07 | 1820007.25 | 2016.98 | CHK*ROCK 2023-09-20 | 1.70 |
| 2070 | 505569.61 | 1820005.31 | 2015.33 | PIPE*8IN TOP | 2090 | 505569.70 | 1820005.38 | 2016.95 | CHK*ROCK 2023-09-20 | 1.62 |
| 2071 | 505593.96 | 1820004.32 | 2015.39 | PIPE*8IN TOP | 2089 | 505593.89 | 1820004.33 | 2017.03 | CHK*ROCK 2023-09-20 | 1.64 |
| 2072 | 505619.04 | 1820003.82 | 2015.54 | PIPE*8IN TOP | 2088 | 505619.11 | 1820003.89 | 2017.26 | CHK*ROCK 2023-09-20 | 1.72 |
| 2073 | 505643.85 | 1820003.10 | 2015.78 | PIPE*8IN TOP | 2087 | 505643.77 | 1820002.96 | 2017.34 | CHK*ROCK 2023-09-20 | 1.56 |
| 2074 | 505668.83 | 1820002.83 | 2015.85 | PIPE*8IN TOP | 2086 | 505668.66 | 1820002.95 | 2017.54 | CHK*ROCK 2023-09-20 | 1.69 |
| 2075 | 505693.88 | 1820002.51 | 2016.05 | PIPE*8IN TOP | 2085 | 505693.89 | 1820002.39 | 2017.83 | CHK*ROCK 2023-09-20 | 1.78 |
| 2076 | 505718.58 | 1820001.51 | 2016.29 | PIPE*8IN TOP | 2084 | 505718.53 | 1820001.52 | 2018.34 | CHK*ROCK 2023-09-20 | 2.05 |

MATTHEW WEEKS
REGISTERED LAND SURVEYOR
L.S. 3626
NORTH DAKOTA

| Rev No | Date | By | Description |
|---|---|---|---|
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Cell 5 Phase 1B
Baranko Brothers
Minnkota - Milton Young Station

# Pipe Verification Tables

Drawn By: C. KNOLL
Checked By: MKT
Surveyed By: LPB
Designed By: MKT
Project No: CR22-08-027.01
Date: 10/08/23

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| 8" Perforated Pipe Verification Points | | | | |
|---|---|---|---|---|
| Point # | Northing | Easting | Elevation | Description |
| 2077 | 505743.21 | 1820000.31 | 2016.37 | PIPE*8IN TOP |
| 2078 | 505747.28 | 1820000.27 | 2016.39 | PIPE*8IN TOP CORNER |
| 2079 | 505748.68 | 1820019.25 | 2016.44 | PIPE*8IN TOP |
| 2080 | 505750.30 | 1820038.88 | 2016.61 | PIPE*8IN TOP |
| 2092 | 505751.79 | 1820063.23 | 2016.63 | PIPE*8IN TOP |
| 2093 | 505752.79 | 1820087.26 | 2016.75 | PIPE*8IN TOP |
| 2094 | 505753.81 | 1820111.60 | 2016.90 | PIPE*8IN TOP |
| 2095 | 505754.02 | 1820136.71 | 2017.02 | PIPE*8IN TOP |
| 2096 | 505753.52 | 1820161.18 | 2017.06 | PIPE*8IN TOP |
| 2097 | 505752.79 | 1820186.34 | 2017.13 | PIPE*8IN TOP |
| 2098 | 505752.37 | 1820210.31 | 2017.19 | PIPE*8IN TOP |
| 2099 | 505751.87 | 1820235.58 | 2017.44 | PIPE*8IN TOP |
| 2100 | 505751.67 | 1820260.47 | 2017.56 | PIPE*8IN TOP |
| 2101 | 505751.51 | 1820285.22 | 2017.74 | PIPE*8IN TOP |
| 2102 | 505752.22 | 1820309.84 | 2017.80 | PIPE*8IN TOP |
| 2103 | 505753.27 | 1820335.76 | 2017.97 | PIPE*8IN TOP |
| 2104 | 505754.31 | 1820360.85 | 2017.96 | PIPE*8IN TOP |
| 2105 | 505755.27 | 1820385.42 | 2017.96 | PIPE*8IN TOP |
| 2106 | 505756.54 | 1820410.48 | 2018.13 | PIPE*8IN TOP |
| 2107 | 505757.91 | 1820435.37 | 2018.44 | PIPE*8IN TOP |
| 2108 | 505758.78 | 1820460.18 | 2018.67 | PIPE*8IN TOP |
| 2109 | 505759.65 | 1820484.68 | 2018.73 | PIPE*8IN TOP |
| 2130 | 505752.24 | 1820504.55 | 2018.76 | PIPE*8IN TOP |
| 2131 | 505759.53 | 1820510.09 | 2018.85 | PIPE*8IN TOP |
| 2132 | 505759.04 | 1820515.33 | 2019.12 | PIPE*8IN TOP WYE |
| 2133 | 505756.89 | 1820535.24 | 2019.16 | PIPE*8IN TOP |
| 2134 | 505755.69 | 1820560.10 | 2019.20 | PIPE*8IN TOP |
| 2135 | 505756.08 | 1820584.96 | 2019.25 | PIPE*8IN TOP |
| 2136 | 505757.32 | 1820609.84 | 2019.39 | PIPE*8IN TOP |
| 2137 | 505758.20 | 1820635.03 | 2019.59 | PIPE*8IN TOP |
| 2138 | 505758.78 | 1820660.03 | 2019.65 | PIPE*8IN TOP |
| 2139 | 505759.26 | 1820685.08 | 2019.74 | PIPE*8IN TOP |
| 2140 | 505759.47 | 1820709.87 | 2019.96 | PIPE*8IN TOP |
| 2141 | 505759.23 | 1820735.11 | 2020.05 | PIPE*8IN TOP |
| 2142 | 505759.37 | 1820760.09 | 2020.19 | PIPE*8IN TOP |
| 2143 | 505760.22 | 1820784.92 | 2020.23 | PIPE*8IN TOP |
| 2144 | 505761.15 | 1820810.16 | 2020.51 | PIPE*8IN TOP |
| 2145 | 505762.38 | 1820835.19 | 2020.56 | PIPE*8IN TOP |
| 2146 | 505763.57 | 1820860.09 | 2020.75 | PIPE*8IN TOP |
| 2147 | 505764.60 | 1820885.00 | 2020.92 | PIPE*8IN TOP |
| 2148 | 505764.62 | 1820910.07 | 2020.99 | PIPE*8IN TOP |
| 2149 | 505764.68 | 1820935.32 | 2021.19 | PIPE*8IN TOP |
| 2150 | 505764.81 | 1820960.37 | 2021.27 | PIPE*8IN TOP |
| 2151 | 505764.55 | 1820985.33 | 2021.35 | PIPE*8IN TOP |
| 2152 | 505763.62 | 1821010.17 | 2021.41 | PIPE*8IN TOP |
| 2153 | 505533.89 | 1820757.36 | 2019.07 | PIPE*8IN TOP |
| 2154 | 505542.76 | 1820780.64 | 2019.10 | PIPE*8IN TOP |
| 2155 | 505551.84 | 1820803.82 | 2019.36 | PIPE*8IN TOP |
| 2156 | 505561.45 | 1820826.89 | 2019.62 | PIPE*8IN TOP |
| 2157 | 505571.51 | 1820850.02 | 2019.66 | PIPE*8IN TOP |
| 2158 | 505581.88 | 1820872.75 | 2019.84 | PIPE*8IN TOP |
| 2159 | 505591.76 | 1820895.51 | 2020.05 | PIPE*8IN TOP |
| 2160 | 505601.32 | 1820918.50 | 2020.26 | PIPE*8IN TOP |
| 2161 | 505610.52 | 1820941.53 | 2020.36 | PIPE*8IN TOP |
| 2162 | 505619.89 | 1820964.65 | 2020.55 | PIPE*8IN TOP |
| 2163 | 505629.34 | 1820987.54 | 2020.69 | PIPE*8IN TOP |

| Rock Coverage Verification Points | | | | | Rock Depth |
|---|---|---|---|---|---|
| Point # | Northing | Easting | Elevation | Description | |
| 2083 | 505743.26 | 1820000.48 | 2018.57 | CHK*ROCK 2023-09-20 | 2.20 |
| 2082 | 505747.21 | 1820000.39 | 2018.29 | CHK*ROCK 2023-09-20 | 1.90 |
| 2081 | 505748.63 | 1820019.33 | 2018.49 | CHK*ROCK 2023-09-20 | 2.05 |
| 2111 | 505750.36 | 1820038.95 | 2018.23 | CHK*ROCK 2023-09-29 | 1.62 |
| 2112 | 505751.79 | 1820063.07 | 2018.16 | CHK*ROCK 2023-09-29 | 1.54 |
| 2113 | 505752.90 | 1820087.29 | 2018.36 | CHK*ROCK 2023-09-29 | 1.61 |
| 2114 | 505753.90 | 1820111.84 | 2018.53 | CHK*ROCK 2023-09-29 | 1.63 |
| 2115 | 505754.26 | 1820136.84 | 2018.58 | CHK*ROCK 2023-09-29 | 1.56 |
| 2116 | 505753.63 | 1820161.20 | 2018.67 | CHK*ROCK 2023-09-29 | 1.61 |
| 2117 | 505752.86 | 1820186.35 | 2018.68 | CHK*ROCK 2023-09-29 | 1.54 |
| 2118 | 505752.44 | 1820210.40 | 2019.02 | CHK*ROCK 2023-09-29 | 1.83 |
| 2119 | 505752.04 | 1820235.51 | 2018.97 | CHK*ROCK 2023-09-29 | 1.53 |
| 2120 | 505751.66 | 1820260.51 | 2019.17 | CHK*ROCK 2023-09-29 | 1.61 |
| 2121 | 505751.60 | 1820285.33 | 2019.31 | CHK*ROCK 2023-09-29 | 1.57 |
| 2122 | 505752.26 | 1820309.92 | 2019.57 | CHK*ROCK 2023-09-29 | 1.78 |
| 2123 | 505753.24 | 1820335.81 | 2019.48 | CHK*ROCK 2023-09-29 | 1.51 |
| 2124 | 505754.42 | 1820360.96 | 2019.63 | CHK*ROCK 2023-09-29 | 1.67 |
| 2125 | 505755.37 | 1820385.55 | 2019.60 | CHK*ROCK 2023-09-29 | 1.63 |
| 2126 | 505756.65 | 1820410.52 | 2019.86 | CHK*ROCK 2023-09-29 | 1.73 |
| 2127 | 505757.98 | 1820435.50 | 2020.05 | CHK*ROCK 2023-09-29 | 1.62 |
| 2128 | 505758.74 | 1820460.12 | 2020.22 | CHK*ROCK 2023-09-29 | 1.55 |
| 2168 | 505759.68 | 1820484.71 | 2020.54 | CHK*ROCK 2023-10-06 | 1.81 |
| 2169 | 505752.41 | 1820504.53 | 2020.65 | CHK*ROCK 2023-10-06 | 1.89 |
| 2170 | 505759.58 | 1820510.07 | 2020.76 | CHK*ROCK 2023-10-06 | 1.91 |
| 2171 | 505759.02 | 1820515.31 | 2020.86 | CHK*ROCK 2023-10-06 | 1.74 |
| 2172 | 505757.02 | 1820535.19 | 2021.01 | CHK*ROCK 2023-10-06 | 1.86 |
| 2173 | 505755.66 | 1820560.28 | 2021.01 | CHK*ROCK 2023-10-06 | 1.81 |
| 2174 | 505756.09 | 1820584.92 | 2021.14 | CHK*ROCK 2023-10-06 | 1.89 |
| 2175 | 505757.37 | 1820609.72 | 2021.39 | CHK*ROCK 2023-10-06 | 2.00 |
| 2176 | 505758.18 | 1820635.02 | 2021.44 | CHK*ROCK 2023-10-06 | 1.85 |
| 2177 | 505758.84 | 1820660.21 | 2021.51 | CHK*ROCK 2023-10-06 | 1.86 |
| 2178 | 505759.29 | 1820685.09 | 2021.49 | CHK*ROCK 2023-10-06 | 1.75 |
| 2179 | 505759.49 | 1820709.84 | 2021.70 | CHK*ROCK 2023-10-06 | 1.73 |
| 2180 | 505759.17 | 1820735.04 | 2022.23 | CHK*ROCK 2023-10-06 | 2.18 |
| 2181 | 505759.36 | 1820760.21 | 2022.17 | CHK*ROCK 2023-10-06 | 1.98 |
| 2182 | 505760.18 | 1820785.00 | 2022.29 | CHK*ROCK 2023-10-06 | 2.06 |
| 2183 | 505761.24 | 1820810.01 | 2022.31 | CHK*ROCK 2023-10-06 | 1.80 |
| 2184 | 505762.38 | 1820835.39 | 2022.36 | CHK*ROCK 2023-10-06 | 1.80 |
| 2185 | 505763.50 | 1820860.02 | 2022.50 | CHK*ROCK 2023-10-06 | 1.75 |
| 2186 | 505764.44 | 1820885.03 | 2022.97 | CHK*ROCK 2023-10-06 | 2.05 |
| 2187 | 505764.56 | 1820910.12 | 2022.84 | CHK*ROCK 2023-10-06 | 1.85 |
| 2188 | 505764.73 | 1820935.38 | 2023.19 | CHK*ROCK 2023-10-06 | 2.00 |
| 2189 | 505764.95 | 1820960.35 | 2022.81 | CHK*ROCK 2023-10-06 | 1.54 |
| 2190 | 505764.61 | 1820985.53 | 2023.07 | CHK*ROCK 2023-10-06 | 1.72 |
| 2260 | 505763.60 | 1821010.22 | 2022.98 | CHK*ROCK 2023-10-09 | 1.57 |
| 2342 | 505533.88 | 1820757.40 | 2020.61 | CHK*ROCK 2023-10-23 | 1.53 |
| 2201 | 505542.87 | 1820780.66 | 2020.84 | CHK*ROCK 2023-10-06 | 1.74 |
| 2200 | 505551.91 | 1820803.84 | 2021.06 | CHK*ROCK 2023-10-06 | 1.70 |
| 2199 | 505561.69 | 1820826.85 | 2021.52 | CHK*ROCK 2023-10-06 | 1.90 |
| 2198 | 505571.42 | 1820850.07 | 2021.50 | CHK*ROCK 2023-10-06 | 1.85 |
| 2197 | 505582.00 | 1820872.70 | 2022.00 | CHK*ROCK 2023-10-06 | 2.16 |
| 2196 | 505591.69 | 1820895.45 | 2022.10 | CHK*ROCK 2023-10-06 | 2.06 |
| 2195 | 505601.39 | 1820918.56 | 2022.04 | CHK*ROCK 2023-10-06 | 1.79 |
| 2194 | 505610.56 | 1820941.42 | 2022.30 | CHK*ROCK 2023-10-06 | 1.93 |
| 2193 | 505619.82 | 1820964.55 | 2022.52 | CHK*ROCK 2023-10-06 | 1.97 |
| 2192 | 505629.43 | 1820987.71 | 2022.62 | CHK*ROCK 2023-10-06 | 1.92 |

MATTHEW WEEKS
REGISTERED
LAND
SURVEYOR
L.S. 3626
NORTH DAKOTA

| Rev No | Date | By | Description |
|---|---|---|---|
| | | | |

Cell 5 Phase 1B
Baranko Brothers
Minnkota - Milton Young Station

Pipe Verification Tables

Drawn By: C. KNOLL | Surveyed By: LPB | Project No: CR22-08-027.01
Checked By: MKT | Designed By: MKT | Date: 10/08/23

Interstate Engineering
2610 Old Red Trail, Suite B
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Mandan, ND 58554
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| 8" Perforated Pipe Verification Points | | | | |
|---|---|---|---|---|
| Point # | Northing | Easting | Elevation | Description |
| 2207 | 505648.25 | 1821033.41 | 2021.00 | PIPE*8IN TOP |
| 2208 | 505657.88 | 1821056.28 | 2021.11 | PIPE*8IN TOP |
| 2209 | 505667.20 | 1821079.30 | 2021.24 | PIPE*8IN TOP |
| 2210 | 505675.12 | 1821102.80 | 2021.61 | PIPE*8IN TOP |
| 2211 | 505683.37 | 1821126.22 | 2021.66 | PIPE*8IN TOP |
| 2212 | 505691.64 | 1821149.25 | 2021.80 | PIPE*8IN TOP |
| 2213 | 505700.03 | 1821172.65 | 2021.96 | PIPE*8IN TOP |
| 2214 | 505708.75 | 1821195.87 | 2022.22 | PIPE*8IN TOP |
| 2215 | 505718.08 | 1821218.71 | 2022.34 | PIPE*8IN TOP |
| 2216 | 505763.16 | 1821035.10 | 2021.56 | PIPE*8IN TOP |
| 2217 | 505762.91 | 1821060.01 | 2021.70 | PIPE*8IN TOP |
| 2218 | 505763.35 | 1821084.70 | 2021.80 | PIPE*8IN TOP |
| 2219 | 505763.97 | 1821109.68 | 2022.07 | PIPE*8IN TOP |
| 2220 | 505765.34 | 1821134.19 | 2022.11 | PIPE*8IN TOP |
| 2221 | 505766.63 | 1821159.01 | 2022.22 | PIPE*8IN TOP |
| 2222 | 505767.56 | 1821183.39 | 2022.47 | PIPE*8IN TOP |
| 2223 | 505768.03 | 1821208.05 | 2022.56 | PIPE*8IN TOP |
| 2224 | 505768.21 | 1821232.81 | 2022.74 | PIPE*8IN TOP |
| 2225 | 505768.04 | 1821257.39 | 2022.82 | PIPE*8IN TOP |
| 2226 | 505767.68 | 1821282.13 | 2022.87 | PIPE*8IN TOP |
| 2227 | 505767.19 | 1821306.96 | 2023.02 | PIPE*8IN TOP |
| 2228 | 505766.99 | 1821316.59 | 2023.05 | PIPE*8IN TOP WYE |
| 2229 | 505766.52 | 1821326.78 | 2023.10 | PIPE*8IN TOP 90 |
| 2230 | 505741.69 | 1821326.67 | 2022.93 | PIPE*8IN TOP |
| 2231 | 505716.89 | 1821326.39 | 2022.89 | PIPE*8IN TOP |
| 2232 | 505692.08 | 1821326.01 | 2022.81 | PIPE*8IN TOP |
| 2233 | 505667.36 | 1821325.65 | 2022.64 | PIPE*8IN TOP |
| 2234 | 505642.58 | 1821325.17 | 2022.58 | PIPE*8IN TOP |
| 2235 | 505617.91 | 1821324.68 | 2022.35 | PIPE*8IN TOP |
| 2236 | 505727.99 | 1821241.68 | 2022.55 | PIPE*8IN TOP |
| 2237 | 505737.86 | 1821264.45 | 2022.63 | PIPE*8IN TOP |
| 2238 | 505748.92 | 1821286.70 | 2022.72 | PIPE*8IN TOP |
| 2239 | 505761.11 | 1821308.38 | 2022.96 | PIPE*8IN TOP |
| 2274 | 505440.28 | 1820669.27 | 2017.95 | PIPE*8IN TOP |
| 2275 | 505440.89 | 1820644.76 | 2017.83 | PIPE*8IN TOP |
| 2276 | 505440.78 | 1820619.84 | 2017.54 | PIPE*8IN TOP |
| 2277 | 505440.77 | 1820594.93 | 2017.43 | PIPE*8IN TOP |
| 2278 | 505441.03 | 1820569.99 | 2017.33 | PIPE*8IN TOP |
| 2279 | 505440.95 | 1820545.13 | 2017.18 | PIPE*8IN TOP |
| 2280 | 505441.59 | 1820520.33 | 2017.13 | PIPE*8IN TOP |
| 2281 | 505442.86 | 1820515.85 | 2017.09 | PIPE*8IN TOP WYE |
| 2282 | 505447.43 | 1820524.59 | 2017.22 | PIPE*8IN TOP |
| 2283 | 505456.86 | 1820547.60 | 2017.23 | PIPE*8IN TOP |
| 2284 | 505465.96 | 1820570.61 | 2017.31 | PIPE*8IN TOP |
| 2285 | 505474.81 | 1820593.84 | 2017.61 | PIPE*8IN TOP |
| 2286 | 505483.33 | 1820617.26 | 2017.72 | PIPE*8IN TOP |
| 2287 | 505491.91 | 1820640.59 | 2017.73 | PIPE*8IN TOP |
| 2288 | 505500.26 | 1820663.98 | 2017.88 | PIPE*8IN TOP |
| 2289 | 505509.01 | 1820687.23 | 2018.24 | PIPE*8IN TOP |
| 2290 | 505517.63 | 1820710.40 | 2018.58 | PIPE*8IN TOP |
| 2291 | 505526.04 | 1820733.72 | 2018.65 | PIPE*8IN TOP |
| 2292 | 505444.75 | 1820495.70 | 2017.06 | PIPE*8IN TOP |
| 2293 | 505446.24 | 1820470.27 | 2016.83 | PIPE*8IN TOP |
| 2294 | 505446.13 | 1820445.55 | 2016.64 | PIPE*8IN TOP |
| 2295 | 505445.49 | 1820420.81 | 2016.62 | PIPE*8IN TOP |
| 2296 | 505445.90 | 1820395.82 | 2016.48 | PIPE*8IN TOP |

| Rock Coverage Verification Points | | | | | Rock |
|---|---|---|---|---|---|
| Point # | Northing | Easting | Elevation | Description | Depth |
| 2248 | 505648.29 | 1821033.44 | 2022.76 | CHK*ROCK 2023-10-09 | 1.76 |
| 2247 | 505657.68 | 1821056.29 | 2023.06 | CHK*ROCK 2023-10-09 | 1.95 |
| 2246 | 505667.09 | 1821079.29 | 2023.16 | CHK*ROCK 2023-10-09 | 1.92 |
| 2245 | 505675.07 | 1821102.82 | 2023.26 | CHK*ROCK 2023-10-09 | 1.65 |
| 2244 | 505683.32 | 1821126.15 | 2023.55 | CHK*ROCK 2023-10-09 | 1.88 |
| 2243 | 505691.54 | 1821149.27 | 2023.67 | CHK*ROCK 2023-10-09 | 1.87 |
| 2242 | 505700.01 | 1821172.74 | 2023.63 | CHK*ROCK 2023-10-09 | 1.68 |
| 2241 | 505708.55 | 1821195.80 | 2023.86 | CHK*ROCK 2023-10-09 | 1.63 |
| 2240 | 505718.16 | 1821218.77 | 2024.06 | CHK*ROCK 2023-10-09 | 1.72 |
| 2259 | 505762.89 | 1821035.11 | 2023.33 | CHK*ROCK 2023-10-09 | 1.77 |
| 2258 | 505762.80 | 1821059.84 | 2023.27 | CHK*ROCK 2023-10-09 | 1.57 |
| 2257 | 505763.29 | 1821084.53 | 2023.45 | CHK*ROCK 2023-10-09 | 1.65 |
| 2256 | 505764.02 | 1821109.56 | 2023.71 | CHK*ROCK 2023-10-09 | 1.64 |
| 2255 | 505765.17 | 1821134.05 | 2023.63 | CHK*ROCK 2023-10-09 | 1.53 |
| 2254 | 505766.56 | 1821159.04 | 2023.73 | CHK*ROCK 2023-10-09 | 1.51 |
| 2253 | 505767.42 | 1821183.37 | 2024.05 | CHK*ROCK 2023-10-09 | 1.58 |
| 2252 | 505767.94 | 1821208.05 | 2024.30 | CHK*ROCK 2023-10-09 | 1.74 |
| 2251 | 505768.05 | 1821232.86 | 2024.28 | CHK*ROCK 2023-10-09 | 1.54 |
| 2250 | 505767.98 | 1821257.23 | 2024.40 | CHK*ROCK 2023-10-09 | 1.58 |
| 2271 | 505767.71 | 1821282.14 | 2024.38 | CHK*ROCK 2023-10-11 | 1.52 |
| 2269 | 505767.22 | 1821306.70 | 2024.56 | CHK*ROCK 2023-10-11 | 1.54 |
| 2268 | 505766.80 | 1821316.61 | 2024.96 | CHK*ROCK 2023-10-11 | 1.91 |
| 2267 | 505766.47 | 1821326.90 | 2025.11 | CHK*ROCK 2023-10-11 | 2.01 |
| 2266 | 505741.64 | 1821326.84 | 2024.60 | CHK*ROCK 2023-10-11 | 1.67 |
| 2265 | 505717.02 | 1821326.38 | 2024.92 | CHK*ROCK 2023-10-11 | 2.03 |
| 2264 | 505692.06 | 1821325.99 | 2024.42 | CHK*ROCK 2023-10-11 | 1.61 |
| 2263 | 505667.33 | 1821325.76 | 2024.27 | CHK*ROCK 2023-10-11 | 1.63 |
| 2262 | 505642.60 | 1821325.15 | 2024.17 | CHK*ROCK 2023-10-11 | 1.59 |
| 2261 | 505617.92 | 1821324.42 | 2023.93 | CHK*ROCK 2023-10-11 | 1.58 |
| 2249 | 505727.85 | 1821241.77 | 2024.21 | CHK*ROCK 2023-10-09 | 1.66 |
| 2273 | 505737.77 | 1821264.41 | 2024.16 | CHK*ROCK 2023-10-11 | 1.53 |
| 2272 | 505749.09 | 1821286.79 | 2024.33 | CHK*ROCK 2023-10-11 | 1.61 |
| 2270 | 505761.26 | 1821308.23 | 2024.49 | CHK*ROCK 2023-10-11 | 1.53 |
| 2347 | 505440.34 | 1820669.24 | 2019.52 | CHK*ROCK 2023-10-23 | 1.57 |
| 2352 | 505440.77 | 1820644.81 | 2019.40 | CHK*ROCK 2023-10-23 | 1.57 |
| 2351 | 505440.99 | 1820619.96 | 2019.28 | CHK*ROCK 2023-10-23 | 1.74 |
| 2350 | 505440.84 | 1820595.11 | 2018.97 | CHK*ROCK 2023-10-23 | 1.54 |
| 2349 | 505440.94 | 1820569.95 | 2019.09 | CHK*ROCK 2023-10-23 | 1.76 |
| 2348 | 505440.80 | 1820545.17 | 2018.78 | CHK*ROCK 2023-10-23 | 1.60 |
| 2331 | 505441.45 | 1820520.42 | 2018.73 | CHK*ROCK 2023-10-23 | 1.60 |
| 2330 | 505442.97 | 1820515.73 | 2018.61 | CHK*ROCK 2023-10-23 | 1.52 |
| 2332 | 505447.04 | 1820524.51 | 2018.79 | CHK*ROCK 2023-10-23 | 1.58 |
| 2333 | 505456.90 | 1820547.54 | 2018.82 | CHK*ROCK 2023-10-23 | 1.60 |
| 2334 | 505465.74 | 1820570.55 | 2019.13 | CHK*ROCK 2023-10-23 | 1.82 |
| 2335 | 505474.78 | 1820593.86 | 2019.16 | CHK*ROCK 2023-10-23 | 1.55 |
| 2336 | 505483.29 | 1820617.11 | 2019.29 | CHK*ROCK 2023-10-23 | 1.57 |
| 2337 | 505491.88 | 1820640.41 | 2019.25 | CHK*ROCK 2023-10-23 | 1.52 |
| 2338 | 505500.30 | 1820663.89 | 2019.59 | CHK*ROCK 2023-10-23 | 1.71 |
| 2339 | 505508.93 | 1820687.17 | 2019.87 | CHK*ROCK 2023-10-23 | 1.63 |
| 2340 | 505517.61 | 1820710.46 | 2020.15 | CHK*ROCK 2023-10-23 | 1.56 |
| 2341 | 505526.14 | 1820733.76 | 2020.31 | CHK*ROCK 2023-10-23 | 1.66 |
| 2329 | 505444.49 | 1820495.60 | 2018.61 | CHK*ROCK 2023-10-23 | 1.55 |
| 2328 | 505446.47 | 1820470.28 | 2018.43 | CHK*ROCK 2023-10-23 | 1.60 |
| 2327 | 505446.13 | 1820445.45 | 2018.48 | CHK*ROCK 2023-10-23 | 1.84 |
| 2326 | 505445.52 | 1820420.80 | 2018.29 | CHK*ROCK 2023-10-23 | 1.67 |
| 2325 | 505445.88 | 1820395.87 | 2018.08 | CHK*ROCK 2023-10-23 | 1.60 |

MATTHEW WEEKS
REGISTERED
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SURVEYOR
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NORTH DAKOTA

| Rev No | Date | By | Description |
|---|---|---|---|
| | | | |

Cell 5 Phase 1B
Baranko Brothers
Minnkota - Milton Young Station

# Pipe Verification Tables

Drawn By: C. KNOLL
Checked By: MKT
Surveyed By: LPB
Designed By: MKT
Project No: CR22-08-027.01
Date: 10/08/23

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| 8" Perforated Pipe Verification Points | | | | | Rock Coverage Verification Points | | | | | Rock |
|---|---|---|---|---|---|---|---|---|---|---|
| Point # | Northing | Easting | Elevation | Description | Point # | Northing | Easting | Elevation | Description | Depth |
| 2298 | 505447.16 | 1820346.37 | 2016.23 | PIPE*8IN TOP | 2323 | 505447.28 | 1820346.49 | 2017.92 | CHK*ROCK 2023-10-23 | 1.69 |
| 2299 | 505447.23 | 1820321.55 | 2016.16 | PIPE*8IN TOP | 2322 | 505447.03 | 1820321.56 | 2017.76 | CHK*ROCK 2023-10-23 | 1.60 |
| 2300 | 505447.83 | 1820296.72 | 2016.11 | PIPE*8IN TOP | 2321 | 505447.83 | 1820296.75 | 2017.73 | CHK*ROCK 2023-10-23 | 1.62 |
| 2301 | 505448.24 | 1820271.84 | 2015.77 | PIPE*8IN TOP | 2320 | 505448.18 | 1820271.90 | 2017.72 | CHK*ROCK 2023-10-23 | 1.95 |
| 2302 | 505448.95 | 1820247.01 | 2015.76 | PIPE*8IN TOP | 2319 | 505448.84 | 1820246.87 | 2017.39 | CHK*ROCK 2023-10-23 | 1.63 |
| 2303 | 505449.51 | 1820222.27 | 2015.75 | PIPE*8IN TOP | 2318 | 505449.33 | 1820222.22 | 2017.35 | CHK*ROCK 2023-10-23 | 1.60 |
| 2304 | 505449.24 | 1820197.36 | 2015.72 | PIPE*8IN TOP | 2317 | 505449.27 | 1820197.37 | 2017.37 | CHK*ROCK 2023-10-23 | 1.65 |
| 2305 | 505449.29 | 1820172.60 | 2015.43 | PIPE*8IN TOP | 2316 | 505449.19 | 1820172.78 | 2016.97 | CHK*ROCK 2023-10-23 | 1.54 |
| 2306 | 505449.01 | 1820147.79 | 2015.32 | PIPE*8IN TOP | 2315 | 505448.87 | 1820147.81 | 2016.83 | CHK*ROCK 2023-10-23 | 1.51 |
| 2307 | 505448.87 | 1820122.97 | 2015.26 | PIPE*8IN TOP | 2314 | 505448.73 | 1820123.10 | 2016.79 | CHK*ROCK 2023-10-23 | 1.53 |
| 2308 | 505449.05 | 1820098.09 | 2015.26 | PIPE*8IN TOP | 2313 | 505449.25 | 1820097.98 | 2016.82 | CHK*ROCK 2023-10-23 | 1.56 |
| 2309 | 505449.47 | 1820084.43 | 2014.99 | PIPE*8IN TOP BEND | 2312 | 505449.66 | 1820084.66 | 2016.50 | CHK*ROCK 2023-10-23 | 1.51 |
| 2310 | 505454.25 | 1820074.77 | 2014.57 | PIPE*8IN TOP BEND | 2311 | 505453.84 | 1820074.84 | 2016.47 | CHK*ROCK 2023-10-23 | 1.90 |
| 2353 | 505357.14 | 1819912.68 | 2046.90 | PIPE*TOP OF CONC | | | | | | |
| 2354 | 505356.00 | 1819913.85 | 2046.87 | PIPE*TOP OF CONC | | | | | | |
| 2355 | 505339.80 | 1819895.06 | 2052.75 | PIPE*TOP OF CONC | | | | | | |
| 2356 | 505338.43 | 1819896.30 | 2052.72 | PIPE*TOP OF CONC | | | | | | |
| 2357 | 505320.74 | 1819878.94 | 2058.56 | PIPE*TOP OF CONC | | | | | | |
| 2358 | 505322.12 | 1819877.49 | 2058.56 | PIPE*TOP OF CONC | | | | | | |
| 2359 | 505304.85 | 1819860.40 | 2064.31 | PIPE*TOP OF CONC | | | | | | |
| 2360 | 505303.44 | 1819861.89 | 2064.25 | PIPE*TOP OF CONC | | | | | | |
| 2361 | 505285.82 | 1819844.25 | 2070.13 | PIPE*TOP OF CONC | | | | | | |
| 2362 | 505287.14 | 1819843.09 | 2070.17 | PIPE*TOP OF CONC | | | | | | |
| 2363 | 505269.93 | 1819825.07 | 2076.06 | PIPE*TOP OF CONC | | | | | | |
| 2364 | 505268.56 | 1819826.47 | 2076.00 | PIPE*TOP OF CONC | | | | | | |
| 2365 | 505250.94 | 1819808.90 | 2081.92 | PIPE*TOP OF CONC | | | | | | |
| 2366 | 505252.39 | 1819807.26 | 2081.97 | PIPE*TOP OF CONC | | | | | | |
| 2367 | 505245.66 | 1819800.81 | 2083.19 | PIPE*TOP | | | | | | |
| 2368 | 505244.29 | 1819802.54 | 2083.18 | PIPE*TOP | | | | | | |
| 2369 | 505240.89 | 1819799.21 | 2084.20 | PIPE*TOP-END | | | | | | |
| 2370 | 505242.50 | 1819797.66 | 2084.13 | PIPE*TOP-END | | | | | | |
| 800001 | 505594.89 | 1821323.69 | 2022.10 | SPOT* TOP OF PIPE | 810000 | 505595.22 | 1821323.98 | 2024.00 | SPOT* TOP OF ROCK | 1.90 |
| 800002 | 505570.23 | 1821322.65 | 2022.16 | SPOT* TOP OF PIPE | 810001 | 505570.78 | 1821322.74 | 2023.87 | SPOT* TOP OF ROCK | 1.71 |
| 800003 | 505545.38 | 1821321.35 | 2021.94 | SPOT* TOP OF PIPE | 810002 | 505545.91 | 1821321.66 | 2023.55 | SPOT* TOP OF ROCK | 1.61 |
| 800004 | 505520.48 | 1821320.32 | 2021.67 | SPOT* TOP OF PIPE | 810003 | 505521.19 | 1821320.22 | 2023.50 | SPOT* TOP OF ROCK | 1.83 |
| 800005 | 505495.63 | 1821319.22 | 2021.69 | SPOT* TOP OF PIPE | 810004 | 505495.23 | 1821318.65 | 2023.81 | SPOT* TOP OF ROCK | 2.12 |
| 800006 | 505470.65 | 1821318.15 | 2021.67 | SPOT* TOP OF PIPE | 810005 | 505470.69 | 1821317.85 | 2023.35 | SPOT* TOP OF ROCK | 1.68 |
| 800008 | 505445.75 | 1821317.56 | 2021.35 | SPOT* TOP OF PIPE | 810006 | 505445.91 | 1821317.57 | 2023.03 | SPOT* TOP OF ROCK | 1.68 |
| 800009 | 505432.59 | 1821317.80 | 2021.26 | SPOT* TOP OF PIPE 90 | 810007 | 505432.51 | 1821317.43 | 2023.13 | SPOT* TOP OF ROCK | 1.87 |
| 800010 | 505431.65 | 1821293.02 | 2021.16 | SPOT* TOP OF PIPE | 810008 | 505431.71 | 1821293.16 | 2022.99 | SPOT* TOP OF ROCK | 1.84 |
| 800011 | 505432.24 | 1821268.25 | 2020.98 | SPOT* TOP OF PIPE | 810009 | 505431.96 | 1821267.56 | 2022.45 | SPOT* TOP OF ROCK | 1.47 |
| 800012 | 505432.03 | 1821243.32 | 2020.95 | SPOT* TOP OF PIPE | 810010 | 505432.32 | 1821244.29 | 2022.85 | SPOT* TOP OF ROCK | 1.89 |
| 800013 | 505431.69 | 1821218.74 | 2020.86 | SPOT* TOP OF PIPE | 810011 | 505431.32 | 1821219.68 | 2022.77 | SPOT* TOP OF ROCK | 1.91 |
| 800014 | 505432.12 | 1821193.75 | 2020.71 | SPOT* TOP OF PIPE | 810012 | 505431.81 | 1821194.18 | 2022.39 | SPOT* TOP OF ROCK | 1.68 |
| 800015 | 505432.62 | 1821168.84 | 2020.59 | SPOT* TOP OF PIPE | 810013 | 505432.44 | 1821167.91 | 2022.27 | SPOT* TOP OF ROCK | 1.68 |
| 800016 | 505432.94 | 1821143.77 | 2020.48 | SPOT* TOP OF PIPE | 810014 | 505433.74 | 1821144.33 | 2022.28 | SPOT* TOP OF ROCK | 1.80 |
| 800017 | 505433.66 | 1821118.96 | 2020.35 | SPOT* TOP OF PIPE | 810015 | 505434.02 | 1821119.09 | 2022.34 | SPOT* TOP OF ROCK | 1.99 |
| 800018 | 505433.95 | 1821094.01 | 2020.23 | SPOT* TOP OF PIPE | 810016 | 505434.37 | 1821093.38 | 2021.75 | SPOT* TOP OF ROCK | 1.52 |
| 800019 | 505435.14 | 1821069.10 | 2020.01 | SPOT* TOP OF PIPE | 810017 | 505435.24 | 1821068.70 | 2021.63 | SPOT* TOP OF ROCK | 1.62 |
| 800020 | 505435.83 | 1821044.06 | 2019.99 | SPOT* TOP OF PIPE | 810018 | 505435.80 | 1821045.41 | 2021.60 | SPOT* TOP OF ROCK | 1.62 |
| 800021 | 505435.87 | 1821019.31 | 2019.86 | SPOT* TOP OF PIPE | 810019 | 505436.24 | 1821019.02 | 2021.72 | SPOT* TOP OF ROCK | 1.86 |
| 800022 | 505435.67 | 1820994.26 | 2019.72 | SPOT* TOP OF PIPE | 810020 | 505435.59 | 1820994.96 | 2021.42 | SPOT* TOP OF ROCK | 1.71 |
| 800023 | 505435.81 | 1820969.19 | 2019.55 | SPOT* TOP OF PIPE | 810021 | 505436.56 | 1820968.78 | 2021.53 | SPOT* TOP OF ROCK | 1.98 |
| 800261 | 505437.16 | 1820944.31 | 2019.48 | SPOT* TOP OF PIPE | 810022 | 505436.32 | 1820943.96 | 2021.13 | SPOT* TOP OF ROCK | 1.65 |
| 800262 | 505438.14 | 1820919.22 | 2019.24 | SPOT* TOP OF PIPE | 810023 | 505437.72 | 1820918.85 | 2021.02 | SPOT* TOP OF ROCK | 1.78 |

MATTHEW WEEKS
REGISTERED LAND SURVEYOR L.S. 3626
NORTH DAKOTA

| Rev No | Date | By | Description |
|---|---|---|---|
| | | | |

Cell 5 Phase 1B
Baranko Brothers
Minnkota - Milton Young Station

# Pipe Verification Tables

Drawn By: C. KNOLL | Surveyed By: LPB | Project No: CR22-08-027.01
Checked By: MKT | Designed By: MKT | Date: 10/08/23

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## Hagel Bed Riser Pipe Verification Points

| Point # | Northing | Easting | Elevation | Description |
|---|---|---|---|---|
| 60125 | 505337.59 | 1819685.01 | 2098.09 | SPOT* TOP OF PIPE |
| 60126 | 505334.92 | 1819748.04 | 2081.08 | SPOT* TOP OF PIPE |
| 60127 | 505332.02 | 1819807.71 | 2061.69 | SPOT* TOP OF PIPE |
| 60128 | 505330.45 | 1819863.50 | 2041.68 | SPOT* TOP OF PIPE |
| 60129 | 505327.51 | 1819868.78 | 2041.92 | SPOT* TOP OF PIPE |
| 60130 | 505323.12 | 1819884.95 | 2041.93 | SPOT* TOP OF PIPE |
| 60131 | 505307.07 | 1819958.05 | 2042.26 | SPOT* TOP OF PIPE |
| 60132 | 505307.89 | 1819994.61 | 2042.23 | SPOT* TOP OF PIPE |
| 60133 | 505308.20 | 1820036.03 | 2042.33 | SPOT* TOP OF PIPE |
| 60134 | 505308.76 | 1820080.30 | 2042.37 | SPOT* TOP OF PIPE |
| 60135 | 505308.37 | 1820126.66 | 2042.55 | SPOT* TOP OF PIPE |
| 60136 | 505309.00 | 1820172.22 | 2042.68 | SPOT* TOP OF PIPE |
| 60350 | 505309.07 | 1820175.26 | 2042.64 | SPOT*TOP OF PIPE |
| 60351 | 505309.20 | 1820197.31 | 2042.59 | SPOT*TOP OF PIPE |
| 60352 | 505308.97 | 1820229.80 | 2042.63 | SPOT*TOP OF PIPE |
| 60353 | 505308.29 | 1820279.79 | 2042.78 | SPOT*TOP OF PIPE |
| 60354 | 505307.93 | 1820326.85 | 2042.91 | SPOT*TOP OF PIPE |
| 60355 | 505307.70 | 1820364.83 | 2043.18 | SPOT*TOP OF PIPE |
| 60356 | 505306.46 | 1820411.21 | 2043.33 | SPOT*TOP OF PIPE |
| 60357 | 505306.10 | 1820446.66 | 2043.52 | SPOT*TOP OF PIPE |
| 60728 | 505304.87 | 1820545.80 | 2044.10 | SPOT*TOP OF PIPE |
| 60729 | 505304.40 | 1820570.32 | 2044.61 | SPOT*TOP OF PIPE |
| 60730 | 505303.49 | 1820620.03 | 2044.86 | SPOT*TOP OF PIPE |
| 60731 | 505303.37 | 1820645.07 | 2045.04 | SPOT*TOP OF PIPE |
| 60732 | 505303.05 | 1820670.54 | 2045.17 | SPOT*TOP OF PIPE |
| 60733 | 505304.39 | 1820695.61 | 2045.33 | SPOT*TOP OF PIPE |
| 60734 | 505305.16 | 1820720.85 | 2045.53 | SPOT*TOP OF PIPE |
| 60735 | 505304.65 | 1820745.88 | 2045.67 | SPOT*TOP OF PIPE |
| 60736 | 505304.66 | 1820770.668 | 2045.75 | SPOT*TOP OF PIPE |
| 60737 | 505304.22 | 1820794.29 | 2045.95 | SPOT*TOP OF PIPE |
| 60738 | 505303.33 | 1820820.09 | 2046.36 | SPOT*TOP OF PIPE |
| 60739 | 505303.46 | 1820844.32 | 2046.63 | SPOT*TOP OF PIPE |
| 271000 | 505304.05 | 1820804.77 | 2046.05 | TOP OF PIPE |
| 271001 | 505303.50 | 1820820.11 | 2046.36 | TOP OF PIPE |
| 271002 | 505303.57 | 1820844.70 | 2046.65 | TOP OF PIPE |
| 271003 | 505303.35 | 1820869.47 | 2046.97 | TOP OF PIPE |
| 271004 | 505302.49 | 1820894.87 | 2047.31 | TOP OF PIPE |
| 271005 | 505302.12 | 1820919.71 | 2048.28 | TOP OF PIPE |
| 271006 | 505301.53 | 1820944.12 | 2048.78 | TOP OF PIPE |
| 271007 | 505301.61 | 1820969.71 | 2049.10 | TOP OF PIPE |
| 271008 | 505301.44 | 1820993.83 | 2049.87 | TOP OF PIPE |
| 271009 | 505300.68 | 1821018.43 | 2050.63 | TOP OF PIPE |
| 271010 | 505299.36 | 1821043.62 | 2051.21 | TOP OF PIPE |
| 271011 | 505296.53 | 1821067.57 | 2051.27 | TOP OF PIPE |
| 271012 | 505295.11 | 1821093.48 | 2051.35 | TOP OF PIPE |
| 271013 | 505294.42 | 1821117.64 | 2051.48 | TOP OF PIPE |
| 271014 | 505294.01 | 1821142.44 | 2051.50 | TOP OF PIPE |
| 271015 | 505293.97 | 1821167.58 | 2051.57 | TOP OF PIPE |
| 271016 | 505293.66 | 1821192.90 | 2051.73 | TOP OF PIPE |
| 271017 | 505293.60 | 1821218.23 | 2051.91 | TOP OF PIPE |
| 271018 | 505293.03 | 1821239.48 | 2052.07 | TOP OF PIPE |

## 8" Perforated Pipe Verification Points

| Point # | Northing | Easting | Elevation | Description |
|---|---|---|---|---|
| 800264 | 505439.07 | 1820869.20 | 2019.06 | SPOT* TOP OF PIPE |
| 800265 | 505439.48 | 1820844.26 | 2019.05 | SPOT* TOP OF PIPE |
| 800266 | 505440.72 | 1820819.04 | 2018.89 | SPOT* TOP OF PIPE |
| 800267 | 505440.96 | 1820794.23 | 2018.81 | SPOT* TOP OF PIPE |
| 800268 | 505440.90 | 1820769.28 | 2018.55 | SPOT* TOP OF PIPE |
| 800269 | 505440.72 | 1820744.22 | 2018.48 | SPOT* TOP OF PIPE |
| 800270 | 505441.17 | 1820719.17 | 2018.28 | SPOT* TOP OF PIPE |
| 800271 | 505441.70 | 1820694.25 | 2018.22 | SPOT* TOP OF PIPE |

## Rock Coverage Verification Points

| Point # | Northing | Easting | Elevation | Description | Rock Depth |
|---|---|---|---|---|---|
| 810025 | 505438.97 | 1820868.92 | 2020.61 | SPOT* TOP OF ROCK | 1.55 |
| 810026 | 505439.22 | 1820842.96 | 2020.56 | SPOT* TOP OF ROCK | 1.52 |
| 810027 | 505439.89 | 1820818.95 | 2020.49 | SPOT* TOP OF ROCK | 1.59 |
| 810028 | 505440.13 | 1820794.83 | 2020.42 | SPOT* TOP OF ROCK | 1.61 |
| 2343 | 505440.80 | 1820769.39 | 2020.10 | CHK*ROCK 2023-10-23 | 1.55 |
| 2344 | 505440.63 | 1820744.26 | 2020.17 | CHK*ROCK 2023-10-23 | 1.69 |
| 2345 | 505440.80 | 1820719.29 | 2019.89 | CHK*ROCK 2023-10-23 | 1.61 |
| 2346 | 505441.59 | 1820694.22 | 2019.83 | CHK*ROCK 2023-10-23 | 1.62 |

MATTHEW WEEKS
REGISTERED LAND SURVEYOR
L.S. 3626
NORTH DAKOTA

| Rev No | Date | By | Description |
|---|---|---|---|
| | | | |

Cell 5 Phase 1B
Baranko Brothers
Minnkota - Milton Young Station

# Pipe Verification Tables

Drawn By: C. KNOLL
Checked By: MKT
Surveyed By: LPB
Designed By: MKT
Project No: CR22-08-027.01
Date: 10/26/23

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| Blowdown Pipe 1A | | | | |
|---|---|---|---|---|
| Point # | Northing | Easting | Elevation | Description |
| 800046 | 505885.79 | 1819870.91 | 2063.99 | SPOT* TOP 1A |
| 800047 | 505908.89 | 1819846.61 | 2072.25 | SPOT* TOP 1A |
| 800054 | 505933.07 | 1819821.87 | 2080.26 | SPOT* TOP 1A |
| 800055 | 505944.71 | 1819810.82 | 2082.79 | SPOT* TOP 1A |
| 800062 | 505970.08 | 1819788.01 | 2083.61 | SPOT* TOP 1A |
| 800063 | 505994.38 | 1819766.09 | 2085.16 | SPOT* TOP 1A |
| 800070 | 506020.29 | 1819738.68 | 2092.09 | SPOT* TOP 1A |
| 800071 | 506045.42 | 1819718.88 | 2098.43 | SPOT* TOP 1A |
| 800083 | 506091.02 | 1819710.15 | 2099.34 | SPOT* TOP 1A |
| 800101 | 506139.97 | 1819712.75 | 2099.40 | SPOT* TOP 1A |
| 800105 | 506050.42 | 1819716.29 | 2099.18 | SPOT* TOP 1A |
| 800109 | 506074.61 | 1819710.74 | 2099.31 | SPOT* TOP 1A |
| 800118 | 506115.52 | 1819711.72 | 2099.38 | SPOT* TOP 1A |
| 800119 | 506163.96 | 1819713.10 | 2099.47 | SPOT* TOP 1A |
| 800126 | 506187.88 | 1819712.93 | 2099.48 | SPOT* TOP 1A |
| 800127 | 506363.77 | 1819715.28 | 2099.66 | SPOT* TOP 1A |
| 800134 | 506388.01 | 1819715.21 | 2099.75 | SPOT* TOP 1A |
| 800138 | 506414.52 | 1819715.24 | 2099.77 | SPOT* TOP 1A |
| 800143 | 506439.87 | 1819715.20 | 2099.82 | SPOT* TOP 1A |
| 800144 | 506464.27 | 1819715.50 | 2099.86 | SPOT* TOP 1A |
| 800149 | 506484.30 | 1819715.24 | 2099.84 | SPOT* TOP 1A |
| 800153 | 506510.98 | 1819715.04 | 2099.86 | SPOT* TOP 1A |
| 800160 | 506534.68 | 1819715.89 | 2099.89 | SPOT* TOP 1A |
| 800161 | 506559.22 | 1819715.22 | 2099.90 | SPOT* TOP 1A |
| 800168 | 506578.81 | 1819715.53 | 2099.92 | SPOT* TOP 1A |
| 800169 | 506603.53 | 1819715.49 | 2099.97 | SPOT* TOP 1A |
| 800173 | 506627.94 | 1819715.18 | 2100.00 | SPOT* TOP 1A |
| 800180 | 506653.09 | 1819715.67 | 2100.05 | SPOT* TOP 1A |
| 800181 | 506673.75 | 1819715.74 | 2100.09 | SPOT* TOP 1A |
| 800188 | 506701.44 | 1819715.79 | 2100.12 | SPOT* TOP 1A |
| 800189 | 506725.92 | 1819715.53 | 2100.19 | SPOT* TOP 1A |

| Blowdown Pipe 1B | | | | |
|---|---|---|---|---|
| Point # | Northing | Easting | Elevation | Description |
| 800024 | 505721.43 | 1820039.49 | 2022.88 | SPOT* TOP 1B |
| 800027 | 505742.35 | 1820015.29 | 2022.96 | SPOT* TOP 1B |
| 800029 | 505762.56 | 1819991.57 | 2025.16 | SPOT* TOP 1B |
| 800031 | 505785.31 | 1819966.16 | 2031.49 | SPOT* TOP 1B |
| 800033 | 505807.53 | 1819944.23 | 2038.63 | SPOT* TOP 1B |
| 800036 | 505813.34 | 1819938.15 | 2040.59 | SPOT* TOP 1B |
| 800039 | 505835.61 | 1819916.95 | 2047.93 | SPOT* TOP 1B |
| 800040 | 505860.92 | 1819891.72 | 2056.24 | SPOT* TOP 1B |
| 800045 | 505884.31 | 1819868.93 | 2064.12 | SPOT* TOP 1B |
| 800048 | 505908.51 | 1819845.85 | 2072.30 | SPOT* TOP 1B |
| 800053 | 505932.28 | 1819821.66 | 2080.14 | SPOT* TOP 1B |
| 800056 | 505944.52 | 1819809.77 | 2082.86 | SPOT* TOP 1B |
| 800061 | 505968.97 | 1819786.91 | 2083.58 | SPOT* TOP 1B |
| 800064 | 505992.98 | 1819765.16 | 2085.16 | SPOT* TOP 1B |
| 800069 | 506019.38 | 1819738.08 | 2092.05 | SPOT* TOP 1B |
| 800072 | 506045.06 | 1819718.16 | 2098.34 | SPOT* TOP 1B |
| 800084 | 506091.07 | 1819709.43 | 2099.35 | SPOT* TOP 1B |
| 800098 | 506138.65 | 1819712.04 | 2099.44 | SPOT* TOP 1B |
| 800106 | 506050.47 | 1819715.36 | 2099.07 | SPOT* TOP 1B |
| 800110 | 506074.45 | 1819709.70 | 2099.30 | SPOT* TOP 1B |
| 800117 | 506115.65 | 1819710.87 | 2099.37 | SPOT* TOP 1B |
| 800120 | 506163.82 | 1819712.20 | 2099.46 | SPOT* TOP 1B |
| 800125 | 506187.24 | 1819711.86 | 2099.49 | SPOT* TOP 1B |
| 800128 | 506363.77 | 1819712.88 | 2099.67 | SPOT* TOP 1B |
| 800133 | 506387.97 | 1819712.98 | 2099.77 | SPOT* TOP 1B |
| 800137 | 506414.07 | 1819712.86 | 2099.83 | SPOT* TOP 1B |
| 800142 | 506438.95 | 1819713.01 | 2099.84 | SPOT* TOP 1B |
| 800146 | 506464.07 | 1819713.15 | 2099.86 | SPOT* TOP 1B |
| 800150 | 506484.26 | 1819712.88 | 2099.82 | SPOT* TOP 1B |
| 800154 | 506510.85 | 1819712.40 | 2099.87 | SPOT* TOP 1B |
| 800159 | 506534.32 | 1819712.80 | 2099.91 | SPOT* TOP 1B |

| Blowdown Pipe 1A | | | | |
|---|---|---|---|---|
| Point # | Northing | Easting | Elevation | Description |
| 800196 | 506750.91 | 1819715.47 | 2100.21 | SPOT* TOP 1A |
| 800197 | 506774.61 | 1819715.43 | 2100.26 | SPOT* TOP 1A |
| 800204 | 506800.60 | 1819714.80 | 2100.31 | SPOT* TOP 1A |
| 800205 | 506812.19 | 1819714.57 | 2100.33 | SPOT* TOP 1A |
| 800212 | 506834.03 | 1819714.48 | 2100.39 | SPOT* TOP 1A |
| 800213 | 506859.11 | 1819714.25 | 2100.43 | SPOT* TOP 1A |
| 800220 | 506879.41 | 1819713.98 | 2100.45 | SPOT* TOP 1A |
| 800221 | 506903.07 | 1819713.95 | 2100.49 | SPOT* TOP 1A |
| 800228 | 506922.09 | 1819716.12 | 2100.63 | SPOT* TOP 1A |
| 800230 | 506946.94 | 1819726.07 | 2100.69 | SPOT* TOP 1A |
| 800234 | 506970.87 | 1819746.16 | 2100.80 | SPOT* TOP 1A |
| 800241 | 506993.70 | 1819769.67 | 2101.33 | SPOT* TOP 1A |
| 800242 | 507018.79 | 1819789.03 | 2101.63 | SPOT* TOP 1A |
| 800248 | 507042.34 | 1819803.04 | 2101.89 | SPOT* TOP 1A |
| 800249 | 507062.02 | 1819812.73 | 2102.16 | SPOT* TOP 1A |
| 800254 | 507095.32 | 1819826.48 | 2102.78 | SPOT* TOP 1A |
| 800256 | 507124.32 | 1819836.17 | 2103.23 | SPOT* TOP 1A |
| 800258 | 507147.74 | 1819842.49 | 2103.48 | SPOT* TOP 1A |
| 800259 | 507171.99 | 1819846.86 | 2103.74 | SPOT* TOP 1A |
| 800260 | 507197.02 | 1819849.74 | 2103.88 | SPOT* TOP 1A |
| 800272 | 506338.45 | 1819715.20 | 2099.65 | SPOT* TOP 1A |
| 800279 | 506314.46 | 1819713.86 | 2099.65 | SPOT* TOP 1A |
| 800280 | 506289.57 | 1819713.32 | 2099.58 | SPOT* TOP 1A |
| 800288 | 506268.66 | 1819713.29 | 2099.55 | SPOT* TOP 1A |
| 800290 | 506246.74 | 1819713.12 | 2099.51 | SPOT* TOP 1A |
| 800298 | 506220.12 | 1819713.12 | 2099.49 | SPOT* TOP 1A |

| Blowdown Pipe 1B | | | | |
|---|---|---|---|---|
| Point # | Northing | Easting | Elevation | Description |
| 800162 | 506559.05 | 1819712.98 | 2099.92 | SPOT* TOP 1B |
| 800167 | 506578.85 | 1819713.17 | 2099.96 | SPOT* TOP 1B |
| 800170 | 506603.01 | 1819713.50 | 2099.99 | SPOT* TOP 1B |
| 800174 | 506627.82 | 1819713.31 | 2100.04 | SPOT* TOP 1B |
| 800179 | 506652.77 | 1819713.84 | 2100.09 | SPOT* TOP 1B |
| 800182 | 506673.64 | 1819713.83 | 2100.13 | SPOT* TOP 1B |
| 800187 | 506700.92 | 1819714.04 | 2100.18 | SPOT* TOP 1B |
| 800190 | 506726.04 | 1819713.79 | 2100.27 | SPOT* TOP 1B |
| 800195 | 506750.59 | 1819713.67 | 2100.29 | SPOT* TOP 1B |
| 800198 | 506774.31 | 1819713.73 | 2100.37 | SPOT* TOP 1B |
| 800203 | 506799.76 | 1819713.83 | 2100.42 | SPOT* TOP 1B |
| 800206 | 506813.35 | 1819713.40 | 2100.44 | SPOT* TOP 1B |
| 800211 | 506833.70 | 1819713.20 | 2100.47 | SPOT* TOP 1B |
| 800214 | 506859.21 | 1819713.17 | 2100.49 | SPOT* TOP 1B |
| 800219 | 506879.47 | 1819713.15 | 2100.50 | SPOT* TOP 1B |
| 800222 | 506903.29 | 1819712.84 | 2100.53 | SPOT* TOP 1B |
| 800227 | 506922.21 | 1819715.13 | 2100.57 | SPOT* TOP 1B |
| 800231 | 506947.46 | 1819724.97 | 2100.61 | SPOT* TOP 1B |
| 800235 | 506971.63 | 1819745.84 | 2100.80 | SPOT* TOP 1B |
| 800240 | 506994.99 | 1819768.06 | 2101.32 | SPOT* TOP 1B |
| 800243 | 507019.54 | 1819787.75 | 2101.64 | SPOT* TOP 1B |
| 800247 | 507042.91 | 1819802.03 | 2101.91 | SPOT* TOP 1B |
| 800250 | 507062.43 | 1819811.89 | 2102.19 | SPOT* TOP 1B |
| 800253 | 507095.37 | 1819825.04 | 2102.99 | SPOT* TOP 1B |
| 800255 | 507124.32 | 1819834.90 | 2103.15 | SPOT* TOP 1B |
| 800257 | 507147.97 | 1819840.51 | 2103.40 | SPOT* TOP 1B |
| 800273 | 506337.97 | 1819713.99 | 2099.65 | SPOT* TOP 1B |
| 800278 | 506314.65 | 1819712.87 | 2099.65 | SPOT* TOP 1B |
| 800281 | 506289.63 | 1819712.55 | 2099.51 | SPOT* TOP 1B |
| 800287 | 506268.84 | 1819712.35 | 2099.45 | SPOT* TOP 1B |
| 800291 | 506246.57 | 1819712.11 | 2099.42 | SPOT* TOP 1B |
| 800297 | 506220.42 | 1819711.80 | 2099.41 | SPOT* TOP 1B |

MATTHEW WEEKS
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NORTH DAKOTA

| Rev No | Date | By | Description |
|---|---|---|---|
| | | | |

Cell 5 Phase 1B
Baranko Brothers
Minnkota - Milton Young Station

# Pipe Verification Tables

Drawn By: C. KNOLL | Surveyed By: LPB | Project No: CR22-08-027.01
Checked By: MKT | Designed By: MKT | Date: 10/06/23


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Q:\2022\CR\08\CR22-08-027.01-Baranko-Cell5_Phase1B_ASBUILT\20230924_CR2208027.01_Phase 1B Asbuilt.dwg 10/26/2023

| Blowdown Pipe 2A | | | | |
|---|---|---|---|---|
| Point # | Northing | Easting | Elevation | Description |
| 800034 | 505811.12 | 1819936.59 | 2040.75 | SPOT* TOP 2A |
| 800037 | 505830.76 | 1819912.61 | 2048.01 | SPOT* TOP 2A |
| 800042 | 505855.94 | 1819886.33 | 2056.55 | SPOT* TOP 2A |
| 800043 | 505879.34 | 1819863.59 | 2064.28 | SPOT* TOP 2A |
| 800050 | 505903.67 | 1819840.34 | 2072.54 | SPOT* TOP 2A |
| 800051 | 505928.27 | 1819817.90 | 2080.26 | SPOT* TOP 2A |
| 800058 | 505940.83 | 1819806.50 | 2082.94 | SPOT* TOP 2A |
| 800059 | 505965.48 | 1819784.05 | 2083.70 | SPOT* TOP 2A |
| 800066 | 505990.10 | 1819761.69 | 2085.16 | SPOT* TOP 2A |
| 800067 | 506016.89 | 1819736.45 | 2092.16 | SPOT* TOP 2A |
| 800074 | 506043.93 | 1819715.98 | 2098.52 | SPOT* TOP 2A |
| 800086 | 506091.04 | 1819707.11 | 2099.54 | SPOT* TOP 2A |
| 800100 | 506139.27 | 1819709.24 | 2099.60 | SPOT* TOP 2A |
| 800108 | 506049.56 | 1819712.85 | 2099.21 | SPOT* TOP 2A |
| 800113 | 506074.48 | 1819707.24 | 2099.49 | SPOT* TOP 2A |
| 800115 | 506115.45 | 1819708.33 | 2099.59 | SPOT* TOP 2A |
| 800122 | 506163.24 | 1819709.19 | 2099.60 | SPOT* TOP 2A |
| 800123 | 506187.20 | 1819709.44 | 2099.65 | SPOT* TOP 2A |
| 800130 | 506363.73 | 1819709.10 | 2099.92 | SPOT* TOP 2A |
| 800131 | 506387.68 | 1819709.21 | 2099.97 | SPOT* TOP 2A |
| 800135 | 506412.73 | 1819709.17 | 2100.06 | SPOT* TOP 2A |
| 800140 | 506438.41 | 1819710.65 | 2100.06 | SPOT* TOP 2A |
| 800148 | 506463.76 | 1819709.98 | 2100.08 | SPOT* TOP 2A |
| 800148 | 506463.76 | 1819709.98 | 2100.08 | SPOT* TOP 2A |
| 800152 | 506484.08 | 1819709.20 | 2100.07 | SPOT* TOP 2A |
| 800156 | 506510.91 | 1819709.37 | 2100.09 | SPOT* TOP 2A |
| 800157 | 506534.29 | 1819709.16 | 2100.11 | SPOT* TOP 2A |
| 800164 | 506559.06 | 1819709.07 | 2100.14 | SPOT* TOP 2A |
| 800165 | 506578.38 | 1819709.30 | 2100.16 | SPOT* TOP 2A |
| 800172 | 506602.76 | 1819709.45 | 2100.19 | SPOT* TOP 2A |
| 800176 | 506627.53 | 1819709.25 | 2100.17 | SPOT* TOP 2A |

| Blowdown Pipe 2B | | | | |
|---|---|---|---|---|
| Point # | Northing | Easting | Elevation | Description |
| 800025 | 505725.85 | 1820032.00 | 2023.32 | SPOT* TOP 2B |
| 800026 | 505741.21 | 1820014.08 | 2023.19 | SPOT* TOP 2B |
| 800028 | 505761.03 | 1819990.54 | 2025.25 | SPOT* TOP 2B |
| 800030 | 505783.94 | 1819965.86 | 2031.49 | SPOT* TOP 2B |
| 800032 | 505806.08 | 1819943.54 | 2038.67 | SPOT* TOP 2B |
| 800035 | 505812.21 | 1819937.06 | 2040.73 | SPOT* TOP 2B |
| 800038 | 505832.81 | 1819914.39 | 2048.06 | SPOT* TOP 2B |
| 800041 | 505857.83 | 1819888.77 | 2056.36 | SPOT* TOP 2B |
| 800044 | 505881.08 | 1819866.24 | 2064.27 | SPOT* TOP 2B |
| 800049 | 505905.90 | 1819843.13 | 2072.54 | SPOT* TOP 2B |
| 800052 | 505930.29 | 1819819.96 | 2080.17 | SPOT* TOP 2B |
| 800057 | 505942.93 | 1819808.16 | 2082.90 | SPOT* TOP 2B |
| 800060 | 505967.71 | 1819786.08 | 2083.70 | SPOT* TOP 2B |
| 800065 | 505992.10 | 1819764.37 | 2085.28 | SPOT* TOP 2B |
| 800068 | 506018.41 | 1819737.66 | 2092.19 | SPOT* TOP 2B |
| 800073 | 506044.36 | 1819717.19 | 2098.46 | SPOT* TOP 2B |
| 800085 | 506090.97 | 1819708.23 | 2099.52 | SPOT* TOP 2B |
| 800099 | 506139.15 | 1819710.82 | 2099.55 | SPOT* TOP 2B |
| 800107 | 506049.90 | 1819713.86 | 2099.23 | SPOT* TOP 2B |
| 800112 | 506074.49 | 1819708.65 | 2099.48 | SPOT* TOP 2B |
| 800116 | 506115.24 | 1819709.66 | 2099.54 | SPOT* TOP 2B |
| 800121 | 506163.92 | 1819711.01 | 2099.57 | SPOT* TOP 2B |
| 800124 | 506186.91 | 1819710.90 | 2099.66 | SPOT* TOP 2B |
| 800129 | 506363.91 | 1819710.99 | 2099.89 | SPOT* TOP 2B |
| 800132 | 506387.65 | 1819711.29 | 2099.94 | SPOT* TOP 2B |
| 800136 | 506413.41 | 1819711.65 | 2100.00 | SPOT* TOP 2B |
| 800141 | 506438.78 | 1819711.83 | 2100.02 | SPOT* TOP 2B |
| 800147 | 506463.86 | 1819711.88 | 2100.05 | SPOT* TOP 2B |
| 800151 | 506484.09 | 1819711.85 | 2100.05 | SPOT* TOP 2B |
| 800155 | 506510.79 | 1819711.61 | 2100.08 | SPOT* TOP 2B |
| 800158 | 506533.92 | 1819711.74 | 2100.11 | SPOT* TOP 2B |

| Blowdown Pipe 2A | | | | |
|---|---|---|---|---|
| Point # | Northing | Easting | Elevation | Description |
| 800177 | 506651.82 | 1819709.83 | 2100.20 | SPOT* TOP 2A |
| 800184 | 506673.71 | 1819709.23 | 2100.23 | SPOT* TOP 2A |
| 800185 | 506700.68 | 1819709.51 | 2100.27 | SPOT* TOP 2A |
| 800192 | 506725.55 | 1819709.44 | 2100.31 | SPOT* TOP 2A |
| 800193 | 506749.93 | 1819709.42 | 2100.37 | SPOT* TOP 2A |
| 800200 | 506774.36 | 1819710.21 | 2100.45 | SPOT* TOP 2A |
| 800201 | 506799.12 | 1819709.61 | 2100.47 | SPOT* TOP 2A |
| 800208 | 506812.92 | 1819709.77 | 2100.49 | SPOT* TOP 2A |
| 800209 | 506834.63 | 1819709.32 | 2100.53 | SPOT* TOP 2A |
| 800216 | 506859.55 | 1819709.36 | 2100.55 | SPOT* TOP 2A |
| 800217 | 506879.07 | 1819709.21 | 2100.61 | SPOT* TOP 2A |
| 800224 | 506903.49 | 1819710.17 | 2100.66 | SPOT* TOP 2A |
| 800225 | 506921.82 | 1819712.78 | 2100.78 | SPOT* TOP 2A |
| 800233 | 506947.54 | 1819722.72 | 2100.82 | SPOT* TOP 2A |
| 800233 | 506947.54 | 1819722.72 | 2100.82 | SPOT* TOP 2A |
| 800237 | 506973.69 | 1819742.64 | 2100.92 | SPOT* TOP 2A |
| 800238 | 506997.07 | 1819766.00 | 2101.51 | SPOT* TOP 2A |
| 800244 | 507020.78 | 1819785.46 | 2101.72 | SPOT* TOP 2A |
| 800245 | 507044.51 | 1819799.58 | 2102.05 | SPOT* TOP 2A |
| 800251 | 507063.27 | 1819808.52 | 2102.29 | SPOT* TOP 2A |
| 800252 | 507095.75 | 1819821.01 | 2102.66 | SPOT* TOP 2A |
| 800275 | 506338.13 | 1819711.75 | 2099.90 | SPOT* TOP 2A |
| 800276 | 506314.49 | 1819710.77 | 2099.81 | SPOT* TOP 2A |
| 800283 | 506289.75 | 1819710.28 | 2099.76 | SPOT* TOP 2A |
| 800284 | 506268.59 | 1819709.88 | 2099.74 | SPOT* TOP 2A |
| 800293 | 506245.69 | 1819709.79 | 2099.71 | SPOT* TOP 2A |
| 800294 | 506220.70 | 1819709.79 | 2099.67 | SPOT* TOP 2A |

| Blowdown Pipe 2B | | | | |
|---|---|---|---|---|
| Point # | Northing | Easting | Elevation | Description |
| 800163 | 506558.90 | 1819711.74 | 2100.11 | SPOT* TOP 2B |
| 800166 | 506578.63 | 1819712.02 | 2100.13 | SPOT* TOP 2B |
| 800171 | 506602.64 | 1819712.62 | 2100.14 | SPOT* TOP 2B |
| 800175 | 506627.30 | 1819712.12 | 2100.18 | SPOT* TOP 2B |
| 800178 | 506652.35 | 1819711.99 | 2100.22 | SPOT* TOP 2B |
| 800183 | 506673.79 | 1819712.09 | 2100.24 | SPOT* TOP 2B |
| 800186 | 506701.00 | 1819712.35 | 2100.36 | SPOT* TOP 2B |
| 800191 | 506725.75 | 1819712.06 | 2100.39 | SPOT* TOP 2B |
| 800194 | 506750.29 | 1819711.57 | 2100.44 | SPOT* TOP 2B |
| 800199 | 506774.33 | 1819711.82 | 2100.52 | SPOT* TOP 2B |
| 800202 | 506799.54 | 1819711.89 | 2100.56 | SPOT* TOP 2B |
| 800207 | 506813.01 | 1819711.58 | 2100.57 | SPOT* TOP 2B |
| 800210 | 506834.83 | 1819711.65 | 2100.58 | SPOT* TOP 2B |
| 800215 | 506859.27 | 1819711.45 | 2100.60 | SPOT* TOP 2B |
| 800218 | 506879.42 | 1819710.94 | 2100.66 | SPOT* TOP 2B |
| 800223 | 506903.32 | 1819711.06 | 2100.74 | SPOT* TOP 2B |
| 800226 | 506921.64 | 1819714.06 | 2100.77 | SPOT* TOP 2B |
| 800232 | 506947.41 | 1819724.09 | 2100.80 | SPOT* TOP 2B |
| 800236 | 506972.29 | 1819744.25 | 2100.95 | SPOT* TOP 2B |
| 800239 | 506996.12 | 1819767.38 | 2101.50 | SPOT* TOP 2B |
| 800274 | 506338.07 | 1819712.56 | 2099.81 | SPOT* TOP 2B |
| 800277 | 506314.87 | 1819711.68 | 2099.77 | SPOT* TOP 2B |
| 800282 | 506289.57 | 1819711.42 | 2099.69 | SPOT* TOP 2B |
| 800285 | 506268.43 | 1819711.36 | 2099.66 | SPOT* TOP 2B |
| 800292 | 506245.67 | 1819710.96 | 2099.62 | SPOT* TOP 2B |
| 800296 | 506220.51 | 1819710.82 | 2099.61 | SPOT* TOP 2B |

MATTHEW WEEKS
REGISTERED LAND SURVEYOR
L.S. 3626
NORTH DAKOTA

| Rev No | Date | By | Description |
|---|---|---|---|
| | | | |

Cell 5 Phase 1B
Baranko Brothers
Minnkota - Milton Young Station

# Pipe Verification Tables

Drawn By: C. KNOLL | Surveyed By: LPB | Project No: CR22-08-027.01
Checked By: MKT | Designed By: MKT | Date: 10/08/23

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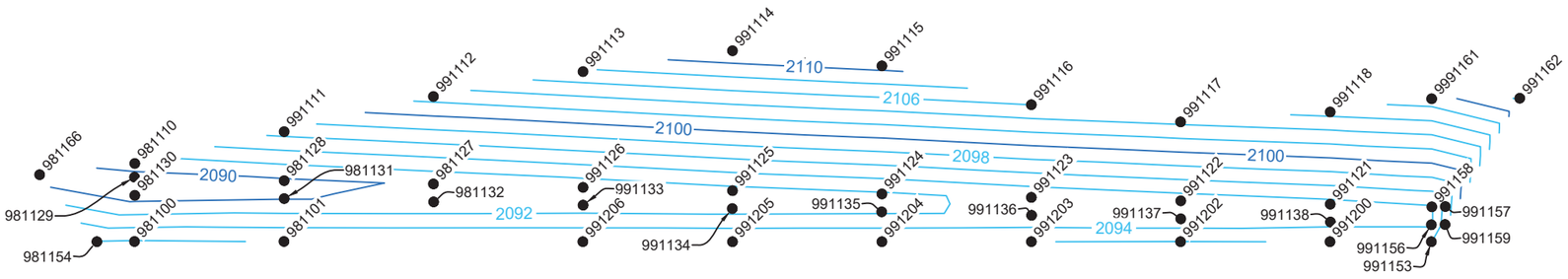
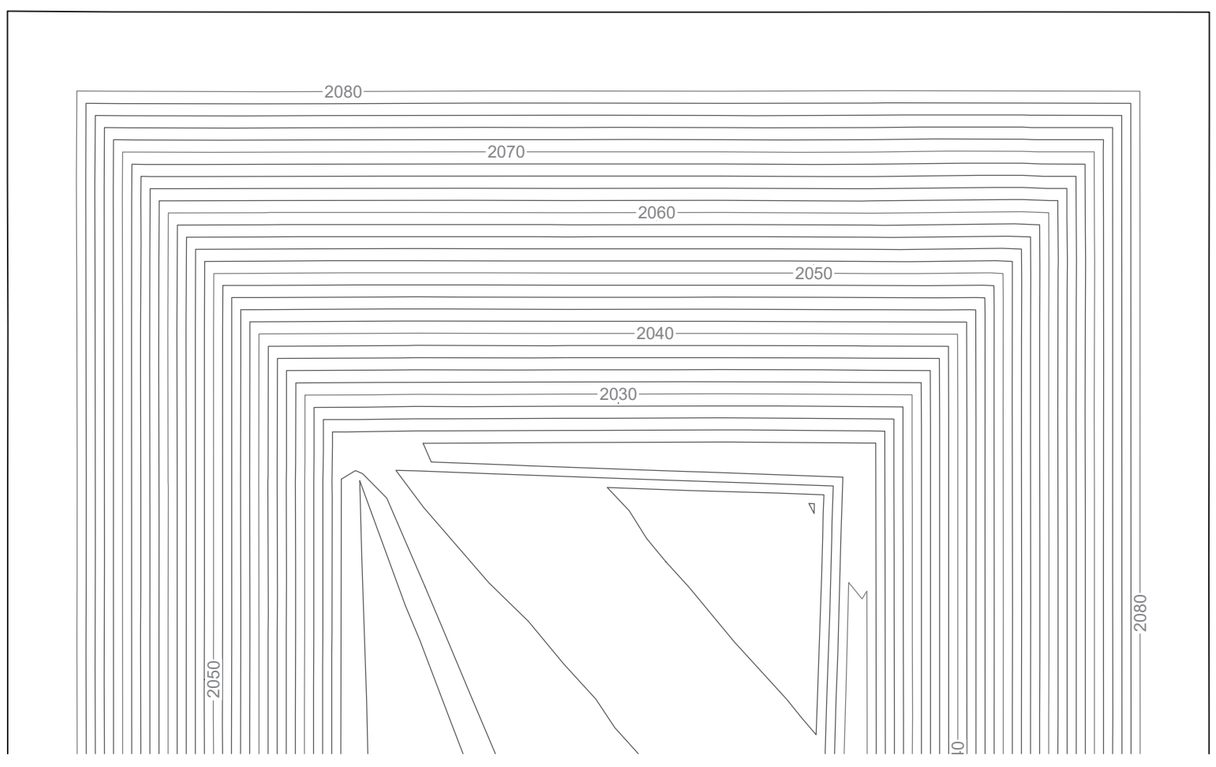
Q:\2022\CR\08\CR22-08-027.01-Baranko-Cell5_Phase1B_ASBUILT\20230924_CR2208027.01_Phase 1B Asbuilt.dwg 10/26/2023




## LEGEND

- ASBUILT SUBSOIL FG MAJOR
- ASBUILT SUBSOIL FG MINOR
- POINT # ASBUILT VERIFICATION POINT

INTERSTATE ENGINEERING SURVEY NOTES:

1. Basis of Bearings: NAD27, North Dakota State Plane, South Zone (US Survey Feet)
2. Located in Section 5, Township 141 North, Range 83 West, 5th P.M., Oliver County, North Dakota

0 50' 100'
HORIZONTAL SCALE IN FEET

MATTHEW WEEKS
REGISTERED LAND SURVEYOR
L.S. 3626
NORTH DAKOTA

| Rev No | Date | By | Description |
|---|---|---|---|
| | | | |

Cell 5 Phase 1B
Baranko Brothers
Minnkota - Milton Young Station

# Embankment Top of Subsoil Asbuilt

Drawn By: C. KNOLL
Checked By: MKT
Surveyed By: LPB
Designed By: MKT
Project No: CR22-08-027.01
Date: 11/21/23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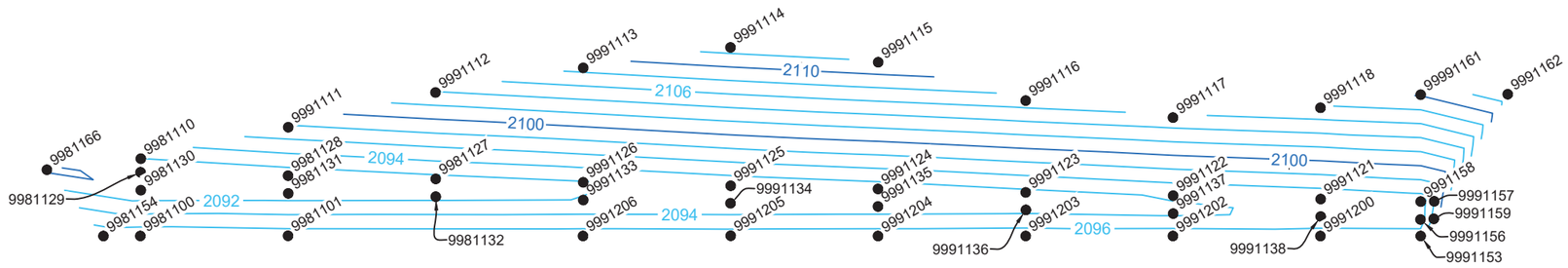
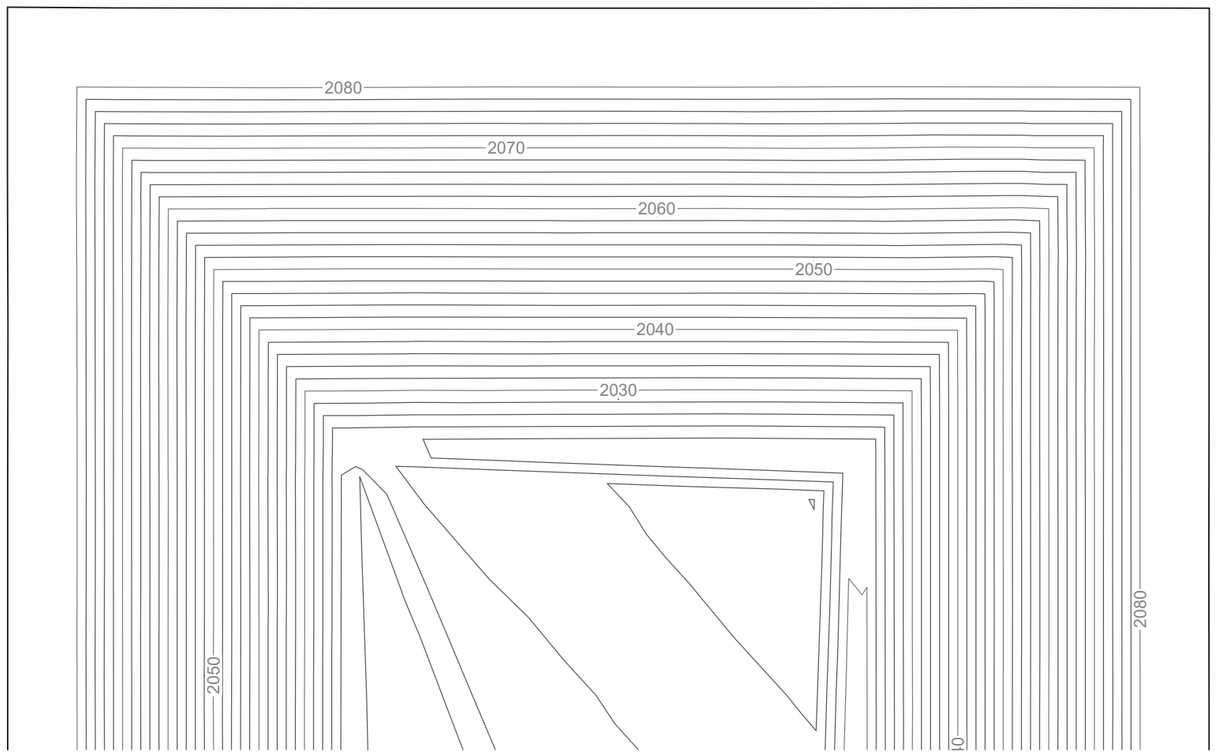


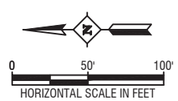




## LEGEND

- ASBUILT TOPSOIL FG MAJOR
- ASBUILT TOPSOIL FG MINOR
- POINT # ASBUILT VERIFICATION POINT

INTERSTATE ENGINEERING SURVEY NOTES:

1. Basis of Bearings: NAD27, North Dakota State Plane, South Zone (US Survey Feet)
2. Located in Section 5, Township 141 North, Range 83 West, 5th P.M., Oliver County, North Dakota




MATTHEW WEEKS
REGISTERED LAND SURVEYOR
L.S. 3626
NORTH DAKOTA

| Rev No | Date | By | Description |
|---|---|---|---|
| | | | |

Cell 5 Phase 1B
Baranko Brothers
Minnkota - Milton Young Station

# Embankment Topsoil Asbuilt

Drawn By: C. KNOLL
Checked By: MKT
Surveyed By: LPB
Designed By: MKT
Project No: CR22-08-027.01
Date: 11/21/23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## Embankment Subsoil Verification Points

| Point # | Northing | Easting | Elevation | Location |
|---|---|---|---|---|
| 981100 | 506024.39 | 1821704.06 | 2096.15 | CHK*SS 2023-11-20 |
| 981101 | 505924.27 | 1821704.10 | 2095.95 | CHK*SS 2023-11-20 |
| 981110 | 506024.10 | 1821756.37 | 2090.95 | CHK*SS 2023-11-20 |
| 981127 | 505824.24 | 1821742.61 | 2090.16 | CHK*SS 2023-11-20 |
| 981128 | 505924.18 | 1821744.83 | 2089.67 | CHK*SS 2023-11-20 |
| 981129 | 506024.23 | 1821747.08 | 2089.32 | CHK*SS 2023-11-20 |
| 981130 | 506024.07 | 1821735.01 | 2089.06 | CHK*SS 2023-11-20 |
| 981131 | 505924.16 | 1821732.86 | 2089.92 | CHK*SS 2023-11-20 |
| 981132 | 505824.15 | 1821730.59 | 2090.36 | CHK*SS 2023-11-20 |
| 981154 | 506049.51 | 1821703.97 | 2096.08 | CHK*SS 2023-11-20 |
| 981166 | 506087.77 | 1821748.86 | 2088.59 | CHK*SS 2023-11-20 |
| 991111 | 505924.23 | 1821777.57 | 2096.66 | CHK*SS 2023-11-20 |
| 991112 | 505824.28 | 1821801.15 | 2102.81 | CHK*SS 2023-11-20 |
| 991113 | 505724.24 | 1821817.77 | 2107.60 | CHK*SS 2023-11-20 |
| 991114 | 505624.22 | 1821831.71 | 2111.81 | CHK*SS 2023-11-20 |
| 991115 | 505524.21 | 1821821.65 | 2110.65 | CHK*SS 2023-11-20 |
| 991116 | 505424.25 | 1821795.65 | 2106.02 | CHK*SS 2023-11-20 |
| 991117 | 505324.29 | 1821784.14 | 2104.38 | CHK*SS 2023-11-20 |
| 991118 | 505224.25 | 1821790.73 | 2106.58 | CHK*SS 2023-11-20 |
| 991121 | 505224.21 | 1821729.06 | 2093.29 | CHK*SS 2023-11-20 |
| 991122 | 505324.20 | 1821731.34 | 2092.90 | CHK*SS 2023-11-20 |
| 991123 | 505424.20 | 1821733.54 | 2092.38 | CHK*SS 2023-11-20 |
| 991124 | 505524.23 | 1821735.88 | 2091.71 | CHK*SS 2023-11-20 |
| 991125 | 505624.20 | 1821738.06 | 2091.32 | CHK*SS 2023-11-20 |
| 991126 | 505724.16 | 1821740.36 | 2090.65 | CHK*SS 2023-11-20 |
| 991133 | 505724.10 | 1821728.43 | 2090.91 | CHK*SS 2023-11-20 |
| 991134 | 505624.28 | 1821726.17 | 2091.22 | CHK*SS 2023-11-20 |
| 991135 | 505524.35 | 1821723.95 | 2091.76 | CHK*SS 2023-11-20 |
| 991136 | 505424.08 | 1821721.57 | 2092.34 | CHK*SS 2023-11-20 |
| 991137 | 505324.24 | 1821719.27 | 2092.65 | CHK*SS 2023-11-20 |
| 991138 | 505224.11 | 1821717.19 | 2093.38 | CHK*SS 2023-11-20 |
| 991153 | 505156.48 | 1821703.95 | 2095.89 | CHK*SS 2023-11-20 |
| 991156 | 505156.48 | 1821715.27 | 2093.73 | CHK*SS 2023-11-20 |
| 991157 | 505147.16 | 1821727.54 | 2096.66 | CHK*SS 2023-11-20 |
| 991158 | 505156.27 | 1821727.34 | 2093.80 | CHK*SS 2023-11-20 |
| 991159 | 505147.38 | 1821715.47 | 2096.85 | CHK*SS 2023-11-20 |
| 991162 | 505097.43 | 1821800.03 | 2112.24 | CHK*SS 2023-11-20 |
| 991200 | 505224.37 | 1821703.93 | 2095.97 | CHK*SS 2023-11-20 |
| 991202 | 505324.35 | 1821703.98 | 2096.04 | CHK*SS 2023-11-20 |
| 991203 | 505424.16 | 1821704.02 | 2095.99 | CHK*SS 2023-11-20 |
| 991204 | 505524.25 | 1821703.97 | 2095.88 | CHK*SS 2023-11-20 |
| 991205 | 505624.19 | 1821703.91 | 2095.89 | CHK*SS 2023-11-20 |
| 991206 | 505724.26 | 1821704.02 | 2095.94 | CHK*SS 2023-11-20 |
| 9991161 | 505156.29 | 1821799.65 | 2109.11 | CHK*SS 2023-11-20 |

## Embankment Topsoil Verification Points

| Point # | Elevation | Location | Layer Depth |
|---|---|---|---|
| 9981100 | 2097.39 | CHK*TS 2023-11-20 | 1.24 |
| 9981101 | 2097.03 | CHK*TS 2023-11-20 | 1.08 |
| 9981110 | 2091.97 | CHK*TS 2023-11-20 | 1.02 |
| 9981127 | 2091.39 | CHK*TS 2023-11-20 | 1.23 |
| 9981128 | 2090.81 | CHK*TS 2023-11-20 | 1.13 |
| 9981129 | 2090.69 | CHK*TS 2023-11-20 | 1.37 |
| 9981130 | 2090.40 | CHK*TS 2023-11-20 | 1.34 |
| 9981131 | 2090.97 | CHK*TS 2023-11-20 | 1.05 |
| 9981132 | 2091.50 | CHK*TS 2023-11-20 | 1.14 |
| 9981154 | 2097.28 | CHK*TS 2023-11-20 | 1.19 |
| 9981166 | 2089.62 | CHK*TS 2023-11-20 | 1.03 |
| 9991111 | 2097.68 | CHK*TS 2023-11-20 | 1.02 |
| 9991112 | 2103.84 | CHK*TS 2023-11-20 | 1.03 |
| 9991113 | 2108.62 | CHK*TS 2023-11-20 | 1.02 |
| 9991114 | 2112.87 | CHK*TS 2023-11-20 | 1.06 |
| 9991115 | 2111.78 | CHK*TS 2023-11-20 | 1.14 |
| 9991116 | 2107.05 | CHK*TS 2023-11-20 | 1.03 |
| 9991117 | 2105.50 | CHK*TS 2023-11-20 | 1.12 |
| 9991118 | 2107.68 | CHK*TS 2023-11-20 | 1.10 |
| 9991121 | 2094.44 | CHK*TS 2023-11-20 | 1.14 |
| 9991122 | 2094.13 | CHK*TS 2023-11-20 | 1.23 |
| 9991123 | 2093.51 | CHK*TS 2023-11-20 | 1.13 |
| 9991124 | 2092.92 | CHK*TS 2023-11-20 | 1.20 |
| 9991125 | 2092.49 | CHK*TS 2023-11-20 | 1.16 |
| 9991126 | 2091.86 | CHK*TS 2023-11-20 | 1.21 |
| 9991133 | 2092.05 | CHK*TS 2023-11-20 | 1.13 |
| 9991134 | 2092.44 | CHK*TS 2023-11-20 | 1.22 |
| 9991135 | 2092.97 | CHK*TS 2023-11-20 | 1.21 |
| 9991136 | 2093.52 | CHK*TS 2023-11-20 | 1.18 |
| 9991137 | 2093.70 | CHK*TS 2023-11-20 | 1.05 |
| 9991138 | 2094.48 | CHK*TS 2023-11-20 | 1.10 |
| 9991153 | 2096.93 | CHK*TS 2023-11-20 | 1.03 |
| 9991156 | 2094.84 | CHK*TS 2023-11-20 | 1.11 |
| 9991157 | 2098.01 | CHK*TS 2023-11-20 | 1.34 |
| 9991158 | 2094.84 | CHK*TS 2023-11-20 | 1.05 |
| 9991159 | 2098.61 | CHK*TS 2023-11-20 | 1.76 |
| 9991162 | 2113.24 | CHK*TS 2023-11-20 | 1.01 |
| 9991200 | 2097.02 | CHK*TS 2023-11-20 | 1.05 |
| 9991202 | 2097.19 | CHK*TS 2023-11-20 | 1.15 |
| 9991203 | 2097.13 | CHK*TS 2023-11-20 | 1.13 |
| 9991204 | 2097.01 | CHK*TS 2023-11-20 | 1.13 |
| 9991205 | 2096.93 | CHK*TS 2023-11-20 | 1.04 |
| 9991206 | 2097.01 | CHK*TS 2023-11-20 | 1.07 |
| 99991161 | 2110.14 | CHK*TS 2023-11-20 | 1.03 |

MATTHEW WEEKS
REGISTERED LAND SURVEYOR
L.S. 3626
NORTH DAKOTA

| Rev No | Date | By | Description |
|---|---|---|---|
| | | | |

Cell 5 Phase 1B
Baranko Brothers
Minnkota - Milton Young Station

# Embankment Verification Tables

Drawn By: C. KNOLL
Checked By: MKT
Surveyed By: LPB
Designed By: MKT
Project No: CR22-08-027.01
Date: 11/21/23

Interstate Engineering
2610 Old Red Trail, Suite B
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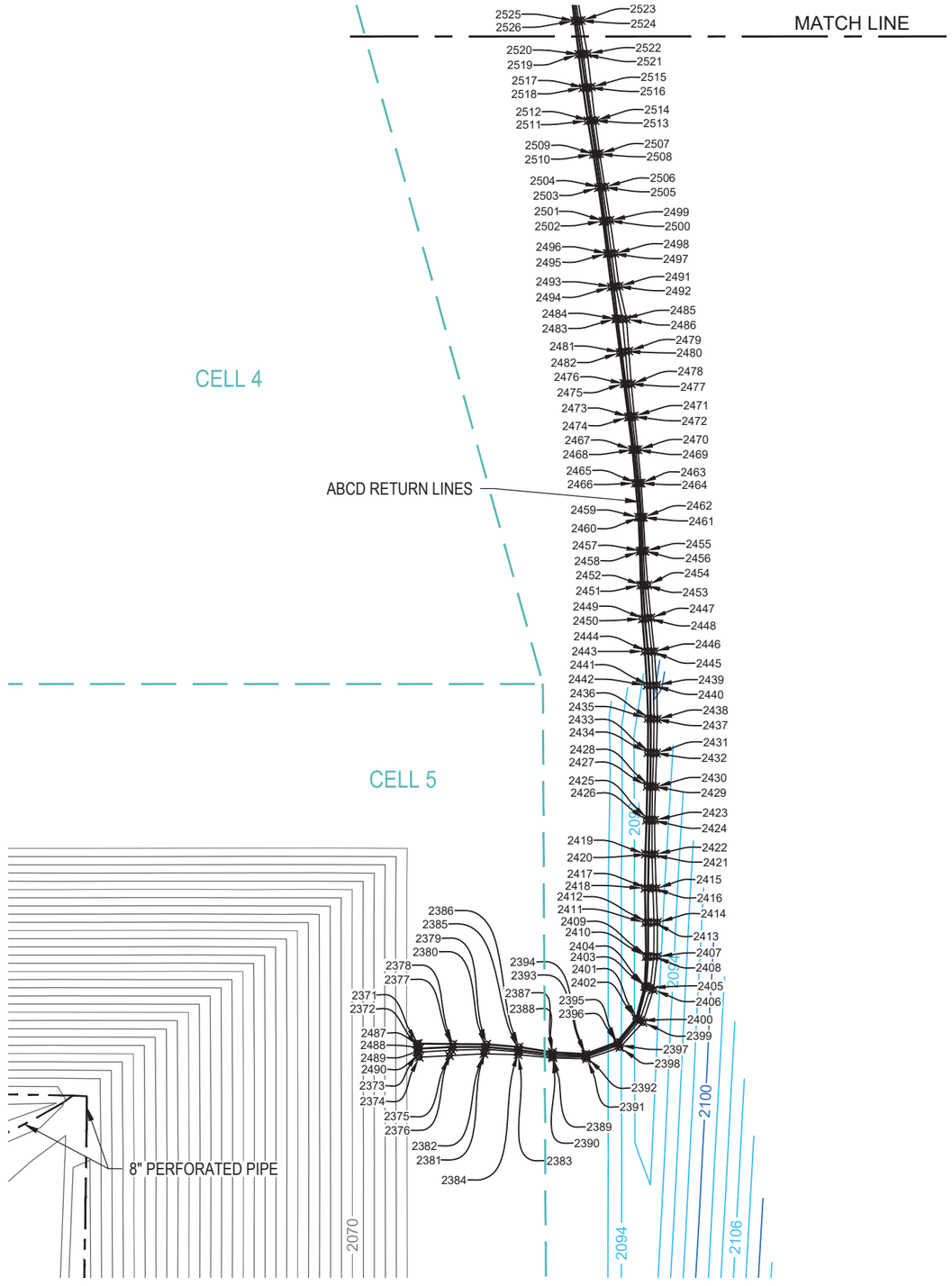


## LEGEND

- ASBUILT FG MAJOR
- ASBUILT FG MINOR
- ● POINT # — ASBUILT VERIFICATION POINT

INTERSTATE ENGINEERING SURVEY NOTES:

1. Basis of Bearings: NAD27, North Dakota State Plane, South Zone (US Survey Feet)
2. Located in Section 5, Township 141 North, Range 83 West, 5th P.M., Oliver County, North Dakota

MATTHEW WEEKS
REGISTERED LAND SURVEYOR
L.S. 3626
NORTH DAKOTA

| Rev No. | Date | By | Description |
|---|---|---|---|
| 1 | ######## | ######## | ########################## |

Cell 5 Phase 1B
Baranko Brothers
Minnkota - Milton Young Station

# ABCD Return Pipe Asbuilt

Drawn By: C. KNOLL | Surveyed By: LPB | Project No: CR22-08-027.01
Checked By: MKT | Designed By: MKT | Date: 11/29/23


Interstate Engineering
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| Return Pipe A | | | | |
|---|---|---|---|---|
| Point # | Northing | Easting | Elevation | Description |
| 2371 | 505805.07 | 1821569.59 | 2082.48 | PIPE1*TOP 12IN |
| 2378 | 505804.71 | 1821595.03 | 2081.95 | PIPE1*TOP 12IN |
| 2379 | 505804.69 | 1821619.82 | 2081.70 | PIPE1*TOP 12IN |
| 2386 | 505802.64 | 1821643.53 | 2081.20 | PIPE1*TOP 12IN |
| 2387 | 505798.76 | 1821667.96 | 2080.95 | PIPE1*TOP 12IN |
| 2394 | 505797.47 | 1821692.39 | 2080.81 | PIPE1*TOP 12IN |
| 2395 | 505806.29 | 1821715.42 | 2080.62 | PIPE1*TOP 12IN |
| 2402 | 505823.24 | 1821729.32 | 2080.46 | PIPE1*TOP 12IN |
| 2403 | 505847.15 | 1821735.62 | 2080.36 | PIPE1*TOP 12IN |
| 2410 | 505869.00 | 1821736.62 | 2080.30 | PIPE1*TOP 12IN |
| 2411 | 505893.76 | 1821736.36 | 2080.12 | PIPE1*TOP 12IN |
| 2418 | 505918.95 | 1821735.78 | 2080.03 | PIPE1*TOP 12IN |
| 2419 | 505944.03 | 1821736.14 | 2079.91 | PIPE1*TOP 12IN |
| 2426 | 505968.84 | 1821736.94 | 2079.83 | PIPE1*TOP 12IN |
| 2427 | 505993.71 | 1821737.46 | 2079.73 | PIPE1*TOP 12IN |
| 2434 | 506018.31 | 1821737.96 | 2079.51 | PIPE1*TOP 12IN |
| 2435 | 506043.42 | 1821738.18 | 2079.47 | PIPE1*TOP 12IN |
| 2442 | 506067.64 | 1821737.32 | 2079.31 | PIPE1*TOP 12IN |
| 2443 | 506092.52 | 1821735.83 | 2079.20 | PIPE1*TOP 12IN |
| 2450 | 506116.29 | 1821733.96 | 2079.06 | PIPE1*TOP 12IN |
| 2451 | 506141.05 | 1821732.74 | 2078.99 | PIPE1*TOP 12IN |
| 2458 | 506165.79 | 1821732.13 | 2078.85 | PIPE1*TOP 12IN |
| 2459 | 506190.69 | 1821731.12 | 2078.82 | PIPE1*TOP 12IN |
| 2466 | 506215.67 | 1821729.05 | 2078.65 | PIPE1*TOP 12IN |
| 2467 | 506240.34 | 1821726.71 | 2078.60 | PIPE1*TOP 12IN |
| 2474 | 506264.11 | 1821723.68 | 2078.17 | PIPE1*TOP 12IN |
| 2475 | 506288.74 | 1821720.43 | 2076.99 | PIPE1*TOP 12IN |
| 2482 | 506311.25 | 1821717.47 | 2075.90 | PIPE1*TOP 12IN |
| 2483 | 506336.07 | 1821714.40 | 2074.63 | PIPE1*TOP 12IN |
| 2487 | 505804.94 | 1821568.53 | 2082.70 | PIPE1*SPOOL |
| 2494 | 506359.37 | 1821711.23 | 2073.52 | PIPE1*TOP 12IN |
| 2495 | 506383.94 | 1821708.11 | 2072.55 | PIPE1*TOP 12IN |
| 2502 | 506407.61 | 1821705.13 | 2071.92 | PIPE1*TOP 12IN |
| 2503 | 506432.23 | 1821701.75 | 2071.03 | PIPE1*TOP 12IN |
| 2510 | 506456.69 | 1821697.94 | 2070.42 | PIPE1*TOP 12IN |
| 2511 | 506481.20 | 1821694.03 | 2069.10 | PIPE1*TOP 12IN |
| 2518 | 506505.31 | 1821690.54 | 2068.59 | PIPE1*TOP 12IN |
| 2519 | 506529.93 | 1821687.28 | 2067.95 | PIPE1*TOP 12IN |
| 2526 | 506554.32 | 1821684.31 | 2067.18 | PIPE1*TOP 12IN |
| 2527 | 506578.95 | 1821681.10 | 2066.48 | PIPE1*TOP 12IN |
| 2534 | 506603.18 | 1821678.00 | 2065.29 | PIPE1*TOP 12IN |
| 2535 | 506627.77 | 1821674.56 | 2064.44 | PIPE1*TOP 12IN |
| 2539 | 506652.40 | 1821671.50 | 2063.44 | PIPE1*TOP 12IN |
| 2546 | 506676.66 | 1821668.64 | 2062.37 | PIPE1*TOP 12IN |
| 2547 | 506701.37 | 1821665.68 | 2061.35 | PIPE1*TOP 12IN |
| 2554 | 506725.68 | 1821663.01 | 2060.12 | PIPE1*TOP 12IN |
| 2555 | 506750.48 | 1821660.95 | 2058.91 | PIPE1*TOP 12IN |
| 2562 | 506774.69 | 1821658.97 | 2058.06 | PIPE1*TOP 12IN |
| 2563 | 506799.51 | 1821658.47 | 2056.87 | PIPE1*TOP 12IN |
| 2570 | 506824.59 | 1821659.27 | 2055.73 | PIPE1*TOP 12IN |

| Return Pipe B | | | | |
|---|---|---|---|---|
| Point # | Northing | Easting | Elevation | Description |
| 2372 | 505801.52 | 1821570.66 | 2082.60 | PIPE2*TOP 12IN |
| 2377 | 505802.66 | 1821595.23 | 2081.83 | PIPE2*TOP 12IN |
| 2380 | 505802.63 | 1821619.29 | 2081.33 | PIPE2*TOP 12IN |
| 2385 | 505800.53 | 1821643.28 | 2081.15 | PIPE2*TOP 12IN |
| 2388 | 505797.13 | 1821667.97 | 2080.97 | PIPE2*TOP 12IN |
| 2393 | 505796.35 | 1821692.69 | 2080.78 | PIPE2*TOP 12IN |
| 2396 | 505805.20 | 1821716.16 | 2080.63 | PIPE2*TOP 12IN |
| 2401 | 505822.73 | 1821730.49 | 2080.47 | PIPE2*TOP 12IN |
| 2404 | 505846.81 | 1821736.68 | 2080.44 | PIPE2*TOP 12IN |
| 2409 | 505869.00 | 1821738.10 | 2080.17 | PIPE2*TOP 12IN |
| 2412 | 505893.98 | 1821738.15 | 2080.15 | PIPE2*TOP 12IN |
| 2417 | 505919.07 | 1821738.17 | 2080.09 | PIPE2*TOP 12IN |
| 2420 | 505943.77 | 1821738.58 | 2079.94 | PIPE2*TOP 12IN |
| 2425 | 505968.87 | 1821739.01 | 2079.84 | PIPE2*TOP 12IN |
| 2428 | 505993.61 | 1821739.58 | 2079.70 | PIPE2*TOP 12IN |
| 2433 | 506018.07 | 1821740.10 | 2079.58 | PIPE2*TOP 12IN |
| 2436 | 506043.05 | 1821739.94 | 2079.53 | PIPE2*TOP 12IN |
| 2441 | 506067.26 | 1821739.71 | 2079.31 | PIPE2*TOP 12IN |
| 2444 | 506092.35 | 1821738.02 | 2079.21 | PIPE2*TOP 12IN |
| 2449 | 506116.43 | 1821735.86 | 2079.11 | PIPE2*TOP 12IN |
| 2452 | 506141.00 | 1821734.33 | 2078.91 | PIPE2*TOP 12IN |
| 2457 | 506166.09 | 1821733.37 | 2078.73 | PIPE2*TOP 12IN |
| 2460 | 506190.79 | 1821732.64 | 2078.64 | PIPE2*TOP 12IN |
| 2465 | 506215.67 | 1821730.45 | 2078.58 | PIPE2*TOP 12IN |
| 2468 | 506240.29 | 1821727.89 | 2078.49 | PIPE2*TOP 12IN |
| 2473 | 506264.21 | 1821724.76 | 2078.04 | PIPE2*TOP 12IN |
| 2476 | 506288.43 | 1821721.68 | 2076.95 | PIPE2*TOP 12IN |
| 2481 | 506311.52 | 1821718.86 | 2075.89 | PIPE2*TOP 12IN |
| 2484 | 506336.07 | 1821715.71 | 2074.56 | PIPE2*TOP 12IN |
| 2488 | 505802.24 | 1821569.88 | 2082.78 | PIPE2*SPOOL |
| 2493 | 506359.69 | 1821712.89 | 2073.46 | PIPE2*TOP 12IN |
| 2496 | 506383.89 | 1821709.53 | 2072.46 | PIPE2*TOP 12IN |
| 2501 | 506407.82 | 1821706.44 | 2071.68 | PIPE2*TOP 12IN |
| 2504 | 506432.66 | 1821703.29 | 2070.97 | PIPE2*TOP 12IN |
| 2509 | 506456.71 | 1821699.59 | 2070.33 | PIPE2*TOP 12IN |
| 2512 | 506481.38 | 1821696.00 | 2069.02 | PIPE2*TOP 12IN |
| 2517 | 506505.44 | 1821692.65 | 2068.42 | PIPE2*TOP 12IN |
| 2520 | 506529.87 | 1821689.13 | 2067.89 | PIPE2*TOP 12IN |
| 2525 | 506554.32 | 1821685.83 | 2067.11 | PIPE2*TOP 12IN |
| 2528 | 506579.19 | 1821682.61 | 2066.36 | PIPE2*TOP 12IN |
| 2533 | 506603.39 | 1821679.52 | 2065.18 | PIPE2*TOP 12IN |
| 2536 | 506627.78 | 1821676.64 | 2064.28 | PIPE2*TOP 12IN |
| 2540 | 506652.60 | 1821673.15 | 2063.38 | PIPE2*TOP 12IN |
| 2545 | 506676.87 | 1821669.82 | 2062.32 | PIPE2*TOP 12IN |
| 2548 | 506701.43 | 1821667.19 | 2061.27 | PIPE2*TOP 12IN |
| 2553 | 506725.78 | 1821664.80 | 2060.05 | PIPE2*TOP 12IN |
| 2556 | 506750.58 | 1821662.32 | 2058.89 | PIPE2*TOP 12IN |
| 2561 | 506774.97 | 1821660.23 | 2058.01 | PIPE2*TOP 12IN |
| 2564 | 506799.35 | 1821659.68 | 2056.88 | PIPE2*TOP 12IN |
| 2569 | 506824.55 | 1821660.54 | 2055.70 | PIPE2*TOP 12IN |

MATTHEW WEEKS
REGISTERED LAND SURVEYOR L.S. 3626
NORTH DAKOTA

| Rev No | Date | By | Description |
|---|---|---|---|
| | | | |

Cell 5 Phase 1B
Baranko Brothers
Minnkota - Milton Young Station

# ABCD Return Pipe Verification Tables

Drawn By: C. KNOLL | Surveyed By: LPB | Project No: CR22-08-027.01
Checked By: MKT | Designed By: MKT | Date: 11/29/23


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Q:\2022\CR\08\CR22-08-027.01-Baranko-Cell5_Phase1B_ASBUILT\20230924_CR2208027.01_Phase 1B Asbuilt.dwg 12/13/2023

| Return Pipe C | | | | |
|---|---|---|---|---|
| Point # | Northing | Easting | Elevation | Description |
| 2373 | 505798.76 | 1821569.65 | 2082.37 | PIPE3*TOP 12IN |
| 2376 | 505800.26 | 1821594.20 | 2081.78 | PIPE3*TOP 12IN |
| 2381 | 505800.88 | 1821619.04 | 2081.17 | PIPE3*TOP 12IN |
| 2384 | 505799.15 | 1821643.18 | 2081.08 | PIPE3*TOP 12IN |
| 2389 | 505795.63 | 1821668.11 | 2081.02 | PIPE3*TOP 12IN |
| 2392 | 505795.26 | 1821692.95 | 2080.75 | PIPE3*TOP 12IN |
| 2397 | 505803.94 | 1821716.70 | 2080.58 | PIPE3*TOP 12IN |
| 2400 | 505822.11 | 1821732.13 | 2080.49 | PIPE3*TOP 12IN |
| 2405 | 505846.09 | 1821739.83 | 2080.35 | PIPE3*TOP 12IN |
| 2408 | 505868.76 | 1821742.28 | 2080.31 | PIPE3*TOP 12IN |
| 2413 | 505893.74 | 1821742.45 | 2080.20 | PIPE3*TOP 12IN |
| 2416 | 505918.94 | 1821741.61 | 2080.03 | PIPE3*TOP 12IN |
| 2421 | 505943.30 | 1821740.96 | 2079.92 | PIPE3*TOP 12IN |
| 2424 | 505968.77 | 1821741.01 | 2079.86 | PIPE3*TOP 12IN |
| 2429 | 505993.51 | 1821741.40 | 2079.69 | PIPE3*TOP 12IN |
| 2432 | 506018.12 | 1821742.12 | 2079.53 | PIPE3*TOP 12IN |
| 2437 | 506043.00 | 1821742.46 | 2079.42 | PIPE3*TOP 12IN |
| 2440 | 506067.38 | 1821742.06 | 2079.20 | PIPE3*TOP 12IN |
| 2445 | 506092.27 | 1821740.75 | 2079.14 | PIPE3*TOP 12IN |
| 2448 | 506116.55 | 1821738.08 | 2079.00 | PIPE3*TOP 12IN |
| 2453 | 506140.99 | 1821735.89 | 2078.87 | PIPE3*TOP 12IN |
| 2456 | 506166.24 | 1821734.61 | 2078.74 | PIPE3*TOP 12IN |
| 2461 | 506190.72 | 1821733.43 | 2078.68 | PIPE3*TOP 12IN |
| 2464 | 506215.75 | 1821731.57 | 2078.58 | PIPE3*TOP 12IN |
| 2469 | 506240.23 | 1821729.12 | 2078.41 | PIPE3*TOP 12IN |
| 2472 | 506264.65 | 1821726.27 | 2078.01 | PIPE3*TOP 12IN |
| 2477 | 506288.36 | 1821723.56 | 2076.96 | PIPE3*TOP 12IN |
| 2480 | 506312.16 | 1821721.42 | 2075.92 | PIPE3*TOP 12IN |
| 2485 | 506335.86 | 1821719.30 | 2074.74 | PIPE3*TOP 12IN |
| 2489 | 505799.26 | 1821568.85 | 2082.55 | PIPE3*SPOOL |
| 2492 | 506359.87 | 1821714.52 | 2073.49 | PIPE3*TOP 12IN |
| 2497 | 506383.95 | 1821711.26 | 2072.54 | PIPE3*TOP 12IN |
| 2500 | 506408.16 | 1821708.18 | 2071.64 | PIPE3*TOP 12IN |
| 2505 | 506432.63 | 1821704.64 | 2071.04 | PIPE3*TOP 12IN |
| 2508 | 506456.85 | 1821700.93 | 2070.31 | PIPE3*TOP 12IN |
| 2513 | 506481.43 | 1821697.37 | 2069.04 | PIPE3*TOP 12IN |
| 2516 | 506505.54 | 1821693.90 | 2068.38 | PIPE3*TOP 12IN |
| 2521 | 506529.98 | 1821690.63 | 2067.85 | PIPE3*TOP 12IN |
| 2524 | 506554.57 | 1821687.25 | 2067.01 | PIPE3*TOP 12IN |
| 2529 | 506579.25 | 1821683.95 | 2066.32 | PIPE3*TOP 12IN |
| 2532 | 506603.72 | 1821680.91 | 2065.16 | PIPE3*TOP 12IN |
| 2537 | 506627.94 | 1821677.76 | 2064.13 | PIPE3*TOP 12IN |
| 2541 | 506652.72 | 1821674.35 | 2063.31 | PIPE3*TOP 12IN |
| 2544 | 506677.06 | 1821671.24 | 2062.40 | PIPE3*TOP 12IN |
| 2549 | 506701.51 | 1821668.49 | 2061.19 | PIPE3*TOP 12IN |
| 2552 | 506726.08 | 1821665.91 | 2060.01 | PIPE3*TOP 12IN |
| 2557 | 506750.68 | 1821663.49 | 2058.81 | PIPE3*TOP 12IN |
| 2560 | 506775.19 | 1821661.41 | 2058.00 | PIPE3*TOP 12IN |
| 2565 | 506799.35 | 1821660.90 | 2057.01 | PIPE3*TOP 12IN |
| 2568 | 506824.37 | 1821661.62 | 2055.99 | PIPE3*TOP 12IN |

| Return Pipe D | | | | |
|---|---|---|---|---|
| Point # | Northing | Easting | Elevation | Description |
| 2374 | 505795.19 | 1821570.58 | 2082.46 | PIPE4*TOP 12IN |
| 2375 | 505796.24 | 1821592.73 | 2081.65 | PIPE4*TOP 12IN |
| 2382 | 505797.70 | 1821617.88 | 2081.24 | PIPE4*TOP 12IN |
| 2383 | 505797.02 | 1821642.91 | 2081.13 | PIPE4*TOP 12IN |
| 2390 | 505794.56 | 1821668.29 | 2081.10 | PIPE4*TOP 12IN |
| 2391 | 505793.97 | 1821693.19 | 2080.78 | PIPE4*TOP 12IN |
| 2398 | 505802.25 | 1821717.46 | 2080.57 | PIPE4*TOP 12IN |
| 2399 | 505820.62 | 1821734.25 | 2080.57 | PIPE4*TOP 12IN |
| 2406 | 505844.46 | 1821742.05 | 2080.49 | PIPE4*TOP 12IN |
| 2407 | 505868.91 | 1821744.80 | 2080.39 | PIPE4*TOP 12IN |
| 2414 | 505893.88 | 1821744.93 | 2080.35 | PIPE4*TOP 12IN |
| 2415 | 505918.75 | 1821743.98 | 2080.18 | PIPE4*TOP 12IN |
| 2422 | 505943.86 | 1821743.16 | 2080.06 | PIPE4*TOP 12IN |
| 2423 | 505968.86 | 1821742.87 | 2079.78 | PIPE4*TOP 12IN |
| 2430 | 505993.18 | 1821743.51 | 2079.67 | PIPE4*TOP 12IN |
| 2431 | 506017.96 | 1821744.38 | 2079.58 | PIPE4*TOP 12IN |
| 2438 | 506042.80 | 1821744.80 | 2079.47 | PIPE4*TOP 12IN |
| 2439 | 506067.84 | 1821744.46 | 2079.14 | PIPE4*TOP 12IN |
| 2446 | 506092.35 | 1821742.64 | 2079.05 | PIPE4*TOP 12IN |
| 2447 | 506117.07 | 1821740.23 | 2078.94 | PIPE4*TOP 12IN |
| 2454 | 506141.13 | 1821737.80 | 2078.90 | PIPE4*TOP 12IN |
| 2455 | 506165.98 | 1821735.90 | 2078.80 | PIPE4*TOP 12IN |
| 2462 | 506190.74 | 1821734.72 | 2078.67 | PIPE4*TOP 12IN |
| 2463 | 506215.69 | 1821732.97 | 2078.56 | PIPE4*TOP 12IN |
| 2470 | 506240.18 | 1821730.67 | 2078.47 | PIPE4*TOP 12IN |
| 2471 | 506264.97 | 1821728.05 | 2078.12 | PIPE4*TOP 12IN |
| 2478 | 506288.47 | 1821725.85 | 2077.05 | PIPE4*TOP 12IN |
| 2479 | 506312.66 | 1821724.04 | 2075.94 | PIPE4*TOP 12IN |
| 2486 | 506335.87 | 1821722.32 | 2074.78 | PIPE4*TOP 12IN |
| 2490 | 505796.06 | 1821569.56 | 2082.48 | PIPE4*SPOOL |
| 2491 | 506360.13 | 1821716.89 | 2073.45 | PIPE4*TOP 12IN |
| 2498 | 506384.01 | 1821713.66 | 2072.45 | PIPE4*TOP 12IN |
| 2499 | 506408.37 | 1821710.23 | 2071.63 | PIPE4*TOP 12IN |
| 2506 | 506432.87 | 1821706.50 | 2071.07 | PIPE4*TOP 12IN |
| 2507 | 506457.18 | 1821702.44 | 2070.22 | PIPE4*TOP 12IN |
| 2514 | 506481.45 | 1821699.40 | 2069.05 | PIPE4*TOP 12IN |
| 2515 | 506506.08 | 1821696.49 | 2068.32 | PIPE4*TOP 12IN |
| 2522 | 506530.35 | 1821693.63 | 2067.83 | PIPE4*TOP 12IN |
| 2523 | 506554.68 | 1821689.20 | 2067.06 | PIPE4*TOP 12IN |
| 2530 | 506579.41 | 1821685.18 | 2066.29 | PIPE4*TOP 12IN |
| 2531 | 506603.93 | 1821682.36 | 2065.10 | PIPE4*TOP 12IN |
| 2538 | 506628.04 | 1821679.29 | 2064.03 | PIPE4*TOP 12IN |
| 2542 | 506652.65 | 1821675.95 | 2063.25 | PIPE4*TOP 12IN |
| 2543 | 506677.22 | 1821672.68 | 2062.29 | PIPE4*TOP 12IN |
| 2550 | 506701.72 | 1821669.91 | 2061.21 | PIPE4*TOP 12IN |
| 2551 | 506726.40 | 1821667.24 | 2060.00 | PIPE4*TOP 12IN |
| 2558 | 506750.71 | 1821664.71 | 2058.75 | PIPE4*TOP 12IN |
| 2559 | 506775.35 | 1821662.55 | 2058.03 | PIPE4*TOP 12IN |
| 2566 | 506799.68 | 1821662.13 | 2056.88 | PIPE4*TOP 12IN |
| 2567 | 506824.57 | 1821662.78 | 2055.60 | PIPE4*TOP 12IN |

MATTHEW WEEKS
REGISTERED LAND SURVEYOR
L.S. 3626
NORTH DAKOTA

| Rev No | Date | By | Description |
|---|---|---|---|
| | | | |

Cell 5 Phase 1B
Baranko Brothers
Minnkota - Milton Young Station

# ABCD Return Pipe Verification Tables

Drawn By: C. KNOLL | Surveyed By: LPB | Project No: CR22-08-027.01
Checked By: MKT | Designed By: MKT | Date: 11/29/23


Interstate Engineering
2610 Old Red Trail, Suite B
PO Box 1254
Mandan, ND 58554
(701) 663.5455
www.interstateeng.com


INTERSTATE ENGINEERING
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SECTION 070
36
SHEET NO.

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# Appendix H

## Geomembrane

Material Data Sheets
Geomembrane Roll Certifications
Subgrade Inspection Forms
Field Forms
Destructive Testing – 3rd Party Laboratory Results
As-Built Drawings
Material Warranty

# Material Data Sheets

# SUBMITTAL CONTROL FORM

DATE: April 10, 2023

SUBMITTAL NO.: 1

PROJECT NUM.: 233013

PROJECT NAME: Minnkota-Coal Combusion Waste Facility-Cell 5 Phase 12B

| | | | |
|---|---|---|---|
| TO: | **Baranko Bros, Inc.** | FROM: | **EC Applications** |
| ATTN: | **Jack Gossen** | | **Ruben Brito** |
| | **3048 Highway 22N** | | **901 E. Orangethorpe Ave.** |
| | **Dickinson, NV 58601** | | **Anaheim, CA 92801** |
| PHONE: | **701-483-5868** | PHONE: | **714-921-9848 X 102** |
| FAX: | **701-483-5960** | FAX: | **866-475-1225** |
| E-MAIL: | **j.gossen@barankoinc.com** | E-MAIL: | **rbrito@ecapps.com** |

**WE ARE SUBMITTING THE ENCLOSED:**

☐ SHOP DRAWINGS ☐ CERTIFICATES OF COMPLIANCE ☐ SAMPLES

☐ MATERIAL DATA ☐ QC INFORMATION ☐ OTHER

**THESE ARE TRANSMITTED FOR:**

☐ APPROVAL ☐ INFORMATION ☐ RESUBMIT

☐ AS REQUESTED ☐ FOR REVIEW

| ITEM NO. | SUBMITTAL DESCRIPTION | NO. OF COPIES | CONTRACT REFERENCE / SPECIFICATION SECTION / DRAWING SHEET NUMBER |
|---|---|---|---|
| | Geomembrane Material Specification Sheet | 1 | Section 310519.16 |

**NOTE:**

***THE ABOVE SUBMITTED ITEMS HAVE BEEN REVIEWED IN DETAIL AND ARE CORRECT AND IN GENERAL CONFORMANCE WITH THE CONTRACT DRAWINGS AND SPECIFICATIONS EXCEPT AS OTHERWISE STATED.***

*Ruben Brito*

*ECApplications AUTHORIZED SIGNATURE*

***IF THE ABOVE VARIANCES ARE ACCEPTABLE, PLEASE CONFIRM IN WRITING WITHIN TEN (10) DAYS, OTHERWISE ECA WILL PROCEED PER***

# SKAPS HD-60T1
# HDPE GEOMEMBRANE
# Textured Single Sided

**Minnkota Power Cooperative, Cell 5 - Phase 1B**


**SKAPS INDUSTRIES**
571 Industrial Pkwy
Commerce, GA 30529
Phone: (706) 336-7000
Fax: (706) 336-7007
E-Mail: contact@skaps.com


SKAPS HD-60T1 Geomembrane is manufactured utilizing the highest quality standards to provide the greatest durability in geomembrane applications. The geomembrane is formulated to meet the requirements of GRI GM13 specifications.

| PROPERTY | TEST METHOD | FREQUENCY | 60 mil | QUALIFIER |
|---|---|---|---|---|
| Thickness (minimum avg), mil | ASTM D 5994 | Per Roll | 57 | MAV(1) |
| Thickness (min 8 of 10), mil | | | 54 | MIN |
| Thickness (minimum), mil | | | 51 | MIN |
| Asperity Height, mils | ASTM D 7466 | 2nd Roll | 35 | MAV |
| Density, g/cc | ASTM D 1505 | 200,000 lb | 0.940 | MIN |
| Tensile Properties (both directions) | ASTM D6693 Type IV Specimen, 2 in/min | 20,000 lb | | |
| Strength at Yield, lb/in width | | | 126 | MAV |
| Elongation at Yield, % (1.3 in. GL) | | | 12 | MAV |
| Strength at Break, lb/in width | | | 90 | MAV |
| Elongation at Break, % (2 in. GL) | | | 100 | MAV |
| Tear Resistance, lb | ASTM D 1004 | 45,000 lb | 42 | MAV |
| Puncture Resistance, lb | ASTM D 4833 | 45,000 lb | 90 | MAV |
| Carbon Black Content, % | ASTM D 4218 | 20,000 lb | 2-3 | Range |
| Carbon Black Dispersion (Category) | ASTM D 5596 | 45,000 lb | Note (2) | Category |
| Stress Crack Resistance, hr. | ASTM D 5397, Appendix | 200,000 lb | 500 | MIN |
| Oxidative Induction Time, minutes | ASTM D 3895 200°C, 1 atm $O_2$ | 200,000 lb | 100 | MIN |
| **ROLL DIMENSIONS** | | | | |
| Roll Length, ft | | | 530 | NOM |
| Roll Width, ft | | | 24.0 | |
| Roll Area, sf | | | 12,720 | |

**Notes:**

(1) Minimum average value

(2) Carbon black dispersion (only near spherical agglomerates) for 10 different views:
9 in Categories 1 or 2 and 1 in Category 3

***APPROVED***
*By Jack A. Gossen at 3:54 pm, Apr 17, 2023*

BBI approved with the addition of comments made by EC Applications in email sent by Jack Gossen to Joe Grosz 4/17/2023.


*This information is provided for reference purposes only and is not intended as a warranty or guarantee.*
*SKAPS assumes no liability in connection with the use of this information.*

# SKAPS HD-60S
# HDPE GEOMEMBRANE
# Smooth

**SKAPS INDUSTRIES**
571 Industrial Pkwy
Commerce, GA 30529
Phone: (706) 336-7000
Fax: (706) 336-7007
E-Mail: contact@skaps.com

SKAPS HD-60S Geomembrane is manufactured utilizing the highest quality standards to provide the greatest durability in geomembrane applications. The geomembrane is formulated to meet the requirements of GRI GM13 specifications.

| PROPERTY | TEST METHOD | FREQUENCY | VALUE | QUALIFIER |
|---|---|---|---|---|
| Thickness (minimum avg), mil | ASTM D 5199 | Per Roll | 60 | MAV(1) |
| Thickness (minimum), mil | | | 54 | MIN |
| Density, g/cc | ASTM D 1505 | 200,000 lb | 0.940 | MIN |
| Tensile Properties (both directions) | ASTM D6693 Type IV Specimen, 2 in/min | 20,000 lb | | |
| Strength at Yield, lb/in width | | | 126 | MAV |
| Elongation at Yield, % (1.3 in. GL) | | | 12 | MAV |
| Strength at Break, lb/in width | | | 228 | MAV |
| Elongation at Break, % (2 in. GL) | | | 700 | MAV |
| Tear Resistance, lb | ASTM D 1004 | 45,000 lb | 42 | MAV |
| Puncture Resistance, lb | ASTM D 4833 | 45,000 lb | 108 | MAV |
| Carbon Black Content, % | ASTM D 4218 | 20,000 lb | 2-3 | Range |
| Carbon Black Dispersion (Category) | ASTM D 5596 | 45,000 lb | Note (2) | Category |
| Stress Crack Resistance, hr. | ASTM D 5397, Appendix | 200,000 lb | 500 | MIN |
| Oxidative Induction Time, minutes | ASTM D 3895 200°C, 1 atm $O_2$ | 200,000 lb | 100 | MIN |
| **ROLL DIMENSIONS** | | | | |
| Roll Length, ft | | | 540 | NOM |
| Roll Width, ft | | | 24.0 | |
| Roll Area, sf | | | 12,960 | |

**Notes:**
(1) Minimum average value
(2) Carbon black dispersion (only near spherical agglomerates) for 10 different views:
9 in Categories 1 or 2 and 1 in Category 3

*This information is provided for reference purposes only and is not intended as a warranty or guarantee.*
*SKAPS assumes no liability in connection with the use of this information.*

# SUBMITTAL CONTROL FORM

ECApplications

DATE: April 10, 2023
SUBMITTAL NO.: 2
PROJECT NUM.: 233013
PROJECT NAME: Minnkota-Coal Combusion Waste Facility-Cell 5 Phase 12B

| | | | |
|---|---|---|---|
| TO: | **Baranko Bros, Inc.** | FROM: | **EC Applications** |
| ATTN: | **Jack Gossen** | | **Ruben Brito** |
| | **3048 Highway 22N** | | **901 E. Orangethorpe Ave.** |
| | **Dickinson, NV 58601** | | **Anaheim, CA 92801** |
| PHONE: | **701-483-5868** | PHONE: | **714-921-9848 X 102** |
| FAX: | **701-483-5960** | FAX: | **866-475-1225** |
| E-MAIL: | **j.gossen@barankoinc.com** | E-MAIL: | **rbrito@ecapps.com** |

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☐ SHOP DRAWINGS ☐ CERTIFICATES OF COMPLIANCE ☐ SAMPLES
☐ MATERIAL DATA ☐ QC INFORMATION ☐ OTHER

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☐ APPROVAL ☐ INFORMATION ☐ RESUBMIT
☐ AS REQUESTED ☐ FOR REVIEW

| ITEM NO. | SUBMITTAL DESCRIPTION | NO. OF COPIES | CONTRACT REFERENCE / SPECIFICATION SECTION / DRAWING SHEET NUMBER |
|---|---|---|---|
| | Resin Data shall include the following. A. Certification stating that the resin meets the specification requirements (Table 2.1) and the requirements in 2.01 (no recycled polymer and no more than 10 percent rework of the same type of material is added to the resin (product run may be recycled)) shall be furnished at the time of shipment. | 1 | Section 310519.16 Subsection 1.04 A-1 |

**NOTE:**

***THE ABOVE SUBMITTED ITEMS HAVE BEEN REVIEWED IN DETAIL AND ARE CORRECT AND IN GENERAL CONFORMANCE WITH THE CONTRACT DRAWINGS AND SPECIFICATIONS EXCEPT AS OTHERWISE STATED.***

*Ruben Brito*

*ECApplications AUTHORIZED SIGNATURE*

***IF THE ABOVE VARIANCES ARE ACCEPTABLE, PLEASE CONFIRM IN WRITING WITHIN TEN (10) DAYS, OTHERWISE ECA WILL PROCEED PER THE PROPOSED VARIANCES.***

APPROVED
By Jack A. Gossen at 7:29 am, Apr 11, 2023

**SKAPS Industries**
571 Industrial Parkway
Commerce, GA 30529
Ph: (706) 336-7000
Fax: (706) 336-7007

April 6, 2023,

Ref: Minnkota Power Cooperative- Cell 5 Phase 1B

SKAPS Industries certifies that the HDPE geomembrane and extrudate rods manufactured for the reference project will be new, first quality resin, compounded and manufactured specifically for producing geomembrane for use in flexible membrane liner installations.

SKAPS Industries specifies that natural HDPE resin shall meet the specifications set forth in Table 2.1

SKAPS Industries certifies that no recycled polymer and no more than 10 percent rework of the same type of material shall be added to the resin.

Malkesh Patel
*Malkesh Patel*
SKAPS Industries

# SUBMITTAL CONTROL FORM

DATE: July 19, 2023

SUBMITTAL NO.: 7

PROJECT NUM.: 233013

PROJECT NAME: Minnkota-Coal Combusion Waste Facility-Cell 5 Phase 12B

| | | | |
|---|---|---|---|
| TO: | **Baranko Bros, Inc.** | FROM: | **EC Applications** |
| ATTN: | **Jack Gossen** | | **Ruben Brito** |
| | **3048 Highway 22N** | | **901 E. Orangethorpe Ave.** |
| | **Dickinson, NV 58601** | | **Anaheim, CA 92801** |
| PHONE: | **701-483-5868** | PHONE: | **714-921-9848 X 102** |
| FAX: | **701-483-5960** | FAX: | **866-475-1225** |
| E-MAIL: | **j.gossen@barankoinc.com** | E-MAIL: | **rbrito@ecapps.com** |

**WE ARE SUBMITTING THE ENCLOSED:**

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- [ ] CERTIFICATES OF COMPLIANCE
- [ ] SAMPLES
- [X] MATERIAL DATA
- [ ] QC INFORMATION
- [ ] OTHER

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- [ ] AS REQUESTED
- [ ] FOR REVIEW

| ITEM NO. | SUBMITTAL DESCRIPTION | NO. OF COPIES | CONTRACT REFERENCE / SPECIFICATION SECTION / DRAWING SHEET NUMBER |
|---|---|---|---|
| | Material Specifications for Ballast Bags, Rope & Ties | 1 | Per Revised Sheet C-11 |

**NOTE:**

***THE ABOVE SUBMITTED ITEMS HAVE BEEN REVIEWED IN DETAIL AND ARE CORRECT AND IN GENERAL CONFORMANCE WITH THE CONTRACT DRAWINGS AND SPECIFICATIONS EXCEPT AS OTHERWISE STATED.***

*Ruben Brito*

*ECApplications AUTHORIZED SIGNATURE*

***IF THE ABOVE VARIANCES ARE ACCEPTABLE, PLEASE CONFIRM IN WRITING WITHIN TEN (10) DAYS, OTHERWISE ECA WILL PROCEED PER THE PROPOSED VARIANCES.***

# ACCESSORIES

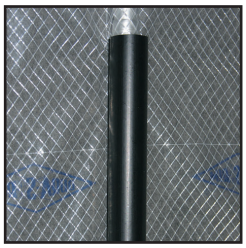
SEAMING TAPES & OTHER ACCESSORIES FOR PLASTIC SHEETING

## ADDITIONAL ACCESSORIES (CONTINUED)

### Dura♦Skrim® Reinforced Sandbags

Dura♦Skrim® reinforced sandbags are used to secure large covers and liners to prevent wind damage. Sandbags are produced with strong Dura♦Skrim® 8 & 12 mil reinforced polyethylene. These 15" wide x 24" long bags are designed to hold 35 lbs. Sandbags are also available in other Raven reinforced materials with minimum order requirements. 11.8" Cable Ties are also available.

### Dura-Clip™ (CLIP11)



These full size clips are 11" long and fit most commercial scaffolding. Dura-Clip™ will securely fasten your poly sheeting to scaffolding, reducing wind whip and increasing the life of your enclosure. The Dura-Clip™ is normally placed about every 3' onto the enclosure.

### Tie-Down Buttons (BUTI) & Tarp Grabbers (BUTEZ)

Tie-Down Buttons and Tarp Grabbers help keep plastic sheeting securely in place. Tie-Down Buttons are designed to eliminate traditional grommets in plastic sheeting up to 10 mil thick and are reusable plastic fittings that are easy to install in any position. Tarp Grabbers are up to 4 times stronger than a brass grommet and are typically used in heavier plastic sheeting from 10 mil to 30 mil thick. Great for equipment covers, large storage covers and truck tarps.

### Raven Welding Rod

Raven Welding Rod is used for field seaming, repairs and detail work, such as installing pipe boots. Packaged in 25 lb spools, it is available in 4mm and 5mm sizes to fit most brands of extrusion guns. Raven Welding Rod is made from a thermally UV stabilized LLDPE resin and is available in both black and white to correspond with the color of geomembranes being utilized.

## TAPE ACCESSORY PROPERTIES

| PROPERTIES | VaporBond Tape (TVB4) | VaporSeal Tape (TVSP4 / TVSP12) | VaporBoot Tape (TBOOT) | R25B Tape (R25B) | Butyl Seal Tape (TP2BR / TP6BR) |
|---|---|---|---|---|---|
| BACKING | 6.7 mil Polyethylene | 7 mil EVOH/LLDPE | 30 mil EPDM | 8 mil Multi-Polymer | N/A |
| ADHESIVE | 3.3 mil Rubber Based Pressure-Sensitive | 2 mil Acrylic Adhesive Pressure-Sensitive | 20 mil Butyl Rubber | 17 mil Synthetic Elastomeric | 40 mil Butyl Rubber |
| COLOR | White | Silver | Black | Black | Black |
| TYPE | Single Sided | Single Sided | Single Sided | Single Sided | Double Sided |
| SIZE | 4" x 210' | 4" x 160' / 12" x 50' | 2" x 16.4' | 4" x 100' | 2" x 50' / 6" x 50' |
| ROLLS PER CASE | 12 | 12 / 4 | 64 | 6 | 16 / 4 |
| WEIGHT PER CASE | 45 lbs | 50 lbs / 18 lbs | 45 lbs | 33 lbs | 47 lbs / 20 lbs |
| ADHESION VALUES | 35 oz. / in. (to steel) | 80 oz. / in. (to steel) | 145 oz. / in. (to steel) | 144 oz. / in. (to steel) | 88 oz. / in. (to steel) |
| PERMS | 0.081 g/(24h*100 $in^2$) | 0.014 g/(24h*100 $in^2$) | N/A | <0.005 g/(24h*100 $in^2$) | 0.82 g/(24h*100 $in^2$) |
| SERVICE TEMP. | -40° F to +180° F | -40° F to +190° F | +14° F to +122° F | +20° F to +180° F | 0° F to +170° F |
| MIN. APPLICATION TEMP. | 50° F | 50° F | 14° F | 35° F | 35° F |
| IDEAL STORAGE TEMP. / HUMIDITY | 70° F w/ 40-50 % | 60°-80° F w/ 40-60 % | 70° F w/ 70 % | 70° F w/ 40-50 % | 70° F w/ 40-50 % |

Scan QR Code to download current technical data sheets via the Raven website.

Note: To the best of our knowledge, unless otherwise stated, these are typical property values and are intended as guides only, not as specification limits. Chemical resistance, odor transmission, longevity as well as other performance criteria is not implied or given and actual testing must be performed for applicability in specific applications and/or conditions. RAVEN INDUSTRIES MAKES NO WARRANTIES AS TO THE FITNESS FOR A SPECIFIC USE OR MERCHANTABILITY OF PRODUCTS REFERRED TO, no guarantee of satisfactory results from reliance upon contained information or recommendations and disclaims all liability for resulting loss or damage. Limited Warranty available at www.RavenEFD.com

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www.ravenefd.com

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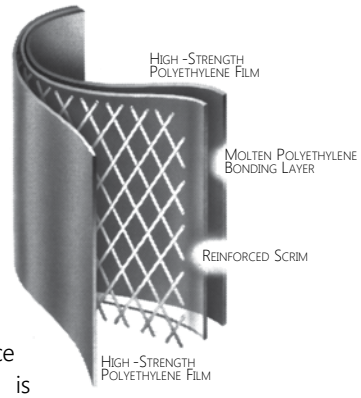
# DURA·SKRIM® R8BV

FOUR-LAYER REINFORCED EXTRUSION LAMINATE - MEETS GRI-GM22

RAVEN

## PRODUCT DESCRIPTION




DURA♦SKRIM® R8BV consists of two sheets of high-strength virgin polyethylene film laminated together with a third layer of molten polyethylene. The black outer layers contain carbon black to enhance outdoor life. A heavy scrim reinforcement placed between these plies greatly enhances tear resistance and increases service life. DURA♦SKRIM® R8BV is reinforced with a high strength scrim reinforcement laid in a diagonal pattern spaced 3/8" apart for uniform tear resistance in both machine and transverse directions with an additional machine direction scrim every 3" across the width for increased stability.

## PRODUCT USE

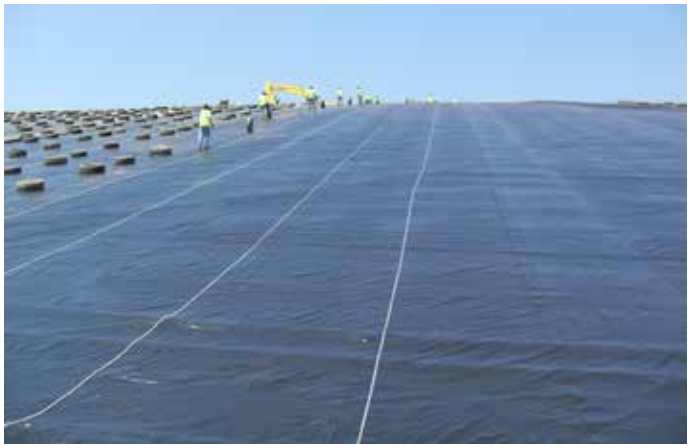
DURA♦SKRIM® R8BV is used in more demanding applications requiring high tear resistance. It is designed to withstand longer term outdoor applications requiring up to 5 years of exposure or more depending upon geographical location.

DURA♦SKRIM® R8BV are designed to meet the requirements of the Geosynthetics Research Institute; GRI-GM22 Standard Specification.

## SIZE & PACKAGING

DURA♦SKRIM® R8BV is available in a variety of widths and panels up to 180,000 square feet. All panels are manufactured in a quality controlled environment and are accordion folded and tightly rolled on a heavy-duty core for ease of handling and time-saving installation.

DURA·SKRIM®



Temporary Rain Shed Cover

| PRODUCT | PART # |
|---|---|
| DURA♦SKRIM | R8BV |

## APPLICATIONS

- Daily Landfill Covers
- Interim Landfill Covers
- Temporary Rainshed Covers
- Remediation Covers or Liners
- Cargo Coverings
- Outdoor Covers

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# DURA·SKRIM® R8BV

FOUR-LAYER REINFORCED EXTRUSION LAMINATE - MEETS GRI-GM22

| | | DURA♦SKRIM R8BV | | | |
|---|---|---|---|---|---|
| | | IMPERIAL | | METRIC | |
| PROPERTIES | TEST METHOD | MINIMUM | TYPICAL | MINIMUM | TYPICAL |
| Appearance | | Black/Black | | | |
| Thickness | ASTM D5199 | 6.4 Mil Average | 8 Mil Nominal | 0.16 mm Average | 0.20 mm Nominal |
| Weight | ASTM D751 | 34 lbs/MSF | 39 lbs/MSF | 166 g/m$^2$ | 190 g/m$^2$ |
| Construction | | Extrusion laminated with scrim reinforcement | | | |
| [2] Grab Tensile | ASTM D7004 | 60 lbs | 85 lbs | 267 N | 378 N |
| [2] Grab Tensile Elongation | ASTM D7004 | 15 % | 17 % | 15 % | 17 % |
| [2] 1" Tensile Strength | ASTM D7003 | 50 lbs/in | 70 lbs/in | 88 N/cm | 123 N/cm |
| [2] Elongation at Film Break | ASTM D7003 | 100 % | 550 % | 100 % | 550 % |
| [3] Tongue Tear | ASTM D5884 | 20 lbs | 35 lbs | 89 N | 156 N |
| CBR Puncture Resistance | ASTM D6241 | 160 lbs | 210 lbs | 712 N | 934 N |
| Mullen Burst | ASTM D751 | 65 psi | 78 psi | 448 kPa | 538 kPa |
| High Pressure OIT | ASTM D5885 | 1000 min | 1600 min | 1000 min | 1600 min |
| WVTR | ASTM E96 | N/A | 0.016 grains/ft$^2$•hr | N/A | 0.268 g/m$^2$•day |
| Perm | ASTM E96 | N/A | 0.039 Perms | N/A | 0.026 g/m$^2$•day•mm Hg |
| Hydraulic Conductivity | ASTM E96 | 3.14x10$^{-10}$ cm/sec | | | |
| UV Resistance | GRI GM22 | > 80% retained / no cracking | | | |
| Maximum Static Use Temperature | | 180° F | | 82° C | |
| Minimum Static Use Temperature | | -70° F | | -57° C | |

[2] Tests are an average of primary reinforcement directions.
[3] Tests are an average of machine and transverse directions.

DURA·SKRIM®

DURA♦SKRIM® R8BV consists of two sheets of high-strength virgin polyethylene film laminated together with a third layer of molten polyethylene. The black outer layers contain carbon black to enhance outdoor life. A heavy scrim reinforcement placed between these plies greatly enhances tear resistance and increases service life. DURA♦SKRIM® R8BV is reinforced with a high strength scrim reinforcement laid in a diagonal pattern spaced 3/8" apart for uniform tear resistance in both machine and transverse directions with an additional machine direction scrim every 3" across the width for increased stability.

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Note: To the best of our knowledge, unless otherwise stated, these are typical property values and are intended as guides only, not as specification limits. Chemical resistance, odor transmission, longevity as well as other performance criteria is not implied or given and actual testing must be performed for applicability in specific applications and/or conditions. RAVEN INDUSTRIES MAKES NO WARRANTIES AS TO THE FITNESS FOR A SPECIFIC USE OR MERCHANTABILITY OF PRODUCTS REFERRED TO, no guarantee of satisfactory results from reliance upon contained information or recommendations and disclaims all liability for resulting loss or damage. Limited Warranty available at www.RavenEFD.com

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www.ravenefd.com

RAVEN

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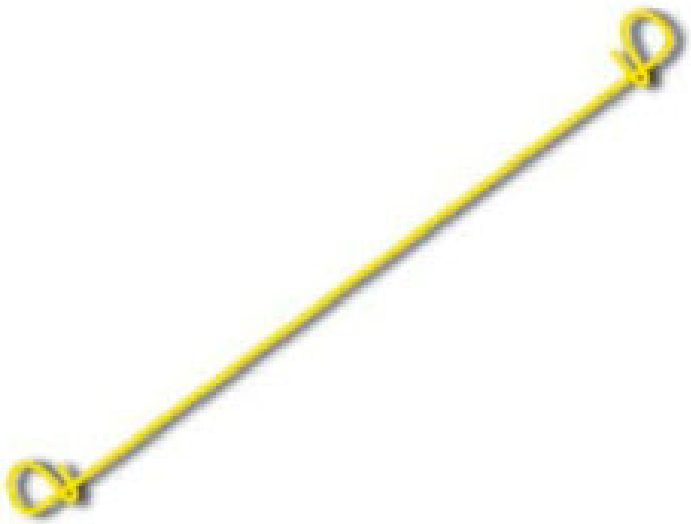
# 3 STRAND 3/4" DIAMETER POLYPROPYLENE ROPE

| Diameter | Length | Minimum Break Strength | Approximate Density | Approximate Package Weight |
|---|---|---|---|---|
| in. | ft. | lbs. | lbs./100 ft. | lbs. |
| 3/16 | 600 | 720 | 0.7 | 4.2 |
| 3/16 | 1,200 | 720 | 0.7 | 8.4 |
| 3/16 | 6,000 | 720 | 0.7 | 42.0 |
| 1/4 | 100 | 1,250 | 1.2 | 1.2 |
| 1/4 | 300 | 1,250 | 1.2 | 3.6 |
| 1/4 | 600 | 1,250 | 1.2 | 7.2 |
| 1/4 | 1,200 | 1,250 | 1.2 | 14.4 |
| 1/4 | 2,400 | 1,250 | 1.2 | 28.8 |
| 1/4 | 5,000 | 1,250 | 1.2 | 60.0 |
| 5/16 | 600 | 1,710 | 1.8 | 10.8 |
| 5/16 | 1,200 | 1,710 | 1.8 | 21.6 |
| 3/8 | 100 | 2,440 | 2.8 | 2.8 |
| 3/8 | 300 | 2,440 | 2.8 | 8.4 |
| 3/8 | 600 | 2,440 | 2.8 | 16.8 |
| 3/8 | 1,200 | 2,440 | 2.8 | 33.6 |
| 3/8 | 2,400 | 2,440 | 2.8 | 67.2 |
| 3/8 | 3,600 | 2,440 | 2.8 | 100.8 |
| 1/2 | 100 | 3,780 | 4.7 | 4.7 |
| 1/2 | 300 | 3,780 | 4.7 | 14.1 |
| 1/2 | 600 | 3,780 | 4.7 | 28.2 |
| 1/2 | 1,200 | 3,780 | 4.7 | 56.4 |
| 1/2 | 2,400 | 3,780 | 4.7 | 112.8 |
| 5/8 | 100 | 5,600 | 7.5 | 7.5 |
| 5/8 | 600 | 5,600 | 7.5 | 45.0 |
| 5/8 | 1,200 | 5,600 | 7.5 | 90.0 |
| 5/8 | 2,400 | 5,600 | 7.5 | 180.0 |
| 3/4 | 100 | 7,650 | 10.7 | 10.7 |
| 3/4 | 300 | 7,650 | 10.7 | 32.1 |
| 3/4 | 600 | 7,650 | 10.7 | 64.2 |
| 3/4 | 1,200 | 7,650 | 10.7 | 128.4 |
| 1 | 100 | 12,600 | 18.0 | 18.0 |
| 1 | 600 | 12,600 | 18.0 | 108.0 |
| 1 | 1,200 | 12,600 | 18.0 | 216.0 |
| 1-1/4 | 600 | 18,900 | 27.0 | 162.0 |
| 1-1/2 | 600 | 26,800 | 38.0 | 230.0 |
| 2 | 600 | 46,800 | 69.0 | 414.0 |

ECA intends to utilize the PVC Coated Rebar Tie as an equal alternative to the specified Nylon cables. See material specifications below.

## 12in. Double Loop Wire Ties PVC Coated

PVC -Made in USA- A dead-soft annealed core, surrounded by a 7 mil thickness of Poly Vinyl Chloride. Used for tying epoxy--Made in USA- rebar, bundling, fertilizer or chemical bags and anytime you need cushioned wire with added protection against corrosion, salt or abrasives.



# Geomembrane Roll Certifications

# SUBMITTAL CONTROL FORM

ECApplications

DATE: July 7, 2023
SUBMITTAL NO.: 3
PROJECT NUM.: 233013
PROJECT NAME: Minnkota-Coal Combusion Waste Facility-Cell 5 Phase 12B

| | | | |
|---|---|---|---|
| TO: | **Baranko Bros, Inc.** | FROM: | **EC Applications** |
| ATTN: | **Jack Gossen** | | **Ruben Brito** |
| | **3048 Highway 22N** | | **901 E. Orangethorpe Ave.** |
| | **Dickinson, NV 58601** | | **Anaheim, CA 92801** |
| PHONE: | **701-483-5868** | PHONE: | **714-921-9848 X 102** |
| FAX: | **701-483-5960** | FAX: | **866-475-1225** |
| E-MAIL: | **j.gossen@barankoinc.com** | E-MAIL: | **rbrito@ecapps.com** |

**WE ARE SUBMITTING THE ENCLOSED:**

☐ SHOP DRAWINGS ☐ CERTIFICATES OF COMPLIANCE ☐ SAMPLES
☐ MATERIAL DATA ☐ QC INFORMATION ☐ OTHER

**THESE ARE TRANSMITTED FOR:**

☐ APPROVAL ☐ INFORMATION ☐ RESUBMIT
☐ AS REQUESTED ☐ FOR REVIEW

| ITEM NO. | SUBMITTAL DESCRIPTION | NO. OF COPIES | CONTRACT REFERENCE / SPECIFICATION SECTION / DRAWING SHEET NUMBER |
|---|---|---|---|
| | Geomembrane Roll A. Certification stating that the material was manufactured and tested in accordance with this specification (Table 2.2), together with a report of the test results, shall be furnished at the time of shipment. B. As geomembrane rolls are delivered to the Site, a copy of each roll's label shall be delivered to Owner's On-Site Representative. | 1 | Section 310519.16 Subsection 1.04 A-2 |

**NOTE:**

***THE ABOVE SUBMITTED ITEMS HAVE BEEN REVIEWED IN DETAIL AND ARE CORRECT AND IN GENERAL CONFORMANCE WITH THE CONTRACT DRAWINGS AND SPECIFICATIONS EXCEPT AS OTHERWISE STATED.***

*Ruben Brito*

*ECApplications AUTHORIZED SIGNATURE*

***IF THE ABOVE VARIANCES ARE ACCEPTABLE, PLEASE CONFIRM IN WRITING WITHIN TEN (10) DAYS, OTHERWISE ECA WILL PROCEED PER THE PROPOSED VARIANCES.***

**Product:** 60-HD-10-BLK-BLK-GRI-STD-24.00
**Project :** Minnkota Landfill Cell 5, ND
**Customer:** EC Applications
**Cust PO:** 23053

**QC'd By:** Malkesh Patel
**Date:** July 7, 2023

We hereby certify the following test results for the above referenced product/project :

| Count | Roll Number | Area (sq ft) | Gross Weight (lb) | Thickness MAV (mil) | Thickness MIN (mil) | Asperity Height (mil) | Tensile at Yield (ppi) | | Elong at Yield (%) | | Tensile at Break (ppi) | | Elong at Break (%) | | Tear Resistance (lb) | | Punct Resist (lb) | Density (g/cc) | Carbon Black (%) | CB Disp (Views in Cat 1 or 2) | Resin OIT (Minute) | Resin Lot # |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | ASTM D 5994 | ASTM D 5994 | ASTM D 7466 | ASTM D 6693 | | ASTM D 6693 | | ASTM D 6693 | | ASTM D 6693 | | ASTM D 1004 | | ASTM D 4833 | ASTM D 1505 | ASTM D 4218 | ASTM D 5596 | ASTM D 3895 | |
| | | | | | | Side | MD | TD | MD | TD | MD | TD | MD | TD | MD | TD | | | | | | |
| 01 | 3111019527 | 11,040.00 | 3516 | 57 | 56 | 37 | 147 | 156 | 16 | 16 | 156 | 148 | 401 | 433 | 50 | 52 | 145 | 0.949 | 2.6 | 10 | 217 | PQD820510 |
| 02 | 3111019528 | 11,040.00 | 3524 | 58 | 54 | 36 | 147 | 156 | 16 | 16 | 156 | 148 | 401 | 433 | 50 | 52 | 145 | 0.949 | 2.6 | 10 | 217 | PQD820510 |
| 03 | 3111019529 | 11,040.00 | 3566 | 57 | 55 | 35 | 147 | 156 | 16 | 16 | 156 | 148 | 401 | 433 | 50 | 52 | 145 | 0.949 | 2.6 | 10 | 217 | PQD820510 |
| 04 | 3111019530 | 11,040.00 | 3566 | 57 | 54 | 36 | 144 | 153 | 18 | 16 | 184 | 136 | 526 | 334 | 50 | 52 | 145 | 0.949 | 2.4 | 10 | 217 | PQD820510 |
| 05 | 3111019531 | 11,040.00 | 3578 | 58 | 55 | 37 | 144 | 153 | 18 | 16 | 184 | 136 | 526 | 334 | 50 | 52 | 145 | 0.949 | 2.4 | 10 | 217 | PQD820510 |
| 06 | 3111019532 | 11,040.00 | 3566 | 57 | 54 | 39 | 144 | 153 | 18 | 16 | 184 | 136 | 526 | 334 | 50 | 52 | 145 | 0.949 | 2.4 | 10 | 217 | PQD820510 |
| 07 | 3111019533 | 11,040.00 | 3582 | 57 | 54 | 38 | 144 | 153 | 18 | 16 | 184 | 136 | 526 | 334 | 50 | 52 | 145 | 0.949 | 2.4 | 10 | 217 | PQD820510 |
| 08 | 3111019534 | 11,040.00 | 3584 | 58 | 55 | 39 | 144 | 153 | 18 | 16 | 184 | 136 | 526 | 334 | 50 | 52 | 145 | 0.949 | 2.4 | 10 | 217 | PQD820510 |
| 09 | 3111019535 | 11,040.00 | 3578 | 58 | 57 | 38 | 148 | 152 | 18 | 16 | 173 | 169 | 473 | 513 | 50 | 53 | 145 | 0.948 | 2.4 | 10 | 217 | PQD820510 |
| 10 | 3111019536 | 11,040.00 | 3606 | 57 | 56 | 36 | 148 | 152 | 18 | 16 | 173 | 169 | 473 | 513 | 50 | 53 | 145 | 0.948 | 2.4 | 10 | 217 | PQD820510 |
| 11 | 3111019537 | 11,040.00 | 3614 | 58 | 56 | 36 | 148 | 152 | 18 | 16 | 173 | 169 | 473 | 513 | 50 | 53 | 145 | 0.948 | 2.4 | 10 | 217 | PQD820510 |
| 12 | 3111019538 | 11,040.00 | 3598 | 58 | 55 | 36 | 148 | 152 | 18 | 16 | 173 | 169 | 473 | 513 | 50 | 53 | 145 | 0.948 | 2.4 | 10 | 217 | PQD820510 |



SKAPS Industries
571 Industrial Parkway
Commerce, GA 30529

Phone: 706-336-7000
Fax: 706-336-7007
E-Mail:contact@skaps.com

**Product:** 60-HD-10-BLK-BLK-GRI-STD-24.00
**Project :** Minnkota Landfill Cell 5, ND
**Customer:** EC Applications
**Cust PO:** 23053

**QC'd By:** Malkesh Patel
**Date:** July 7, 2023

We hereby certify the following test results for the above referenced product/project :

| Count | Roll Number | Area (sq ft) | Gross Weight (lb) | Thickness MAV (mil) | Thickness MIN (mil) | Asperity Height (mil) | Tensile at Yield (ppi) | | Elong at Yield (%) | | Tensile at Break (ppi) | | Elong at Break (%) | | Tear Resistance (lb) | | Punct Resist (lb) | Density (g/cc) | Carbon Black (%) | CB Disp (Views in Cat 1 or 2) | Resin OIT (Minute) | Resin Lot # |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | ASTM D 5994 | ASTM D 5994 | ASTM D 7466 | ASTM D 6693 | | ASTM D 6693 | | ASTM D 6693 | | ASTM D 6693 | | ASTM D 1004 | | ASTM D 4833 | ASTM D 1505 | ASTM D 4218 | ASTM D 5596 | ASTM D 3895 | |
| | | | | | | Side | MD | TD | MD | TD | MD | TD | MD | TD | MD | TD | | | | | | |
| 13 | 3111019539 | 11,040.00 | 3600 | 57 | 56 | 38 | 150 | 156 | 17 | 15 | 190 | 150 | 525 | 382 | 50 | 53 | 145 | 0.948 | 2.5 | 10 | 217 | PQD820510 |
| 14 | 3111019540 | 11,040.00 | 3612 | 58 | 56 | 38 | 150 | 156 | 17 | 15 | 190 | 150 | 525 | 382 | 50 | 53 | 145 | 0.948 | 2.5 | 10 | 217 | PQD820510 |
| 15 | 3111019541 | 11,040.00 | 3586 | 58 | 57 | 38 | 150 | 156 | 17 | 15 | 190 | 150 | 525 | 382 | 50 | 53 | 145 | 0.948 | 2.5 | 10 | 217 | PQD820510 |
| 16 | 3111019542 | 11,040.00 | 3608 | 57 | 55 | 38 | 150 | 156 | 17 | 15 | 190 | 150 | 525 | 382 | 50 | 53 | 145 | 0.948 | 2.5 | 10 | 217 | PQD820510 |
| 17 | 3111019543 | 11,040.00 | 3628 | 57 | 56 | 38 | 150 | 156 | 17 | 15 | 190 | 150 | 525 | 382 | 50 | 53 | 145 | 0.948 | 2.5 | 10 | 217 | PQD820510 |
| 18 | 3111019544 | 11,040.00 | 3,576 | 57 | 56 | 38 | 152 | 158 | 16 | 15 | 183 | 143 | 498 | 383 | 46 | 52 | 144 | 0.948 | 2.4 | 10 | 217 | PQD820510 |
| 19 | 3111019545 | 11,040.00 | 3,566 | 57 | 54 | 38 | 152 | 158 | 16 | 15 | 183 | 143 | 498 | 383 | 46 | 52 | 144 | 0.948 | 2.4 | 10 | 217 | PQD820510 |
| 20 | 3111019546 | 11,040.00 | 3,562 | 58 | 57 | 36 | 152 | 158 | 16 | 15 | 183 | 143 | 498 | 383 | 46 | 52 | 144 | 0.948 | 2.4 | 10 | 217 | PQD820510 |
| 21 | 3111019547 | 11,040.00 | 3,582 | 58 | 54 | 37 | 152 | 158 | 16 | 15 | 183 | 143 | 498 | 383 | 46 | 52 | 144 | 0.948 | 2.4 | 10 | 217 | PQD820510 |
| 22 | 3111019548 | 11,040.00 | 3,590 | 58 | 57 | 37 | 151 | 157 | 18 | 18 | 182 | 162 | 524 | 465 | 46 | 52 | 144 | 0.948 | 2.6 | 10 | 217 | PQD820510 |
| 23 | 3111019549 | 11,040.00 | 3,564 | 57 | 54 | 38 | 151 | 157 | 18 | 18 | 182 | 162 | 524 | 465 | 46 | 52 | 144 | 0.948 | 2.6 | 10 | 217 | PQD820510 |
| 24 | 3111019550 | 11,040.00 | 3,584 | 58 | 56 | 35 | 151 | 157 | 18 | 18 | 182 | 162 | 524 | 465 | 46 | 52 | 144 | 0.948 | 2.6 | 10 | 217 | PQD820510 |



SKAPS Industries
571 Industrial Parkway
Commerce, GA 30529

Phone: 706-336-7000
Fax: 706-336-7007
E-Mail:contact@skaps.com

**Product:** 60-HD-10-BLK-BLK-GRI-STD-24.00
**Project :** Minnkota Landfill Cell 5, ND
**Customer:** EC Applications
**Cust PO:** 23053

**QC'd By:** Malkesh Patel
**Date:** July 7, 2023

We hereby certify the following test results for the above referenced product/project :

| Count | Roll Number | Area (sq ft) | Gross Weight (lb) | Thickness MAV (mil) | Thickness MIN (mil) | Asperity Height (mil) | Tensile at Yield (ppi) | | Elong at Yield (%) | | Tensile at Break (ppi) | | Elong at Break (%) | | Tear Resistance (lb) | | Punct Resist (lb) | Density (g/cc) | Carbon Black (%) | CB Disp (Views in Cat 1 or 2) | Resin OIT (Minute) | Resin Lot # |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | ASTM D 5994 | ASTM D 5994 | ASTM D 7466 | ASTM D 6693 | | ASTM D 6693 | | ASTM D 6693 | | ASTM D 6693 | | ASTM D 1004 | | ASTM D 4833 | ASTM D 1505 | ASTM D 4218 | ASTM D 5596 | ASTM D 3895 | |
| | | | | | | Side | MD | TD | MD | TD | MD | TD | MD | TD | MD | TD | | | | | | |
| 25 | 3111019551 | 11,040.00 | 3,578 | 57 | 54 | 36 | 151 | 157 | 18 | 18 | 182 | 162 | 524 | 465 | 46 | 52 | 144 | 0.948 | 2.6 | 10 | 217 | PQD820510 |
| 26 | 3111019552 | 11,040.00 | 3,586 | 57 | 56 | 35 | 151 | 157 | 18 | 18 | 182 | 162 | 524 | 465 | 46 | 52 | 144 | 0.948 | 2.6 | 10 | 217 | PQD820510 |
| 27 | 3111019553 | 11,040.00 | 3,592 | 58 | 55 | 36 | 150 | 154 | 19 | 16 | 189 | 169 | 541 | 516 | 52 | 53 | 143 | 0.947 | 2.4 | 10 | 226 | PQD820520 |
| 28 | 3111019554 | 11,040.00 | 3,580 | 58 | 56 | 38 | 150 | 154 | 19 | 16 | 189 | 169 | 541 | 516 | 52 | 53 | 143 | 0.947 | 2.4 | 10 | 226 | PQD820520 |
| 29 | 3111019555 | 11,040.00 | 3,600 | 58 | 56 | 38 | 150 | 154 | 19 | 16 | 189 | 169 | 541 | 516 | 52 | 53 | 143 | 0.947 | 2.4 | 10 | 226 | PQD820520 |
| 30 | 3111019556 | 11,040.00 | 3,600 | 58 | 57 | 38 | 150 | 154 | 19 | 16 | 189 | 169 | 541 | 516 | 52 | 53 | 143 | 0.947 | 2.4 | 10 | 226 | PQD820520 |
| 31 | 3111019557 | 11,040.00 | 3,582 | 58 | 57 | 39 | 154 | 163 | 17 | 17 | 175 | 152 | 497 | 385 | 52 | 53 | 143 | 0.947 | 2.5 | 10 | 226 | PQD820520 |
| 32 | 3111019558 | 11,040.00 | 3,608 | 58 | 57 | 38 | 154 | 163 | 17 | 17 | 175 | 152 | 497 | 385 | 52 | 53 | 143 | 0.947 | 2.5 | 10 | 226 | PQD820520 |
| 33 | 3111019559 | 11,040.00 | 3,584 | 58 | 57 | 37 | 154 | 163 | 17 | 17 | 175 | 152 | 497 | 385 | 52 | 53 | 143 | 0.947 | 2.5 | 10 | 226 | PQD820520 |
| 34 | 3111019560 | 11,040.00 | 3,584 | 58 | 57 | 38 | 154 | 163 | 17 | 17 | 175 | 152 | 497 | 385 | 52 | 53 | 143 | 0.947 | 2.5 | 10 | 226 | PQD820520 |
| 35 | 3111019561 | 11,040.00 | 3,612 | 58 | 57 | 39 | 154 | 163 | 17 | 17 | 175 | 152 | 497 | 385 | 52 | 53 | 143 | 0.947 | 2.5 | 10 | 226 | PQD820520 |
| 36 | 3111019562 | 11,040.00 | 3,600 | 58 | 57 | 38 | 146 | 153 | 18 | 16 | 171 | 163 | 480 | 487 | 50 | 51 | 146 | 0.948 | 2.4 | 10 | 226 | PQD820520 |



SKAPS Industries
571 Industrial Parkway
Commerce, GA 30529

Phone: 706-336-7000
Fax: 706-336-7007
E-Mail:contact@skaps.com

**Product:** 60-HD-10-BLK-BLK-GRI-STD-24.00
**Project :** Minnkota Landfill Cell 5, ND
**Customer:** EC Applications
**Cust PO:** 23053

**QC'd By:** Malkesh Patel
**Date:** July 7, 2023

We hereby certify the following test results for the above referenced product/project :

| Count | Roll Number | Area (sq ft) | Gross Weight (lb) | Thickness MAV (mil) | Thickness MIN (mil) | Asperity Height (mil) | Tensile at Yield (ppi) | | Elong at Yield (%) | | Tensile at Break (ppi) | | Elong at Break (%) | | Tear Resistance (lb) | | Punct Resist (lb) | Density (g/cc) | Carbon Black (%) | CB Disp (Views in Cat 1 or 2) | Resin OIT (Minute) | Resin Lot # |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | ASTM D 5994 | ASTM D 5994 | ASTM D 7466 | ASTM D 6693 | | ASTM D 6693 | | ASTM D 6693 | | ASTM D 6693 | | ASTM D 1004 | | ASTM D 4833 | ASTM D 1505 | ASTM D 4218 | ASTM D 5596 | ASTM D 3895 | |
| | | | | | | Side | MD | TD | MD | TD | MD | TD | MD | TD | MD | TD | | | | | | |
| 37 | 3111019563 | 11,040.00 | 3,610 | 58 | 57 | 39 | 146 | 153 | 18 | 16 | 171 | 163 | 480 | 487 | 50 | 51 | 146 | 0.948 | 2.4 | 10 | 226 | PQD820520 |
| 38 | 3111019564 | 11,040.00 | 3,586 | 60 | 56 | 36 | 146 | 153 | 18 | 16 | 171 | 163 | 480 | 487 | 50 | 51 | 146 | 0.948 | 2.4 | 10 | 226 | PQD820520 |
| 39 | 3111019565 | 11,040.00 | 3,592 | 59 | 56 | 36 | 146 | 153 | 18 | 16 | 171 | 163 | 480 | 487 | 50 | 51 | 146 | 0.948 | 2.4 | 10 | 226 | PQD820520 |
| 40 | 3111019566 | 11,040.00 | 3,570 | 58 | 56 | 38 | 147 | 150 | 16 | 16 | 173 | 163 | 482 | 448 | 50 | 51 | 146 | 0.948 | 2.4 | 10 | 226 | PQD820520 |
| 41 | 3111019567 | 11,040.00 | 3,590 | 58 | 53 | 40 | 147 | 150 | 16 | 16 | 173 | 163 | 482 | 448 | 50 | 51 | 146 | 0.948 | 2.4 | 10 | 226 | PQD820520 |
| 42 | 3111019568 | 11,040.00 | 3,594 | 58 | 54 | 41 | 147 | 150 | 16 | 16 | 173 | 163 | 482 | 448 | 50 | 51 | 146 | 0.948 | 2.4 | 10 | 226 | PQD820520 |
| 43 | 3111019569 | 11,040.00 | 3,590 | 59 | 56 | 40 | 147 | 150 | 16 | 16 | 173 | 163 | 482 | 448 | 50 | 51 | 146 | 0.948 | 2.4 | 10 | 226 | PQD820520 |
| 44 | 3111019570 | 11,040.00 | 3,586 | 59 | 55 | 40 | 147 | 150 | 16 | 16 | 173 | 163 | 482 | 448 | 50 | 51 | 146 | 0.948 | 2.4 | 10 | 226 | PQD820520 |
| 45 | 3111019571 | 11,040.00 | 3,596 | 58 | 55 | 41 | 155 | 152 | 18 | 17 | 177 | 147 | 509 | 381 | 50 | 53 | 141 | 0.948 | 2.6 | 10 | 226 | PQD820520 |
| 46 | 3111019572 | 11,040.00 | 3,598 | 59 | 55 | 38 | 155 | 152 | 18 | 17 | 177 | 147 | 509 | 381 | 50 | 53 | 141 | 0.948 | 2.6 | 10 | 226 | PQD820520 |
| 47 | 3111019573 | 11,040.00 | 3,604 | 59 | 57 | 38 | 155 | 152 | 18 | 17 | 177 | 147 | 509 | 381 | 50 | 53 | 141 | 0.948 | 2.6 | 10 | 226 | PQD820520 |
| 48 | 3111019574 | 11,040.00 | 3,608 | 58 | 55 | 38 | 155 | 152 | 18 | 17 | 177 | 147 | 509 | 381 | 50 | 53 | 141 | 0.948 | 2.6 | 10 | 226 | PQD820520 |



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Commerce, GA 30529

Phone: 706-336-7000
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E-Mail:contact@skaps.com

**Product:** 60-HD-10-BLK-BLK-GRI-STD-24.00
**Project :** Minnkota Landfill Cell 5, ND
**Customer:** EC Applications
**Cust PO:** 23053

**QC'd By:** Malkesh Patel
**Date:** July 7, 2023

We hereby certify the following test results for the above referenced product/project :

| Count | Roll Number | Area (sq ft) | Gross Weight (lb) | Thickness MAV (mil) | Thickness MIN (mil) | Asperity Height (mil) | Tensile at Yield (ppi) | | Elong at Yield (%) | | Tensile at Break (ppi) | | Elong at Break (%) | | Tear Resistance (lb) | | Punct Resist (lb) | Density (g/cc) | Carbon Black (%) | CB Disp (Views in Cat 1 or 2) | Resin OIT (Minute) | Resin Lot # |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | ASTM D 5994 | ASTM D 5994 | ASTM D 7466 | ASTM D 6693 | | ASTM D 6693 | | ASTM D 6693 | | ASTM D 6693 | | ASTM D 1004 | | ASTM D 4833 | ASTM D 1505 | ASTM D 4218 | ASTM D 5596 | ASTM D 3895 | |
| | | | | | | Side | MD | TD | MD | TD | MD | TD | MD | TD | MD | TD | | | | | | |
| 49 | 3111019575 | 11,040.00 | 3,612 | 58 | 55 | 35 | 146 | 151 | 18 | 17 | 188 | 170 | 521 | 498 | 50 | 53 | 141 | 0.948 | 2.5 | 10 | 226 | PQD820520 |
| 50 | 3111019576 | 11,040.00 | 3,590 | 57 | 55 | 38 | 146 | 151 | 18 | 17 | 188 | 170 | 521 | 498 | 50 | 53 | 141 | 0.948 | 2.5 | 10 | 226 | PQD820520 |
| 51 | 3111019577 | 11,040.00 | 3,602 | 58 | 56 | 38 | 146 | 151 | 18 | 17 | 188 | 170 | 521 | 498 | 50 | 53 | 141 | 0.948 | 2.5 | 10 | 226 | PQD820520 |
| 52 | 3111019578 | 11,040.00 | 3,582 | 58 | 55 | 36 | 146 | 151 | 18 | 17 | 188 | 170 | 521 | 498 | 50 | 53 | 141 | 0.948 | 2.5 | 10 | 226 | PQD820520 |
| 53 | 3111019579 | 11,040.00 | 3,590 | 57 | 55 | 38 | 146 | 151 | 18 | 17 | 188 | 170 | 521 | 498 | 50 | 53 | 141 | 0.948 | 2.5 | 10 | 226 | PQD820520 |
| 54 | 3111019580 | 11,040.00 | 3,590 | 58 | 56 | 38 | 144 | 148 | 19 | 17 | 188 | 148 | 555 | 415 | 53 | 52 | 143 | 0.948 | 2.4 | 10 | 226 | PQD820520 |
| 55 | 3111019581 | 11,040.00 | 3,586 | 58 | 55 | 35 | 144 | 148 | 19 | 17 | 188 | 148 | 555 | 415 | 53 | 52 | 143 | 0.948 | 2.4 | 10 | 226 | PQD820520 |
| 56 | 3111019582 | 11,040.00 | 3,606 | 57 | 56 | 37 | 144 | 148 | 19 | 17 | 188 | 148 | 555 | 415 | 53 | 52 | 143 | 0.948 | 2.4 | 10 | 226 | PQD820520 |
| 57 | 3111019583 | 11,040.00 | 3,603 | 59 | 58 | 38 | 144 | 148 | 19 | 17 | 188 | 148 | 555 | 415 | 53 | 52 | 143 | 0.948 | 2.4 | 10 | 226 | PQD820520 |
| 58 | 3111019584 | 11,040.00 | 3,610 | 58 | 54 | 38 | 158 | 150 | 17 | 18 | 154 | 168 | 434 | 458 | 53 | 52 | 143 | 0.948 | 2.5 | 10 | 226 | PQD820520 |
| 59 | 3111019585 | 11,040.00 | 3,596 | 58 | 55 | 39 | 158 | 150 | 17 | 18 | 154 | 168 | 434 | 458 | 53 | 52 | 143 | 0.948 | 2.5 | 10 | 226 | PQD820520 |
| 60 | 3111019586 | 11,040.00 | 3,580 | 58 | 56 | 37 | 158 | 150 | 17 | 18 | 154 | 168 | 434 | 458 | 53 | 52 | 143 | 0.948 | 2.5 | 10 | 226 | PQD820520 |



SKAPS Industries
571 Industrial Parkway
Commerce, GA 30529

Phone: 706-336-7000
Fax: 706-336-7007
E-Mail:contact@skaps.com

CoA Date: 05/12/2023

# Certificate of Analysis

Shipped To: SKAPS
571 Industrial Park Way
COMMERCE GA 30529-1326
USA

Recipient: JETAL
Fax:

Delivery #: 80904241
PO #: 30131230069
Weight: 185500.000 LB
Ship Date: 05/12/2023
Package: BULK
Mode: Hopper Car
Car #: CPCX817227
Seal No: 328166

Product:
MARLEX K306 POLYETHYLENE in Bulk

Lot Number: PQD820510

| Property | Test Method | Value | Unit |
|---|---|---|---|
| Melt Index | ASTM D1238 | 0.090 | g/10min |
| HLMI Flow Rate | ASTM D1238 | 13.50 | g/10min |
| Density | D1505 or D4883 | 0.9370 | g/cm3 |

The data set forth herein have been carefully compiled by Chevron Phillips Chemical Company LP (CPChem).
**However, there is no warranty of any kind, either expressed or implied, applicable to its use, and the user assumes all risk and liability in connection therewith.**

Steven Beck

Steven Beck
Quality Systems Coordinator

For CoA questions contact Leslie Dziamara at +1-832-813-4806

CoA Date: 05/19/2023

# Certificate of Analysis

Shipped To: SKAPS
571 Industrial Park Way
COMMERCE GA 30529-1326
USA

Recipient: JETAL
Fax:

Delivery #: 80908590
PO #: 30131230069
Weight: 181800.000 LB
Ship Date: 05/19/2023
Package: BULK
Mode: Hopper Car
Car #: CPCX815514
Seal No: 328165

Product:
MARLEX K306 POLYETHYLENE in Bulk

Lot Number: PQD820520

| Property | Test Method | Value | Unit |
|---|---|---|---|
| Melt Index | ASTM D1238 | 0.090 | g/10min |
| HLMI Flow Rate | ASTM D1238 | 12.30 | g/10min |
| Density | D1505 or D4883 | 0.9370 | g/cm3 |

The data set forth herein have been carefully compiled by Chevron Phillips Chemical Company LP (CPChem).
**However, there is no warranty of any kind, either expressed or implied, applicable to its use, and the user assumes all risk and liability in connection therewith.**

Steven Beck

Steven Beck
Quality Systems Coordinator

For CoA questions contact Leslie Dziamara at +1-832-813-4806

# SUBMITTAL CONTROL FORM

DATE: July 18, 2023

SUBMITTAL NO.: 3-1

PROJECT NUM.: 233013

PROJECT NAME: Minnkota-Coal Combusion Waste Facility-Cell 5 Phase 12B

| | | | |
|---|---|---|---|
| TO: | **Baranko Bros, Inc.** | FROM: | **EC Applications** |
| ATTN: | **Jack Gossen** | | **Ruben Brito** |
| | **3048 Highway 22N** | | **901 E. Orangethorpe Ave.** |
| | **Dickinson, NV 58601** | | **Anaheim, CA 92801** |
| PHONE: | **701-483-5868** | PHONE: | **714-921-9848 X 102** |
| FAX: | **701-483-5960** | FAX: | **866-475-1225** |
| E-MAIL: | **j.gossen@barankoinc.com** | E-MAIL: | **rbrito@ecapps.com** |

**WE ARE SUBMITTING THE ENCLOSED:**

- ☐ SHOP DRAWINGS
- ☐ CERTIFICATES OF COMPLIANCE
- ☐ SAMPLES
- ☐ MATERIAL DATA
- ☐ QC INFORMATION
- ☐ OTHER

**THESE ARE TRANSMITTED FOR:**

- ☐ APPROVAL
- ☐ INFORMATION
- ☐ RESUBMIT
- ☐ AS REQUESTED
- ☐ FOR REVIEW

| ITEM NO. | SUBMITTAL DESCRIPTION | NO. OF COPIES | CONTRACT REFERENCE / SPECIFICATION SECTION / DRAWING SHEET NUMBER |
|---|---|---|---|
| | Geomembrane Roll A. Certification stating that the material was manufactured and tested in accordance with this specification (Table 2.2), together with a report of the test results, shall be furnished at the time of shipment. B. As geomembrane rolls are delivered to the Site, a copy of each roll's label shall be delivered to Owner's On-Site Representative. Additional Rolls | 1 | Section 310519.16 Subsection 1.04 A-2 |

**NOTE:**

***THE ABOVE SUBMITTED ITEMS HAVE BEEN REVIEWED IN DETAIL AND ARE CORRECT AND IN GENERAL CONFORMANCE WITH THE CONTRACT DRAWINGS AND SPECIFICATIONS EXCEPT AS OTHERWISE STATED.***

Ruben Brito

*ECApplications AUTHORIZED SIGNATURE*

***IF THE ABOVE VARIANCES ARE ACCEPTABLE, PLEASE CONFIRM IN WRITING WITHIN TEN (10) DAYS, OTHERWISE ECA WILL PROCEED PER THE PROPOSED VARIANCES.***

**Product:** 60-HD-10-BLK-BLK-GRI-STD-24.00
**Project :** Minnkota Landfill Cell 5, ND
**Customer:** EC Applications
**Cust PO:** 23053

**QC'd By:** Malkesh Patel
**Date:** July 18, 2023

We hereby certify the following test results for the above referenced product/project :

| Count | Roll Number | Area (sq ft) | Gross Weight (lb) | Thickness MAV (mil) | Thickness MIN (mil) | Asperity Height (mil) | Tensile at Yield (ppi) | | Elong at Yield (%) | | Tensile at Break (ppi) | | Elong at Break (%) | | Tear Resistance (lb) | | Punct Resist (lb) | Density (g/cc) | Carbon Black (%) | CB Disp (Views in Cat 1 or 2) | Resin OIT (Minute) | Resin Lot # |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | ASTM D 5994 | ASTM D 5994 | ASTM D 7466 | ASTM D 6693 | | ASTM D 6693 | | ASTM D 6693 | | ASTM D 6693 | | ASTM D 1004 | | ASTM D 4833 | ASTM D 1505 | ASTM D 4218 | ASTM D 5596 | ASTM D 3895 | |
| | | | | | | Side | MD | TD | MD | TD | MD | TD | MD | TD | MD | TD | | | | | | |
| 01 | 3111019587 | 11,040.00 | 3596 | 58 | 55 | 39 | 158 | 150 | 17 | 18 | 154 | 168 | 434 | 458 | 53 | 52 | 143 | 0.948 | 2.5 | 10 | 226 | PQD820520 |
| 02 | 3111019588 | 11,040.00 | 3604 | 59 | 56 | 38 | 158 | 150 | 17 | 18 | 154 | 168 | 434 | 458 | 53 | 52 | 143 | 0.948 | 2.5 | 10 | 226 | PQD820520 |
| 03 | 3111019589 | 11,040.00 | 3592 | 58 | 55 | 39 | 157 | 157 | 15 | 15 | 148 | 135 | 362 | 313 | 50 | 52 | 144 | 0.947 | 2.3 | 10 | 226 | PQD820520 |
| 04 | 3111019590 | 11,040.00 | 3564 | 58 | 58 | 39 | 157 | 157 | 15 | 15 | 148 | 135 | 362 | 313 | 50 | 52 | 144 | 0.947 | 2.3 | 10 | 226 | PQD820520 |
| 05 | 3111019591 | 11,040.00 | 3582 | 58 | 54 | 38 | 157 | 157 | 15 | 15 | 148 | 135 | 362 | 313 | 50 | 52 | 144 | 0.947 | 2.3 | 10 | 226 | PQD820520 |
| 06 | 3111019592 | 11,040.00 | 3588 | 58 | 55 | 39 | 157 | 157 | 15 | 15 | 148 | 135 | 362 | 313 | 50 | 52 | 144 | 0.947 | 2.3 | 10 | 226 | PQD820520 |
| 07 | 3111019593 | 11,040.00 | 3580 | 58 | 55 | 35 | 141 | 157 | 18 | 16 | 174 | 162 | 499 | 507 | 50 | 52 | 144 | 0.947 | 2.6 | 10 | 226 | PQD820520 |
| 08 | 3111019594 | 11,040.00 | 3590 | 58 | 56 | 38 | 141 | 157 | 18 | 16 | 174 | 162 | 499 | 507 | 50 | 52 | 144 | 0.947 | 2.6 | 10 | 212 | PQC821020 |
| 09 | 3111019595 | 11,040.00 | 3580 | 58 | 56 | 38 | 141 | 157 | 18 | 16 | 174 | 162 | 499 | 507 | 50 | 52 | 144 | 0.947 | 2.6 | 10 | 212 | PQC821020 |
| 10 | 3111019596 | 11,040.00 | 3580 | 57 | 54 | 36 | 141 | 157 | 18 | 16 | 174 | 162 | 499 | 507 | 50 | 52 | 144 | 0.947 | 2.6 | 10 | 212 | PQC821020 |
| 11 | 3111019597 | 11,040.00 | 3570 | 58 | 56 | 38 | 141 | 157 | 18 | 16 | 174 | 162 | 499 | 507 | 50 | 52 | 144 | 0.947 | 2.6 | 10 | 212 | PQC821020 |
| 12 | 3111019598 | 11,040.00 | 3572 | 57 | 56 | 37 | 148 | 153 | 18 | 17 | 179 | 149 | 521 | 426 | 52 | 52 | 141 | 0.947 | 2.4 | 10 | 212 | PQC821020 |



SKAPS Industries
571 Industrial Parkway
Commerce, GA 30529

Phone: 706-336-7000
Fax: 706-336-7007
E-Mail:contact@skaps.com

**Product:** 60-HD-10-BLK-BLK-GRI-STD-24.00
**Project :** Minnkota Landfill Cell 5, ND
**Customer:** EC Applications
**Cust PO:** 23053

**QC'd By:** Malkesh Patel
**Date:** July 18, 2023

We hereby certify the following test results for the above referenced product/project :

| Count | Roll Number | Area (sq ft) | Gross Weight (lb) | Thickness MAV (mil) | Thickness MIN (mil) | Asperity Height (mil) | Tensile at Yield (ppi) | | Elong at Yield (%) | | Tensile at Break (ppi) | | Elong at Break (%) | | Tear Resistance (lb) | | Punct Resist (lb) | Density (g/cc) | Carbon Black (%) | CB Disp (Views in Cat 1 or 2) | Resin OIT (Minute) | Resin Lot # |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | ASTM D 5994 | ASTM D 5994 | ASTM D 7466 | ASTM D 6693 | | ASTM D 6693 | | ASTM D 6693 | | ASTM D 6693 | | ASTM D 1004 | | ASTM D 4833 | ASTM D 1505 | ASTM D 4218 | ASTM D 5596 | ASTM D 3895 | |
| | | | | | | Side | MD | TD | MD | TD | MD | TD | MD | TD | MD | TD | | | | | | |
| 13 | 3111019599 | 11,040.00 | 3550 | 58 | 55 | 36 | 148 | 153 | 18 | 17 | 179 | 149 | 521 | 426 | 52 | 52 | 141 | 0.947 | 2.4 | 10 | 212 | PQC821020 |
| 14 | 3111019600 | 11,040.00 | 3580 | 57 | 56 | 37 | 148 | 153 | 18 | 17 | 179 | 149 | 521 | 426 | 52 | 52 | 141 | 0.947 | 2.4 | 10 | 212 | PQC821020 |
| 15 | 3111019601 | 11,040.00 | 3570 | 57 | 56 | 37 | 148 | 153 | 18 | 17 | 179 | 149 | 521 | 426 | 52 | 52 | 141 | 0.947 | 2.4 | 10 | 212 | PQC821020 |
| 16 | 3111019602 | 11,040.00 | 3572 | 57 | 56 | 37 | 159 | 163 | 18 | 14 | 169 | 172 | 444 | 442 | 52 | 52 | 141 | 0.947 | 2.4 | 10 | 212 | PQC821020 |
| 17 | 3111019603 | 11,040.00 | 3570 | 57 | 55 | 37 | 159 | 163 | 18 | 14 | 169 | 172 | 444 | 442 | 52 | 52 | 141 | 0.947 | 2.4 | 10 | 212 | PQC821020 |
| 18 | 3111019604 | 11,040.00 | 3,560 | 57 | 55 | 35 | 159 | 163 | 18 | 14 | 169 | 172 | 444 | 442 | 52 | 52 | 141 | 0.947 | 2.4 | 10 | 212 | PQC821020 |
| 19 | 3111019605 | 11,040.00 | 3,566 | 57 | 55 | 37 | 159 | 163 | 18 | 14 | 169 | 172 | 444 | 442 | 52 | 52 | 141 | 0.947 | 2.4 | 10 | 212 | PQC821020 |
| 20 | 3111019606 | 11,040.00 | 3,560 | 57 | 56 | 39 | 159 | 163 | 18 | 14 | 169 | 172 | 444 | 442 | 52 | 52 | 141 | 0.947 | 2.4 | 10 | 212 | PQC821020 |
| 21 | 3111019607 | 11,040.00 | 3,566 | 57 | 53 | 37 | 149 | 148 | 19 | 17 | 185 | 164 | 537 | 524 | 50 | 51 | 142 | 0.947 | 2.5 | 10 | 212 | PQC821020 |
| 22 | 3111019608 | 11,040.00 | 3,558 | 58 | 55 | 37 | 149 | 148 | 19 | 17 | 185 | 164 | 537 | 524 | 50 | 51 | 142 | 0.947 | 2.5 | 10 | 212 | PQC821020 |
| 23 | 3111019609 | 11,040.00 | 3,558 | 57 | 54 | 38 | 149 | 148 | 19 | 17 | 185 | 164 | 537 | 524 | 50 | 51 | 142 | 0.947 | 2.5 | 10 | 212 | PQC821020 |
| 24 | 3111019610 | 11,040.00 | 3,574 | 57 | 55 | 38 | 149 | 148 | 19 | 17 | 185 | 164 | 537 | 524 | 50 | 51 | 142 | 0.947 | 2.5 | 10 | 212 | PQC821020 |



SKAPS Industries
571 Industrial Parkway
Commerce, GA 30529

Phone: 706-336-7000
Fax: 706-336-7007
E-Mail:contact@skaps.com

**Product:** 60-HD-10-BLK-BLK-GRI-STD-24.00
**Project :** Minnkota Landfill Cell 5, ND
**Customer:** EC Applications
**Cust PO:** 23053

**QC'd By:** Malkesh Patel
**Date:** July 18, 2023

We hereby certify the following test results for the above referenced product/project :

| Count | Roll Number | Area (sq ft) | Gross Weight (lb) | Thickness MAV (mil) | Thickness MIN (mil) | Asperity Height (mil) | Tensile at Yield (ppi) | | Elong at Yield (%) | | Tensile at Break (ppi) | | Elong at Break (%) | | Tear Resistance (lb) | | Punct Resist (lb) | Density (g/cc) | Carbon Black (%) | CB Disp (Views in Cat 1 or 2) | Resin OIT (Minute) | Resin Lot # |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | ASTM D 5994 | ASTM D 5994 | ASTM D 7466 | ASTM D 6693 | | ASTM D 6693 | | ASTM D 6693 | | ASTM D 6693 | | ASTM D 1004 | | ASTM D 4833 | ASTM D 1505 | ASTM D 4218 | ASTM D 5596 | ASTM D 3895 | |
| | | | | | | Side | MD | TD | MD | TD | MD | TD | MD | TD | MD | TD | | | | | | |
| 25 | 3111019611 | 11,040.00 | 3,538 | 58 | 54 | 40 | 140 | 150 | 20 | 19 | 181 | 163 | 523 | 482 | 50 | 51 | 142 | 0.947 | 2.5 | 10 | 212 | PQC821020 |
| 26 | 3111019612 | 11,040.00 | 3,570 | 57 | 56 | 38 | 140 | 150 | 20 | 19 | 181 | 163 | 523 | 482 | 50 | 51 | 142 | 0.947 | 2.5 | 10 | 212 | PQC821020 |
| 27 | 3111019613 | 11,040.00 | 3,572 | 58 | 57 | 39 | 140 | 150 | 20 | 19 | 181 | 163 | 523 | 482 | 50 | 51 | 142 | 0.947 | 2.5 | 10 | 212 | PQC821020 |
| 28 | 3111019614 | 11,040.00 | 3,582 | 58 | 57 | 40 | 140 | 150 | 20 | 19 | 181 | 163 | 523 | 482 | 50 | 51 | 142 | 0.947 | 2.5 | 10 | 212 | PQC821020 |
| 29 | 3111019615 | 11,040.00 | 3,580 | 58 | 57 | 39 | 140 | 150 | 20 | 19 | 181 | 163 | 523 | 482 | 50 | 51 | 142 | 0.947 | 2.5 | 10 | 212 | PQC821020 |
| 30 | 3111019616 | 11,040.00 | 3,588 | 58 | 57 | 38 | 146 | 144 | 19 | 17 | 163 | 155 | 461 | 456 | 50 | 52 | 144 | 0.947 | 2.5 | 10 | 212 | PQC821020 |
| 31 | 3111019617 | 11,040.00 | 3,552 | 58 | 57 | 38 | 146 | 144 | 19 | 17 | 163 | 155 | 461 | 456 | 50 | 52 | 144 | 0.947 | 2.5 | 10 | 212 | PQC821020 |
| 32 | 3111019618 | 11,040.00 | 3,542 | 58 | 57 | 39 | 146 | 144 | 19 | 17 | 163 | 155 | 461 | 456 | 50 | 52 | 144 | 0.947 | 2.5 | 10 | 212 | PQC821020 |
| 33 | 3111019619 | 11,040.00 | 3,540 | 58 | 57 | 38 | 146 | 144 | 19 | 17 | 163 | 155 | 461 | 456 | 50 | 52 | 144 | 0.947 | 2.5 | 10 | 212 | PQC821020 |
| 34 | 3111019620 | 11,040.00 | 3,580 | 58 | 57 | 39 | 146 | 153 | 18 | 16 | 190 | 160 | 551 | 479 | 50 | 52 | 144 | 0.947 | 2.6 | 10 | 212 | PQC821020 |
| 35 | 3111019621 | 11,040.00 | 3,552 | 59 | 58 | 38 | 146 | 153 | 18 | 16 | 190 | 160 | 551 | 479 | 50 | 52 | 144 | 0.947 | 2.6 | 10 | 212 | PQC821020 |
| 36 | 3111019622 | 11,040.00 | 3,550 | 58 | 57 | 37 | 146 | 153 | 18 | 16 | 190 | 160 | 551 | 479 | 50 | 52 | 144 | 0.947 | 2.6 | 10 | 212 | PQC821020 |



SKAPS Industries
571 Industrial Parkway
Commerce, GA 30529

Phone: 706-336-7000
Fax: 706-336-7007
E-Mail:contact@skaps.com

**Product:** 60-HD-10-BLK-BLK-GRI-STD-24.00
**Project :** Minnkota Landfill Cell 5, ND
**Customer:** EC Applications
**Cust PO:** 23053

**QC'd By:** Malkesh Patel
**Date:** July 18, 2023

We hereby certify the following test results for the above referenced product/project :

| Count | Roll Number | Area (sq ft) | Gross Weight (lb) | Thickness MAV (mil) | Thickness MIN (mil) | Asperity Height (mil) | Tensile at Yield (ppi) | | Elong at Yield (%) | | Tensile at Break (ppi) | | Elong at Break (%) | | Tear Resistance (lb) | | Punct Resist (lb) | Density (g/cc) | Carbon Black (%) | CB Disp (Views in Cat 1 or 2) | Resin OIT (Minute) | Resin Lot # |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | ASTM D 5994 | ASTM D 5994 | ASTM D 7466 Side | ASTM D 6693 MD | ASTM D 6693 TD | ASTM D 6693 MD | ASTM D 6693 TD | ASTM D 6693 MD | ASTM D 6693 TD | ASTM D 6693 MD | ASTM D 6693 TD | ASTM D 1004 MD | ASTM D 1004 TD | ASTM D 4833 | ASTM D 1505 | ASTM D 4218 | ASTM D 5596 | ASTM D 3895 | |
| 37 | 3111019623 | 11,040.00 | 3,540 | 57 | 54 | 36 | 146 | 153 | 18 | 16 | 190 | 160 | 551 | 479 | 50 | 52 | 144 | 0.947 | 2.6 | 10 | 212 | PQC821020 |
| 38 | 3111019624 | 11,040.00 | 3,542 | 58 | 56 | 36 | 146 | 153 | 18 | 16 | 190 | 160 | 551 | 479 | 50 | 52 | 144 | 0.947 | 2.6 | 10 | 212 | PQC821020 |
| 39 | 3111019625 | 11,040.00 | 3,558 | 57 | 54 | 36 | 148 | 153 | 17 | 16 | 189 | 178 | 538 | 566 | 49 | 52 | 147 | 0.946 | 2.3 | 10 | 212 | PQC821020 |
| 40 | 3111019626 | 11,040.00 | 3,584 | 57 | 54 | 39 | 143 | 150 | 18 | 17 | 182 | 168 | 541 | 530 | 49 | 52 | 145 | 0.947 | 2.4 | 10 | 212 | PQC821020 |
| 41 | 3111019627 | 11,040.00 | 3,575 | 57 | 54 | 37 | 143 | 150 | 18 | 17 | 182 | 168 | 541 | 530 | 49 | 52 | 145 | 0.947 | 2.4 | 10 | 212 | PQC821020 |



SKAPS Industries
571 Industrial Parkway
Commerce, GA 30529

Phone: 706-336-7000
Fax: 706-336-7007
E-Mail:contact@skaps.com

CoA Date: 05/19/2023

# Certificate of Analysis

Shipped To: SKAPS
571 Industrial Park Way
COMMERCE GA 30529-1326
USA

Recipient: JETAL
Fax:

Delivery #: 80908590
PO #: 30131230069
Weight: 181800.000 LB
Ship Date: 05/19/2023
Package: BULK
Mode: Hopper Car
Car #: CPCX815514
Seal No: 328165

Product:
MARLEX K306 POLYETHYLENE in Bulk

Lot Number: PQD820520

| Property | Test Method | Value | Unit |
|---|---|---|---|
| Melt Index | ASTM D1238 | 0.090 | g/10min |
| HLMI Flow Rate | ASTM D1238 | 12.30 | g/10min |
| Density | D1505 or D4883 | 0.9370 | g/cm3 |

The data set forth herein have been carefully compiled by Chevron Phillips Chemical Company LP (CPChem).
**However, there is no warranty of any kind, either expressed or implied, applicable to its use, and the user assumes all risk and liability in connection therewith.**

Steven Beck

Steven Beck
Quality Systems Coordinator

For CoA questions contact Leslie Dziamara at +1-832-813-4806

CoA Date: 05/19/2023

# Certificate of Analysis

Shipped To: SKAPS
571 Industrial Park Way
COMMERCE GA 30529-1326
USA

Recipient: JETAL
Fax:

Delivery #: 80908589
PO #: 30131230069
Weight: 184600.000 LB
Ship Date: 05/19/2023
Package: BULK
Mode: Hopper Car
Car #: CPCX815549
Seal No: 331953

Product:
MARLEX K306 POLYETHYLENE in Bulk

Lot Number: PQC821020

| Property | Test Method | Value | Unit |
|---|---|---|---|
| Melt Index | ASTM D1238 | 0.080 | g/10min |
| HLMI Flow Rate | ASTM D1238 | 13.10 | g/10min |
| Density | D1505 or D4883 | 0.9380 | g/cm3 |

The data set forth herein have been carefully compiled by Chevron Phillips Chemical Company LP (CPChem).
**However, there is no warranty of any kind, either expressed or implied, applicable to its use, and the user assumes all risk and liability in connection therewith.**

Steven Beck

Steven Beck
Quality Systems Coordinator

For CoA questions contact Leslie Dziamara at +1-832-813-4806

# SUBMITTAL CONTROL FORM

ECApplications

DATE: July 25, 2023
SUBMITTAL NO.: 3-2
PROJECT NUM.: 233013
PROJECT NAME: Minnkota-Coal Combusion Waste Facility-Cell 5 Phase 12B

| | | | |
|---|---|---|---|
| TO: | **Baranko Bros, Inc.** | FROM: | **EC Applications** |
| ATTN: | **Jack Gossen** | | **Ruben Brito** |
| | **3048 Highway 22N** | | **901 E. Orangethorpe Ave.** |
| | **Dickinson, NV 58601** | | **Anaheim, CA 92801** |
| PHONE: | **701-483-5868** | PHONE: | **714-921-9848 X 102** |
| FAX: | **701-483-5960** | FAX: | **866-475-1225** |
| E-MAIL: | **j.gossen@barankoinc.com** | E-MAIL: | **rbrito@ecapps.com** |

**WE ARE SUBMITTING THE ENCLOSED:**

- ☐ SHOP DRAWINGS
- ☐ CERTIFICATES OF COMPLIANCE
- ☐ SAMPLES
- ☐ MATERIAL DATA
- ☐ QC INFORMATION
- ☐ OTHER

**THESE ARE TRANSMITTED FOR:**

- ☐ APPROVAL
- ☐ INFORMATION
- ☐ RESUBMIT
- ☐ AS REQUESTED
- ☐ FOR REVIEW

| ITEM NO. | SUBMITTAL DESCRIPTION | NO. OF COPIES | CONTRACT REFERENCE / SPECIFICATION SECTION / DRAWING SHEET NUMBER |
|---|---|---|---|
| | Geomembrane Roll A. Certification stating that the material was manufactured and tested in accordance with this specification (Table 2.2), together with a report of the test results, shall be furnished at the time of shipment. B. As geomembrane rolls are delivered to the Site, a copy of each roll's label shall be delivered to Owner's On-Site Representative. | 1 | Section 310519.16 Subsection 1.04 A-2 |

**NOTE:**

***THE ABOVE SUBMITTED ITEMS HAVE BEEN REVIEWED IN DETAIL AND ARE CORRECT AND IN GENERAL CONFORMANCE WITH THE CONTRACT DRAWINGS AND SPECIFICATIONS EXCEPT AS OTHERWISE STATED.***

Ruben Brito

*ECApplications AUTHORIZED SIGNATURE*

***IF THE ABOVE VARIANCES ARE ACCEPTABLE, PLEASE CONFIRM IN WRITING WITHIN TEN (10) DAYS, OTHERWISE ECA WILL PROCEED PER THE PROPOSED VARIANCES.***

**Product:** 60-HD-00-BLK-BLK-AVG-STD-24.00
**Project :** Minnkota Landfill Cell 5, ND
**Customer:** EC Applications
**Cust PO:** 23053

**QC'd By:** Malkesh Patel
**Date:** July 24, 2023

We hereby certify the following test results for the above referenced product/project :

| Count | Roll Number | Area (sq ft) | Gross Weight (lb) | Thickness MAV (mil) | Thickness MIN (mil) | Tensile at Yield (ppi) | | Elong at Yield (%) | | Tensile at Break (ppi) | | Elong at Break (%) | | Tear Resistance (lb) | | Punct Resist (lb) | Density (g/cc) | Carbon Black (%) | CB Disp (Views in Cat 1 or 2) | Resin OIT (Minute) | Resin Lot # |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | ASTM D 5199 | ASTM D 5199 | ASTM D 6693 | | ASTM D 6693 | | ASTM D 6693 | | ASTM D 6693 | | ASTM D 1004 | | ASTM D 4833 | ASTM D 1505 | ASTM D 4218 | ASTM D 5596 | ASTM D 3895 | |
| | | | | | | MD | TD | MD | TD | MD | TD | MD | TD | MD | TD | | | | | | |
| 01 | 3112020441 | 12,960.00 | 4110 | 65 | 63 | 155 | 162 | 20 | 19 | 304 | 312 | 859 | 934 | 53 | 55 | 153 | 0.947 | 2.5 | 10 | 243 | 23C1231 |
| 02 | 3112020442 | 12,960.00 | 4118 | 63 | 59 | 146 | 148 | 19 | 19 | 279 | 278 | 828 | 873 | 50 | 52 | 143 | 0.947 | 2.3 | 10 | 243 | 23C1231 |
| 03 | 3112020443 | 12,960.00 | 4000 | 61 | 59 | 146 | 148 | 19 | 19 | 279 | 278 | 828 | 873 | 50 | 52 | 143 | 0.947 | 2.3 | 10 | 243 | 23C1231 |
| 04 | 3112020444 | 12,960.00 | 3984 | 61 | 56 | 146 | 148 | 19 | 19 | 279 | 278 | 828 | 873 | 50 | 52 | 143 | 0.947 | 2.3 | 10 | 243 | 23C1231 |
| 05 | 3112020445 | 12,960.00 | 3990 | 62 | 59 | 146 | 148 | 19 | 19 | 279 | 278 | 828 | 873 | 50 | 52 | 143 | 0.947 | 2.3 | 10 | 243 | 23C1231 |
| 06 | 3112020448 | 12,960.00 | 3987 | 61 | 59 | 140 | 159 | 21 | 18 | 288 | 298 | 820 | 913 | 50 | 52 | 143 | 0.947 | 2.4 | 10 | 243 | 23C1231 |
| 07 | 3112020449 | 12,960.00 | 3988 | 61 | 59 | 140 | 159 | 21 | 18 | 288 | 298 | 820 | 913 | 50 | 52 | 143 | 0.947 | 2.4 | 10 | 243 | 23C1231 |
| 08 | 3112020450 | 12,960.00 | 3989 | 62 | 59 | 140 | 159 | 21 | 18 | 288 | 298 | 820 | 913 | 50 | 52 | 143 | 0.947 | 2.4 | 10 | 243 | 23C1231 |
| 09 | 3112020451 | 12,960.00 | 3982 | 61 | 59 | 140 | 159 | 21 | 18 | 288 | 298 | 820 | 913 | 50 | 52 | 143 | 0.947 | 2.4 | 10 | 243 | 23C1231 |
| 10 | 3112020452 | 12,960.00 | 3978 | 60 | 58 | 149 | 155 | 19 | 18 | 282 | 296 | 819 | 908 | 49 | 50 | 148 | 0.946 | 2.4 | 10 | 243 | 23C1231 |
| 11 | 3112020453 | 12,960.00 | 3960 | 61 | 58 | 149 | 155 | 19 | 18 | 282 | 296 | 819 | 908 | 49 | 50 | 148 | 0.946 | 2.4 | 10 | 243 | 23C1231 |
| 12 | 3112020464 | 12,960.00 | 3941 | 61 | 59 | 149 | 159 | 19 | 18 | 286 | 297 | 840 | 923 | 49 | 51 | 140 | 0.947 | 2.5 | 10 | 251 | 23D1154 |



SKAPS Industries
571 Industrial Parkway
Commerce, GA 30529

Phone: 706-336-7000
Fax: 706-336-7007
E-Mail:contact@skaps.com

**Product:** 60-HD-00-BLK-BLK-AVG-STD-24.00
**Project :** Minnkota Landfill Cell 5, ND
**Customer:** EC Applications
**Cust PO:** 23053

**QC'd By:** Malkesh Patel
**Date:** July 24, 2023

We hereby certify the following test results for the above referenced product/project :

| Count | Roll Number | Area (sq ft) | Gross Weight (lb) | Thickness MAV (mil) | Thickness MIN (mil) | Tensile at Yield (ppi) | | Elong at Yield (%) | | Tensile at Break (ppi) | | Elong at Break (%) | | Tear Resistance (lb) | | Punct Resist (lb) | Density (g/cc) | Carbon Black (%) | CB Disp (Views in Cat 1 or 2) | Resin OIT (Minute) | Resin Lot # |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | ASTM D 5199 | ASTM D 5199 | ASTM D 6693 | | ASTM D 6693 | | ASTM D 6693 | | ASTM D 6693 | | ASTM D 1004 | | ASTM D 4833 | ASTM D 1505 | ASTM D 4218 | ASTM D 5596 | ASTM D 3895 | |
| | | | | | | MD | TD | MD | TD | MD | TD | MD | TD | MD | TD | | | | | | |
| 13 | 3112020465 | 12,960.00 | 3943 | 61 | 60 | 149 | 159 | 19 | 18 | 286 | 297 | 840 | 923 | 49 | 51 | 140 | 0.947 | 2.5 | 10 | 251 | 23D1154 |
| 14 | 3112020466 | 12,960.00 | 3954 | 61 | 60 | 149 | 156 | 19 | 18 | 271 | 283 | 819 | 898 | 49 | 51 | 140 | 0.947 | 2.5 | 10 | 251 | 23D1154 |
| 15 | 3112020467 | 12,960.00 | 3960 | 61 | 58 | 149 | 156 | 19 | 18 | 271 | 283 | 819 | 898 | 49 | 51 | 140 | 0.947 | 2.5 | 10 | 251 | 23D1154 |
| 16 | 3112020468 | 12,960.00 | 3948 | 62 | 60 | 149 | 156 | 19 | 18 | 271 | 283 | 819 | 898 | 49 | 51 | 140 | 0.947 | 2.5 | 10 | 251 | 23D1154 |
| 17 | 3112020469 | 12,960.00 | 3944 | 61 | 58 | 149 | 156 | 19 | 18 | 271 | 283 | 819 | 898 | 49 | 51 | 140 | 0.947 | 2.5 | 10 | 251 | 23D1154 |
| 18 | 3112020470 | 12,960.00 | 3,950 | 61 | 57 | 149 | 156 | 19 | 18 | 271 | 283 | 819 | 898 | 49 | 51 | 140 | 0.947 | 2.5 | 10 | 251 | 23D1154 |
| 19 | 3112020471 | 12,960.00 | 3,934 | 61 | 59 | 147 | 151 | 19 | 19 | 284 | 296 | 860 | 945 | 49 | 53 | 147 | 0.947 | 2.5 | 10 | 251 | 23D1154 |
| 20 | 3112020472 | 12,960.00 | 3,945 | 61 | 59 | 147 | 151 | 19 | 19 | 284 | 296 | 860 | 945 | 49 | 53 | 147 | 0.947 | 2.5 | 10 | 251 | 23D1154 |
| 21 | 3112020473 | 12,960.00 | 3,930 | 61 | 59 | 147 | 151 | 19 | 19 | 284 | 296 | 860 | 945 | 49 | 53 | 147 | 0.947 | 2.5 | 10 | 251 | 23D1154 |
| 22 | 3112020474 | 12,960.00 | 3,930 | 60 | 59 | 147 | 151 | 19 | 19 | 284 | 296 | 860 | 945 | 49 | 53 | 147 | 0.947 | 2.5 | 10 | 251 | 23D1154 |
| 23 | 3112020475 | 12,960.00 | 3,932 | 60 | 59 | 140 | 152 | 20 | 18 | 267 | 298 | 806 | 933 | 49 | 53 | 147 | 0.947 | 2.4 | 10 | 251 | 23D1154 |
| 24 | 3112020476 | 12,960.00 | 3,924 | 60 | 58 | 140 | 152 | 20 | 18 | 267 | 298 | 806 | 933 | 49 | 53 | 147 | 0.947 | 2.4 | 10 | 251 | 23D1154 |



SKAPS Industries
571 Industrial Parkway
Commerce, GA 30529

Phone: 706-336-7000
Fax: 706-336-7007
E-Mail:contact@skaps.com

Formosa Plastics

FORMOSA PLASTICS CORPORATION, TEXAS
201 FORMOSA DRIVE
PO BOX 700
POINT COMFORT TX 77978
PHONE:( 888 )FPCUSA3

# Certificate of Analysis

(CONFIDENTAL)

CUSTOMER:SKAPS INC.
571 INDUSTRIAL PARKWAY
COMMERCE GA 30529
PRODUCT :HL3812
RAILCAR AOKX091506
CLEANING/INSPECTION NO: 091506052123

S/O NO : E35A731
CUSTOMER PO : 30131230086
DATE SHIPPED: 6/27/23
LOT NO : 23E1253
WEIGHT (LB) : 186,250.00
CUSTID:FT04342 SPIDM1

DATE OF PROD: 5/21/23

| Test | Method | Spec Min | Spec Max | Actual |
|---|---|---|---|---|
| Melt Index,g/10min | ASTM D1238 | 0 | .1 | .068 |
| HLMI, g/10 min. | ASTM D1238 | 9 | 15 | 11.1 |
| Density, g/cm3 | ASTM D1505 | .935 | .939 | .9369 |

Linda Kao

QC SUPERVISOR

Formosa Plastics

FORMOSA PLASTICS CORPORATION, TEXAS
201 FORMOSA DRIVE
PO BOX 700
POINT COMFORT TX 77978
PHONE:( 888 )FPCUSA3

# Certificate of Analysis

(CONFIDENTAL)

CUSTOMER:SKAPS INC.
571 INDUSTRIAL PARKWAY
COMMERCE GA 30529
PRODUCT :HL3812
RAILCAR AOKX091508
CLEANING/INSPECTION NO: 091508032023

S/O NO : E34A695
CUSTOMER PO : 30131230071
DATE SHIPPED: 5/16/23
LOT NO : 23C1231
WEIGHT (LB) : 196,750.00
CUSTID:FT04342 SPIDM1

DATE OF PROD: 3/20/23

| Test | Method | Spec Min | Spec Max | Actual |
|---|---|---|---|---|
| Melt Index,g/10min | ASTM D1238 | 0 | .1 | .074 |
| HLMI, g/10 min. | ASTM D1238 | 9 | 15 | 11.2 |
| Density, g/cm3 | ASTM D1505 | .935 | .939 | .9373 |

Linda Kao

QC SUPERVISOR

Formosa Plastics

FORMOSA PLASTICS CORPORATION, TEXAS
201 FORMOSA DRIVE
PO BOX 700
POINT COMFORT TX 77978
PHONE:( 888 )FPCUSA3

# Certificate of Analysis

(CONFIDENTAL)

CUSTOMER:SKAPS INC.
571 INDUSTRIAL PARKWAY
COMMERCE GA 30529
PRODUCT :HL3812
RAILCAR FPAX950103
CLEANING/INSPECTION NO: 950103041523

S/O NO : E34A699
CUSTOMER PO : 30131230071
DATE SHIPPED: 5/30/23
LOT NO : 23D1154
WEIGHT (LB) : 182,200.00
CUSTID:FT04342 SPIDM1
DATE OF PROD: 4/15/23

| Test | Method | Spec Min | Spec Max | Actual |
|---|---|---|---|---|
| Melt Index,g/10min | ASTM D1238 | 0 | .1 | .082 |
| HLMI, g/10 min. | ASTM D1238 | 9 | 15 | 11.7 |
| Density, g/cm3 | ASTM D1505 | .935 | .939 | .9381 |

Linda Kao

QC SUPERVISOR

# SUBMITTAL CONTROL FORM

ECApplications

DATE: October 5, 2023
SUBMITTAL NO.: 3-3
PROJECT NUM.: 233013
PROJECT NAME: Minnkota-Coal Combusion Waste Facility-Cell 5 Phase 12B

| | | | |
|---|---|---|---|
| TO: | **Baranko Bros, Inc.** | FROM: | **EC Applications** |
| ATTN: | **Jack Gossen** | | **Ruben Brito** |
| | **3048 Highway 22N** | | **901 E. Orangethorpe Ave.** |
| | **Dickinson, NV 58601** | | **Anaheim, CA 92801** |
| PHONE: | **701-483-5868** | PHONE: | **714-921-9848 X 102** |
| FAX: | **701-483-5960** | FAX: | **866-475-1225** |
| E-MAIL: | **j.gossen@barankoinc.com** | E-MAIL: | **rbrito@ecapps.com** |

**WE ARE SUBMITTING THE ENCLOSED:**

- ☐ SHOP DRAWINGS
- ☐ CERTIFICATES OF COMPLIANCE
- ☐ SAMPLES
- ☐ MATERIAL DATA
- ☐ QC INFORMATION
- ☐ OTHER

**THESE ARE TRANSMITTED FOR:**

- ☐ APPROVAL
- ☐ INFORMATION
- ☐ RESUBMIT
- ☐ AS REQUESTED
- ☐ FOR REVIEW

| ITEM NO. | SUBMITTAL DESCRIPTION | NO. OF COPIES | CONTRACT REFERENCE / SPECIFICATION SECTION / DRAWING SHEET NUMBER |
|---|---|---|---|
| | Geomembrane Roll A. Certification stating that the material was manufactured and tested in accordance with this specification (Table 2.2), together with a report of the test results, shall be furnished at the time of shipment. B. As geomembrane rolls are delivered to the Site, a copy of each roll's label shall be delivered to Owner's On-Site Representative. Final Rolls (1 to 10) | 1 | Section 310519.16 Subsection 1.04 A-2 |

**NOTE:**

***THE ABOVE SUBMITTED ITEMS HAVE BEEN REVIEWED IN DETAIL AND ARE CORRECT AND IN GENERAL CONFORMANCE WITH THE CONTRACT DRAWINGS AND SPECIFICATIONS EXCEPT AS OTHERWISE STATED.***

*Ruben Brito*

*ECApplications AUTHORIZED SIGNATURE*

***IF THE ABOVE VARIANCES ARE ACCEPTABLE, PLEASE CONFIRM IN WRITING WITHIN TEN (10) DAYS, OTHERWISE ECA WILL PROCEED PER THE PROPOSED VARIANCES.***

**Product:** 60-HD-10-BLK-BLK-GRI-STD-24.00
**Project :** Minnkota Landfill Cell 5, ND
**Customer:** EC Applications
**Cust PO:** 23053

**QC'd By:** Malkesh Patel
**Date:** October 5, 2023

We hereby certify the following test results for the above referenced product/project :

| Count | Roll Number | Area (sq ft) | Gross Weight (lb) | Thickness MAV (mil) | Thickness MIN (mil) | Asperity Height (mil) | Tensile at Yield (ppi) | | Elong at Yield (%) | | Tensile at Break (ppi) | | Elong at Break (%) | | Tear Resistance (lb) | | Punct Resist (lb) | Density (g/cc) | Carbon Black (%) | CB Disp (Views in Cat 1 or 2) | Resin OIT (Minute) | Resin Lot # |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | ASTM D 5994 | ASTM D 5994 | ASTM D 7466 | ASTM D 6693 | | ASTM D 6693 | | ASTM D 6693 | | ASTM D 6693 | | ASTM D 1004 | | ASTM D 4833 | ASTM D 1505 | ASTM D 4218 | ASTM D 5596 | ASTM D 3895 | |
| | | | | | | Side | MD | TD | MD | TD | MD | TD | MD | TD | MD | TD | | | | | | |
| 01 | 3118000427 | 11,040.00 | 3484 | 58 | 54 | 39 | 151 | 157 | 18 | 16 | 178 | 142 | 492 | 361 | 51 | 52 | 142 | 0.947 | 2.6 | 10 | 226 | PQH820410 |
| 02 | 3118000428 | 11,040.00 | 3486 | 58 | 57 | 41 | 154 | 165 | 17 | 16 | 183 | 137 | 507 | 306 | 51 | 55 | 140 | 0.947 | 2.4 | 10 | 226 | PQH820410 |
| 03 | 3118000429 | 11,040.00 | 3480 | 58 | 55 | 43 | 154 | 165 | 17 | 16 | 183 | 137 | 507 | 306 | 51 | 55 | 140 | 0.947 | 2.4 | 10 | 226 | PQH820410 |
| 04 | 3118000430 | 11,040.00 | 3475 | 58 | 57 | 40 | 154 | 165 | 17 | 16 | 183 | 137 | 507 | 306 | 51 | 55 | 140 | 0.947 | 2.4 | 10 | 226 | PQH820410 |
| 05 | 3118000431 | 11,040.00 | 3490 | 58 | 56 | 39 | 154 | 165 | 17 | 16 | 183 | 137 | 507 | 306 | 51 | 55 | 140 | 0.947 | 2.4 | 10 | 226 | PQH820410 |
| 06 | 3118000432 | 11,040.00 | 3480 | 58 | 57 | 40 | 152 | 160 | 17 | 17 | 179 | 131 | 498 | 273 | 51 | 55 | 140 | 0.947 | 2.5 | 10 | 226 | PQH820410 |
| 07 | 3118000433 | 11,040.00 | 3482 | 57 | 56 | 38 | 152 | 160 | 17 | 17 | 179 | 131 | 498 | 273 | 51 | 55 | 140 | 0.947 | 2.5 | 10 | 226 | PQH820410 |
| 08 | 3118000434 | 11,040.00 | 3474 | 58 | 56 | 39 | 152 | 160 | 17 | 17 | 179 | 131 | 498 | 273 | 51 | 55 | 140 | 0.947 | 2.5 | 10 | 226 | PQH820410 |
| 09 | 3118000435 | 11,040.00 | 3484 | 58 | 57 | 39 | 152 | 160 | 17 | 17 | 179 | 131 | 498 | 273 | 51 | 55 | 140 | 0.947 | 2.5 | 10 | 226 | PQH820410 |
| 10 | 3118000436 | 11,040.00 | 3488 | 58 | 57 | 36 | 152 | 160 | 17 | 17 | 179 | 131 | 498 | 273 | 51 | 55 | 140 | 0.947 | 2.5 | 10 | 226 | PQH820410 |



SKAPS Industries
571 Industrial Parkway
Commerce, GA 30529

Phone: 706-336-7000
Fax: 706-336-7007
E-Mail:contact@skaps.com

CoA Date: 09/01/2023

# Certificate of Analysis

Shipped To: SKAPS
571 Industrial Park Way
COMMERCE GA 30529-1326
USA

Recipient: JETAL
Fax:

Delivery #: 80979256
PO #: 30131230150
Weight: 187800.000 LB
Ship Date: 09/01/2023
Package: BULK
Mode: Hopper Car
Car #: SHQX041604
Seal No: 343321

Product:
MARLEX K306 POLYETHYLENE in Bulk

Lot Number: PQH820410

| Property | Test Method | Value | Unit |
|---|---|---|---|
| Melt Index | ASTM D1238 | 0.070 | g/10min |
| HLMI Flow Rate | ASTM D1238 | 10.40 | g/10min |
| Density | D1505 or D4883 | 0.9360 | g/cm3 |

The data set forth herein have been carefully compiled by Chevron Phillips Chemical Company LP (CPChem).
**However, there is no warranty of any kind, either expressed or implied, applicable to its use, and the user assumes all risk and liability in connection therewith.**

Steven Beck

Steven Beck
Quality Systems Coordinator

For CoA questions contact Leslie Dziamara at +1-832-813-4806

# Subgrade Inspection Forms

**CERTIFICATE OF ACCEPTANCE OF**
**GEOMEMBRANE SUBGRADE SURFACE BY INSTALLER**

DESCRIPTION OF AREA TO BE CERTIFIED Generally flat with minor ridges.

| INSTALLER | PROJECT |
|---|---|
| NAME: ECApplications | LOCATION: Mankato |
| ADDRESS: 1901 E Orangethorpe Ave, | PROJECT: Cell 5 Phase 1B |
| Anaheim CA, 92801 | |
| AUTHORIZED REPRESENTATIVE: Octavio Rivas | OWNER: Mankato |

The undersigned, Octavio Rivas certifies that he is a representative of (company), duly authorized to execute this certificate, that he visually inspected the subgrade surface described above on 7/20/23 (date) and found the surface to be acceptable for installation of the geomembrane.
This certification is based on observations of the surface of the subgrade only. No subterrain inspections or tests have been performed and ECA (company) makes no representations or warranties regarding conditions which may exist below the surface of the subgrade.

DATE: 7-20-23

SIGNATURE: Octavio Rivas

NAME: Octavio Rivas

TITLE: Foreman

| CERTIFICATE RECEIVED BY CONTRACTOR: | CERTIFICATE RECEIVED BY OWNER: |
|---|---|
| DATE: 7-20-23 | DATE: 7-20-23 |
| COMPANY: Barnka Bros Inc | COMPANY: Barr Engineering |
| SIGNATURE: | SIGNATURE: Chance Norton |
| NAME: Daniel Rhoads | NAME: Chance Norton |
| TITLE: Foreman | TITLE: Environmental Field Technician |

**CERTIFICATE OF ACCEPTANCE OF**
**GEOMEMBRANE SUBGRADE SURFACE BY INSTALLER**

DESCRIPTION OF AREA TO BE CERTIFIED: Western half of subgrade in northern ditch

| INSTALLER | PROJECT |
|---|---|
| NAME: ECApplications | LOCATION: Mandan, Center ND |
| ADDRESS: 901 E Orangethorpe Ave | PROJECT: Cell 5 Phase 1B |
| Anaheim, CA 92801 | |
| AUTHORIZED REPRESENTATIVE: Octavio Rivas | OWNER: Minnkota |

The undersigned, Octavio Rivas, certifies that he is a representative of (company), duly authorized to execute this certificate, that he visually inspected the subgrade surface described above on 7/21/23 (date) and found the surface to be acceptable for installation of the geomembrane.

This certification is based on observations of the surface of the subgrade only. No subterrain inspections or tests have been performed and ECA (company) makes no representations or warranties regarding conditions which may exist below the surface of the subgrade.

DATE: 7/21/23

SIGNATURE: [signature]

NAME: Octavio Rivas

TITLE: Foreman

| CERTIFICATE RECEIVED BY CONTRACTOR: | CERTIFICATE RECEIVED BY OWNER: |
|---|---|
| DATE: 7/21/23 | DATE: 7/21/23 |
| COMPANY: Bergeson Bros Inc | COMPANY: Barr Engineering |
| SIGNATURE: [signature] | SIGNATURE: [signature] |
| NAME: Daniel Rhoads | NAME: Chance Norton |
| TITLE: Foreman | TITLE: Environmental Field Technician |

**CERTIFICATE OF ACCEPTANCE OF GEOMEMBRANE SUBGRADE SURFACE BY INSTALLER**

DESCRIPTION OF AREA TO BE CERTIFIED: Sump, located in the southwest of the west floor

| INSTALLER | PROJECT |
|---|---|
| NAME: EC Applications | LOCATION: Minnkota, Center ND |
| ADDRESS: 901 E Orangethorpe Ave | PROJECT: Cell 5 Phase 1B |
| Anaheim, CA 92801 | |
| AUTHORIZED REPRESENTATIVE: Ochuio Rivas | OWNER: Minnkota |

The undersigned, Ochuio Rivas, certifies that he is a representative of (company), duly authorized to execute this certificate, that he visually inspected the subgrade surface described above on 7/22/23 (date) and found the surface to be acceptable for installation of the geomembrane.

This certification is based on observations of the surface of the subgrade only. No subterrain inspections or tests have been performed and ECA (company) makes no representations or warranties regarding conditions which may exist below the surface of the subgrade.

DATE: 7-22-23

SIGNATURE:

NAME: Ochuio Rivas

TITLE: Foreman

| CERTIFICATE RECEIVED BY CONTRACTOR: | CERTIFICATE RECEIVED BY OWNER: |
|---|---|
| DATE: 7-22-23 | DATE: 7-22-23 |
| COMPANY: Barnka Bros Inc | COMPANY: Barr Engineering |
| SIGNATURE: | SIGNATURE: |
| NAME: Darrel Rhoads | NAME: Chance Norton |
| TITLE: Foreman | TITLE: Environmental Field Technician |

**CERTIFICATE OF ACCEPTANCE OF**
**GEOMEMBRANE SUBGRADE SURFACE BY INSTALLER**

DESCRIPTION OF AREA TO BE CERTIFIED Northern half of the west floor

INSTALLER

NAME: ECApplications

ADDRESS: 901 E Ontario Ave

Anaheim, CA 92801

AUTHORIZED REPRESENTATIVE: Octavio Rivera

PROJECT

LOCATION: Mankato, Center ND

PROJECT: Cell 5 Phase 1B

OWNER: Mankato

The undersigned, Octavio Rivera certifies that he is a representative of (company), duly authorized to execute this certificate, that he visually inspected the subgrade surface described above on 7/24/23 (date) and found the surface to be acceptable for installation of the geomembrane.

This certification is based on observations of the surface of the subgrade only. No subterrain inspections or tests have been performed and EC-A (company) makes no representations or warranties regarding conditions which may exist below the surface of the subgrade.

DATE: 7/24/23

SIGNATURE:

NAME: Octavio Rivera

TITLE: Foreman

**CERTIFICATE RECEIVED BY CONTRACTOR:**

DATE: 7/24/23

COMPANY: Barnes Bros Inc

SIGNATURE:

NAME: Daniel Rhodes

TITLE: Foreman

**CERTIFICATE RECEIVED BY OWNER:**

DATE: 7/24/23

COMPANY: Barr Engineering

SIGNATURE:

NAME: Chance Norton

TITLE: Environmental Field Technician

## CERTIFICATE OF ACCEPTANCE OF GEOMEMBRANE SUBGRADE SURFACE BY INSTALLER

DESCRIPTION OF AREA TO BE CERTIFIED Southern half of the west floor

INSTALLER

NAME: ECApplications

ADDRESS: 901 E Ornge thorpe Ave

Anaheim, CA 92801

AUTHORIZED REPRESENTATIVE: Octavio Rita

PROJECT

LOCATION: Mankato, Center ND

PROJECT: Cell 5 Phase 1B

OWNER: Mankato

The undersigned, Octavio certifies that he is a representative of (company), duly authorized to execute this certificate, that he visually inspected the subgrade surface described above on 7/25/23 (date) and found the surface to be acceptable for installation of the geomembrane.

This certification is based on observations of the surface of the subgrade only. No subterrain inspections or tests have been performed and ECA (company) makes no representations or warranties regarding conditions which may exist below the surface of the subgrade.

DATE: 7/25/23

SIGNATURE:

NAME: Octavio Rita

TITLE: Foreman

**CERTIFICATE RECEIVED BY CONTRACTOR:**

DATE: 7/25/23

COMPANY: Mankato Bass Inc

SIGNATURE:

NAME: Daniel Rhoads

TITLE: Foreman

**CERTIFICATE RECEIVED BY OWNER:**

DATE: 7/25/23

COMPANY: Barr Engineering

SIGNATURE:

NAME: Chance Norton

TITLE: Foreman

**CERTIFICATE OF ACCEPTANCE OF**
**GEOMEMBRANE SUBGRADE SURFACE BY INSTALLER**

DESCRIPTION OF AREA TO BE CERTIFIED: Northern sidewall trench Subgrade

INSTALLER

NAME: ECApplications

ADDRESS: 901 E Orangethorpe Ave

Anaheim, CA 92801

AUTHORIZED REPRESENTATIVE: [signature]

PROJECT

LOCATION: Minnkota, Center ND

PROJECT: Cell 5 Phase 1B

OWNER: Minnkota

The undersigned, [signature] certifies that he is a representative of (company), duly authorized to execute this certificate, that he visually inspected the subgrade surface described above on 9/8/23 (date) and found the surface to be acceptable for installation of the geomembrane.

This certification is based on observations of the surface of the subgrade only. No subterrain inspections or tests have been performed and ECA (company) makes no representations or warranties regarding conditions which may exist below the surface of the subgrade.

DATE: 9/8/23

SIGNATURE: [signature]

NAME: Octavio Rivas

TITLE: Foreman

**CERTIFICATE RECEIVED BY CONTRACTOR:**

DATE: 9/8/23

COMPANY: Barnhart Bros Inc

SIGNATURE: [signature]

NAME: Jacob Barnhart

TITLE: Foreman

**CERTIFICATE RECEIVED BY OWNER:**

DATE: 9/8/23

COMPANY: Bott Engineering

SIGNATURE: [signature]

NAME: Chance Norton

TITLE: Environmental Technician

**CERTIFICATE OF ACCEPTANCE OF**
**GEOMEMBRANE SUBGRADE SURFACE BY INSTALLER**

DESCRIPTION OF AREA TO BE CERTIFIED Northern trench subgrade

INSTALLER

NAME: ECApplications

ADDRESS: 901 E Orangethorpe Ave

Anaheim, CA 92801

AUTHORIZED REPRESENTATIVE: [signature]

PROJECT

LOCATION: Minnkota, Center ND

PROJECT: Cell 5 Phase 1B

OWNER: Minnkota

The undersigned, [signature] certifies that he is a representative of (company), duly authorized to execute this certificate, that he visually inspected the subgrade surface described above on 9-10-23 (date) and found the surface to be acceptable for installation of the geomembrane.

This certification is based on observations of the surface of the subgrade only. No subterrain inspections or tests have been performed and ECA (company) makes no representations or warranties regarding conditions which may exist below the surface of the subgrade.

DATE: 9-10-23

SIGNATURE: [signature]

NAME: Octavio M Rivas

TITLE: Foreman

**CERTIFICATE RECEIVED BY CONTRACTOR:**

DATE: 9-10-23

COMPANY: Brunke Bros Inc

SIGNATURE: [signature]

NAME: Jack Brunke

TITLE: Foreman

**CERTIFICATE RECEIVED BY OWNER:**

DATE: 9-10-23

COMPANY: Barr Engineering

SIGNATURE: [signature]

NAME: Chance Norton

TITLE: Environmental Technician

## CERTIFICATE OF ACCEPTANCE OF GEOMEMBRANE SUBGRADE SURFACE BY INSTALLER

DESCRIPTION OF AREA TO BE CERTIFIED: North sidewall slope subgrade

INSTALLER

NAME: ECApplications

ADDRESS: 901 E Orangethorpe Ave

Anaheim, CA 92801

AUTHORIZED REPRESENTATIVE: [signature]

PROJECT

LOCATION: Minnkota, Center ND

PROJECT: Cell 5 Phase 1B

OWNER: Minnkota

The undersigned, [signature] certifies that he is a representative of (company), duly authorized to execute this certificate, that he visually inspected the subgrade surface described above on 9/11/23 (date) and found the surface to be acceptable for installation of the geomembrane.

This certification is based on observations of the surface of the subgrade only. No subterrain inspections or tests have been performed and ECA (company) makes no representations or warranties regarding conditions which may exist below the surface of the subgrade.

DATE: 9/11/23

SIGNATURE: [signature]

NAME: Octavio M Ruiz

TITLE: Foreman

**CERTIFICATE RECEIVED BY CONTRACTOR:**

DATE: 9/11/23

COMPANY: Brandt Bros Dev

SIGNATURE: [signature]

NAME: Daniel Rhoads

TITLE: Foreman

**CERTIFICATE RECEIVED BY OWNER:**

DATE: 9/11/23

COMPANY: Barr Engineering

SIGNATURE: [signature]

NAME: Chance Victor

TITLE: Environmental Technician

## CERTIFICATE OF ACCEPTANCE OF GEOMEMBRANE SUBGRADE SURFACE BY INSTALLER

DESCRIPTION OF AREA TO BE CERTIFIED North Sidewall slope subgrade in trench

INSTALLER

NAME: ECApplications

ADDRESS: 901 E Orangethorpe Ave
Anaheim, CA 92801

AUTHORIZED REPRESENTATIVE: [signature]

PROJECT

LOCATION: Mankato, Center ND

PROJECT: Cell 5 Phase 1B

OWNER: Minnkota

The undersigned, [signature] certifies that he is a representative of (company), duly authorized to execute this certificate, that he visually inspected the subgrade surface described above on 9/13/23 (date) and found the surface to be acceptable for installation of the geomembrane.

This certification is based on observations of the surface of the subgrade only. No subterrain inspections or tests have been performed and ECA (company) makes no representations or warranties regarding conditions which may exist below the surface of the subgrade.

DATE: 9/13/23

SIGNATURE: [signature]

NAME: Octavio M Rivas

TITLE: Foreman

**CERTIFICATE RECEIVED BY CONTRACTOR:**

DATE: 9/13/23

COMPANY: Brandt Bros Inc

SIGNATURE: [signature]

NAME: Daniel Woods

TITLE: Foreman

**CERTIFICATE RECEIVED BY OWNER:**

DATE: 9/13/23

COMPANY: Barr Engineering

SIGNATURE: [signature]

NAME: Chance Norton

TITLE: Environmental Field Technician

**CERTIFICATE OF ACCEPTANCE OF**
**GEOMEMBRANE SUBGRADE SURFACE BY INSTALLER**

DESCRIPTION OF AREA TO BE CERTIFIED North sidewall trench subgrade

INSTALLER

NAME: ECApplications

ADDRESS: 901 E Orangethorpe Ave

Anaheim, CA 92801

AUTHORIZED REPRESENTATIVE: [signature]

PROJECT

LOCATION: Mankato, Center ND

PROJECT: Cell 5 Phase 1B

OWNER: Minnkota

The undersigned, [signature] certifies that he is a representative of (company), duly authorized to execute this certificate, that he visually inspected the subgrade surface described above on 9/14/23 (date) and found the surface to be acceptable for installation of the geomembrane.

This certification is based on observations of the surface of the subgrade only. No subterrain inspections or tests have been performed and ECA (company) makes no representations or warranties regarding conditions which may exist below the surface of the subgrade.

DATE: 9/14/23

SIGNATURE: [signature]

NAME: Octavio M Rivas

TITLE: Foreman

**CERTIFICATE RECEIVED BY CONTRACTOR:**

DATE: 9/14/23

COMPANY: Bauer Bros Inc

SIGNATURE: [signature]

NAME: Daniel Rhoads

TITLE: Foreman

**CERTIFICATE RECEIVED BY OWNER:**

DATE: 9/14/23

COMPANY: Bec Engineering

SIGNATURE: [signature]

NAME: Chance Norton

TITLE: Environmental Field Technician

**CERTIFICATE OF ACCEPTANCE OF**
**GEOMEMBRANE SUBGRADE SURFACE BY INSTALLER**

DESCRIPTION OF AREA TO BE CERTIFIED North sidewall trench extends

INSTALLER

NAME: ECApplications

ADDRESS: 901 E Orangethorpe Ave
Anaheim, CA 92801

AUTHORIZED REPRESENTATIVE: [signature]

PROJECT

LOCATION: Minnkota, Center ND

PROJECT: Cell 5 Phase 1B

OWNER: Minnkota

The undersigned, [signature] certifies that he is a representative of (company), duly authorized to execute this certificate, that he visually inspected the subgrade surface described above on 9/15/23 (date) and found the surface to be acceptable for installation of the geomembrane.

This certification is based on observations of the surface of the subgrade only. No subterrain inspections or tests have been performed and ECA (company) makes no representations or warranties regarding conditions which may exist below the surface of the subgrade.

DATE: 9/15/23

SIGNATURE: [signature]

NAME: Octavio M Rivas

TITLE: Foreman

**CERTIFICATE RECEIVED BY CONTRACTOR:**

DATE: 9/15/23

COMPANY: Brown Bros Inc

SIGNATURE: [signature]

NAME: Daniel Rhoads

TITLE: Foreman

**CERTIFICATE RECEIVED BY OWNER:**

DATE: 9/15/23

COMPANY: Bass Engineering

SIGNATURE: [signature]

NAME: Chance Norton

TITLE: Environmental Field Technician

**CERTIFICATE OF ACCEPTANCE OF**
**GEOMEMBRANE SUBGRADE SURFACE BY INSTALLER**

DESCRIPTION OF AREA TO BE CERTIFIED: Northeast sidewall trench subgrade

INSTALLER

NAME: ECApplications

ADDRESS: 901 E Orangethorpe Ave
Anaheim, CA 92801

AUTHORIZED REPRESENTATIVE: [signature]

PROJECT

LOCATION: Minnkota, Center ND

PROJECT: Cell 5 Phase 1B

OWNER: Minnkota

The undersigned, [signature] (company), duly authorized to execute this certificate, that he visually inspected the subgrade surface described above on 9/6/23 (date) and found the surface to be acceptable for installation of the geomembrane.

This certification is based on observations of the surface of the subgrade only. No subterrain inspections or tests have been performed and ECA (company) makes no representations or warranties regarding conditions which may exist below the surface of the subgrade.

DATE: 9/6/23

SIGNATURE: [signature]

NAME: Octavio M Riva

TITLE: Foreman

**CERTIFICATE RECEIVED BY CONTRACTOR:**

DATE: 9/6/23

COMPANY: Bergeson Bros Inc

SIGNATURE: [signature]

NAME: Daniel Rhoads

TITLE: Foreman

**CERTIFICATE RECEIVED BY OWNER:**

DATE: 9/6/23

COMPANY: Bell Engineering

SIGNATURE: [signature]

NAME: Chance Norton

TITLE: Environmental Field Technician

**CERTIFICATE OF ACCEPTANCE OF**
**GEOMEMBRANE SUBGRADE SURFACE BY INSTALLER**

DESCRIPTION OF AREA TO BE CERTIFIED East Sidewall trench subgrade

INSTALLER

NAME: ECApplications

ADDRESS: 901 E Orangethorpe Ave
Anaheim, CA 92801

AUTHORIZED REPRESENTATIVE: [signature]

PROJECT

LOCATION: Minnkota, Center ND

PROJECT: Cell 5 Phase 1B

OWNER: Minnkota

The undersigned, [signature] certifies that he is a representative of (company), duly authorized to execute this certificate, that he visually inspected the subgrade surface described above on 9/18/23 (date) and found the surface to be acceptable for installation of the geomembrane.

This certification is based on observations of the surface of the subgrade only. No subterrain inspections or tests have been performed and EC A (company) makes no representations or warranties regarding conditions which may exist below the surface of the subgrade.

DATE: 9/18/23

SIGNATURE: [signature]

NAME: Ortoio M Rivas

TITLE: Foreman

**CERTIFICATE RECEIVED BY CONTRACTOR:**

DATE: 9/18/23

COMPANY: Brooks Bros Inc

SIGNATURE: [signature]

NAME: Daniel Brooks

TITLE: Foreman

**CERTIFICATE RECEIVED BY OWNER:**

DATE: 9/18/23

COMPANY: BEC Engineering

SIGNATURE: [signature]

NAME: Steve Norton

TITLE: Environmental Field Technician

**CERTIFICATE OF ACCEPTANCE OF**
**GEOMEMBRANE SUBGRADE SURFACE BY INSTALLER**

DESCRIPTION OF AREA TO BE CERTIFIED Southeast corner trench subgrade

INSTALLER

NAME: ECApplications

ADDRESS: 901 E Orangethorpe Ave

Anaheim, CA 92801

AUTHORIZED REPRESENTATIVE: [signature]

PROJECT

LOCATION: Mandan, Center ND

PROJECT: Cell 5 Phase 1B

OWNER: Minnkota

The undersigned, [signature] certifies that he is a representative of (company), duly authorized to execute this certificate, that he visually inspected the subgrade surface described above on 10/7/23 (date) and found the surface to be acceptable for installation of the geomembrane.

This certification is based on observations of the surface of the subgrade only. No subterrain inspections or tests have been performed and ECA (company) makes no representations or warranties regarding conditions which may exist below the surface of the subgrade.

DATE: 10/7/23

SIGNATURE: [signature]

NAME: Octavio M Ruiz

TITLE: Foreman

**CERTIFICATE RECEIVED BY CONTRACTOR:**

DATE: 10/7/23

COMPANY: Bergelo Bros Inc

SIGNATURE: [signature]

NAME: Daniel Rhoads

TITLE: Foreman

**CERTIFICATE RECEIVED BY OWNER:**

DATE: 10/7/23

COMPANY: Bell Engineering

SIGNATURE: [signature]

NAME: Chance Nuxton

TITLE: Environmental Field Technician

## CERTIFICATE OF ACCEPTANCE OF GEOMEMBRANE SUBGRADE SURFACE BY INSTALLER

DESCRIPTION OF AREA TO BE CERTIFIED Southeast corner trench subgrade

**INSTALLER**

NAME: ECApplications

ADDRESS: 901 E Orangethorpe Ave

Anaheim, CA 92801

AUTHORIZED REPRESENTATIVE: [signature]

**PROJECT**

LOCATION: Minnkota, Center ND

PROJECT: Cell 5 Phase 1B

OWNER: Minnkota

The undersigned, [signature] certifies that he is a representative of (company), duly authorized to execute this certificate, that he visually inspected the subgrade surface described above on 10/8/23 (date) and found the surface to be acceptable for installation of the geomembrane.

This certification is based on observations of the surface of the subgrade only. No subterrain inspections or tests have been performed and ECA (company) makes no representations or warranties regarding conditions which may exist below the surface of the subgrade.

DATE: 10/8/23

SIGNATURE: [signature]

NAME: Octavio Rivas

TITLE: Foreman

**CERTIFICATE RECEIVED BY CONTRACTOR:**

DATE: 10/8/23

COMPANY: Granite Bay Inc

SIGNATURE: [signature]

NAME: Daniel Rhoads

TITLE: Foreman

**CERTIFICATE RECEIVED BY OWNER:**

DATE: 10/8/23

COMPANY: Burr Engineering

SIGNATURE: [signature]

NAME: Chance Nelson

TITLE: Environmental Field Technician

**CERTIFICATE OF ACCEPTANCE OF**
**GEOMEMBRANE SUBGRADE SURFACE BY INSTALLER**

DESCRIPTION OF AREA TO BE CERTIFIED South Sidewall Trench Subgrade

INSTALLER

NAME: ECApplications

ADDRESS: 901 E Orangethorpe Ave

Anaheim, CA 92801

AUTHORIZED REPRESENTATIVE: Octavio

PROJECT

LOCATION: Mankato, Center ND

PROJECT: Cell 5 Phase 1B

OWNER: Minnkota

The undersigned, Octavio certifies that he is a representative of (company), duly authorized to execute this certificate, that he visually inspected the subgrade surface described above on 10/9/23 (date) and found the surface to be acceptable for installation of the geomembrane.

This certification is based on observations of the surface of the subgrade only. No subterrain inspections or tests have been performed and ECA (company) makes no representations or warranties regarding conditions which may exist below the surface of the subgrade.

DATE: 10/9/23

SIGNATURE: Octavio

NAME: Octavio La Rosa

TITLE: Foreman

**CERTIFICATE RECEIVED BY CONTRACTOR:**

DATE: 10/9/23

COMPANY: Brooks Bros Inc

SIGNATURE: Daniel Rhoads

NAME: Daniel Rhoads

TITLE: Foreman

**CERTIFICATE RECEIVED BY OWNER:**

DATE: 10/9/23

COMPANY: Burr Engineering

SIGNATURE: Chance Norton

NAME: Chance Norton

TITLE: [redacted] Environmental Field Tech

**CERTIFICATE OF ACCEPTANCE OF**
**GEOMEMBRANE SUBGRADE SURFACE BY INSTALLER**

DESCRIPTION OF AREA TO BE CERTIFIED: South Sidewall trench Subgrade

| INSTALLER | PROJECT |
|---|---|
| NAME: ECApplications | LOCATION: Mandaton, Center ND |
| ADDRESS: 901 E Orangethorpe Ave | PROJECT: Cell 5 Phase 1B |
| Anaheim, CA 92801 | |
| AUTHORIZED REPRESENTATIVE: | OWNER: Minnkota |

The undersigned, _____ certifies that he is a representative of (company), duly authorized to execute this certificate, that he visually inspected the subgrade surface described above on 10/10/23 (date) and found the surface to be acceptable for installation of the geomembrane.

This certification is based on observations of the surface of the subgrade only. No subterrain inspections or tests have been performed and ECA (company) makes no representations or warranties regarding conditions which may exist below the surface of the subgrade.

DATE: 10/10/23 SIGNATURE: _____

NAME: Octavio M Rivas

TITLE: Foreman

| CERTIFICATE RECEIVED BY CONTRACTOR: | CERTIFICATE RECEIVED BY OWNER: |
|---|---|
| DATE: 10/10/23 | DATE: 10/10/23 |
| COMPANY: Boyle Bros Inc | COMPANY: B.I. Engineering |
| SIGNATURE: _____ | SIGNATURE: _____ |
| NAME: Daniel Rhoads | NAME: Chance Nelson |
| TITLE: Foreman | TITLE: Environmental Field Technician |

**CERTIFICATE OF ACCEPTANCE OF**
**GEOMEMBRANE SUBGRADE SURFACE BY INSTALLER**

DESCRIPTION OF AREA TO BE CERTIFIED South sidewall trench subgrade

| INSTALLER | PROJECT |
|---|---|
| NAME: ECApplications | LOCATION: Minnkota, Center ND |
| ADDRESS: 901 E Orangethorpe Ave | PROJECT: Cell 5 Phase 1B |
| Anaheim, CA 92801 | |
| AUTHORIZED REPRESENTATIVE: | OWNER: Minnkota |

The undersigned, _____ certifies that he is a representative of (company), duly authorized to execute this certificate, that he visually inspected the subgrade surface described above on 10/19/23 (date) and found the surface to be acceptable for installation of the geomembrane.

This certification is based on observations of the surface of the subgrade only. No subterrain inspections or tests have been performed and ECA (company) makes no representations or warranties regarding conditions which may exist below the surface of the subgrade.

DATE: 10/19/23 SIGNATURE: _____

NAME: OCTAVIO M RIVA

TITLE: Foreman

| CERTIFICATE RECEIVED BY CONTRACTOR: | CERTIFICATE RECEIVED BY OWNER: |
|---|---|
| DATE: 10/19/23 | DATE: 10/19/23 |
| COMPANY: Ame Bros Inc | COMPANY: Bec Engineering |
| SIGNATURE: _____ | SIGNATURE: _____ |
| NAME: Daniel Rhoads | NAME: Chance Nieto |
| TITLE: Foreman | TITLE: Environmental Field Technician |

## CERTIFICATE OF ACCEPTANCE OF GEOMEMBRANE SUBGRADE SURFACE BY INSTALLER

DESCRIPTION OF AREA TO BE CERTIFIED: South Sidewall trench subgrade

**INSTALLER**

NAME: ECApplications

ADDRESS: 901 E Orangethorpe Ave

Anaheim, CA 92801

AUTHORIZED REPRESENTATIVE: [signature]

**PROJECT**

LOCATION: Mankato, Center ND

PROJECT: Cell 5 Phase 1B

OWNER: Minnkota

The undersigned, [signature] certifies that he is a representative of (company), duly authorized to execute this certificate, that he visually inspected the subgrade surface described above on 10/5/23 (date) and found the surface to be acceptable for installation of the geomembrane.

This certification is based on observations of the surface of the subgrade only. No subterrain inspections or tests have been performed and ECA (company) makes no representations or warranties regarding conditions which may exist below the surface of the subgrade.

DATE: 10/5/23

SIGNATURE: [signature]

NAME: Cathie M. Rios

TITLE: Foreman

**CERTIFICATE RECEIVED BY CONTRACTOR:**

DATE: 10/5/23

COMPANY: Barnhart Bros Inc

SIGNATURE: [signature]

NAME: Daniel Rhoads

TITLE: Foreman

**CERTIFICATE RECEIVED BY OWNER:**

DATE: 10/5/23

COMPANY: Burr Engineering

SIGNATURE: [signature]

NAME: Chance Norton

TITLE: Environmental Field Technician

## CERTIFICATE OF ACCEPTANCE OF GEOMEMBRANE SUBGRADE SURFACE BY INSTALLER

DESCRIPTION OF AREA TO BE CERTIFIED South Sidewall trench subgrade

INSTALLER

NAME: ECApplications

ADDRESS: 901 E Orangethorpe Ave

Anaheim, CA 92801

AUTHORIZED REPRESENTATIVE:

PROJECT

LOCATION: Mandan, Center ND

PROJECT: Cell 5 Phase 1B

OWNER: Minnkota

The undersigned, _____ certifies that he is a representative of (company), duly authorized to execute this certificate, that he visually inspected the subgrade surface described above on 10/16/23 (date) and found the surface to be acceptable for installation of the geomembrane.

This certification is based on observations of the surface of the subgrade only. No subterrain inspections or tests have been performed and ECA (company) makes no representations or warranties regarding conditions which may exist below the surface of the subgrade.

DATE: 10/16/23

SIGNATURE: _____

NAME: Jesus M Rios

TITLE: Foreman

**CERTIFICATE RECEIVED BY CONTRACTOR:**

DATE: 10/16/23

COMPANY: Beacon Bros Inc

SIGNATURE: _____

NAME: Jesus Rios

TITLE: Foreman

**CERTIFICATE RECEIVED BY OWNER:**

DATE: 10/16/23

COMPANY: Burr Engineering

SIGNATURE: _____

NAME: Chance Nuter

TITLE: Environmental Field Inspector

# Field Forms

# SUBMITTAL CONTROL FORM

DATE: November 2, 2023

SUBMITTAL NO.: 9-1

PROJECT NUM.: 233013

PROJECT NAME: Minnkota-Coal Combusion Waste Facility-Cell 5 Phase 12B

| | | | |
|---|---|---|---|
| TO: | **Baranko Bros, Inc.** | FROM: | **EC Applications** |
| ATTN: | **Jack Gossen** | | **Ruben Brito** |
| | **3048 Highway 22N** | | **901 E. Orangethorpe Ave.** |
| | **Dickinson, NV 58601** | | **Anaheim, CA 92801** |
| PHONE: | **701-483-5868** | PHONE: | **714-921-9848 X 102** |
| FAX: | **701-483-5960** | FAX: | **866-475-1225** |
| E-MAIL: | **j.gossen@barankoinc.com** | E-MAIL: | **rbrito@ecapps.com** |

**WE ARE SUBMITTING THE ENCLOSED:**

☐ SHOP DRAWINGS ☐ CERTIFICATES OF COMPLIANCE ☐ SAMPLES

☐ MATERIAL DATA ☐ QC INFORMATION ☐ OTHER

**THESE ARE TRANSMITTED FOR:**

☐ APPROVAL ☐ INFORMATION ☐ RESUBMIT

☐ AS REQUESTED ☐ FOR REVIEW

| ITEM NO. | SUBMITTAL DESCRIPTION | NO. OF COPIES | CONTRACT REFERENCE / SPECIFICATION SECTION / DRAWING SHEET NUMBER |
|---|---|---|---|
| | Formal field logs (Quality Control Documentation) | 1 | Section 310519.16 Subsection 1.04 E-1 |

**NOTE:**

***THE ABOVE SUBMITTED ITEMS HAVE BEEN REVIEWED IN DETAIL AND ARE CORRECT AND IN GENERAL CONFORMANCE WITH THE CONTRACT DRAWINGS AND SPECIFICATIONS EXCEPT AS OTHERWISE STATED.***

*Ruben Brito*

*ECApplications AUTHORIZED SIGNATURE*

***IF THE ABOVE VARIANCES ARE ACCEPTABLE, PLEASE CONFIRM IN WRITING WITHIN TEN (10) DAYS, OTHERWISE ECA WILL PROCEED PER THE PROPOSED VARIANCES.***

# ECApplications

## Preweld Test Report

**Project Name:** Minnkota Power Cooperative, Inc. **Job #** 233013 **Superintendent:** Octavio Rivas

**Material Type:** 60 Mil HDPE SS Textured / Smooth Liner

**Job Description:** Celll 5 Phase 1B

**Reported By :** Daniel Martinez

| | | |

# ECApplications

## Preweld Test Report

**Project Name:** Minnkota Power Cooperative, Inc. **Job #** 233013 **Superintendent:** Octavio Rivas

**Material Type:** 60 Mil HDPE SS Textured / Smooth Liner

**Job Description:** Celll 5 Phase 1B

**Reported By :** Daniel Martinez

| | | | |
|---|---|---|---|
| **Primary** | X | **Pond** | |
| **Secondary** | | **Cell** | X |
| | | **Pad** | |

| | | |
|---|---|---|
| **Peel Test Extrusion Minimum** | 78 | **PPI** |
| **Peel Test Fusion Minimum** | 91 | **PPI** |
| **Shear Test Minimum** | 120 | **PPI** |

| Weld Date | Weld Time | Operator Name / ID | Mach No | Mach Speed | Mach Temp | Preheat Temp | Amb Temp | Peel Extrusion 1 | 2 | 3 | 4 | 5 | | Peel Wedge 1 | 2 | 3 | 4 | 5 | Shear 1 | 2 | 3 | 4 | 5 | Test Results |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7/24/23 | 13:35 | EDUARDO DEL VALLE | 616 | 14 | 800 | | 80 | | | | | | A | 112 | 114 | 119 | 110 | 109 | 146 | 142 | 144 | 140 | 143 | Pass |
| | | | | | | | | | | | | | B | 116 | 142 | 144 | 140 | 143 | | | | | | |
| 7/25/23 | 7:47 | EDUARDO DEL VALLE | 616 | 13 | 800 | | 62 | | | | | | A | 116 | 102 | 119 | 134 | 125 | 148 | 139 | 138 | 142 | 140 | Pass |
| | | | | | | | | | | | | | B | 108 | 122 | 115 | 113 | 109 | | | | | | |
| 7/25/23 | 7:45 | JAVIER MEZA | 614 | 13 | 800 | | 62 | | | | | | A | 128 | 100 | 127 | 125 | 121 | 133 | 147 | 152 | 146 | 137 | Pass |
| | | | | | | | | | | | | | B | 99 | 108 | 111 | 120 | 119 | | | | | | |
| 7/25/23 | 7:50 | EDUARDO DEL VALLE | 616 | 12 | | | 62 | | | | | | A | 123 | 126 | 131 | 129 | 120 | 159 | 154 | 160 | 150 | 161 | Pass |
| | | | | | | | | | | | | | B | 140 | 125 | 136 | 131 | 128 | | | | | | |
| 7/26/23 | 8:00 | JAVIER MEZA | 614 | 12 | | | 72 | | | | | | A | 114 | 105 | 104 | 115 | 111 | 155 | 152 | 158 | 149 | 152 | Pass |
| | | | | | | | | | | | | | B | 123 | 121 | 131 | 129 | 130 | | | | | | |
| 7/26/23 | 9:10 | FRANCISCO NUNES | 713 | | 520 | 600 | 72 | 108 | 91 | 96 | 106 | 104 | A | | | | | | 152 | 156 | 160 | 149 | 161 | Pass |
| | | | | | | | | | | | | | B | | | | | | | | | | | |
| 7/26/23 | 10:00 | BRANDON GOULD | 538 | | 545 | 540 | 75 | 119 | 100 | 145 | 146 | 138 | A | | | | | | 152 | 150 | 151 | 151 | 148 | Pass |
| | | | | | | | | | | | | | B | | | | | | | | | | | |
| 7/26/23 | 13:40 | FRANCISCO NUNES | 713 | | 520 | 600 | 81 | 95 | 111 | 116 | 123 | 114 | A | | | | | | 137 | 132 | 137 | 129 | 132 | Pass |
| | | | | | | | | | | | | | B | | | | | | | | | | | |
| 7/26/23 | 14:05 | BRANDON GOULD | 538 | | 545 | 540 | 93 | 126 | 105 | 125 | 123 | 123 | A | | | | | | 153 | 149 | 156 | 162 | 157 | Pass |
| | | | | | | | | | | | | | B | | | | | | | | | | | |
| 8/28/23 | 10:51 | BRANDON GOULD | 535 | | 485 | 500 | 72 | 126 | 125 | 149 | 145 | 156 | A | | | | | | 155 | 157 | 160 | 155 | 154 | Pass |
| | | | | | | | | | | | | | B | | | | | | | | | | | |
| 8/28/23 | 10:57 | GONZALO SUAREZ | 713 | | 510 | 700 | 72 | 89 | 97 | 104 | 112 | 123 | A | | | | | | 152 | 155 | 147 | 155 | 159 | Pass |
| | | | | | | | | | | | | | B | | | | | | | | | | | |
| 8/29/23 | 8:07 | GONZALO SUAREZ | 713 | | 510 | 700 | 61 | 92 | 95 | 100 | 101 | 95 | A | | | | | | 168 | 158 | 173 | 164 | 160 | Pass |
| | | | | | | | | | | | | | B | | | | | | | | | | | |
| 8/29/23 | 8:30 | BRANDON GOULD | 535 | | 500 | 495 | 61 | 139 | 116 | 137 | 132 | 129 | A | | | | | | 156 | 157 | 168 | 165 | 168 | Pass |
| | | | | | | | | | | | | | B | | | | | | | | | | | |
| 8/29/23 | 13:20 | GONZALO SUAREZ | 713 | | 510 | 700 | 81 | 108 | 126 | 108 | 106 | 113 | A | | | | | | 170 | 162 | 169 | 169 | 170 | Pass |
| | | | | | | | | | | | | | B | | | | | | | | | | | |
| 8/29/23 | 13:35 | BRANDON GOULD | 535 | | 500 | 500 | 81 | 130 | 119 | 126 | 132 | 119 | A | | | | | | 142 | 159 | 165 | 161 | 167 | Pass |
| | | | | | | | | | | | | | B | | | | | | | | | | | |
| 8/30/23 | 8:25 | GONZALO SUAREZ | 713 | | 510 | 700 | 65 | 133 | 130 | 119 | 102 | 132 | A | | | | | | 167 | 163 | 162 | 166 | 166 | Pass |
| | | | | | | | | | | | | | B | | | | | | | | | | | |
| 8/30/23 | 8:26 | BRANDON GOULD | 535 | | 500 | 500 | 65 | 154 | 127 | 159 | 148 | 112 | A | | | | | | 170 | 170 | 168 | 170 | 163 | Pass |
| | | | | | | | | | | | | | B | | | | | | | | | | | |
| 8/31/23 | 8:17 | EDUARDO DEL VALLE | 713 | | 510 | 700 | 59 | 110 | 103 | 125 | 109 | 131 | A | | | | | | 168 | 160 | 163 | 164 | 164 | Pass |
| | | | | | | | | | | | | | B | | | | | | | | | | | |

# ECApplications

## Preweld Test Report

**Project Name:** Minnkota Power Cooperative, Inc. **Job #** 233013 **Superintendent:** Octavio Rivas

**Material Type:** 60 Mil HDPE SS Textured / Smooth Liner

**Job Description:** Celll 5 Phase 1B

**Reported By :** Daniel Martinez

| | | | |
|---|---|---|---|
| **Primary** | X | **Pond** | |
| **Secondary** | | **Cell** | X |
| | | **Pad** | |

| | | |
|---|---|---|
| **Peel Test Extrusion Minimum** | 78 | **PPI** |
| **Peel Test Fusion Minimum** | 91 | **PPI** |
| **Shear Test Minimum** | 120 | **PPI** |

| Weld Date | Weld Time | Operator Name / ID | Mach No | Mach Speed | Mach Temp | Preheat Temp | Amb Temp | Peel Extrusion 1 | 2 | 3 | 4 | 5 | | Peel Wedge 1 | 2 | 3 | 4 | 5 | Shear 1 | 2 | 3 | 4 | 5 | Test Results |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9/1/23 | 8:25 | BRANDON GOULD | 535 | | 500 | 485 | 60 | 144 | 135 | 155 | 133 | 135 | A | | | | | | 162 | 163 | 164 | 172 | 163 | Pass |
| | | | | | | | | | | | | | B | | | | | | | | | | | |
| 9/1/23 | 8:34 | GONZALO SUAREZ | 713 | | 510 | 700 | 60 | 89 | 87 | 96 | 117 | 119 | A | | | | | | 167 | 162 | 162 | 152 | 149 | Pass |
| | | | | | | | | | | | | | B | | | | | | | | | | | |
| 9/7/23 | 8:43 | BRANDON GOULD | 535 | | 520 | 510 | 56 | 147 | 135 | 127 | 145 | 143 | A | | | | | | 178 | 176 | 168 | 159 | 168 | Pass |
| | | | | | | | | | | | | | B | | | | | | | | | | | |
| 9/7/23 | 13:25 | BRANDON GOULD | 535 | | 520 | 510 | 71 | 120 | 108 | 136 | 110 | 123 | A | | | | | | 168 | 157 | 163 | 169 | 151 | Pass |
| | | | | | | | | | | | | | B | | | | | | | | | | | |
| 9/8/23 | 13:35 | EDUARDO DEL VALLE | 616 | 12 | 800 | | | | | | | | A | 132 | 111 | 122 | 128 | 115 | 149 | 150 | 155 | 144 | 151 | Pass |
| | | | | | | | | | | | | | B | 126 | 130 | 129 | 128 | 125 | | | | | | |
| 9/10/23 | 9:32 | EDUARDO DEL VALLE | 616 | 12 | 800 | | | | | | | | A | 139 | 119 | 127 | 124 | 128 | 158 | 161 | 162 | 164 | 165 | Pass |
| | | | | | | | | | | | | | B | 127 | 125 | 131 | 134 | 109 | | | | | | |
| 9/10/23 | 9:30 | JOSE RODRIGUEZ | 614 | 12 | 800 | | | | | | | | A | 122 | 122 | 128 | 120 | 124 | 173 | 167 | 160 | 161 | 173 | Pass |
| | | | | | | | | | | | | | B | 124 | 120 | 124 | 127 | 132 | | | | | | |
| 9/10/23 | 13:17 | EDUARDO DEL VALLE | 616 | 11 | 800 | | | | | | | | A | 121 | 130 | 113 | 114 | 118 | 153 | 153 | 150 | 152 | 155 | Pass |
| | | | | | | | | | | | | | B | 120 | 130 | 131 | 122 | 130 | | | | | | |
| 9/10/23 | 13:40 | JOSE RODRIGUEZ | 614 | 12 | 800 | | | | | | | | A | 120 | 111 | 112 | 116 | 139 | 145 | 149 | 148 | 150 | 150 | Pass |
| | | | | | | | | | | | | | B | 112 | 106 | 117 | 122 | 129 | | | | | | |
| 9/11/23 | 13:17 | EDUARDO DEL VALLE | 616 | 11 | 800 | | | | | | | | A | 122 | 111 | 106 | 106 | 108 | 149 | 163 | 160 | 157 | 160 | Pass |
| | | | | | | | | | | | | | B | 129 | 115 | 119 | 125 | 114 | | | | | | |
| 9/11/23 | 13:42 | JOSE RODRIGUEZ | 614 | 12 | 800 | | | | | | | | A | 127 | 128 | 114 | 126 | 126 | 154 | 156 | 161 | 159 | 158 | Pass |
| | | | | | | | | | | | | | B | 111 | 121 | 123 | 113 | 119 | | | | | | |
| 9/12/23 | 14:05 | BRANDON GOULD | 535 | | 510 | 520 | | 139 | 90 | 153 | 123 | 118 | A | | | | | | 155 | 155 | 159 | 156 | 153 | Pass |
| | | | | | | | | | | | | | B | | | | | | | | | | | |
| 9/12/23 | 13:57 | GONZALO SUAREZ | 713 | | 510 | 600 | | 99 | 100 | 94 | 106 | 118 | A | | | | | | 170 | 156 | 164 | 166 | 163 | Pass |
| | | | | | | | | | | | | | B | | | | | | | | | | | |
| 9/12/23 | 16:08 | JOSE RODRIGUEZ | 614 | 11 | 800 | | | | | | | | A | 100 | 98 | 102 | 98 | 131 | 159 | 158 | 162 | 156 | 157 | Pass |
| | | | | | | | | | | | | | B | 97 | 100 | 134 | 135 | 116 | | | | | | |
| 9/13/23 | 7:55 | GUILLERMO BENITEZ | 616 | 11 | 825 | | | | | | | | A | 128 | 132 | 144 | 147 | 132 | 198 | 191 | 199 | 192 | 199 | Pass |
| | | | | | | | | | | | | | B | 120 | 122 | 125 | 139 | 126 | | | | | | |
| 9/13/23 | 9:00 | JOSE RODRIGUEZ | 614 | 11 | 825 | | | | | | | | A | 130 | 130 | 133 | 140 | 135 | 197 | 190 | 191 | 192 | 126 | Pass |
| | | | | | | | | | | | | | B | 132 | 131 | 133 | 140 | 136 | | | | | | |
| 9/13/23 | 13:20 | JOSE RODRIGUEZ | 614 | 12 | 825 | | | | | | | | A | 130 | 125 | 126 | 130 | 133 | 151 | 147 | 152 | 160 | 161 | Pass |
| | | | | | | | | | | | | | B | 128 | 126 | 128 | 127 | 126 | | | | | | |
| 9/13/23 | 13:25 | GUILLERMO BENITEZ | 616 | 12 | 825 | | | | | | | | A | 130 | 128 | 126 | 127 | 128 | 160 | 158 | 159 | 156 | 157 | Pass |
| | | | | | | | | | | | | | B | 123 | 121 | 117 | 114 | 111 | | | | | | |

# ECApplications

## Preweld Test Report

**Project Name:** Minnkota Power Cooperative, Inc. **Job #** 233013 **Superintendent:** Octavio Rivas

**Material Type:** 60 Mil HDPE SS Textured / Smooth Liner

**Job Description:** Celll 5 Phase 1B

**Reported By :** Daniel Martinez

| | | | |
|---|---|---|---|
| **Primary** | X | **Pond** | |
| **Secondary** | | **Cell** | X |
| | | **Pad** | |

**Peel Test Extrusion Minimum** 78 PPI

**Peel Test Fusion Minimum** 91 PPI

**Shear Test Minimum** 120 PPI

| Weld Date | Weld Time | Operator Name / ID | Mach No | Mach Speed | Mach Temp | Preheat Temp | Amb Temp | Peel Extrusion 1 | 2 | 3 | 4 | 5 | | Peel Wedge 1 | 2 | 3 | 4 | 5 | Shear 1 | 2 | 3 | 4 | 5 | Test Results |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9/14/23 | 10:02 | JOSE RODRIGUEZ | 614 | 11 | 825 | | | | | | | | A | 120 | 121 | 132 | 124 | 106 | 167 | 160 | 167 | 167 | 158 | Pass |
| | | | | | | | | | | | | | B | 122 | 115 | 104 | 135 | 117 | | | | | | |
| 9/14/23 | 10:00 | GUILLERMO BENITEZ | 616 | 11 | 825 | | | | | | | | A | 108 | 115 | 123 | 120 | 111 | 172 | 170 | 170 | 178 | 173 | Pass |
| | | | | | | | | | | | | | B | 127 | 114 | 122 | 116 | 120 | | | | | | |
| 9/14/23 | 13:27 | GUILLERMO BENITEZ | 616 | 12 | 825 | | | | | | | | A | 108 | 112 | 108 | 109 | 101 | 152 | 149 | 151 | 150 | 152 | Pass |
| | | | | | | | | | | | | | B | 110 | 113 | 112 | 111 | 115 | | | | | | |
| 9/14/23 | 13:28 | JOSE RODRIGUEZ | 614 | 12 | 825 | | | | | | | | A | 106 | 106 | 107 | 109 | 103 | 153 | 151 | 144 | 152 | 149 | Pass |
| | | | | | | | | | | | | | B | 109 | 113 | 112 | 112 | 113 | | | | | | |
| 9/15/23 | 8:15 | EDUARDO DEL VALLE | 616 | 11 | 840 | | | | | | | | A | 101 | 127 | 145 | 134 | 134 | 192 | 189 | 187 | 192 | 189 | Pass |
| | | | | | | | | | | | | | B | 116 | 140 | 162 | 131 | 161 | | | | | | |
| 9/15/23 | 8:31 | JOSE RODRIGUEZ | 614 | 11 | 840 | | | | | | | | A | 136 | 139 | 137 | 144 | 100 | 182 | 176 | 183 | 180 | 184 | Pass |
| | | | | | | | | | | | | | B | 133 | 149 | 149 | 129 | 118 | | | | | | |
| 9/15/23 | 13:24 | EDUARDO DEL VALLE | 616 | 12 | 840 | | | | | | | | A | 131 | 129 | 136 | 132 | 135 | 167 | 174 | 163 | 159 | 163 | Pass |
| | | | | | | | | | | | | | B | 129 | 139 | 129 | 126 | 126 | | | | | | |
| 9/15/23 | 13:35 | JOSE RODRIGUEZ | 614 | 12 | 840 | | | | | | | | A | 129 | 133 | 142 | 130 | 129 | 157 | 157 | 164 | 157 | 180 | Pass |
| | | | | | | | | | | | | | B | 138 | 131 | 142 | 124 | 148 | | | | | | |
| 9/16/23 | 8:10 | EDUARDO DEL VALLE | 616 | 11 | 825 | | | | | | | | A | 136 | 146 | 143 | 131 | 129 | 170 | 156 | 174 | 184 | 180 | Pass |
| | | | | | | | | | | | | | B | 148 | 127 | 149 | 137 | 136 | | | | | | |
| 9/16/23 | 8:21 | JOSE RODRIGUEZ | 614 | 11 | 825 | | | | | | | | A | 124 | 113 | 135 | 134 | 138 | 187 | 187 | 180 | 174 | 186 | Pass |
| | | | | | | | | | | | | | B | 135 | 135 | 127 | 131 | 130 | | | | | | |
| 9/16/23 | 13:15 | EDUARDO DEL VALLE | 616 | 12 | 825 | | | | | | | | A | 135 | 137 | 127 | 126 | 128 | 164 | 159 | 161 | 162 | 163 | Pass |
| | | | | | | | | | | | | | B | 130 | 135 | 126 | 127 | 140 | | | | | | |
| 9/16/23 | 13:20 | JOSE RODRIGUEZ | 614 | 12 | 825 | | | | | | | | A | 129 | 128 | 127 | 131 | 127 | 160 | 159 | 163 | 159 | 160 | Pass |
| | | | | | | | | | | | | | B | 131 | 129 | 126 | 125 | 126 | | | | | | |
| 9/18/23 | 8:20 | JOSE RODRIGUEZ | 614 | 11 | 825 | | | | | | | | A | 119 | 112 | 121 | 101 | 111 | 183 | 161 | 179 | 165 | 176 | Pass |
| | | | | | | | | | | | | | B | 118 | 116 | 137 | 110 | 121 | | | | | | |
| 9/18/23 | 8:56 | EDUARDO DEL VALLE | 964 | 11 | 825 | | | | | | | | A | 122 | 123 | 140 | 136 | 127 | 176 | 171 | 169 | 175 | 171 | Pass |
| | | | | | | | | | | | | | B | 126 | 145 | 114 | 128 | 138 | | | | | | |
| 9/18/23 | 13:43 | EDUARDO DEL VALLE | 964 | 12 | 825 | | | | | | | | A | 116 | 123 | 107 | 112 | 106 | 147 | 140 | 144 | 140 | 143 | Pass |
| | | | | | | | | | | | | | B | 109 | 100 | 105 | 102 | 115 | | | | | | |
| 9/18/23 | 14:16 | JOSE RODRIGUEZ | 614 | 12 | 825 | | | | | | | | A | 100 | 105 | 110 | 107 | 111 | 140 | 137 | 139 | 138 | 137 | Pass |
| | | | | | | | | | | | | | B | 107 | 98 | 95 | 98 | 108 | | | | | | |
| 9/19/23 | 8:15 | EDUARDO DEL VALLE | 964 | 11 | 825 | | | | | | | | A | 113 | 99 | 128 | 129 | 125 | 160 | 160 | 158 | 159 | 163 | Pass |
| | | | | | | | | | | | | | B | 129 | 120 | 117 | 118 | 135 | | | | | | |
| 9/19/23 | 8:23 | JOSE RODRIGUEZ | 614 | 11 | 825 | | | | | | | | A | 107 | 107 | 110 | 111 | 108 | 172 | 173 | 178 | 178 | 177 | Pass |
| | | | | | | | | | | | | | B | 119 | 116 | 124 | 106 | 111 | | | | | | |

# ECApplications

## Preweld Test Report

**Project Name:** Minnkota Power Cooperative, Inc. **Job #** 233013 **Superintendent:** Octavio Rivas

**Material Type:** 60 Mil HDPE SS Textured / Smooth Liner

**Job Description:** Celll 5 Phase 1B

**Reported By :** Daniel Martinez

| | | | |
|---|---|---|---|
| **Primary** | X | **Pond** | |
| **Secondary** | | **Cell** | X |
| | | **Pad** | |

| | | |
|---|---|---|
| **Peel Test Extrusion Minimum** | 78 | **PPI** |
| **Peel Test Fusion Minimum** | 91 | **PPI** |
| **Shear Test Minimum** | 120 | **PPI** |

| Weld Date | Weld Time | Operator Name / ID | Mach No | Mach Speed | Mach Temp | Preheat Temp | Amb Temp | Peel Extrusion 1 | 2 | 3 | 4 | 5 | | Peel Wedge 1 | 2 | 3 | 4 | 5 | Shear 1 | 2 | 3 | 4 | 5 | Test Results |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9/19/23 | 13:09 | EDUARDO DEL VALLE | 964 | 12 | 825 | | | | | | | | A | 116 | 105 | 113 | 119 | 116 | 164 | 151 | 149 | 149 | 160 | Pass |
| | | | | | | | | | | | | | B | 104 | 118 | 125 | 99 | 103 | | | | | | |
| 9/19/23 | 13:10 | JOSE RODRIGUEZ | 614 | 11 | | | | | | | | | A | 122 | 111 | 117 | 110 | 118 | 167 | 143 | 157 | 167 | 139 | Pass |
| | | | | | | | | | | | | | B | 117 | 105 | 118 | 109 | 108 | | | | | | |
| 9/19/23 | 10:00 | BRANDON GOULD | 535 | | 500 | 490 | | 129 | 99 | 132 | 159 | 137 | A | | | | | | 172 | 141 | 162 | 156 | 158 | Pass |
| | | | | | | | | | | | | | B | | | | | | | | | | | |
| 9/19/23 | 15:15 | JOSE RODRIGUEZ | 614 | 12 | 825 | | | | | | | | # | 126 | 127 | 125 | 127 | 126 | 149 | 152 | 155 | 154 | 148 | Pass |
| | | | | | | | | | | | | | B | 126 | 131 | 124 | 126 | 128 | | | | | | |
| 9/20/23 | 8:40 | GONZALO SUAREZ | 713 | | 510 | 700 | | 105 | 90 | 101 | 98 | 109 | A | | | | | | 161 | 180 | 160 | 178 | 180 | Pass |
| | | | | | | | | | | | | | B | | | | | | | | | | | |
| 9/20/23 | 8:46 | BRANDON GOULD | 535 | | 485 | 410 | | 114 | 119 | 132 | 128 | 117 | A | | | | | | 179 | 171 | 183 | 176 | 171 | Pass |
| | | | | | | | | | | | | | B | | | | | | | | | | | |
| 9/20/23 | 13:46 | GONZALO SUAREZ | 713 | | 510 | 800 | | 93 | 96 | 101 | 99 | 105 | A | | | | | | 157 | 158 | 158 | 140 | 199 | Pass |
| | | | | | | | | | | | | | B | | | | | | | | | | | |
| 9/20/23 | 13:50 | BRANDON GOULD | 535 | | 485 | 445 | | 141 | 146 | 142 | 146 | 140 | A | | | | | | 158 | 156 | 161 | 155 | 160 | Pass |
| | | | | | | | | | | | | | B | | | | | | | | | | | |
| 9/21/23 | 10:30 | EDUARDO DEL VALLE | 964 | 12 | 825 | | | | | | | | A | 116 | 109 | 124 | 117 | 120 | 169 | 169 | 171 | 170 | 170 | Pass |
| | | | | | | | | | | | | | B | 113 | 124 | 128 | 121 | 122 | | | | | | |
| 9/21/23 | 10:44 | JOSE RODRIGUEZ | 614 | 12 | 825 | | | | | | | | A | 128 | 114 | 119 | 123 | 120 | 174 | 171 | 170 | 171 | 169 | Pass |
| | | | | | | | | | | | | | B | 123 | 129 | 127 | 108 | 119 | | | | | | |
| 9/21/23 | 15:30 | EDUARDO DEL VALLE | 964 | 11 | 825 | | | | | | | | A | 115 | 107 | 99 | 119 | 120 | 153 | 158 | 151 | 154 | 164 | Pass |
| | | | | | | | | | | | | | B | 117 | 115 | 132 | 125 | 109 | | | | | | |
| 9/21/23 | 16:00 | JOSE RODRIGUEZ | 614 | 11 | 825 | | | | | | | | A | 127 | 118 | 119 | 111 | 117 | 163 | 160 | 157 | 149 | 151 | Pass |
| | | | | | | | | | | | | | B | 119 | 125 | 123 | 121 | 119 | | | | | | |
| 9/22/23 | 8:34 | EDUARDO DEL VALLE | 964 | 11 | 825 | | | | | | | | A | 131 | 127 | 132 | 129 | 156 | 172 | 176 | 175 | 177 | 177 | Pass |
| | | | | | | | | | | | | | B | 133 | 129 | 147 | 112 | 139 | | | | | | |
| 9/22/23 | 8:30 | JOSE RODRIGUEZ | 614 | 11 | 825 | | | | | | | | A | 120 | 120 | 116 | 125 | 126 | 178 | 170 | 178 | 176 | 176 | Pass |
| | | | | | | | | | | | | | B | 133 | 130 | 130 | 126 | 124 | | | | | | |
| 9/26/23 | 12:49 | GUILLERMO BENITEZ | 264 | | 500 | 700 | | 136 | 110 | 131 | 132 | 137 | A | | | | | | 166 | 164 | 167 | 168 | 165 | Pass |
| | | | | | | | | | | | | | B | | | | | | | | | | | |
| 9/26/23 | 12:50 | GONZALO SUAREZ | 713 | | 510 | 800 | | 110 | 98 | 114 | 130 | 107 | A | | | | | | 167 | 161 | 168 | 156 | 167 | Pass |
| | | | | | | | | | | | | | B | | | | | | | | | | | |
| 9/27/23 | 9:15 | GONZALO SUAREZ | 713 | | 510 | 800 | | 123 | 103 | 101 | 105 | 121 | A | | | | | | 178 | 188 | 178 | 181 | 168 | Pass |
| | | | | | | | | | | | | | B | | | | | | | | | | | |
| 9/27/23 | 9:20 | GUILLERMO BENITEZ | 264 | | 500 | 800 | | 128 | 129 | 126 | 120 | 126 | A | | | | | | 156 | 150 | 176 | 159 | 165 | Pass |
| | | | | | | | | | | | | | B | | | | | | | | | | | |

# ECApplications

## Preweld Test Report

**Project Name:** Minnkota Power Cooperative, Inc. **Job #** 233013 **Superintendent:** Octavio Rivas

**Material Type:** 60 Mil HDPE SS Textured / Smooth Liner **Primary** X **Pond**

**Job Description:** Celll 5 Phase 1B **Secondary** **Cell** X

**Reported By :** Daniel Martinez **Pad**

**Peel Test Extrusion Minimum** 78 PPI

**Peel Test Fusion Minimum** 91 PPI

**Shear Test Minimum** 120 PPI

| Weld Date | Weld Time | Operator Name / ID | Mach No | Mach Speed | Mach Temp | Preheat Temp | Amb Temp | Peel Extrusion | | | | | | Peel Wedge | | | | | | Shear | | | | | Test Results |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | 1 | 2 | 3 | 4 | 5 | | 1 | 2 | 3 | 4 | 5 | | 1 | 2 | 3 | 4 | 5 | |
| 9/27/23 | 13:40 | GONZALO SUAREZ | 713 | | 510 | 800 | | 132 | 128 | 128 | 116 | 116 | A | | | | | | | 164 | 165 | 165 | 153 | 157 | Pass |
| | | | | | | | | | | | | | B | | | | | | | | | | | | |
| 9/27/23 | 13:45 | GUILLERMO BENITEZ | 264 | | 500 | 700 | | 93 | 118 | 106 | 103 | 96 | A | | | | | | | 162 | 160 | 168 | 165 | 160 | Pass |
| | | | | | | | | | | | | | B | | | | | | | | | | | | |
| 9/28/23 | 9:00 | GUILLERMO BENITEZ | 264 | | 500 | 800 | | 101 | 150 | 129 | 147 | 131 | A | | | | | | | 178 | 171 | 169 | 170 | 173 | Pass |
| | | | | | | | | | | | | | B | | | | | | | | | | | | |
| 9/28/23 | 9:00 | GONZALO SUAREZ | 713 | | 510 | 800 | | 128 | 135 | 121 | 137 | 139 | A | | | | | | | 173 | 171 | 179 | 171 | 167 | Pass |
| | | | | | | | | | | | | | B | | | | | | | | | | | | |
| 9/28/23 | 13:45 | GUILLERMO BENITEZ | 264 | | 500 | 700 | | 116 | 122 | 132 | 110 | 134 | A | | | | | | | 146 | 150 | 147 | 148 | 148 | Pass |
| | | | | | | | | | | | | | B | | | | | | | | | | | | |
| 9/28/23 | 13:28 | GONZALO SUAREZ | 713 | | 510 | 800 | | 98 | 99 | 97 | 93 | 105 | A | | | | | | | 149 | 149 | 148 | 144 | 143 | Pass |
| | | | | | | | | | | | | | B | | | | | | | | | | | | |
| 9/30/23 | 8:53 | JOSE RODRIGUEZ | 614 | 11 | 830 | | | | | | | | A | 123 | 121 | 161 | 122 | 144 | | 187 | 174 | 176 | 177 | 178 | Pass |
| | | | | | | | | | | | | | B | 145 | 132 | 133 | 120 | 141 | | | | | | | |
| 9/30/23 | 9:08 | EDUARDO DEL VALLE | 964 | 11 | 830 | | | | | | | | A | 133 | 133 | 133 | 127 | 138 | | 187 | 182 | 188 | 186 | 187 | Pass |
| | | | | | | | | | | | | | B | 132 | 127 | 142 | 134 | 125 | | | | | | | |
| 9/30/23 | 16:44 | GONZALO SUAREZ | 713 | | 510 | 800 | | 121 | 132 | 104 | 117 | 129 | A | | | | | | | 160 | 157 | 147 | 159 | 167 | Pass |
| | | | | | | | | | | | | | B | | | | | | | | | | | | |
| 9/30/23 | 17:03 | BRANDON GOULD | 535 | | 485 | 475 | | 127 | 143 | 109 | 137 | 139 | A | | | | | | | 148 | 155 | 151 | 156 | 159 | Pass |
| | | | | | | | | | | | | | B | | | | | | | | | | | | |
| 10/2/23 | 8:41 | BRANDON GOULD | 535 | | 485 | 475 | | 133 | 131 | 155 | 102 | 107 | A | | | | | | | 168 | 164 | 185 | 186 | 173 | Pass |
| | | | | | | | | | | | | | B | | | | | | | | | | | | |
| 10/2/23 | 9:20 | GONZALO SUAREZ | 713 | | 510 | 800 | | 116 | 119 | 123 | 123 | 104 | A | | | | | | | 143 | 166 | 156 | 156 | 161 | Pass |
| | | | | | | | | | | | | | B | | | | | | | | | | | | |
| 10/4/23 | 10:21 | GONZALO SUAREZ | 713 | | 510 | 800 | | 96 | 91 | 91 | 112 | 98 | A | | | | | | | 160 | 168 | 157 | 167 | 162 | Pass |
| | | | | | | | | | | | | | B | | | | | | | | | | | | |
| 10/4/23 | 10:30 | BRANDON GOULD | 535 | | 499 | 485 | | 99 | 136 | 123 | 133 | 122 | A | | | | | | | 158 | 163 | 169 | 154 | 160 | Pass |
| | | | | | | | | | | | | | B | | | | | | | | | | | | |
| 10/4/23 | 14:53 | GONZALO SUAREZ | 713 | | 510 | 800 | | 83 | 84 | 96 | 105 | 100 | A | | | | | | | 155 | 151 | 162 | 143 | 158 | Pass |
| | | | | | | | | | | | | | B | | | | | | | | | | | | |
| 10/6/23 | 10:22 | GONZALO SUAREZ | 713 | | 510 | 700 | | 140 | 105 | 132 | 131 | 129 | A | | | | | | | 201 | 193 | 199 | 200 | 201 | Pass |
| | | | | | | | | | | | | | B | | | | | | | | | | | | |
| 10/8/23 | 8:40 | EDUARDO DEL VALLE | 964 | 11 | 850 | | | | | | | | A | 130 | 115 | 124 | 129 | 128 | | 200 | 199 | 201 | 199 | 189 | Pass |
| | | | | | | | | | | | | | B | 136 | 117 | 128 | 128 | 139 | | | | | | | |
| 10/8/23 | 8:50 | JOSE RODRIGUEZ | 614 | 11 | 850 | | | | | | | | A | 123 | 129 | 131 | 131 | 126 | | 194 | 199 | 199 | 203 | 202 | Pass |
| | | | | | | | | | | | | | B | 130 | 132 | 138 | 129 | 137 | | | | | | | |

# ECApplications

## Preweld Test Report

**Project Name:** Minnkota Power Cooperative, Inc. **Job #** 233013 **Superintendent:** Octavio Rivas

**Material Type:** 60 Mil HDPE SS Textured / Smooth Liner

**Job Description:** Celll 5 Phase 1B

**Reported By :** Daniel Martinez

| | | | |
|---|---|---|---|
| **Primary** | X | **Pond** | |
| **Secondary** | | **Cell** | X |
| | | **Pad** | |

**Peel Test Extrusion Minimum** 78 **PPI**

**Peel Test Fusion Minimum** 91 **PPI**

**Shear Test Minimum** 120 **PPI**

| Weld Date | Weld Time | Operator Name / ID | Mach No | Mach Speed | Mach Temp | Preheat Temp | Amb Temp | Peel Extrusion | | | | | | Peel Wedge | | | | | | Shear | | | | | Test Results |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | 1 | 2 | 3 | 4 | 5 | | 1 | 2 | 3 | 4 | 5 | | 1 | 2 | 3 | 4 | 5 | |
| 10/7/23 | 10:00 | JOSE RODRIGUEZ | 614 | 11 | 850 | | | | | | | | A | 155 | 134 | 140 | 129 | 149 | | 198 | 197 | 204 | 194 | 199 | Pass |
| | | | | | | | | | | | | | B | 152 | 143 | 159 | 150 | 143 | | | | | | | |
| 10/7/23 | 10:14 | EDUARDO DEL VALLE | 964 | 11 | 850 | | | | | | | | A | 133 | 139 | 152 | 136 | 165 | | 199 | 197 | 202 | 196 | 200 | Pass |
| | | | | | | | | | | | | | B | 141 | 139 | 151 | 153 | 161 | | | | | | | |
| 10/7/23 | 13:32 | EDUARDO DEL VALLE | 964 | 11 | 850 | | | | | | | | A | 133 | 140 | 133 | 123 | 114 | | 176 | 172 | 174 | 174 | 174 | Pass |
| | | | | | | | | | | | | | B | 134 | 127 | 132 | 117 | 123 | | | | | | | |
| 10/7/23 | 13:48 | JOSE RODRIGUEZ | 614 | 11 | 850 | | | | | | | | A | 118 | 119 | 124 | 119 | 117 | | 173 | 173 | 170 | 168 | 170 | Pass |
| | | | | | | | | | | | | | B | 125 | 117 | 125 | 120 | 123 | | | | | | | |
| 10/8/23 | 8:35 | EDUARDO DEL VALLE | 964 | 12 | 850 | | | | | | | | A | 131 | 138 | 131 | 121 | 112 | | 197 | 193 | 200 | 194 | 196 | Pass |
| | | | | | | | | | | | | | B | 116 | 117 | 122 | 117 | 121 | | | | | | | |
| 10/8/23 | 9:05 | JOSE RODRIGUEZ | 614 | 12 | 850 | | | | | | | | A | 116 | 132 | 114 | 125 | 112 | | 179 | 183 | 178 | 183 | 189 | Pass |
| | | | | | | | | | | | | | B | 123 | 110 | 124 | 113 | 125 | | | | | | | |
| 10/8/23 | 13:28 | EDUARDO DEL VALLE | 964 | 11 | 850 | | | | | | | | A | 126 | 109 | 128 | 118 | 127 | | 177 | 175 | 189 | 174 | 189 | Pass |
| | | | | | | | | | | | | | B | 120 | 118 | 125 | 121 | 110 | | | | | | | |
| 10/8/23 | 14:00 | JOSE RODRIGUEZ | 614 | 11 | 850 | | | | | | | | A | 137 | 127 | 124 | 113 | 122 | | 164 | 161 | 154 | 163 | 164 | Pass |
| | | | | | | | | | | | | | B | 130 | 119 | 124 | 114 | 120 | | | | | | | |
| 10/9/23 | 9:27 | JOSE RODRIGUEZ | 614 | 11 | 850 | | | | | | | | A | 129 | 117 | 132 | 120 | 125 | | 199 | 198 | 196 | 197 | 200 | Pass |
| | | | | | | | | | | | | | B | 128 | 128 | 120 | 126 | 127 | | | | | | | |
| 10/9/23 | 13:26 | JOSE RODRIGUEZ | 614 | 11 | 850 | | | | | | | | A | 115 | 114 | 116 | 119 | 117 | | 175 | 176 | 174 | 180 | 173 | Pass |
| | | | | | | | | | | | | | B | 133 | 112 | 117 | 123 | 117 | | | | | | | |
| 10/9/23 | 14:12 | GONZALO SUAREZ | 713 | | 510 | 800 | | 98 | 93 | 96 | 110 | 104 | A | | | | | | | 165 | 165 | 160 | 163 | 168 | Pass |
| | | | | | | | | | | | | | B | | | | | | | | | | | | |
| 10/10/23 | 8:57 | JOSE RODRIGUEZ | 614 | 11 | 850 | | | | | | | | A | 144 | 143 | 137 | 150 | 136 | | 208 | 207 | 208 | 201 | 206 | Pass |
| | | | | | | | | | | | | | B | 138 | 150 | 143 | 139 | 140 | | | | | | | |
| 10/10/23 | 9:05 | GONZALO SUAREZ | 713 | | 510 | 800 | | 121 | 109 | 108 | 111 | 112 | A | | | | | | | 196 | 195 | 183 | 200 | 201 | Pass |
| | | | | | | | | | | | | | B | | | | | | | | | | | | |
| 10/10/23 | 13:22 | EDUARDO DEL VALLE | 614 | 11 | 850 | | | | | | | | A | 127 | 112 | 130 | 106 | 126 | | 176 | 175 | 179 | 176 | 179 | Pass |
| | | | | | | | | | | | | | B | 123 | 118 | 121 | 119 | 125 | | | | | | | |
| 10/10/23 | 14:05 | GONZALO SUAREZ | 713 | | 510 | 800 | | 113 | 106 | 94 | 101 | 109 | A | | | | | | | 162 | 161 | 161 | 157 | 172 | Pass |
| | | | | | | | | | | | | | B | | | | | | | | | | | | |
| 10/10/23 | 15:20 | GUILLERMO BENITEZ | 963 | 5 | 850 | | | | | | | | A | 101 | 105 | 96 | 101 | 108 | | 187 | 178 | 193 | 181 | 186 | Pass |
| | | | | | | | | | | | | | B | 107 | 106 | 98 | 102 | 106 | | | | | | | |
| 10/11/23 | 8:45 | EDUARDO DEL VALLE | 614 | 9 | 850 | | | | | | | | A | 121 | 111 | 113 | 112 | 124 | | 196 | 192 | 186 | 191 | 196 | Pass |
| | | | | | | | | | | | | | B | 119 | 115 | 120 | 122 | 121 | | | | | | | |
| 10/11/23 | 9:05 | JOSE RODRIGUEZ | 963 | 5 | 850 | | | | | | | | A | 112 | 114 | 117 | 121 | 111 | | 189 | 187 | 193 | 180 | 198 | Pass |
| | | | | | | | | | | | | | B | 123 | 121 | 119 | 131 | 116 | | | | | | | |

# ECApplications

## Preweld Test Report

**Project Name:** Minnkota Power Cooperative, Inc. **Job #** 233013 **Superintendent:** Octavio Rivas

**Material Type:** 60 Mil HDPE SS Textured / Smooth Liner

**Job Description:** Celll 5 Phase 1B

**Reported By :** Daniel Martinez

| | | | |
|---|---|---|---|
| **Primary** | X | **Pond** | |
| **Secondary** | | **Cell** | X |
| | | **Pad** | |

**Peel Test Extrusion Minimum** 78 **PPI**

**Peel Test Fusion Minimum** 91 **PPI**

**Shear Test Minimum** 120 **PPI**

| Weld Date | Weld Time | Operator Name / ID | Mach No | Mach Speed | Mach Temp | Preheat Temp | Amb Temp | Peel Extrusion 1 | 2 | 3 | 4 | 5 | | Peel Wedge 1 | 2 | 3 | 4 | 5 | Shear 1 | 2 | 3 | 4 | 5 | Test Results |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10/11/23 | 14:40 | JOSE RODRIGUEZ | 963 | 5 | 850 | | | | | | | | A | 121 | 108 | 111 | 108 | 129 | 181 | 178 | 181 | 179 | 177 | Pass |
| | | | | | | | | | | | | | B | 116 | 180 | 129 | 116 | 115 | | | | | | |
| 10/11/23 | 15:00 | BRANDON GOULD | 535 | | 505 | 485 | | 128 | 138 | 137 | 101 | 141 | A | | | | | | 171 | 172 | 169 | 172 | 178 | Pass |
| | | | | | | | | | | | | | B | | | | | | | | | | | |
| 10/11/23 | 15:13 PM | GONZALO SUAREZ | 713 | | 510 | 800 | | 123 | 116 | 107 | 116 | 119 | A | | | | | | 176 | 169 | 169 | 171 | 182 | Pass |
| | | | | | | | | | | | | | B | | | | | | | | | | | |
| 10/13/22 | 10:21 | GONZALO SUAREZ | 713 | | 510 | 800 | | 114 | 111 | 112 | 110 | 112 | A | | | | | | 201 | 192 | 196 | 181 | 180 | Pass |
| | | | | | | | | | | | | | B | | | | | | | | | | | |
| 10/13/22 | 10:29 | BRANDON GOULD | 535 | | 525 | 515 | | 112 | 113 | 116 | 116 | 112 | A | | | | | | 198 | 192 | 192 | 190 | 190 | Pass |
| | | | | | | | | | | | | | B | | | | | | | | | | | |
| 10/13/22 | 13:50 | BRANDON GOULD | 535 | | 525 | 515 | | 181 | 145 | 173 | 158 | 183 | A | | | | | | 176 | 182 | 183 | 173 | 179 | Pass |
| | | | | | | | | | | | | | B | | | | | | | | | | | |
| 10/14/23 | 8:40 | JOSE RODRIGUEZ | 963 | 5 | 850 | | | | | | | | A | 136 | 117 | 127 | 133 | 122 | 202 | 202 | 199 | 198 | 202 | Pass |
| | | | | | | | | | | | | | B | 144 | 109 | 128 | 106 | 102 | | | | | | |
| 10/14/23 | 9:00 | EDUARDO DEL VALLE | 614 | 9.5 | 850 | | | | | | | | A | 120 | 115 | 123 | 135 | 130 | 201 | 204 | 205 | 203 | 200 | Pass |
| | | | | | | | | | | | | | B | 129 | 123 | 133 | 128 | 129 | | | | | | |
| 10/14/23 | 9:05 | GUILLERMO BENITEZ | 64 | 4.5 | 850 | | | | | | | | A | 121 | 122 | 123 | 122 | 135 | 206 | 203 | 204 | 200 | 201 | Pass |
| | | | | | | | | | | | | | B | 142 | 124 | 126 | 127 | 133 | | | | | | |
| 10/14/23 | 13:48 | JOSE RODRIGUEZ | 963 | 5 | 850 | | | | | | | | A | 127 | 121 | 129 | 121 | 120 | 182 | 182 | 185 | 182 | 184 | Pass |
| | | | | | | | | | | | | | B | 119 | 130 | 141 | 127 | 129 | | | | | | |
| 10/14/23 | 13:48 | EDUARDO DEL VALLE | 614 | 9 | 850 | | | | | | | | A | 123 | 118 | 123 | 131 | 123 | 191 | 192 | 194 | 194 | 194 | Pass |
| | | | | | | | | | | | | | B | 137 | 125 | 132 | 117 | 134 | | | | | | |
| 10/14/23 | 14:00 | GUILLERMO BENITEZ | 64 | 4.5 | 850 | | | | | | | | A | 118 | 124 | 125 | 126 | 125 | 187 | 188 | 177 | 187 | 188 | Pass |
| | | | | | | | | | | | | | B | 123 | 126 | 129 | 133 | 132 | | | | | | |
| 10/15/23 | 8:20 | JOSE RODRIGUEZ | 963 | 5 | 850 | | | | | | | | A | 123 | 133 | 136 | 113 | 129 | 198 | 202 | 198 | 200 | 204 | Pass |
| | | | | | | | | | | | | | B | 126 | 134 | 113 | 127 | 140 | | | | | | |
| 10/15/23 | 9:21 | EDUARDO DEL VALLE | 614 | 9 | 850 | | | | | | | | A | 125 | 123 | 123 | 117 | 134 | 191 | 191 | 185 | 187 | 192 | Pass |
| | | | | | | | | | | | | | B | 131 | 135 | 136 | 125 | 130 | | | | | | |
| 10/15/23 | 10:20 | GUILLERMO BENITEZ | 64 | 4.5 | 850 | | | | | | | | A | 124 | 126 | 137 | 132 | 142 | 160 | 159 | 164 | 149 | 157 | Pass |
| | | | | | | | | | | | | | B | 127 | 139 | 132 | 129 | 134 | | | | | | |
| 10/15/23 | 12:55 | GUILLERMO BENITEZ | 64 | 4.5 | 850 | | | | | | | | A | 1225 | 122 | 129 | 138 | 128 | 175 | 176 | 177 | 173 | 171 | Pass |
| | | | | | | | | | | | | | B | 123 | 118 | 126 | 121 | 127 | | | | | | |
| 10/15/23 | 13:09 | JOSE RODRIGUEZ | 963 | 5 | 850 | | | | | | | | A | 110 | 99 | 107 | 114 | 126 | 188 | 184 | 183 | 184 | 185 | Pass |
| | | | | | | | | | | | | | B | 140 | 134 | 136 | 138 | 136 | | | | | | |
| 10/15/23 | 13:10 | EDUARDO DEL VALLE | 614 | 9 | 850 | | | | | | | | A | 126 | 129 | 117 | 110 | 119 | 175 | 176 | 177 | 173 | 171 | Pass |
| | | | | | | | | | | | | | B | 119 | 115 | 125 | 123 | 114 | | | | | | |

# ECApplications

## Preweld Test Report

**Project Name:** Minnkota Power Cooperative, Inc. **Job #** 233013 **Superintendent:** Octavio Rivas

**Material Type:** 60 Mil HDPE SS Textured / Smooth Liner

**Job Description:** Celll 5 Phase 1B

**Reported By :** Daniel Martinez

| | | | |
|---|---|---|---|
| **Primary** | X | **Pond** | |
| **Secondary** | | **Cell** | X |
| | | **Pad** | |

| | | |
|---|---|---|
| **Peel Test Extrusion Minimum** | 78 | **PPI** |
| **Peel Test Fusion Minimum** | 91 | **PPI** |
| **Shear Test Minimum** | 120 | **PPI** |

| Weld Date | Weld Time | Operator Name / ID | Mach No | Mach Speed | Mach Temp | Preheat Temp | Amb Temp | Peel Extrusion 1 | 2 | 3 | 4 | 5 | | Peel Wedge 1 | 2 | 3 | 4 | 5 | Shear 1 | 2 | 3 | 4 | 5 | Test Results |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10/16/23 | 8:48 | GUILLERMO BENITEZ | 64 | 4.5 | 850 | | | | | | | | A | 154 | 159 | 132 | 119 | 119 | 199 | 197 | 200 | 203 | 199 | Pass |
| | | | | | | | | | | | | | B | 123 | 126 | 123 | 132 | 139 | | | | | | |
| 10/16/23 | 8:49 | JOSE RODRIGUEZ | 963 | 5 | 850 | | | | | | | | A | 138 | 122 | 131 | 130 | 132 | 190 | 192 | 189 | 191 | 190 | Pass |
| | | | | | | | | | | | | | B | 130 | 135 | 130 | 132 | 129 | | | | | | |
| 10/16/23 | 8:50 | EDUARDO DEL VALLE | 614 | 9 | 850 | | | | | | | | A | 118 | 123 | 124 | 126 | 125 | 191 | 188 | 178 | 198 | 199 | Pass |
| | | | | | | | | | | | | | B | 124 | 112 | 131 | 128 | 121 | | | | | | |
| 10/17/23 | 8:52 | EDUARDO DEL VALLE | 614 | 9 | 850 | | | | | | | | A | 128 | 127 | 130 | 126 | 126 | 190 | 186 | 201 | 199 | 204 | Pass |
| | | | | | | | | | | | | | B | 129 | 120 | 146 | 137 | 121 | | | | | | |
| 10/17/23 | 8:56 | EDUARDO DEL VALLE | 614 | 9 | 850 | | | | | | | | A | 127 | 122 | 122 | 127 | 124 | 198 | 206 | 198 | 209 | 199 | Pass |
| | | | | | | | | | | | | | B | 133 | 132 | 122 | 113 | 119 | | | | | | |
| 10/17/23 | 9:05 | JOSE RODRIGUEZ | 963 | 4 | 850 | | | | | | | | A | 128 | 131 | 122 | 122 | 124 | 190 | 190 | 190 | 198 | 187 | Pass |
| | | | | | | | | | | | | | B | 130 | 136 | 123 | 136 | 137 | | | | | | |
| 10/17/23 | 13:17 | EDUARDO DEL VALLE | 614 | 10 | 850 | | | | | | | | A | 197 | 113 | 110 | 107 | 106 | 169 | 177 | 168 | 175 | 173 | Pass |
| | | | | | | | | | | | | | B | 120 | 115 | 107 | 110 | 107 | | | | | | |
| 10/17/23 | 13:24 | JOSE RODRIGUEZ | 963 | 4 | 850 | | | | | | | | A | 127 | 111 | 126 | 126 | 132 | 166 | 166 | 172 | 167 | 163 | Pass |
| | | | | | | | | | | | | | B | 118 | 116 | 124 | 130 | 131 | | | | | | |
| 10/19/23 | 9:32 | GONZALO SUAREZ | 713 | | 510 | 800 | | 108 | 110 | 115 | 105 | 116 | A | | | | | | 169 | 171 | 175 | 178 | 175 | Pass |
| | | | | | | | | | | | | | B | | | | | | | | | | | |
| 10/19/23 | 9:35 | BRANDON GOULD | 535 | | 495 | 485 | | 143 | 147 | 156 | 130 | 138 | A | | | | | | 172 | 173 | 174 | 170 | 170 | Pass |
| | | | | | | | | | | | | | B | | | | | | | | | | | |
| 10/21/23 | 9:15 | GONZALO SUAREZ | 713 | | 510 | 800 | | 99 | 103 | 100 | 98 | 97 | A | | | | | | 189 | 189 | 199 | 197 | 201 | Pass |
| | | | | | | | | | | | | | B | | | | | | | | | | | |
| 10/21/23 | 9:38 | BRANDON GOULD | 264 | | 535 | 555 | | 109 | 112 | 114 | 103 | 100 | A | | | | | | 179 | 175 | 182 | 183 | 193 | Pass |
| | | | | | | | | | | | | | B | | | | | | | | | | | |
| 10/23/23 | 9:00 | BRANDON GOULD | 264 | | 535 | 555 | | 96 | 123 | 141 | 118 | 111 | A | | | | | | 204 | 200 | 207 | 200 | 196 | Pass |
| | | | | | | | | | | | | | B | | | | | | | | | | | |
| 10/23/23 | 9:00 | GONZALO SUAREZ | 713 | | 510 | 800 | | 114 | 118 | 111 | 107 | 116 | A | | | | | | 191 | 199 | 196 | 198 | 202 | Pass |
| | | | | | | | | | | | | | B | | | | | | | | | | | |
| 10/24/23 | 9:38 | GONZALO SUAREZ | 713 | | 510 | 800 | | 109 | 113 | 121 | 117 | 134 | A | | | | | | 183 | 189 | 180 | 180 | 192 | Pass |
| | | | | | | | | | | | | | B | | | | | | | | | | | |
| | | | | | | | | | | | | | A | | | | | | | | | | | |
| | | | | | | | | | | | | | B | | | | | | | | | | | |
| | | | | | | | | | | | | | A | | | | | | | | | | | |
| | | | | | | | | | | | | | B | | | | | | | | | | | |
| | | | | | | | | | | | | | A | | | | | | | | | | | |
| | | | | | | | | | | | | | B | | | | | | | | | | | |

# Panel Placement Log

| | | | | | |
|---|---|---|---|---|---|
| **Project Name:** | Minnkota Power Cooperative, Inc. | **Primary** | X | **Cell** | X |
| **Job #** | 233013 | **Secondary** | - | **Pond** | - |
| **Superintendent:** | Octavio Rivas | | | **Pad** | - |
| **Material Type:** | 60 Mil HDPE SS Textured / Smooth Lin | | | **Depth & Width of AT** | 6 |
| **Description:** | Celll 5 Phase 1B | | | **Roll Stock Width** | |

| | | | | | | **Totals to Date** | | **1,381,204.13** | **44,526.00** | **1,425,730.13** |
|---|---|---|---|---|---|---|---|---|---|---|
| **Panel #** | **Roll Stock #** | **Deploy Date** | **Width 1 (Angle)** | **Side 1 Length (Angle)** | **Width 2** | **Side 2 Length** | **LF in Trench** | **Panel Total SF** | **SF In Trench** | **Total SF (Pay Area)** |
| 1 | 3111019547 | 7/20/23 | 23.50 | 245.00 | 23.50 | 245.00 | 23.50 | 5,757.50 | 141.00 | 5,898.50 |
| 2 | 3111019576 | 7/20/23 | 23.50 | 248.00 | 23.50 | 248.00 | 23.50 | 5,828.00 | 141.00 | 5,969.00 |
| 3 | 3111019560 | 7/20/23 | 23.50 | 246.00 | 23.50 | 246.00 | 23.50 | 5,781.00 | 141.00 | 5,922.00 |
| 4 | 3111019582 | 7/20/23 | 23.50 | 248.00 | 23.50 | 248.00 | 23.50 | 5,828.00 | 141.00 | 5,969.00 |
| 5 | 3111019549 | 7/20/23 | 23.50 | 247.00 | 23.50 | 247.00 | 23.50 | 5,804.50 | 141.00 | 5,945.50 |
| 6 | 3111019569 | 7/20/23 | 23.50 | 249.00 | 23.50 | 249.00 | 23.50 | 5,851.50 | 141.00 | 5,992.50 |
| 7 | 3111019580 | 7/20/23 | 23.50 | 250.00 | 23.50 | 250.00 | 23.50 | 5,875.00 | 141.00 | 6,016.00 |
| 8 | 3111019562 | 7/20/23 | 23.50 | 251.00 | 23.50 | 251.00 | 23.50 | 5,898.50 | 141.00 | 6,039.50 |
| 9 | 3111019585 | 7/20/23 | 23.50 | 248.00 | 23.50 | 224.00 | 23.50 | 5,546.00 | 141.00 | 5,687.00 |
| 10 | 3111019553 | 7/20/23 | 23.50 | 224.00 | 23.50 | 201.00 | 23.50 | 4,993.75 | 141.00 | 5,134.75 |
| 11 | 3111019533 | 7/20/23 | 23.50 | 201.00 | 32.00 | 178.00 | 23.50 | 5,258.63 | 141.00 | 5,399.63 |
| 12 | 3111019576 | 7/20/23 | 32.00 | 178.00 | 23.50 | 156.00 | 32.00 | 4,634.25 | 192.00 | 4,826.25 |
| 13 | 3111019560 | 7/20/23 | 23.50 | 156.00 | 34.00 | 130.00 | 23.50 | 4,111.25 | 141.00 | 4,252.25 |
| 14 | 3111019582 | 7/20/23 | 23.50 | 130.00 | 33.00 | 107.00 | 23.50 | 3,347.63 | 141.00 | 3,488.63 |
| 15 | 3111019585 | 7/20/23 | 23.50 | 107.00 | 33.00 | 81.00 | 23.50 | 2,655.50 | 141.00 | 2,796.50 |
| 16 | 3111019569 | 7/20/23 | 23.50 | 81.00 | 33.00 | 57.00 | 23.50 | 1,949.25 | 141.00 | 2,090.25 |
| 17 | 3111019569 | 7/20/23 | 23.50 | 57.00 | 32.00 | 35.00 | 23.50 | 1,276.50 | 141.00 | 1,417.50 |
| 18 | 3111019585 | 7/20/23 | 23.50 | 54.00 | 24.00 | 9.00 | 23.50 | 748.13 | 141.00 | 889.13 |
| 19 | 3111019585 | 7/20/23 | 9.00 | 9.00 | 6.00 | 5.00 | 9.00 | 52.50 | 54.00 | 106.50 |
| 20 | 3111019531 | 7/21/23 | 17.00 | 17.00 | 11.00 | 17.00 | 17.00 | 238.00 | 102.00 | 340.00 |
| 21 | 3111019531 | 7/21/23 | 23.50 | 42.00 | 36.00 | 17.00 | 23.50 | 877.63 | 141.00 | 1,018.63 |
| 22 | 3111019562 | 7/21/23 | 23.50 | 67.00 | 35.00 | 42.00 | 23.50 | 1,594.13 | 141.00 | 1,735.13 |
| 23 | 3111019562 | 7/21/23 | 23.50 | 93.00 | 35.00 | 67.00 | 23.50 | 2,340.00 | 141.00 | 2,481.00 |
| 24 | 3111019547 | 7/21/23 | 23.50 | 117.00 | 35.00 | 93.00 | 23.50 | 3,071.25 | 141.00 | 3,212.25 |
| 25 | 3111019531 | 7/21/23 | 23.50 | 142.00 | 36.00 | 117.00 | 23.50 | 3,852.63 | 141.00 | 3,993.63 |
| 26 | 3111019610 | 7/21/23 | 23.50 | 169.00 | 36.00 | 142.00 | 23.50 | 4,626.13 | 141.00 | 4,767.13 |
| 27 | 3111019604 | 7/21/23 | 23.50 | 193.00 | 35.00 | 169.00 | 23.50 | 5,294.25 | 141.00 | 5,435.25 |
| 28 | 3111019604 | 7/21/23 | 23.50 | 220.00 | 35.00 | 193.00 | 23.50 | 6,040.13 | 141.00 | 6,181.13 |
| 29 | 3111019610 | 7/21/23 | 23.50 | 245.00 | 34.00 | 220.00 | 23.50 | 6,684.38 | 141.00 | 6,825.38 |
| 30 | 3111019531 | 7/21/23 | 23.50 | 245.00 | 23.50 | 245.00 | 23.50 | 5,757.50 | 141.00 | 5,898.50 |
| 31 | 3111019611 | 7/22/23 | 23.50 | 311.00 | 23.50 | 244.00 | 23.50 | 6,521.25 | 141.00 | 6,662.25 |
| 32 | 3111019607 | 7/22/23 | 23.50 | 312.00 | 23.50 | 312.00 | 23.50 | 7,332.00 | 141.00 | 7,473.00 |
| 33 | 3111019566 | 7/22/23 | 23.50 | 315.00 | 23.50 | 312.00 | 23.50 | 7,367.25 | 141.00 | 7,508.25 |
| 34 | 3111019552 | 7/22/23 | 23.50 | 315.00 | 38.00 | 192.00 | 23.50 | 7,795.13 | 141.00 | 7,936.13 |
| 35 | 3111019603 | 7/22/23 | 23.50 | 192.00 | 36.00 | 164.00 | 23.50 | 5,295.50 | 141.00 | 5,436.50 |
| 36 | 3111019603 | 7/22/23 | 23.50 | 164.00 | 37.00 | 138.00 | 23.50 | 4,567.75 | 141.00 | 4,708.75 |
| 37 | 3111019538 | 7/22/23 | 23.50 | 138.00 | 37.00 | 111.00 | 23.50 | 3,766.13 | 141.00 | 3,907.13 |
| 38 | 3111019552 | 7/22/23 | 23.50 | 111.00 | 36.00 | 86.00 | 23.50 | 2,930.38 | 141.00 | 3,071.38 |
| 39 | 3111019566 | 7/22/23 | 23.50 | 86.00 | 37.00 | 59.00 | 23.50 | 2,193.13 | 141.00 | 2,334.13 |
| 40 | 3111019552 | 7/22/23 | 23.50 | 59.00 | 36.00 | 33.00 | 23.50 | 1,368.50 | 141.00 | 1,509.50 |
| 41 | 3111019611 | 7/22/23 | 23.50 | 33.00 | 36.00 | 7.00 | 23.50 | 595.00 | 141.00 | 736.00 |
| 42 | 3111019611 | 7/22/23 | 23.50 | 11.00 | 23.50 | 7.00 | 23.50 | 211.50 | 141.00 | 352.50 |
| 43 | 3111019538 | 7/22/23 | 23.50 | 296.00 | 38.00 | 270.00 | 23.50 | 8,702.25 | 141.00 | 8,843.25 |
| 44 | 3111019466 | 7/24/23 | 23.50 | 110.00 | 23.50 | 86.00 | 23.50 | 2,303.00 | 141.00 | 2,444.00 |
| 45 | 3111019481 | 7/24/23 | 23.50 | 488.00 | 23.50 | 488.00 | 23.50 | 11,468.00 | 141.00 | 11,609.00 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 46 | 3111019476 | 7/24/23 | 23.50 | 488.00 | 23.50 | 488.00 | 23.50 | 11,468.00 | 141.00 | 11,609.00 |
| 47 | 3111019475 | 7/24/23 | 23.50 | 488.00 | 23.50 | 488.00 | 23.50 | 11,468.00 | 141.00 | 11,609.00 |
| 48 | 3111019469 | 7/25/23 | 23.50 | 488.00 | 23.50 | 488.00 | 23.50 | 11,468.00 | 141.00 | 11,609.00 |
| 49 | 3111019478 | 7/25/23 | 23.50 | 488.00 | 23.50 | 488.00 | 23.50 | 11,468.00 | 141.00 | 11,609.00 |
| 50 | 3111019449 | 7/25/23 | 23.50 | 488.00 | 23.50 | 488.00 | 23.50 | 11,468.00 | 141.00 | 11,609.00 |
| 51 | 3111019464 | 7/25/23 | 23.50 | 488.00 | 23.50 | 488.00 | 23.50 | 11,468.00 | 141.00 | 11,609.00 |
| 52 | 3111019452 | 7/25/23 | 23.50 | 422.00 | 23.50 | 422.00 | 23.50 | 9,917.00 | 141.00 | 10,058.00 |
| 53 | 3111019443 | 7/25/23 | 23.50 | 422.00 | 23.50 | 422.00 | 23.50 | 9,917.00 | 141.00 | 10,058.00 |
| 54 | 3111019549 | 7/26/23 | 23.50 | 110.00 | 23.50 | 89.00 | 23.50 | 2,338.25 | 141.00 | 2,479.25 |
| 55 | 3111019627 | 9/823 | 23.50 | 246.00 | 23.50 | 246.00 | 23.50 | 5,781.00 | 141.00 | 5,922.00 |
| 56 | 3111019601 | 9/8/23 | 23.50 | 244.00 | 23.50 | 244.00 | 23.50 | 5,734.00 | 141.00 | 5,875.00 |
| 57 | 3111019594 | 9/10/23 | 23.50 | 242.00 | 23.50 | 242.00 | 23.50 | 5,687.00 | 141.00 | 5,828.00 |
| 58 | 3111019598 | 9/10/23 | 23.50 | 244.00 | 23.50 | 244.00 | 23.50 | 5,734.00 | 141.00 | 5,875.00 |
| 59 | 3111019592 | 9/10/23 | 23.50 | 48.00 | 23.50 | 48.00 | 23.50 | 1,128.00 | 141.00 | 1,269.00 |
| 60 | 3111019598 | 9/10/23 | 23.50 | 196.00 | | 196.00 | 23.50 | 2,303.00 | 141.00 | 2,444.00 |
| 61 | 3111019592 | 9/10/23 | 23.50 | 46.00 | 23.50 | 46.00 | 23.50 | 1,081.00 | 141.00 | 1,222.00 |
| 62 | 3111019627 | 9/10/23 | 23.50 | 195.00 | 23.50 | 195.00 | 23.50 | 4,582.50 | 141.00 | 4,723.50 |
| 63 | 3111019592 | 9/10/23 | 23.50 | 46.00 | 23.50 | 46.00 | 23.50 | 1,081.00 | 141.00 | 1,222.00 |
| 64 | 3111019594 | 9/10/23 | 23.50 | 195.00 | 23.50 | 195.00 | 23.50 | 4,582.50 | 141.00 | 4,723.50 |
| 65 | 3111019592 | 9/10/23 | 23.50 | 48.00 | 23.50 | 48.00 | 23.50 | 1,128.00 | 141.00 | 1,269.00 |
| 66 | 3111019601 | 9/10/23 | 23.50 | 193.00 | 23.50 | 193.00 | 23.50 | 4,535.50 | 141.00 | 4,676.50 |
| 67 | 3111019592 | 9/10/23 | 23.50 | 237.00 | 23.50 | 237.00 | 23.50 | 5,569.50 | 141.00 | 5,710.50 |
| 68 | 3111019605 | 9/10/23 | 23.50 | 237.00 | 23.50 | 237.00 | 23.50 | 5,569.50 | 141.00 | 5,710.50 |
| 69 | 3111019535 | 9/10/23 | 23.50 | 237.00 | 23.50 | 237.00 | 23.50 | 5,569.50 | 141.00 | 5,710.50 |
| 70 | 3111019606 | 9/10/23 | 23.50 | 236.00 | 23.50 | 236.00 | 23.50 | 5,546.00 | 141.00 | 5,687.00 |
| 71 | 3111019599 | 9/10/23 | 23.50 | 235.00 | 23.50 | 235.00 | 23.50 | 5,522.50 | 141.00 | 5,663.50 |
| 72 | 3111019613 | 9/10/23 | 23.50 | 234.00 | 23.50 | 234.00 | 23.50 | 5,499.00 | 141.00 | 5,640.00 |
| 73 | 3111019466 | 9/11/23 | 23.50 | 41.00 | 23.50 | 41.00 | 23.50 | 963.50 | 141.00 | 1,104.50 |
| 74 | 3111019612 | 9/11/23 | 23.50 | 189.00 | 23.50 | 189.00 | 23.50 | 4,441.50 | 141.00 | 4,582.50 |
| 75 | 3111019537 | 9/11/23 | 23.50 | 42.00 | 23.50 | 42.00 | 23.50 | 987.00 | 141.00 | 1,128.00 |
| 76 | 3111019606 | 9/11/23 | 23.50 | 188.00 | 23.50 | 188.00 | 23.50 | 4,418.00 | 141.00 | 4,559.00 |
| 77 | 3111019537 | 9/11/23 | 23.50 | 42.00 | 23.50 | 42.00 | 23.50 | 987.00 | 141.00 | 1,128.00 |
| 78 | 3111019535 | 9/11/23 | 23.50 | 190.00 | 23.50 | 190.00 | 23.50 | 4,465.00 | 141.00 | 4,606.00 |
| 79 | 3111019537 | 9/11/23 | 23.50 | 43.00 | 23.50 | 43.00 | 23.50 | 1,010.50 | 141.00 | 1,151.50 |
| 80 | 3111019605 | 9/11/23 | 23.50 | 189.00 | 23.50 | 189.00 | 23.50 | 4,441.50 | 141.00 | 4,582.50 |
| 81 | 3111019537 | 9/11/23 | 23.50 | 43.00 | 23.50 | 43.00 | 23.50 | 1,010.50 | 141.00 | 1,151.50 |
| 82 | 3111019599 | 9/11/23 | 23.50 | 189.00 | 23.50 | 189.00 | 23.50 | 4,441.50 | 141.00 | 4,582.50 |
| 83 | 3111019626 | 9/11/23 | 23.50 | 229.00 | 23.50 | 229.00 | 23.50 | 5,381.50 | 141.00 | 5,522.50 |
| 84 | 3111019626 | 9/11/23 | 23.50 | 191.00 | 23.50 | 191.00 | 23.50 | 4,488.50 | 141.00 | 4,629.50 |
| 85 | 3111019537 | 9/11/23 | 23.50 | 38.00 | 23.50 | 38.00 | 23.50 | 893.00 | 141.00 | 1,034.00 |
| 86 | 3111019534 | 9/11/23 | 23.50 | 233.00 | 23.50 | 233.00 | 23.50 | 5,475.50 | 141.00 | 5,616.50 |
| 87 | 3111019540 | 9/11/23 | 23.50 | 46.00 | 23.50 | 46.00 | 23.50 | 1,081.00 | 141.00 | 1,222.00 |
| 88 | 3111019534 | 9/11/23 | 23.50 | 186.00 | 23.50 | 186.00 | 23.50 | 4,371.00 | 141.00 | 4,512.00 |
| 89 | 3111019540 | 9/11/23 | 23.50 | 233.00 | 23.50 | 233.00 | 23.50 | 5,475.50 | 141.00 | 5,616.50 |
| 90 | 3111019527 | 9/13/23 | 23.50 | 230.00 | 23.50 | 230.00 | 23.50 | 5,405.00 | 141.00 | 5,546.00 |
| 91 | 3111019523 | 9/15/23 | 23.50 | 48.00 | 23.50 | 48.00 | 23.50 | 1,128.00 | 141.00 | 1,269.00 |
| 92 | 3111019527 | 9/13/23 | 23.50 | 190.00 | 23.50 | 190.00 | 23.50 | 4,465.00 | 141.00 | 4,606.00 |
| 93 | 3111019545 | 9/13/23 | 23.50 | 230.00 | 23.50 | 230.00 | 23.50 | 5,405.00 | 141.00 | 5,546.00 |
| 94 | 3111019545 | 9/13/23 | 23.50 | 190.00 | 23.50 | 190.00 | 23.50 | 4,465.00 | 141.00 | 4,606.00 |
| 95 | 3111019523 | 9/15/23 | 23.50 | 47.00 | 23.50 | 47.00 | 23.50 | 1,104.50 | 141.00 | 1,245.50 |
| 96 | 3111019578 | 9/13/23 | 23.50 | 230.00 | 23.50 | 230.00 | 23.50 | 5,405.00 | 141.00 | 5,546.00 |
| 97 | 3111019523 | 9/15/23 | 23.50 | 49.00 | 23.50 | 49.00 | 23.50 | 1,151.50 | 141.00 | 1,292.50 |
| 98 | 3111019578 | 9/13/23 | 23.50 | 190.00 | 23.50 | 190.00 | 23.50 | 4,465.00 | 141.00 | 4,606.00 |
| 99 | 3111019565 | 9/13/23 | 23.50 | 230.00 | 23.50 | 230.00 | 23.50 | 5,405.00 | 141.00 | 5,546.00 |
| 100 | 3111019565 | 9/13/23 | 23.50 | 190.00 | 23.50 | 190.00 | 23.50 | 4,465.00 | 141.00 | 4,606.00 |
| 101 | 3111019533 | 9/15/23 | 23.50 | 50.00 | 23.50 | 50.00 | 23.50 | 1,175.00 | 141.00 | 1,316.00 |
| 102 | 3111019544 | 9/13/23 | 23.50 | 230.00 | 23.50 | 230.00 | 23.50 | 5,405.00 | 141.00 | 5,546.00 |

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|---|---|---|---|---|---|---|---|---|---|---|
| 103 | 3111019533 | 9/15/23 | 23.50 | 48.00 | 23.50 | 48.00 | 23.50 | 1,128.00 | 141.00 | 1,269.00 |
| 104 | 3111019544 | 9/13/23 | 23.50 | 190.00 | 23.50 | 190.00 | 23.50 | 4,465.00 | 141.00 | 4,606.00 |
| 105 | 3111019550 | 9/13/23 | 23.50 | 230.00 | 23.50 | 230.00 | 23.50 | 5,405.00 | 141.00 | 5,546.00 |
| 106 | 3111019550 | 9/13/23 | 23.50 | 190.00 | 23.50 | 190.00 | 23.50 | 4,465.00 | 141.00 | 4,606.00 |
| 107 | 3111019533 | 9/15/23 | 23.50 | 49.00 | 23.50 | 49.00 | 23.50 | 1,151.50 | 141.00 | 1,292.50 |
| 108 | 3111019529 | 9/13/23 | 23.50 | 230.00 | 23.50 | 230.00 | 23.50 | 5,405.00 | 141.00 | 5,546.00 |
| 109 | 3111019533 | 9/15/23 | 23.50 | 46.00 | 23.50 | 46.00 | 23.50 | 1,081.00 | 141.00 | 1,222.00 |
| 110 | 3111019529 | 9/13/23 | 23.50 | 190.00 | 23.50 | 190.00 | 23.50 | 4,465.00 | 141.00 | 4,606.00 |
| 111 | 3111019539 | 9/13/23 | 23.50 | 230.00 | 23.50 | 230.00 | 23.50 | 5,405.00 | 141.00 | 5,546.00 |
| 112 | 3111019621 | 9/14/23 | 23.50 | 230.00 | 23.50 | 230.00 | 23.50 | 5,405.00 | 141.00 | 5,546.00 |
| 113 | 3111019587 | 9/15/23 | 23.50 | 45.00 | 23.50 | 45.00 | 23.50 | 1,057.50 | 141.00 | 1,198.50 |
| 114 | 3111019621 | 9/14/23 | 23.50 | 230.00 | 23.50 | 190.00 | 23.50 | 4,935.00 | 141.00 | 5,076.00 |
| 115 | 3111019624 | 9/14/23 | 23.50 | 230.00 | 23.50 | 230.00 | 23.50 | 5,405.00 | 141.00 | 5,546.00 |
| 116 | 3111019624 | 9/14/23 | 23.50 | | 23.50 | 190.00 | 23.50 | 2,232.50 | 141.00 | 2,373.50 |
| 117 | 3111019587 | 9/15/23 | 23.50 | 45.00 | 23.50 | 45.00 | 23.50 | 1,057.50 | 141.00 | 1,198.50 |
| 118 | 3111019614 | 9/14/23 | 23.50 | | 23.50 | 230.00 | 23.50 | 2,702.50 | 141.00 | 2,843.50 |
| 119 | 3111019587 | 9/15/23 | 23.50 | 44.00 | 23.50 | 44.00 | 23.50 | 1,034.00 | 141.00 | 1,175.00 |
| 120 | 3111019614 | 9/14/23 | 23.50 | | 23.50 | 190.00 | 23.50 | 2,232.50 | 141.00 | 2,373.50 |
| 121 | 3111019578 | 9/14/23 | 23.50 | | 23.50 | 230.00 | 23.50 | 2,702.50 | 141.00 | 2,843.50 |
| 122 | 3111019578 | 9/14/23 | 23.50 | | 23.50 | 190.00 | 23.50 | 2,232.50 | 141.00 | 2,373.50 |
| 123 | 3111019587 | 9/15/23 | 23.50 | 45.00 | 23.50 | 45.00 | 23.50 | 1,057.50 | 141.00 | 1,198.50 |
| 124 | 3111019619 | 9/14/23 | 23.50 | | 23.50 | 230.00 | 23.50 | 2,702.50 | 141.00 | 2,843.50 |
| 125 | 3111019587 | 9/15/23 | 23.50 | 41.00 | 23.50 | 41.00 | 23.50 | 963.50 | 141.00 | 1,104.50 |
| 126 | 3111019619 | 9/14/23 | 23.50 | | 23.50 | 190.00 | 23.50 | 2,232.50 | 141.00 | 2,373.50 |
| 127 | 3111019612 | 9/14/23 | 23.50 | | 23.50 | 230.00 | 23.50 | 2,702.50 | 141.00 | 2,843.50 |
| 128 | 3111019612 | 9/14/23 | 23.50 | | 23.50 | 190.00 | 23.50 | 2,232.50 | 141.00 | 2,373.50 |
| 129 | 3111019533 | 9/15/23 | 23.50 | 40.00 | 23.50 | 40.00 | 23.50 | 940.00 | 141.00 | 1,081.00 |
| 130 | 3111019551 | 9/14/23 | 23.50 | | 23.50 | 230.00 | 23.50 | 2,702.50 | 141.00 | 2,843.50 |
| 131 | 3111019533 | 9/14/23 | 23.50 | 40.00 | 23.50 | 40.00 | 23.50 | 940.00 | 141.00 | 1,081.00 |
| 132 | 3111019551 | 9/14/23 | 23.50 | 190.00 | 23.50 | 190.00 | 23.50 | 4,465.00 | 141.00 | 4,606.00 |
| 133 | 3111019543 | 9/16/23 | 30.00 | 199.00 | 23.50 | 188.00 | 30.00 | 5,176.13 | 180.00 | 5,356.13 |
| 134 | 3111019543 | 9/16/23 | 30.00 | 199.00 | 23.50 | 179.00 | 30.00 | 5,055.75 | 180.00 | 5,235.75 |
| 135 | 3111019572 | 9/16/23 | 30.00 | 179.00 | 23.50 | 163.00 | 30.00 | 4,574.25 | 180.00 | 4,754.25 |
| 136 | 3111019572 | 9/16/23 | 30.00 | 163.00 | 23.50 | 144.00 | 30.00 | 4,106.13 | 180.00 | 4,286.13 |
| 137 | 3111019588 | 9/16/23 | 30.00 | 144.00 | 23.50 | 125.00 | 30.00 | 3,597.88 | 180.00 | 3,777.88 |
| 138 | 3111019588 | 9/16/23 | 30.00 | 125.00 | 23.50 | 106.00 | 30.00 | 3,089.63 | 180.00 | 3,269.63 |
| 139 | 3111019588 | 9/16/23 | 30.00 | 106.00 | 23.50 | 87.00 | 30.00 | 2,581.38 | 180.00 | 2,761.38 |
| 140 | 3111019587 | 9/16/23 | 30.00 | 87.00 | 23.50 | 70.00 | 30.00 | 2,099.88 | 180.00 | 2,279.88 |
| 141 | 3111019587 | 9/16/23 | 30.00 | 70.00 | 23.50 | 52.00 | 30.00 | 1,631.75 | 180.00 | 1,811.75 |
| 142 | 3111019587 | 9/16/23 | 30.00 | 52.00 | 23.50 | 34.00 | 30.00 | 1,150.25 | 180.00 | 1,330.25 |
| 143 | 3111019572 | 9/16/23 | 23.50 | 34.00 | 23.50 | 15.00 | 23.50 | 575.75 | 141.00 | 716.75 |
| 144 | 3111019572 | 9/16/23 | 23.50 | 22.00 | 23.50 | 15.00 | 23.50 | 434.75 | 141.00 | 575.75 |
| 145 | 3111019539 | 9/16/23 | 23.50 | 22.00 | 23.50 | 22.00 | 23.50 | 517.00 | 141.00 | 658.00 |
| 146 | 3111019539 | 9/16/23 | 38.00 | 51.00 | 38.00 | 21.00 | 38.00 | 1,368.00 | 228.00 | 1,596.00 |
| 147 | 3111019539 | 9/16/23 | 42.00 | 84.00 | 42.00 | 51.00 | 42.00 | 2,835.00 | 252.00 | 3,087.00 |
| 148 | 3111019577 | 9/16/23 | 42.00 | 116.00 | 42.00 | 84.00 | 42.00 | 4,200.00 | 252.00 | 4,452.00 |
| 149 | 3111019589 | 9/16/23 | 40.00 | 147.00 | 40.00 | 116.00 | 40.00 | 5,260.00 | 240.00 | 5,500.00 |
| 150 | 3111019568 | 9/16/23 | 41.00 | 179.00 | 41.00 | 147.00 | 41.00 | 6,683.00 | 246.00 | 6,929.00 |
| 151 | 3111019568 | 9/16/23 | 41.00 | 214.00 | 41.00 | 214.00 | 41.00 | 8,774.00 | 246.00 | 9,020.00 |
| 152 | 3111019589 | 9/16/23 | 41.00 | 245.00 | 41.00 | 214.00 | 41.00 | 9,409.50 | 246.00 | 9,655.50 |
| 153 | 3111019577 | 9/16/23 | 44.00 | 245.00 | 44.00 | 245.00 | 44.00 | 10,780.00 | 264.00 | 11,044.00 |
| 154 | 3111019575 | 9/18/23 | 23.50 | 283.00 | 23.50 | 283.00 | 23.50 | 6,650.50 | 141.00 | 6,791.50 |
| 155 | 3111019572 | 9/18/23 | 23.50 | 284.00 | 23.50 | 284.00 | 23.50 | 6,674.00 | 141.00 | 6,815.00 |
| 156 | 3111019575 | 9/18/23 | 23.50 | 124.00 | 23.50 | 124.00 | 23.50 | 2,914.00 | 141.00 | 3,055.00 |
| 157 | 3111019572 | 9/18/23 | 23.50 | 160.00 | 23.50 | 160.00 | 23.50 | 3,760.00 | 141.00 | 3,901.00 |
| 158 | 3111019583 | 9/18/23 | 23.50 | 289.00 | 23.50 | 289.00 | 23.50 | 6,791.50 | 141.00 | 6,932.50 |
| 159 | 3111019617 | 9/18/23 | 23.50 | 291.00 | 23.50 | 291.00 | 23.50 | 6,838.50 | 141.00 | 6,979.50 |

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|---|---|---|---|---|---|---|---|---|---|---|
| 160 | 3111019583 | 9/18/23 | 23.50 | 120.00 | 23.50 | 120.00 | 23.50 | 2,820.00 | 141.00 | 2,961.00 |
| 161 | 3111019617 | 9/18/23 | 23.50 | 161.00 | 23.50 | 161.00 | 23.50 | 3,783.50 | 141.00 | 3,924.50 |
| 162 | 3111019620 | 9/18/23 | 23.50 | 295.00 | 23.50 | 295.00 | 23.50 | 6,932.50 | 141.00 | 7,073.50 |
| 163 | 3111019586 | 9/18/23 | 23.50 | 297.00 | 23.50 | 297.00 | 23.50 | 6,979.50 | 141.00 | 7,120.50 |
| 164 | 3111019620 | 9/18/23 | 23.50 | 130.00 | 23.50 | 130.00 | 23.50 | 3,055.00 | 141.00 | 3,196.00 |
| 165 | 3111019586 | 9/18/23 | 23.50 | 160.00 | 23.50 | 160.00 | 23.50 | 3,760.00 | 141.00 | 3,901.00 |
| 166 | 3111019618 | 9/18/23 | 23.50 | 301.00 | 23.50 | 301.00 | 23.50 | 7,073.50 | 141.00 | 7,214.50 |
| 167 | 3111019591 | 9/18/23 | 23.50 | 302.00 | 23.50 | 302.00 | 23.50 | 7,097.00 | 141.00 | 7,238.00 |
| 168 | 3111019551 | 9/18/23 | 23.50 | 149.00 | 23.50 | 149.00 | 23.50 | 3,501.50 | 141.00 | 3,642.50 |
| 169 | 3111019551 | 9/18/23 | 23.50 | 159.00 | 23.50 | 159.00 | 23.50 | 3,736.50 | 141.00 | 3,877.50 |
| 170 | 3111019540 | 9/19/23 | 32.50 | 17.00 | 17.00 | 12.00 | 32.50 | 358.88 | 195.00 | 553.88 |
| 171 | 3111019540 | 9/19/23 | 34.00 | 35.00 | 23.50 | 12.00 | 34.00 | 675.63 | 204.00 | 879.63 |
| 172 | 3111019537 | 9/19/23 | 34.00 | 56.00 | 23.50 | 35.00 | 34.00 | 1,308.13 | 204.00 | 1,512.13 |
| 173 | 3111019540 | 9/19/23 | 36.00 | 85.00 | 23.50 | 56.00 | 36.00 | 2,097.38 | 216.00 | 2,313.38 |
| 174 | 3111019540 | 9/19/23 | 35.00 | 109.00 | 23.50 | 85.00 | 35.00 | 2,837.25 | 210.00 | 3,047.25 |
| 175 | 3111019537 | 9/19/23 | 35.00 | 133.00 | 23.50 | 109.00 | 35.00 | 3,539.25 | 210.00 | 3,749.25 |
| 176 | 3111019602 | 9/19/23 | 35.00 | 157.00 | 23.50 | 133.00 | 35.00 | 4,241.25 | 210.00 | 4,451.25 |
| 177 | 3111019602 | 9/19/23 | 35.00 | 183.00 | 23.50 | 157.00 | 35.00 | 4,972.50 | 210.00 | 5,182.50 |
| 178 | 3111019600 | 9/19/23 | 30.00 | 192.00 | 23.50 | 183.00 | 30.00 | 5,015.63 | 180.00 | 5,195.63 |
| 179 | 3111019600 | 9/19/23 | 23.50 | 203.00 | 23.50 | 192.00 | 23.50 | 4,641.25 | 141.00 | 4,782.25 |
| 180 | 3111019595 | 9/19/23 | 23.50 | 213.00 | 23.50 | 203.00 | 23.50 | 4,888.00 | 141.00 | 5,029.00 |
| 181 | 3111019595 | 9/19/23 | 23.50 | 223.00 | 23.50 | 213.00 | 23.50 | 5,123.00 | 141.00 | 5,264.00 |
| 182 | 3111019551 | 9/19/23 | 23.50 | 247.00 | 23.50 | 223.00 | 23.50 | 5,522.50 | 141.00 | 5,663.50 |
| 183 | 3112020484 | 9/21/23 | 23.50 | 540.00 | 23.50 | 540.00 | 23.50 | 12,690.00 | 141.00 | 12,831.00 |
| 184 | 3112020468 | 9/21/23 | 23.50 | 540.00 | 23.50 | 540.00 | 23.50 | 12,690.00 | 141.00 | 12,831.00 |
| 185 | 3112020481 | 9/21/23 | 23.50 | 540.00 | 23.50 | 540.00 | 23.50 | 12,690.00 | 141.00 | 12,831.00 |
| 186 | 3112020476 | 9/21/23 | 23.50 | 540.00 | 23.50 | 540.00 | 23.50 | 12,690.00 | 141.00 | 12,831.00 |
| 187 | 3112020452 | 9/21/23 | 23.50 | 540.00 | 23.50 | 540.00 | 23.50 | 12,690.00 | 141.00 | 12,831.00 |
| 188 | 3112020467 | 9/21/23 | 6.00 | 115.00 | 6.00 | 115.00 | 6.00 | 690.00 | 36.00 | 726.00 |
| 189 | 3112020467 | 9/21/23 | 6.00 | 117.00 | 6.00 | 117.00 | 6.00 | 702.00 | 36.00 | 738.00 |
| 190 | 3112020464 | 9/22/23 | 23.50 | 540.00 | 23.50 | 540.00 | 23.50 | 12,690.00 | 141.00 | 12,831.00 |
| 191 | 3112020483 | 9/22/23 | 23.50 | 540.00 | 23.50 | 540.00 | 23.50 | 12,690.00 | 141.00 | 12,831.00 |
| 192 | 3112020443 | 9/22/23 | 23.50 | 540.00 | 23.50 | 540.00 | 23.50 | 12,690.00 | 141.00 | 12,831.00 |
| 193 | 3112020473 | 9/22/23 | 23.50 | 540.00 | 23.50 | 540.00 | 23.50 | 12,690.00 | 141.00 | 12,831.00 |
| 194 | 3112020478 | 9/30/23 | 23.50 | 278.00 | 23.50 | 278.00 | 23.50 | 6,533.00 | 141.00 | 6,674.00 |
| 195 | 3112020478 | 9/30/23 | 23.50 | 270.00 | 23.50 | 270.00 | 23.50 | 6,345.00 | 141.00 | 6,486.00 |
| 196 | 3112020482 | 9/30/23 | 23.50 | 274.00 | 23.50 | 274.00 | 23.50 | 6,439.00 | 141.00 | 6,580.00 |
| 197 | 3112020482 | 9/30/23 | 23.50 | 266.00 | 23.50 | 266.00 | 23.50 | 6,251.00 | 141.00 | 6,392.00 |
| 198 | 3112020474 | 9/30/23 | 23.50 | 289.00 | 23.50 | 289.00 | 23.50 | 6,791.50 | 141.00 | 6,932.50 |
| 199 | 3112020474 | 9/30/23 | 23.50 | 251.00 | 23.50 | 251.00 | 23.50 | 5,898.50 | 141.00 | 6,039.50 |
| 200 | 3112020451 | 9/30/23 | 23.50 | 282.00 | 23.50 | 282.00 | 23.50 | 6,627.00 | 141.00 | 6,768.00 |
| 201 | 3112020451 | 9/30/23 | 23.50 | 270.00 | 23.50 | 270.00 | 23.50 | 6,345.00 | 141.00 | 6,486.00 |
| 202 | 3112020449 | 9/30/23 | 23.50 | 280.00 | 23.50 | 280.00 | 23.50 | 6,580.00 | 141.00 | 6,721.00 |
| 203 | 3112020441 | 9/30/23 | 23.50 | 14.00 | 23.50 | 14.00 | 23.50 | 329.00 | 141.00 | 470.00 |
| 204 | 3112020441 | 9/30/23 | 23.50 | 30.00 | 23.50 | 30.00 | 23.50 | 705.00 | 141.00 | 846.00 |
| 205 | 3112020441 | 9/30/23 | 23.50 | 12.00 | 23.50 | 12.00 | 23.50 | 282.00 | 141.00 | 423.00 |
| 206 | 3112020441 | 9/30/23 | 23.50 | 7.00 | 23.50 | 7.00 | 23.50 | 164.50 | 141.00 | 305.50 |
| 207 | 3111019540 | 10/7/23 | 23.50 | 308.00 | 33.00 | 296.00 | 23.50 | 8,531.50 | 141.00 | 8,672.50 |
| 208 | 3111019540 | 10/7/23 | 23.50 | 296.00 | 34.00 | 273.00 | 23.50 | 8,179.38 | 141.00 | 8,320.38 |
| 209 | 3111019540 | 10/7/23 | 23.50 | 273.00 | 39.00 | 250.00 | 23.50 | 8,171.88 | 141.00 | 8,312.88 |
| 210 | 3111019540 | 10/7/23 | 23.50 | 250.00 | 48.00 | 220.00 | 23.50 | 8,401.25 | 141.00 | 8,542.25 |
| 211 | 3111019540 | 10/7/23 | 23.50 | 220.00 | 46.00 | 188.00 | 23.50 | 7,089.00 | 141.00 | 7,230.00 |
| 212 | 3111019540 | 10/7/23 | 23.50 | 188.00 | 41.00 | 145.00 | 23.50 | 5,369.63 | 141.00 | 5,510.63 |
| 213 | 3111019540 | 10/7/23 | 23.50 | 145.00 | 39.00 | 124.00 | 23.50 | 4,203.13 | 141.00 | 4,344.13 |
| 214 | 3111019540 | 10/7/23 | 23.50 | 124.00 | 39.00 | 92.00 | 23.50 | 3,375.00 | 141.00 | 3,516.00 |
| 215 | 3111019540 | 10/7/23 | 23.50 | 92.00 | 23.50 | 60.00 | 23.50 | 1,786.00 | 141.00 | 1,927.00 |
| 216 | 3111019540 | 10/7/23 | 23.50 | 60.00 | 42.00 | 26.00 | 23.50 | 1,408.25 | 141.00 | 1,549.25 |

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|---|---|---|---|---|---|---|---|---|---|---|
| 217 | 3111019542 | 10/8/23 | 23.50 | 26.00 | 33.00 | 11.00 | 23.50 | 522.63 | 141.00 | 663.63 |
| 218 | 3111019542 | 10/8/23 | 23.50 | 29.00 | 30.00 | 11.00 | 23.50 | 535.00 | 141.00 | 676.00 |
| 219 | 3111019542 | 10/8/23 | 23.50 | 47.00 | 30.00 | 29.00 | 23.50 | 1,016.50 | 141.00 | 1,157.50 |
| 220 | 3111019542 | 10/8/23 | 23.50 | 66.00 | 31.00 | 47.00 | 23.50 | 1,539.63 | 141.00 | 1,680.63 |
| 221 | 3111019542 | 10/8/23 | 23.50 | 84.00 | 30.00 | 66.00 | 23.50 | 2,006.25 | 141.00 | 2,147.25 |
| 222 | 3111019542 | 10/8/23 | 23.50 | 104.00 | 31.00 | 84.00 | 23.50 | 2,561.50 | 141.00 | 2,702.50 |
| 223 | 3111019541 | 10/8/23 | 23.50 | 122.00 | 31.00 | 104.00 | 23.50 | 3,079.25 | 141.00 | 3,220.25 |
| 224 | 3111019541 | 10/8/23 | 23.50 | 139.00 | 30.00 | 122.00 | 23.50 | 3,490.88 | 141.00 | 3,631.88 |
| 225 | 3111019541 | 10/8/23 | 23.50 | 158.00 | 32.00 | 139.00 | 23.50 | 4,120.88 | 141.00 | 4,261.88 |
| 226 | 3111019570 | 10/8/23 | 23.50 | 179.00 | 32.00 | 158.00 | 23.50 | 4,675.88 | 141.00 | 4,816.88 |
| 227 | 3111019574 | 10/8/23 | 23.50 | 196.00 | 30.00 | 179.00 | 23.50 | 5,015.63 | 141.00 | 5,156.63 |
| 228 | 3111019574 | 10/8/23 | 23.50 | 223.00 | 35.00 | 196.00 | 23.50 | 6,127.88 | 141.00 | 6,268.88 |
| 229 | 3111019570 | 10/8/23 | 23.50 | 240.00 | 27.00 | 240.00 | 23.50 | 6,060.00 | 141.00 | 6,201.00 |
| 230 | 3111019555 | 10/8/23 | 23.50 | 240.00 | 23.50 | 240.00 | 23.50 | 5,640.00 | 141.00 | 5,781.00 |
| 231 | 3111019528 | 10/8/23 | 23.50 | 240.00 | 23.50 | 240.00 | 23.50 | 5,640.00 | 141.00 | 5,781.00 |
| 232 | 3111019528 | 10/8/23 | 23.50 | 181.00 | 23.50 | 181.00 | 23.50 | 4,253.50 | 141.00 | 4,394.50 |
| 233 | 3111019559 | 10/8/23 | 23.50 | 60.00 | 23.50 | 60.00 | 23.50 | 1,410.00 | 141.00 | 1,551.00 |
| 234 | 3111019559 | 10/8/23 | 23.50 | 240.00 | 23.50 | 240.00 | 23.50 | 5,640.00 | 141.00 | 5,781.00 |
| 235 | 3111019564 | 10/8/23 | 23.50 | 240.00 | 23.50 | 240.00 | 23.50 | 5,640.00 | 141.00 | 5,781.00 |
| 236 | 3111019579 | 10/9/23 | 23.50 | 241.00 | 23.50 | 241.00 | 23.50 | 5,663.50 | 141.00 | 5,804.50 |
| 237 | 3111019542 | 10/9/23 | 23.50 | 58.00 | 23.50 | 58.00 | 23.50 | 1,363.00 | 141.00 | 1,504.00 |
| 238 | 3111019579 | 10/9/23 | 23.50 | 183.00 | 23.50 | 183.00 | 23.50 | 4,300.50 | 141.00 | 4,441.50 |
| 239 | 3111019557 | 10/9/23 | 23.50 | 242.00 | 23.50 | 242.00 | 23.50 | 5,687.00 | 141.00 | 5,828.00 |
| 240 | 31110195557 | 10/9/23 | 23.50 | 183.00 | 23.50 | 183.00 | 23.50 | 4,300.50 | 141.00 | 4,441.50 |
| 241 | 3111019542 | 10/9/23 | 23.50 | 60.00 | 23.50 | 60.00 | 23.50 | 1,410.00 | 141.00 | 1,551.00 |
| 242 | 3111019558 | 10/9/23 | 23.50 | 242.00 | 23.50 | 242.00 | 23.50 | 5,687.00 | 141.00 | 5,828.00 |
| 243 | 3111019542 | 10/9/23 | 23.50 | 56.00 | 23.50 | 56.00 | 23.50 | 1,316.00 | 141.00 | 1,457.00 |
| 244 | 3111019558 | 10/9/23 | 23.50 | 181.00 | 23.50 | 181.00 | 23.50 | 4,253.50 | 141.00 | 4,394.50 |
| 245 | 3111019616 | 10/9/23 | 23.50 | 242.00 | 23.50 | 242.00 | 23.50 | 5,687.00 | 141.00 | 5,828.00 |
| 246 | 3111019616 | 10/9/23 | 23.50 | 181.00 | 23.50 | 181.00 | 23.50 | 4,253.50 | 141.00 | 4,394.50 |
| 247 | 3111019554 | 10/10/23 | 23.50 | 74.00 | 23.50 | 74.00 | 23.50 | 1,739.00 | 141.00 | 1,880.00 |
| 248 | 3111019615 | 10/10/23 | 23.50 | 250.00 | 23.50 | 250.00 | 23.50 | 5,875.00 | 141.00 | 6,016.00 |
| 249 | 3111019564 | 10/10/23 | 23.50 | 73.00 | 23.50 | 73.00 | 23.50 | 1,715.50 | 141.00 | 1,856.50 |
| 250 | 3111019615 | 10/10/23 | 23.50 | 182.00 | 23.50 | 182.00 | 23.50 | 4,277.00 | 141.00 | 4,418.00 |
| 251 | 3111019530 | 10/10/23 | 23.50 | 250.00 | 23.50 | 250.00 | 23.50 | 5,875.00 | 141.00 | 6,016.00 |
| 252 | 3111019530 | 10/10/23 | 23.50 | 183.00 | 23.50 | 183.00 | 23.50 | 4,300.50 | 141.00 | 4,441.50 |
| 253 | 3111019555 | 10/10/23 | 23.50 | 75.00 | 23.50 | 75.00 | 23.50 | 1,762.50 | 141.00 | 1,903.50 |
| 254 | 3111019623 | 10/10/23 | 23.50 | 253.00 | 23.50 | 253.00 | 23.50 | 5,945.50 | 141.00 | 6,086.50 |
| 255 | 3111019555 | 10/10/23 | 23.50 | 74.00 | 23.50 | 74.00 | 23.50 | 1,739.00 | 141.00 | 1,880.00 |
| 256 | 3111019623 | 10/10/23 | 23.50 | 183.00 | 23.50 | 183.00 | 23.50 | 4,300.50 | 141.00 | 4,441.50 |
| 257 | 3111019581 | 10/10/23 | 23.50 | 255.00 | 23.50 | 255.00 | 23.50 | 5,992.50 | 141.00 | 6,133.50 |
| 258 | 3111019581 | 10/10/23 | 23.50 | 183.00 | 23.50 | 183.00 | 23.50 | 4,300.50 | 141.00 | 4,441.50 |
| 259 | 3111019555 | 10/10/23 | 23.50 | 68.00 | 23.50 | 68.00 | 23.50 | 1,598.00 | 141.00 | 1,739.00 |
| 260 | 3111019584 | 10/10/23 | 23.50 | 255.00 | 23.50 | 255.00 | 23.50 | 5,992.50 | 141.00 | 6,133.50 |
| 261 | 3112020475 | 10/11/23 | 23.50 | 540.00 | 23.50 | 540.00 | 23.50 | 12,690.00 | 141.00 | 12,831.00 |
| 262 | 3112020479 | 10/11/23 | 23.50 | 540.00 | 23.50 | 540.00 | 23.50 | 12,690.00 | 141.00 | 12,831.00 |
| 263 | 3112020449 | 10/11/23 | 23.50 | 300.00 | 23.50 | 300.00 | 23.50 | 7,050.00 | 141.00 | 7,191.00 |
| 264 | 3112020441 | 10/11/23 | 23.50 | 36.00 | 23.50 | 36.00 | 23.50 | 846.00 | 141.00 | 987.00 |
| 265 | 3111019615 | 10/14/23 | 23.50 | 240.00 | 23.50 | 240.00 | 23.50 | 5,640.00 | 141.00 | 5,781.00 |
| 266 | 3111019615 | 10/14/23 | 23.50 | 190.00 | 23.50 | 190.00 | 23.50 | 4,465.00 | 141.00 | 4,606.00 |
| 267 | 3111019615 | 10/14/23 | 23.50 | 50.00 | 23.50 | 50.00 | 23.50 | 1,175.00 | 141.00 | 1,316.00 |
| 268 | 3111019615 | 10/14/23 | 23.50 | 240.00 | 23.50 | 240.00 | 23.50 | 5,640.00 | 141.00 | 5,781.00 |
| 269 | 3111019615 | 10/14/23 | 23.50 | 60.00 | 23.50 | 60.00 | 23.50 | 1,410.00 | 141.00 | 1,551.00 |
| 270 | 3111019615 | 10/14/23 | 23.50 | 180.00 | 23.50 | 180.00 | 23.50 | 4,230.00 | 141.00 | 4,371.00 |
| 271 | 3111019615 | 10/14/23 | 23.50 | 240.00 | 23.50 | 240.00 | 23.50 | 5,640.00 | 141.00 | 5,781.00 |
| 272 | 3111019615 | 10/14/23 | 23.50 | 190.00 | 23.50 | 190.00 | 23.50 | 4,465.00 | 141.00 | 4,606.00 |
| 273 | 3111019615 | 10/14/23 | 23.50 | 50.00 | 23.50 | 50.00 | 23.50 | 1,175.00 | 141.00 | 1,316.00 |

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| 274 | 3111019615 | 10/14/23 | 23.50 | 260.00 | 23.50 | 260.00 | 23.50 | 6,110.00 | 141.00 | 6,251.00 |
| 275 | 3111019615 | 10/14/23 | 23.50 | 260.00 | 23.50 | 260.00 | 23.50 | 6,110.00 | 141.00 | 6,251.00 |
| 276 | 3118000427 | 10/14/23 | 23.50 | 166.00 | 23.50 | 166.00 | 23.50 | 3,901.00 | 141.00 | 4,042.00 |
| 277 | 3118000428 | 10/14/23 | 23.50 | 100.00 | 23.50 | 100.00 | 23.50 | 2,350.00 | 141.00 | 2,491.00 |
| 278 | 3118000429 | 10/14/23 | 23.50 | 260.00 | 23.50 | 260.00 | 23.50 | 6,110.00 | 141.00 | 6,251.00 |
| 279 | 3118000430 | 10/14/23 | 23.50 | 100.00 | 23.50 | 100.00 | 23.50 | 2,350.00 | 141.00 | 2,491.00 |
| 280 | 3118000431 | 10/14/23 | 23.50 | 168.00 | 23.50 | 168.00 | 23.50 | 3,948.00 | 141.00 | 4,089.00 |
| 281 | 3118000432 | 10/14/23 | 23.50 | 260.00 | 23.50 | 260.00 | 23.50 | 6,110.00 | 141.00 | 6,251.00 |
| 282 | 3118000530 | 10/14/23 | 23.50 | 260.00 | 23.50 | 260.00 | 23.50 | 6,110.00 | 141.00 | 6,251.00 |
| 283 | 3111019593 | 10/15/23 | 23.50 | 60.00 | 23.50 | 60.00 | 23.50 | 1,410.00 | 141.00 | 1,551.00 |
| 284 | 3118000435 | 10/15/23 | 23.50 | 250.00 | 23.50 | 250.00 | 23.50 | 5,875.00 | 141.00 | 6,016.00 |
| 285 | 3118000433 | 10/15/23 | 23.50 | 250.00 | 23.50 | 250.00 | 23.50 | 5,875.00 | 141.00 | 6,016.00 |
| 286 | 3118000433 | 10/15/23 | 23.50 | 200.00 | 23.50 | 200.00 | 23.50 | 4,700.00 | 141.00 | 4,841.00 |
| 287 | 3111019593 | 10/15/23 | 23.50 | 50.00 | 23.50 | 50.00 | 23.50 | 1,175.00 | 141.00 | 1,316.00 |
| 288 | 3118000432 | 10/15/23 | 23.50 | 250.00 | 23.50 | 250.00 | 23.50 | 5,875.00 | 141.00 | 6,016.00 |
| 289 | 3111019593 | 10/15/23 | 23.50 | 70.00 | 23.50 | 70.00 | 23.50 | 1,645.00 | 141.00 | 1,786.00 |
| 290 | 3118000436 | 10/15/23 | 23.50 | 190.00 | 23.50 | 190.00 | 23.50 | 4,465.00 | 141.00 | 4,606.00 |
| 291 | 3118000436 | 10/15/23 | 23.50 | 180.00 | 23.50 | 55.00 | 23.50 | 2,761.25 | 141.00 | 2,902.25 |
| 292 | 3118000428 | 10/15/23 | 23.50 | 253.00 | 23.50 | 253.00 | 23.50 | 5,945.50 | 141.00 | 6,086.50 |
| 293 | 3111019593 | 10/15/23 | 23.50 | 253.00 | 23.50 | 253.00 | 23.50 | 5,945.50 | 141.00 | 6,086.50 |
| 294 | 3111019593 | 10/16/23 | 23.50 | 251.00 | 23.50 | 251.00 | 23.50 | 5,898.50 | 141.00 | 6,039.50 |
| 295 | 3111019593 | 10/16/23 | 23.50 | 186.00 | 23.50 | 186.00 | 23.50 | 4,371.00 | 141.00 | 4,512.00 |
| 296 | 3111019593 | 10/16/23 | 23.50 | 186.00 | 23.50 | 186.00 | 23.50 | 4,371.00 | 141.00 | 4,512.00 |
| 297 | 3111019593 | 10/16/23 | 23.50 | 253.00 | 23.50 | 253.00 | 23.50 | 5,945.50 | 141.00 | 6,086.50 |
| 298 | 3111019593 | 10/16/23 | 23.50 | 250.00 | 23.50 | 250.00 | 23.50 | 5,875.00 | 141.00 | 6,016.00 |
| 299 | 3111019593 | 10/16/23 | 23.50 | 63.00 | 23.50 | 63.00 | 23.50 | 1,480.50 | 141.00 | 1,621.50 |
| 300 | 3111019593 | 10/16/23 | 23.50 | 186.00 | 23.50 | 186.00 | 23.50 | 4,371.00 | 141.00 | 4,512.00 |
| 301 | 3111019593 | 10/16/23 | 23.50 | 250.00 | 23.50 | 250.00 | 23.50 | 5,875.00 | 141.00 | 6,016.00 |
| 302 | 3111019593 | 10/16/23 | 23.50 | 250.00 | 23.50 | 250.00 | 23.50 | 5,875.00 | 141.00 | 6,016.00 |
| 303 | 3118000477 | 10/17/23 | 23.50 | 146.00 | 23.50 | 146.00 | 23.50 | 3,431.00 | 141.00 | 3,572.00 |
| 304 | 3118000477 | 10/17/23 | 23.50 | 293.00 | 23.50 | 293.00 | 23.50 | 6,885.50 | 141.00 | 7,026.50 |
| 305 | 3118000469 | 10/17/23 | 23.50 | 402.00 | 23.50 | 402.00 | 23.50 | 9,447.00 | 141.00 | 9,588.00 |
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# ECApplications
# Seam Control Form

**Project Name:** Minnkota Power Cooperative, Inc. **Job #** 233013 **Superintendent:** Octavio Rivas

**Material Type:** 60 Mil HDPE SS Textured / Smooth Liner **Primary** X **Pond** - **Air Pressure Test** 30 PSI

**Job Description:** Celll 5 Phase 1B **Secondary** **Cell** X **Air Pressure Hold Time** 5 Minutes

**Reported By** Daniel Martinez **Pad** - **Allowable Air Pressure Loss** 2 PSI

**62,571** **Total LF of Welding to Date Combined** **Extrusion LF Weld Total To Date** **2,075** **Fusion LF Weld Total To Date** **60,496**

| Weld Date | Seam Number | | Seam Length | Weld Time | Operator Name / ID | Mach Number | Mach Speed | Mach Temp | Preheat Temp | Ambient Temp | Test Date | Test Type | PSI IN | Time (Mins) | PSI OUT | PSI Loss | Test Results |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7/20/23 | 1 | 2 | 245 | 10:53 | EDUARDO DEL VALLE | 616 | 12 | 800 | | 62 | 7/20/23 | Air Test | 30 | 5 | 30 | | Pass |
| 7/20/23 | 2 | 3 | 248 | 10:37 | JAVIER MEZA | 614 | 12 | 800 | | 68 | 7/20/23 | Air Test | 30 | 5 | 30 | | Pass |
| 7/20/23 | 3 | 4 | 246 | 10:12 | EDUARDO DEL VALLE | 616 | 12 | 800 | | 68 | 7/20/23 | Air Test | 30 | 5 | 29 | 1 | Pass |
| 7/20/23 | 4 | 5 | 248 | 9:50 | JAVIER MEZA | 614 | 12 | 800 | | 64 | 7/20/23 | Air Test | 30 | 5 | 30 | | Pass |
| 7/20/23 | 5 | 6 | 247 | 9:34 | EDUARDO DEL VALLE | 616 | 12 | 800 | | 64 | 7/20/23 | Air Test | 30 | 5 | 29 | 1 | Pass |
| 7/20/23 | 6 | 7 | 249 | 9:15 | JAVIER MEZA | 614 | 12 | 800 | | 62 | 7/20/23 | Air Test | 30 | 5 | 30 | | Pass |
| 7/20/23 | 7 | 8 | 250 | 8:56 | EDUARDO DEL VALLE | 616 | 12 | 800 | | 62 | 7/20/23 | Air Test | 30 | 5 | 30 | | Pass |
| 7/20/23 | 8 | 9 | 248 | 12:10 | EDUARDO DEL VALLE | 616 | 12 | 800 | | 62 | 7/20/23 | Air Test | 30 | 5 | 30 | | Pass |
| 7/20/23 | 9 | 10 | 224 | 12:27 | JAVIER MEZA | 614 | 12 | 800 | | 62 | 7/20/23 | Air Test | 30 | 5 | 30 | | Pass |
| 7/20/23 | 10 | 11 | 201 | 14:38 | JAVIER MEZA | 614 | 14 | 800 | | 73 | 7/20/23 | Air Test | 30 | 5 | 29 | 1 | Pass |
| 7/20/23 | 11 | 12 | 178 | 14:40 | EDUARDO DEL VALLE | 616 | 14 | 800 | | 73 | 7/20/23 | Air Test | 30 | 5 | 30 | | Pass |
| 7/20/23 | 12 | 13 | 156 | 15:07 | EDUARDO DEL VALLE | 616 | 14 | 800 | | 73 | 7/20/23 | Air Test | 30 | 5 | 30 | | Pass |
| 7/20/23 | 13 | 14 | 130 | 15:10 | JAVIER MEZA | 614 | 14 | 800 | | 73 | 7/20/23 | Air Test | 30 | 5 | 30 | | Pass |
| 7/20/23 | 14 | 15 | 107 | 15:29 | EDUARDO DEL VALLE | 616 | 14 | 800 | | 73 | 7/20/23 | Air Test | 30 | 5 | 30 | | Pass |
| 7/20/23 | 15 | 16 | 81 | 15:35 | JAVIER MEZA | 614 | 14 | 800 | | 73 | 7/20/23 | Air Test | 30 | 5 | 30 | | Pass |
| 7/20/23 | 16 | 17 | 57 | 15:46 | EDUARDO DEL VALLE | 616 | 14 | 800 | | 73 | 7/20/23 | Air Test | 30 | 5 | 30 | | Pass |

# ECApplications
# Seam Control Form

**Project Name:** Minnkota Power Cooperative, Inc. **Job #** 233013 **Superintendent:** Octavio Rivas

**Material Type:** 60 Mil HDPE SS Textured / Smooth Liner **Primary** X **Pond** -

**Job Description:** Celll 5 Phase 1B **Secondary** **Cell** X

**Reported By** Daniel Martinez **Pad** -

**Air Pressure Test** 30 PSI

**Air Pressure Hold Time** 5 Minutes

**Allowable Air Pressure Loss** 2 PSI

**62,571** **Total LF of Welding to Date Combined** **Extrusion LF Weld Total To Date** **2,075** **Fusion LF Weld Total To Date** **60,496**

| Weld Date | Seam Number | | Seam Length | Weld Time | Operator Name / ID | Mach Number | Mach Speed | Mach Temp | Preheat Temp | Ambient Temp | Test Date | Test Type | PSI IN | Time (Mins) | PSI OUT | PSI Loss | Test Results |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7/20/23 | 17 | 18 | 35 | 15:57 | JAVIER MEZA | 614 | 14 | 800 | | 75 | 7/20/23 | Air Test | 30 | 5 | 30 | | Pass |
| 7/20/23 | 18 | 19 | 11 | 16:06 | JAVIER MEZA | 614 | 14 | 800 | | 75 | 7/20/23 | Air Test | 30 | 5 | 29 | 1 | Pass |
| 7/21/23 | 19 | 20 | 5 | 14:46 | EDUARDO DEL VALLE | 616 | 12 | 800 | | 67 | 7/20/23 | Air Test | 30 | 5 | 30 | | Pass |
| 7/21/23 | 20 | 21 | 17 | 11:30 | EDUARDO DEL VALLE | 616 | 12 | 800 | | 60 | 7/20/23 | Air Test | 30 | 5 | 30 | | Pass |
| 7/21/23 | 21 | 22 | 42 | 11:20 | JAVIER MEZA | 614 | 12 | 800 | | 60 | 7/20/23 | Air Test | 30 | 5 | 30 | | Pass |
| 7/21/23 | 22 | 23 | 67 | 11:15 | EDUARDO DEL VALLE | 616 | 12 | 800 | | 60 | 7/20/23 | Air Test | 30 | 5 | 30 | | Pass |
| 7/21/23 | 23 | 24 | 93 | 10:50 | JAVIER MEZA | 614 | 12 | 800 | | 60 | 7/20/23 | Air Test | 30 | 5 | 30 | | Pass |
| 7/21/23 | 24 | 25 | 117 | 10:55 | EDUARDO DEL VALLE | 616 | 12 | 800 | | 60 | 7/20/23 | Air Test | 30 | 5 | 30 | | Pass |
| 7/21/23 | 25 | 26 | 142 | 10:27 | JAVIER MEZA | 614 | 12 | 800 | | 55 | 7/20/23 | Air Test | 30 | 5 | 30 | | Pass |
| 7/21/23 | 26 | 27 | 169 | 10:05 | JAVIER MEZA | 614 | 12 | 800 | | 55 | 7/20/23 | Air Test | 30 | 5 | 30 | | Pass |
| 7/21/23 | 27 | 28 | 193 | 10:27 | EDUARDO DEL VALLE | 616 | 12 | 800 | | 55 | 7/20/23 | Air Test | 30 | 5 | 30 | | Pass |
| 7/21/23 | 28 | 29 | 220 | 8:30 | JAVIER MEZA | 614 | 12 | 800 | | 55 | 7/20/23 | Air Test | 30 | 5 | 30 | | Pass |
| 7/21/23 | 29 | 30 | 245 | 8:15 | EDUARDO DEL VALLE | 616 | 12 | 800 | | 55 | 7/20/23 | Air Test | 30 | 5 | 30 | | Pass |
| 7/21/23 | 18 | 20 | 12 | 14:47 | EDUARDO DEL VALLE | 616 | 12 | 800 | | 81 | 7/21/23 | Air Test | 30 | 5 | 30 | | Pass |
| 7/21/23 | 18 | 21 | 22 | 14:49 | EDUARDO DEL VALLE | 616 | 12 | 800 | | 81 | 7/21/23 | Air Test | 30 | 5 | 30 | | Pass |
| 7/21/23 | 17 | 21 | 14 | 14:51 | EDUARDO DEL VALLE | 616 | 12 | 800 | | 81 | 7/21/23 | Air Test | 30 | 5 | 30 | | Pass |

# ECApplications
# Seam Control Form

**Project Name:** Minnkota Power Cooperative, Inc. **Job #** 233013 **Superintendent:** Octavio Rivas

**Material Type:** 60 Mil HDPE SS Textured / Smooth Liner **Primary** X **Pond** -

**Job Description:** Celll 5 Phase 1B **Secondary** **Cell** X

**Reported By** Daniel Martinez **Pad** -

**Air Pressure Test** 30 PSI

**Air Pressure Hold Time** 5 Minutes

**Allowable Air Pressure Loss** 2 PSI

**62,571** **Total LF of Welding to Date Combined** **Extrusion LF Weld Total To Date** **2,075** **Fusion LF Weld Total To Date** **60,496**

| Weld Date | Seam Number | | Seam Length | Weld Time | Operator Name / ID | Mach Number | Mach Speed | Mach Temp | Preheat Temp | Ambient Temp | Test Date | Test Type | PSI IN | Time (Mins) | PSI OUT | PSI Loss | Test Results |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7/21/23 | 17 | 22 | 18 | 14:53 | EDUARDO DEL VALLE | 616 | 12 | 800 | | 81 | 7/21/23 | Air Test | 30 | 5 | 30 | | Pass |
| 7/21/23 | 16 | 22 | 17 | 14:53 | EDUARDO DEL VALLE | 616 | 12 | 800 | | 81 | 7/21/23 | Air Test | 30 | 5 | 30 | | Pass |
| 7/21/23 | 16 | 23 | 16 | 14:54 | EDUARDO DEL VALLE | 616 | 12 | 800 | | 81 | 7/21/23 | Air Test | 30 | 5 | 30 | | Pass |
| 7/21/23 | 15 | 23 | 19 | 14:54 | EDUARDO DEL VALLE | 616 | 12 | 800 | | 81 | 7/21/23 | Air Test | 30 | 5 | 29 | 1 | Pass |
| 7/21/23 | 15 | 24 | 14 | 14:55 | EDUARDO DEL VALLE | 616 | 12 | 800 | | 81 | 7/21/23 | Air Test | 30 | 5 | 30 | | Pass |
| 7/21/23 | 14 | 24 | 21 | 14:58 | EDUARDO DEL VALLE | 616 | 12 | 800 | | 81 | 7/21/23 | Air Test | 30 | 5 | 30 | | Pass |
| 7/21/23 | 14 | 25 | 12 | 15:00 | EDUARDO DEL VALLE | 616 | 12 | 800 | | 81 | 7/21/23 | Air Test | 30 | 5 | 30 | | Pass |
| 7/21/23 | 13 | 25 | 24 | 15:01 | EDUARDO DEL VALLE | 616 | 12 | 800 | | 81 | 7/21/23 | Air Test | 30 | 5 | 30 | | Pass |
| 7/21/23 | 13 | 26 | 10 | 15:03 | EDUARDO DEL VALLE | 616 | 12 | 800 | | 81 | 7/21/23 | Air Test | 30 | 5 | 30 | | Pass |
| 7/21/23 | 12 | 26 | 26 | 15:04 | EDUARDO DEL VALLE | 616 | 12 | 800 | | 81 | 7/21/23 | Air Test | 30 | 5 | 30 | | Pass |
| 7/21/23 | 12 | 27 | 6 | 15:06 | EDUARDO DEL VALLE | 616 | 12 | 800 | | 81 | 7/21/23 | Air Test | 30 | 5 | 30 | | Pass |
| 7/21/23 | 11 | 27 | 29 | 15:07 | EDUARDO DEL VALLE | 616 | 12 | 800 | | 81 | 7/21/23 | Air Test | 30 | 5 | 30 | | Pass |
| 7/21/23 | 11 | 28 | 3 | 15:43 | EDUARDO DEL VALLE | 616 | 12 | 800 | | 81 | 7/21/23 | Air Test | 30 | 5 | 30 | | Pass |
| 7/21/23 | 10 | 28 | 32 | 15:40 | EDUARDO DEL VALLE | 616 | 12 | 800 | | 81 | 7/21/23 | Air Test | 30 | 5 | 29 | 1 | Pass |
| 7/21/23 | 9 | 29 | 34 | 15:37 | EDUARDO DEL VALLE | 616 | 12 | 800 | | 81 | 7/21/23 | Air Test | 30 | 5 | 29 | 1 | Pass |
| 7/22/23 | 1 | 31 | 244 | 8:55 | EDUARDO DEL VALLE | 616 | 13 | 800 | | 62 | 7/22/23 | Air Test | 30 | 5 | 30 | | Pass |

# ECApplications
## Seam Control Form

**Project Name:** Minnkota Power Cooperative, Inc. **Job #** 233013 **Superintendent:** Octavio Rivas

**Material Type:** 60 Mil HDPE SS Textured / Smooth Liner **Primary** X **Pond** -

**Job Description:** Celll 5 Phase 1B **Secondary** **Cell** X

**Reported By** Daniel Martinez **Pad** -

**Air Pressure Test** 30 PSI

**Air Pressure Hold Time** 5 Minutes

**Allowable Air Pressure Loss** 2 PSI

**62,571** **Total LF of Welding to Date Combined** **Extrusion LF Weld Total To Date** **2,075** **Fusion LF Weld Total To Date** **60,496**

| Weld Date | Seam Number | | Seam Length | Weld Time | Operator Name / ID | Mach Number | Mach Speed | Mach Temp | Preheat Temp | Ambient Temp | Test Date | Test Type | PSI IN | Time (Mins) | PSI OUT | PSI Loss | Test Results |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7/22/23 | 31 | 32 | 311 | 10:05 | JAVIER MEZA | 614 | 12 | 800 | | 62 | 7/22/23 | Air Test | 30 | 5 | 30 | | Pass |
| 7/22/23 | 32 | 33 | 312 | 9:55 | EDUARDO DEL VALLE | 616 | 13 | 800 | | 62 | 7/22/23 | Air Test | 30 | 5 | 30 | | Pass |
| 7/22/23 | 33 | 34 | 315 | 11:15 | EDUARDO DEL VALLE | 616 | 13 | 800 | | 62 | 7/22/23 | Air Test | 30 | 5 | 30 | | Pass |
| 7/22/23 | 34 | 35 | 192 | 13:55 | EDUARDO DEL VALLE | 616 | 14 | 800 | | 83 | 7/22/23 | Air Test | 30 | 5 | 30 | | Pass |
| 7/22/23 | 35 | 36 | 164 | 13:40 | JAVIER MEZA | 614 | 14 | 800 | | 83 | 7/22/23 | Air Test | 30 | 5 | 30 | | Pass |
| 7/22/23 | 36 | 37 | 138 | 13:59 | EDUARDO DEL VALLE | 616 | 14 | 800 | | 83 | 7/22/23 | Air Test | 30 | 5 | 30 | | Pass |
| 7/22/23 | 37 | 38 | 111 | 14:05 | JAVIER MEZA | 614 | 14 | 800 | | 83 | 7/22/23 | Air Test | 30 | 5 | 30 | | Pass |
| 7/22/23 | 38 | 39 | 86 | 14:20 | JAVIER MEZA | 614 | 14 | 800 | | 83 | 7/22/23 | Air Test | 30 | 5 | 30 | | Pass |
| 7/22/23 | 39 | 40 | 59 | 14:40 | JAVIER MEZA | 614 | 14 | 800 | | 83 | 7/22/23 | Air Test | 30 | 5 | 30 | | Pass |
| 7/22/23 | 40 | 41 | 33 | 14:55 | JAVIER MEZA | 614 | 14 | 800 | | 83 | 7/22/23 | Air Test | 30 | 5 | 30 | | Pass |
| 7/22/23 | 41 | 42 | 7 | 15:05 | JAVIER MEZA | 614 | 14 | 800 | | 83 | 7/22/23 | Air Test | 30 | 5 | 30 | | Pass |
| 7/22/23 | 42 | 43 | 11 | 15:51 | EDUARDO DEL VALLE | 616 | 14 | 800 | | 83 | 7/22/23 | Air Test | 30 | 5 | 30 | | Pass |
| 7/22/23 | 34 | 43 | 38 | 14:28 | EDUARDO DEL VALLE | 616 | 14 | 800 | | 83 | 7/22/23 | Air Test | 30 | 5 | 30 | | Pass |
| 7/22/23 | 35 | 43 | 36 | 15:09 | EDUARDO DEL VALLE | 616 | 14 | 800 | | 83 | 7/22/23 | Air Test | 30 | 5 | 30 | | Pass |
| 7/22/23 | 36 | 43 | 37 | 15:11 | EDUARDO DEL VALLE | 616 | 14 | 800 | | 83 | 7/22/23 | Air Test | 30 | 5 | 30 | | Pass |
| 7/22/23 | 37 | 43 | 37 | 15:14 | EDUARDO DEL VALLE | 616 | 14 | 800 | | 83 | 7/22/23 | Air Test | 30 | 5 | 30 | | Pass |

# ECApplications
## Seam Control Form

**Project Name:** Minnkota Power Cooperative, Inc. **Job #** 233013 **Superintendent:** Octavio Rivas

**Material Type:** 60 Mil HDPE SS Textured / Smooth Liner **Primary** X **Pond** - **Air Pressure Test** 30 PSI

**Job Description:** Celll 5 Phase 1B **Secondary** **Cell** X **Air Pressure Hold Time** 5 Minutes

**Reported By** Daniel Martinez **Pad** - **Allowable Air Pressure Loss** 2 PSI

**62,571** **Total LF of Welding to Date Combined** **Extrusion LF Weld Total To Date** **2,075** **Fusion LF Weld Total To Date** **60,496**

| Weld Date | Seam Number | | Seam Length | Weld Time | Operator Name / ID | Mach Number | Mach Speed | Mach Temp | Preheat Temp | Ambient Temp | Test Date | Test Type | PSI IN | Time (Mins) | PSI OUT | PSI Loss | Test Results |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7/22/23 | 38 | 43 | 37 | 15:19 | EDUARDO DEL VALLE | 616 | 14 | 800 | | 83 | 7/22/23 | Air Test | 30 | 5 | 30 | | Pass |
| 7/22/23 | 39 | 43 | 36 | 15:21 | EDUARDO DEL VALLE | 616 | 14 | 800 | | 83 | 7/22/23 | Air Test | 30 | 5 | 30 | | Pass |
| 7/22/23 | 40 | 43 | 36 | 15:47 | EDUARDO DEL VALLE | 616 | 14 | 800 | | 83 | 7/22/23 | Air Test | 30 | 5 | 30 | | Pass |
| 7/22/23 | 41 | 43 | 38 | 15:49 | EDUARDO DEL VALLE | 616 | 14 | 800 | | 83 | 7/22/23 | Air Test | 30 | 5 | 30 | | Pass |
| 7/26/23 | 54 | 34 | 86 | 8:45 | JAVIER MEZA | 614 | 12 | 800 | | 75 | 7/26/23 | Air Test | 30 | 5 | 30 | | Pass |
| 7/26/23 | 54 | 43 | 38 | 9:25 | JAVIER MEZA | 614 | 12 | 800 | | 75 | 7/26/23 | Air Test | 30 | 5 | 30 | | Pass |
| 7/24/23 | 44 | 45 | 483 | 14:35 | JAVIER MEZA | 614 | 14 | 800 | | 80 | 7/25/23 | Air Test | 30 | 5 | 30 | | Pass |
| 7/24/23 | 45 | 46 | 488 | 14:59 | EDUARDO DEL VALLE | 616 | 14 | 800 | | 69 | 7/25/23 | Air Test | 30 | 5 | 30 | | Pass |
| 7/24/23 | 46 | 47 | 488 | 15:35 | JAVIER MEZA | 614 | 14 | 800 | | 73 | 7/25/23 | Air Test | 30 | 5 | 28 | 2 | Pass |
| 7/25/23 | 47 | 48 | 488 | 8:05 | EDUARDO DEL VALLE | 616 | 13 | 800 | | 66 | 7/25/23 | Air Test | 30 | 5 | 30 | | Pass |
| 7/25/23 | 48 | 49 | 488 | 8:30 | JAVIER MEZA | 614 | 13 | 800 | | 66 | 7/25/23 | Air Test | 30 | 5 | 29 | 1 | Pass |
| 7/25/23 | 49 | 50 | 488 | 9:35 | EDUARDO DEL VALLE | 616 | 13 | 800 | | 71 | 7/25/23 | Air Test | 30 | 5 | 30 | | Pass |
| 7/25/23 | 50 | 51 | 487 | 9:45 | JAVIER MEZA | 614 | 13 | 800 | | 71 | 7/25/23 | Air Test | 30 | 5 | 30 | | Pass |
| 7/25/23 | 51 | 52 | 422 | 10:39 | EDUARDO DEL VALLE | 616 | 13 | 800 | | 73 | 7/25/23 | Air Test | 30 | 5 | 30 | | Pass |
| 7/25/23 | 52 | 53 | 422 | 10:38 | JAVIER MEZA | 614 | 13 | 800 | | 73 | 7/25/23 | Air Test | 30 | 5 | 30 | | Pass |
| 7/25/23 | 51 | 31 | 66 | 11:15 | JAVIER MEZA | 614 | 13 | 800 | | 73 | 7/25/23 | Air Test | 30 | 5 | 30 | | Pass |

# ECApplications
## Seam Control Form

**Project Name:** Minnkota Power Cooperative, Inc. **Job #** 233013 **Superintendent:** Octavio Rivas

**Material Type:** 60 Mil HDPE SS Textured / Smooth Liner **Primary** X **Pond** -

**Job Description:** Celll 5 Phase 1B **Secondary** **Cell** X

**Reported By** Daniel Martinez **Pad** -

**Air Pressure Test** 30 PSI

**Air Pressure Hold Time** 5 Minutes

**Allowable Air Pressure Loss** 2 PSI

**62,571** **Total LF of Welding to Date Combined** **Extrusion LF Weld Total To Date** **2,075** **Fusion LF Weld Total To Date** **60,496**

| Weld Date | Seam Number | | Seam Length | Weld Time | Operator Name / ID | Mach Number | Mach Speed | Mach Temp | Preheat Temp | Ambient Temp | Test Date | Test Type | PSI IN | Time (Mins) | PSI OUT | PSI Loss | Test Results |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7/26/23 | 53 | 32 | 23.5 | 9:10 | EDUARDO DEL VALLE | 616 | 12 | 800 | | 72 | 7/26/23 | Air Test | 30 | 5 | 30 | | Pass |
| 7/26/23 | 31 | 52 | 23.5 | 9:12 | EDUARDO DEL VALLE | 616 | 12 | 800 | | 72 | 7/26/23 | Air Test | 30 | 5 | 30 | | Pass |
| 7/26/23 | 51 | 1 | 23.5 | 8:10 | EDUARDO DEL VALLE | 616 | 12 | 800 | | 72 | 7/26/23 | Air Test | 30 | 5 | 30 | | Pass |
| 7/26/23 | 50 | 2 | 23.5 | 8:12 | EDUARDO DEL VALLE | 616 | 12 | 800 | | 72 | 7/26/23 | Air Test | 30 | 5 | 30 | | Pass |
| 7/26/23 | 49 | 3 | 23.5 | 8:16 | EDUARDO DEL VALLE | 616 | 12 | 800 | | 72 | 7/26/23 | Air Test | 30 | 5 | 30 | | Pass |
| 7/26/23 | 48 | 4 | 23.5 | 8:18 | EDUARDO DEL VALLE | 616 | 12 | 800 | | 72 | 7/26/23 | Air Test | 30 | 5 | 28 | 2 | Pass |
| 7/26/23 | 47 | 5 | 23.5 | 8:21 | EDUARDO DEL VALLE | 616 | 12 | 800 | | 72 | 7/26/23 | Air Test | 30 | 5 | 30 | | Pass |
| 7/26/23 | 46 | 6 | 23.5 | 8:23 | EDUARDO DEL VALLE | 616 | 12 | 800 | | 72 | 7/26/23 | Air Test | 30 | 5 | 30 | | Pass |
| 7/26/23 | 45 | 7 | 23.5 | 8:26 | EDUARDO DEL VALLE | 616 | 12 | 800 | | 72 | 7/26/23 | Air Test | 30 | 5 | 30 | | Pass |
| 7/26/23 | 44 | 8 | 23.5 | 8:39 | EDUARDO DEL VALLE | 616 | 12 | 800 | | 72 | 7/26/23 | Air Test | 30 | 5 | 30 | | Pass |
| 7/26/23 | 30 | 44 | 22 | 8:50 | EDUARDO DEL VALLE | 616 | 12 | 800 | | 72 | 7/26/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/8/23 | 30 | 55 | 246 | 14:40 | EDUARDO DEL VALLE | 616 | 12 | 800 | | | 9/12/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/8/23 | 55 | 56 | 246 | 15:15 | EDUARDO DEL VALLE | 616 | 12 | 800 | | | 9/12/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/10/23 | 56 | 57 | 244 | 10:02 | EDUARDO DEL VALLE | 616 | 12 | 800 | | | 9/12/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/10/23 | 57 | 58 | 242 | 10:10 | JOSE RODRIGUEZ | 614 | 12 | 800 | | | 9/12/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/10/23 | 58 | 60 | 196 | 10:36 | EDUARDO DEL VALLE | 616 | 12 | 800 | | | 9/12/23 | Air Test | 30 | 5 | 30 | | Pass |

# ECApplications
# Seam Control Form

**Project Name:** Minnkota Power Cooperative, Inc. **Job #** 233013 **Superintendent:** Octavio Rivas

**Material Type:** 60 Mil HDPE SS Textured / Smooth Liner **Primary** X **Pond** - **Air Pressure Test** 30 PSI

**Job Description:** Celll 5 Phase 1B **Secondary** **Cell** X **Air Pressure Hold Time** 5 Minutes

**Reported By** Daniel Martinez **Pad** - **Allowable Air Pressure Loss** 2 PSI

**62,571** **Total LF of Welding to Date Combined** **Extrusion LF Weld Total To Date** **2,075** **Fusion LF Weld Total To Date** **60,496**

| Weld Date | Seam Number | | Seam Length | Weld Time | Operator Name / ID | Mach Number | Mach Speed | Mach Temp | Preheat Temp | Ambient Temp | Test Date | Test Type | PSI IN | Time (Mins) | PSI OUT | PSI Loss | Test Results |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9/10/23 | 60 | 62 | 196 | 10:53 | JOSE RODRIGUEZ | 614 | 12 | 800 | | | 9/12/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/10/23 | 62 | 64 | 195 | 11:12 | EDUARDO DEL VALLE | 616 | 12 | 800 | | | 9/12/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/10/23 | 64 | 66 | 195 | 11:30 | JOSE RODRIGUEZ | 614 | 12 | 800 | | | 9/12/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/10/23 | 58 | 59 | 48 | 13:40 | EDUARDO DEL VALLE | 616 | 11 | 800 | | | 9/12/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/10/23 | 59 | 61 | 46 | 13:55 | EDUARDO DEL VALLE | 616 | 11 | 800 | | | 9/12/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/10/23 | 61 | 63 | 45 | 14:00 | EDUARDO DEL VALLE | 616 | 11 | 800 | | | 9/12/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/10/23 | 63 | 65 | 45 | 14:10 | EDUARDO DEL VALLE | 616 | 11 | 800 | | | 9/12/23 | Air Test | 30 | 5 | 29 | 1 | Pass |
| 9/10/23 | 59 | 60 | 23.5 | 15:01 | EDUARDO DEL VALLE | 616 | 11 | 800 | | | 9/12/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/10/23 | 61 | 62 | 23.5 | 14:59 | EDUARDO DEL VALLE | 616 | 11 | 800 | | | 9/12/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/10/23 | 63 | 64 | 23.5 | 14:57 | EDUARDO DEL VALLE | 616 | 11 | 800 | | | 9/12/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/10/23 | 65 | 66 | 23.5 | 14:55 | EDUARDO DEL VALLE | 616 | 11 | 800 | | | 9/12/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/10/23 | 66 | 67 | 193 | 15:05 | JOSE RODRIGUEZ | 614 | 12 | 800 | | | 9/12/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/10/23 | 67 | 68 | 237 | 15:28 | EDUARDO DEL VALLE | 616 | 11 | 800 | | | 9/12/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/10/23 | 68 | 69 | 237 | 15:47 | JOSE RODRIGUEZ | 614 | 12 | 800 | | | 9/12/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/10/23 | 69 | 70 | 237 | 16:11 | EDUARDO DEL VALLE | 616 | 11 | 800 | | | 9/12/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/10/23 | 70 | 71 | 235 | 16:59 | EDUARDO DEL VALLE | 616 | 11 | 800 | | | 9/12/23 | Air Test | 30 | 5 | 30 | | Pass |

# ECApplications
# Seam Control Form

**Project Name:** Minnkota Power Cooperative, Inc. **Job #** 233013 **Superintendent:** Octavio Rivas

**Material Type:** 60 Mil HDPE SS Textured / Smooth Liner **Primary** X **Pond** - **Air Pressure Test** 30 PSI

**Job Description:** Celll 5 Phase 1B **Secondary** **Cell** X **Air Pressure Hold Time** 5 Minutes

**Reported By** Daniel Martinez **Pad** - **Allowable Air Pressure Loss** 2 PSI

**62,571** **Total LF of Welding to Date Combined** **Extrusion LF Weld Total To Date** **2,075** **Fusion LF Weld Total To Date** **60,496**

| Weld Date | Seam Number | | Seam Length | Weld Time | Operator Name / ID | Mach Number | Mach Speed | Mach Temp | Preheat Temp | Ambient Temp | Test Date | Test Type | PSI IN | Time (Mins) | PSI OUT | PSI Loss | Test Results |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9/10/23 | 71 | 72 | 234 | 17:22 | JOSE RODRIGUEZ | 614 | 12 | 800 | | | 9/12/23 | Air Test | 30 | 5 | 28 | 2 | Pass |
| 9/11/23 | 72 | 73 | 41 | 14:05 | EDUARDO DEL VALLE | 616 | 11 | 800 | | | 9/12/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/11/23 | 72 | 74 | 193 | 8:09 | EDUARDO DEL VALLE | 616 | 12 | 800 | | | 9/12/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/11/23 | 74 | 76 | 189 | 8:18 | JOSE RODRIGUEZ | 614 | 12 | 800 | | | 9/12/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/11/23 | 76 | 78 | 188 | 8:42 | EDUARDO DEL VALLE | 616 | 12 | 800 | | | 9/12/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/11/23 | 78 | 80 | 190 | 8:52 | JOSE RODRIGUEZ | 614 | 12 | 800 | | | 9/12/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/11/23 | 80 | 82 | 189 | 9:25 | EDUARDO DEL VALLE | 616 | 12 | 800 | | | 9/12/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/11/23 | 82 | 83 | 189 | 10:02 | JOSE RODRIGUEZ | 614 | 12 | 800 | | | 9/12/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/11/23 | 83 | 84 | 191 | 10:25 | EDUARDO DEL VALLE | 616 | 12 | 800 | | | 9/12/23 | Air Test | 30 | 5 | 29 | 1 | Pass |
| 9/11/23 | 84 | 86 | 191 | 14:31 | JOSE RODRIGUEZ | 614 | 12 | 800 | | | 9/12/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/11/23 | 86 | 88 | 187 | 15:00 | JOSE RODRIGUEZ | 614 | 12 | 800 | | | 9/12/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/11/23 | 88 | 89 | 186 | 15:33 | JOSE RODRIGUEZ | 614 | 12 | 800 | | | 9/12/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/11/23 | 73 | 75 | 41 | 14:10 | EDUARDO DEL VALLE | 616 | 11 | 800 | | | 9/12/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/11/23 | 75 | 77 | 42 | 14:16 | EDUARDO DEL VALLE | 616 | 11 | 800 | | | 9/12/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/11/23 | 77 | 79 | 42 | 14:23 | EDUARDO DEL VALLE | 616 | 11 | 800 | | | 9/12/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/11/23 | 79 | 81 | 43 | 14:32 | EDUARDO DEL VALLE | 616 | 11 | 800 | | | 9/12/23 | Air Test | 30 | 5 | 30 | | Pass |

# ECApplications
# Seam Control Form

**Project Name:** Minnkota Power Cooperative, Inc. **Job #** 233013 **Superintendent:** Octavio Rivas

**Material Type:** 60 Mil HDPE SS Textured / Smooth Liner **Primary** X **Pond** -

**Job Description:** Celll 5 Phase 1B **Secondary** **Cell** X

**Reported By** Daniel Martinez **Pad** -

**Air Pressure Test** 30 PSI

**Air Pressure Hold Time** 5 Minutes

**Allowable Air Pressure Loss** 2 PSI

**62,571** **Total LF of Welding to Date Combined** **Extrusion LF Weld Total To Date** **2,075** **Fusion LF Weld Total To Date** **60,496**

| Weld Date | Seam Number | | Seam Length | Weld Time | Operator Name / ID | Mach Number | Mach Speed | Mach Temp | Preheat Temp | Ambient Temp | Test Date | Test Type | PSI IN | Time (Mins) | PSI OUT | PSI Loss | Test Results |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9/11/23 | 83 | 85 | 38 | 14:55 | EDUARDO DEL VALLE | 616 | 11 | 800 | | | 9/12/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/11/23 | 85 | 86 | 38 | 15:02 | EDUARDO DEL VALLE | 616 | 11 | 800 | | | 9/12/23 | Air Test | 30 | 5 | 29 | 1 | Pass |
| 9/11/23 | 86 | 87 | 46 | 16:20 | EDUARDO DEL VALLE | 616 | 11 | 800 | | | 9/12/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/11/23 | 87 | 89 | 47 | 16:27 | EDUARDO DEL VALLE | 616 | 11 | 800 | | | 9/12/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/10/23 | 65 | 67 | 45 | 14:55 | EDUARDO DEL VALLE | 616 | 11 | 800 | | | 9/12/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/11/23 | 73 | 74 | 23.5 | 16:00 | EDUARDO DEL VALLE | 616 | 11 | 800 | | | 9/12/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/11/23 | 75 | 76 | 23.5 | 15:52 | EDUARDO DEL VALLE | 616 | 11 | 800 | | | 9/12/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/11/23 | 77 | 78 | 23.5 | 15:45 | EDUARDO DEL VALLE | 616 | 11 | 800 | | | 9/12/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/11/23 | 79 | 80 | 23.5 | 15:36 | EDUARDO DEL VALLE | 616 | 11 | 800 | | | 9/12/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/11/23 | 81 | 82 | 23.5 | 15:28 | EDUARDO DEL VALLE | 616 | 11 | 800 | | | 9/12/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/11/23 | 84 | 85 | 23.5 | 15:44 | EDUARDO DEL VALLE | 616 | 11 | 800 | | | 9/12/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/11/23 | 87 | 88 | 23.5 | 16:49 | EDUARDO DEL VALLE | 616 | 11 | 800 | | | 9/12/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/11/23 | 81 | 83 | 40 | 14:40 | EDUARDO DEL VALLE | 616 | 11 | 800 | | | 9/12/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/13/23 | 89 | 90 | 186 | 8:19 | GUILLERMO BENITEZ | 616 | 11 | 825 | | | 9/20/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/13/23 | 90 | 92 | 188 | 8:40 | JOSE RODRIGUEZ | 614 | 11 | 825 | | | 9/20/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/13/23 | 92 | 93 | 188 | 9:00 | GUILLERMO BENITEZ | 616 | 11 | 825 | | | 9/20/23 | Air Test | 30 | 5 | 30 | | Pass |

# ECApplications
# Seam Control Form

**Project Name:** Minnkota Power Cooperative, Inc. **Job #** 233013 **Superintendent:** Octavio Rivas

**Material Type:** 60 Mil HDPE SS Textured / Smooth Liner **Primary** X **Pond** -

**Job Description:** Celll 5 Phase 1B **Secondary** **Cell** X

**Reported By** Daniel Martinez **Pad** -

**Air Pressure Test** 30 PSI

**Air Pressure Hold Time** 5 Minutes

**Allowable Air Pressure Loss** 2 PSI

**62,571** **Total LF of Welding to Date Combined** **Extrusion LF Weld Total To Date** **2,075** **Fusion LF Weld Total To Date** **60,496**

| Weld Date | Seam Number | | Seam Length | Weld Time | Operator Name / ID | Mach Number | Mach Speed | Mach Temp | Preheat Temp | Ambient Temp | Test Date | Test Type | PSI IN | Time (Mins) | PSI OUT | PSI Loss | Test Results |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9/13/23 | 93 | 94 | 189 | 9:45 | JOSE RODRIGUEZ | 614 | 11 | 825 | | | 9/20/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/13/23 | 94 | 96 | 188 | 10:22 | GUILLERMO BENITEZ | 616 | 11 | 825 | | | 9/20/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/13/23 | 96 | 98 | 189 | 11:04 | JOSE RODRIGUEZ | 614 | 11 | 825 | | | 9/20/23 | Air Test | 30 | 5 | 29 | 1 | Pass |
| 9/13/23 | 98 | 99 | 188 | 11:35 | GUILLERMO BENITEZ | 616 | 11 | 825 | | | 9/20/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/13/23 | 99 | 100 | 187 | 13:25 | JOSE RODRIGUEZ | 614 | 12 | 825 | | | 9/20/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/13/23 | 100 | 102 | 188 | 14:13 | GUILLERMO BENITEZ | 616 | 12 | 825 | | | 9/20/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/13/23 | 102 | 104 | 187 | 14:36 | JOSE RODRIGUEZ | 614 | 12 | 825 | | | 9/20/23 | Air Test | 30 | 5 | 29 | 1 | Pass |
| 9/13/23 | 104 | 105 | 186 | 15:15 | GUILLERMO BENITEZ | 616 | 12 | 825 | | | 9/20/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/13/23 | 105 | 106 | 185 | 15:50 | JOSE RODRIGUEZ | 614 | 12 | 825 | | | 9/20/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/13/23 | 106 | 108 | 184 | 16:25 | GUILLERMO BENITEZ | 616 | 12 | 825 | | | 9/20/23 | Air Test | 30 | 5 | 29 | 1 | Pass |
| 9/13/23 | 108 | 110 | 185 | 16:47 | JOSE RODRIGUEZ | 614 | 12 | 825 | | | 9/20/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/13/23 | 110 | 111 | 185 | 17:23 | GUILLERMO BENITEZ | 616 | 12 | 825 | | | 9/20/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/14/23 | 111 | 112 | 228 | 10:28 | GUILLERMO BENITEZ | 616 | 11 | 825 | | | 9/20/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/14/23 | 112 | 114 | 184 | 10:27 | JOSE RODRIGUEZ | 614 | 11 | 825 | | | 9/20/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/14/23 | 114 | 115 | 184 | 10:50 | GUILLERMO BENITEZ | 616 | 11 | 825 | | | 9/20/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/14/23 | 115 | 116 | 183 | 11:00 | JOSE RODRIGUEZ | 614 | 11 | 825 | | | 9/20/23 | Air Test | 30 | 5 | 29 | 1 | Pass |

# ECApplications
# Seam Control Form

**Project Name:** Minnkota Power Cooperative, Inc. **Job #** 233013 **Superintendent:** Octavio Rivas

**Material Type:** 60 Mil HDPE SS Textured / Smooth Liner **Primary** X **Pond** - **Air Pressure Test** 30 PSI

**Job Description:** Celll 5 Phase 1B **Secondary** **Cell** X **Air Pressure Hold Time** 5 Minutes

**Reported By** Daniel Martinez **Pad** - **Allowable Air Pressure Loss** 2 PSI

**62,571** **Total LF of Welding to Date Combined** **Extrusion LF Weld Total To Date** **2,075** **Fusion LF Weld Total To Date** **60,496**

| Weld Date | Seam Number | | Seam Length | Weld Time | Operator Name / ID | Mach Number | Mach Speed | Mach Temp | Preheat Temp | Ambient Temp | Test Date | Test Type | PSI IN | Time (Mins) | PSI OUT | PSI Loss | Test Results |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9/14/23 | 116 | 118 | 183 | 11:20 | GUILLERMO BENITEZ | 616 | 11 | 825 | | | 9/20/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/14/23 | 118 | 120 | 183 | 11:37 | JOSE RODRIGUEZ | 614 | 11 | 825 | | | 9/20/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/14/23 | 120 | 121 | 182 | 13:35 | GUILLERMO BENITEZ | 616 | 12 | 825 | | | 9/20/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/14/23 | 121 | 122 | 181 | 13:44 | JOSE RODRIGUEZ | 614 | 12 | 825 | | | 9/20/23 | Air Test | 30 | 5 | 29 | 1 | Pass |
| 9/14/23 | 122 | 124 | 181 | 14:05 | GUILLERMO BENITEZ | 616 | 12 | 825 | | | 9/20/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/14/23 | 124 | 126 | 181 | 14:44 | JOSE RODRIGUEZ | 614 | 12 | 825 | | | 9/20/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/14/23 | 126 | 127 | 181 | 14:48 | GUILLERMO BENITEZ | 616 | 12 | 825 | | | 9/20/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/14/23 | 127 | 128 | 180 | 15:05 | JOSE RODRIGUEZ | 614 | 12 | 825 | | | 9/20/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/14/23 | 128 | 130 | 180 | 15:35 | GUILLERMO BENITEZ | 616 | 12 | 825 | | | 9/20/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/14/23 | 130 | 132 | 180 | 15:50 | JOSE RODRIGUEZ | 614 | 12 | 825 | | | 9/20/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/15/23 | 90 | 91 | 48 | 9:30 | EDUARDO DEL VALLE | 616 | 11 | 840 | | | 9/20/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/15/23 | 91 | 93 | 48 | 9:52 | EDUARDO DEL VALLE | 616 | 11 | 840 | | | 9/20/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/15/23 | 93 | 95 | 47 | 9:37 | JOSE RODRIGUEZ | 614 | 11 | 840 | | | 9/20/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/15/23 | 95 | 96 | 47 | 10:12 | JOSE RODRIGUEZ | 614 | 11 | 840 | | | 9/20/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/15/23 | 96 | 97 | 49 | 10:24 | JOSE RODRIGUEZ | 614 | 11 | 840 | | | 9/20/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/15/23 | 97 | 99 | 49 | 10:38 | JOSE RODRIGUEZ | 614 | 11 | 840 | | | 9/20/23 | Air Test | 30 | 5 | 29 | 1 | Pass |

# ECApplications
## Seam Control Form

**Project Name:** Minnkota Power Cooperative, Inc. **Job #** 233013 **Superintendent:** Octavio Rivas

**Material Type:** 60 Mil HDPE SS Textured / Smooth Liner **Primary** X **Pond** - **Air Pressure Test** 30 PSI

**Job Description:** Celll 5 Phase 1B **Secondary** **Cell** X **Air Pressure Hold Time** 5 Minutes

**Reported By** Daniel Martinez **Pad** - **Allowable Air Pressure Loss** 2 PSI

**62,571** **Total LF of Welding to Date Combined** **Extrusion LF Weld Total To Date** **2,075** **Fusion LF Weld Total To Date** **60,496**

| Weld Date | Seam Number | | Seam Length | Weld Time | Operator Name / ID | Mach Number | Mach Speed | Mach Temp | Preheat Temp | Ambient Temp | Test Date | Test Type | PSI IN | Time (Mins) | PSI OUT | PSI Loss | Test Results |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9/15/23 | 99 | 101 | 50 | 10:37 | EDUARDO DEL VALLE | 616 | 11 | 840 | | | 9/20/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/15/23 | 101 | 102 | 50 | 10:52 | EDUARDO DEL VALLE | 616 | 11 | 840 | | | 9/20/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/15/23 | 102 | 103 | 48 | 11:12 | JOSE RODRIGUEZ | 614 | 11 | 840 | | | 9/20/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/15/23 | 103 | 105 | 48 | 11:43 | JOSE RODRIGUEZ | 614 | 11 | 840 | | | 9/20/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/15/23 | 105 | 107 | 49 | 11:41 | EDUARDO DEL VALLE | 616 | 11 | 840 | | | 9/20/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/15/23 | 107 | 108 | 49 | 13:54 | EDUARDO DEL VALLE | 616 | 12 | 840 | | | 9/20/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/15/23 | 108 | 109 | 46 | 14:04 | JOSE RODRIGUEZ | 614 | 12 | 840 | | | 9/20/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/15/23 | 109 | 111 | 23.5 | 14:19 | JOSE RODRIGUEZ | 614 | 12 | 840 | | | 9/20/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/15/23 | 91 | 92 | 23.5 | 10:12 | EDUARDO DEL VALLE | 616 | 11 | 840 | | | 9/20/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/15/23 | 94 | 95 | 23.5 | 10:25 | EDUARDO DEL VALLE | 616 | 11 | 840 | | | 9/20/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/15/23 | 97 | 98 | 23.5 | 11:07 | EDUARDO DEL VALLE | 616 | 11 | 840 | | | 9/20/23 | Air Test | 30 | 5 | 29 | 1 | Pass |
| 9/15/23 | 100 | 101 | 23.5 | 11:23 | EDUARDO DEL VALLE | 616 | 11 | 840 | | | 9/20/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/15/23 | 103 | 104 | 23.5 | 10:57 | EDUARDO DEL VALLE | 616 | 11 | 840 | | | 9/20/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/15/23 | 106 | 107 | 23.5 | 13:10 | EDUARDO DEL VALLE | 616 | 12 | 840 | | | 9/20/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/15/23 | 109 | 110 | 23.5 | 14:30 | EDUARDO DEL VALLE | 616 | 12 | 840 | | | 9/20/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/15/23 | 112 | 113 | 45 | 14:33 | JOSE RODRIGUEZ | 614 | 12 | 840 | | | 9/20/23 | Air Test | 30 | 5 | 30 | | Pass |

# ECApplications
# Seam Control Form

**Project Name:** Minnkota Power Cooperative, Inc. **Job #** 233013 **Superintendent:** Octavio Rivas

**Material Type:** 60 Mil HDPE SS Textured / Smooth Liner **Primary** X **Pond** - **Air Pressure Test** 30 PSI

**Job Description:** Celll 5 Phase 1B **Secondary** **Cell** X **Air Pressure Hold Time** 5 Minutes

**Reported By** Daniel Martinez **Pad** - **Allowable Air Pressure Loss** 2 PSI

**62,571** **Total LF of Welding to Date Combined** **Extrusion LF Weld Total To Date** **2,075** **Fusion LF Weld Total To Date** **60,496**

| Weld Date | Seam Number | | Seam Length | Weld Time | Operator Name / ID | Mach Number | Mach Speed | Mach Temp | Preheat Temp | Ambient Temp | Test Date | Test Type | PSI IN | Time (Mins) | PSI OUT | PSI Loss | Test Results |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9/15/23 | 113 | 115 | 45 | 14:52 | JOSE RODRIGUEZ | 614 | 12 | 840 | | | 9/20/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/15/23 | 115 | 117 | 45 | 15:01 | JOSE RODRIGUEZ | 614 | 12 | 840 | | | 9/20/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/15/23 | 117 | 118 | 45 | 15:10 | JOSE RODRIGUEZ | 614 | 12 | 840 | | | 9/20/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/15/23 | 118 | 119 | 44 | 15:26 | JOSE RODRIGUEZ | 614 | 12 | 840 | | | 9/20/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/15/23 | 119 | 121 | 44 | 15:34 | JOSE RODRIGUEZ | 614 | 12 | 840 | | | 9/20/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/15/23 | 121 | 123 | 45 | 15:45 | JOSE RODRIGUEZ | 614 | 12 | 840 | | | 9/20/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/15/23 | 123 | 124 | 45 | 15:51 | JOSE RODRIGUEZ | 614 | 12 | 840 | | | 9/20/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/15/23 | 124 | 125 | 41 | 15:59 | JOSE RODRIGUEZ | 614 | 12 | 840 | | | 9/20/23 | Air Test | 30 | 5 | 29 | 1 | Pass |
| 9/15/23 | 125 | 127 | 41 | 16:06 | JOSE RODRIGUEZ | 614 | 12 | 840 | | | 9/20/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/15/23 | 127 | 129 | 40 | 16:16 | JOSE RODRIGUEZ | 614 | 12 | 840 | | | 9/20/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/15/23 | 129 | 130 | 40 | 16:30 | JOSE RODRIGUEZ | 614 | 12 | 840 | | | 9/20/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/15/23 | 130 | 131 | 40 | 16:40 | JOSE RODRIGUEZ | 614 | 12 | 840 | | | 9/20/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/15/23 | 113 | 114 | 23.5 | 14:55 | EDUARDO DEL VALLE | 616 | 12 | 840 | | | 9/20/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/15/23 | 116 | 117 | 23.5 | 15:16 | EDUARDO DEL VALLE | 616 | 12 | 840 | | | 9/20/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/15/23 | 119 | 120 | 23.5 | 15:47 | EDUARDO DEL VALLE | 616 | 12 | 840 | | | 9/20/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/15/23 | 122 | 123 | 23.5 | 16:06 | EDUARDO DEL VALLE | 616 | 12 | 840 | | | 9/20/23 | Air Test | 30 | 5 | 30 | | Pass |

# ECApplications
## Seam Control Form

**Project Name:** Minnkota Power Cooperative, Inc. **Job #** 233013 **Superintendent:** Octavio Rivas

**Material Type:** 60 Mil HDPE SS Textured / Smooth Liner **Primary** X **Pond** -

**Job Description:** Celll 5 Phase 1B **Secondary** **Cell** X

**Reported By** Daniel Martinez **Pad** -

**Air Pressure Test** 30 PSI

**Air Pressure Hold Time** 5 Minutes

**Allowable Air Pressure Loss** 2 PSI

**62,571** **Total LF of Welding to Date Combined** **Extrusion LF Weld Total To Date** **2,075** **Fusion LF Weld Total To Date** **60,496**

| Weld Date | Seam Number | | Seam Length | Weld Time | Operator Name / ID | Mach Number | Mach Speed | Mach Temp | Preheat Temp | Ambient Temp | Test Date | Test Type | PSI IN | Time (Mins) | PSI OUT | PSI Loss | Test Results |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9/15/23 | 125 | 126 | 23.5 | 16:23 | EDUARDO DEL VALLE | 616 | 12 | 840 | | | 9/20/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/15/23 | 128 | 129 | 23.5 | 16:40 | EDUARDO DEL VALLE | 616 | 12 | 840 | | | 9/20/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/15/23 | 131 | 132 | 23.5 | 16:57 | EDUARDO DEL VALLE | 616 | 12 | 840 | | | 9/20/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/16/23 | 132 | 133 | 180 | 8:40 | JOSE RODRIGUEZ | 614 | 11 | 825 | | | 9/20/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/16/23 | 133 | 134 | 199 | 8:45 | EDUARDO DEL VALLE | 616 | 11 | 825 | | | 9/18/23 | Air Test | 30 | 5 | 29 | 1 | Pass |
| 9/16/23 | 134 | 135 | 179 | 9:27 | EDUARDO DEL VALLE | 616 | 11 | 825 | | | 9/18/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/16/23 | 135 | 136 | 163 | 9:41 | JOSE RODRIGUEZ | 614 | 11 | 825 | | | 9/18/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/16/23 | 136 | 137 | 144 | 9:55 | EDUARDO DEL VALLE | 616 | 11 | 825 | | | 9/18/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/16/23 | 137 | 138 | 125 | 10:13 | JOSE RODRIGUEZ | 614 | 11 | 825 | | | 9/18/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/16/23 | 138 | 139 | 106 | 10:22 | EDUARDO DEL VALLE | 616 | 11 | 825 | | | 9/18/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/16/23 | 139 | 140 | 87 | 10:48 | JOSE RODRIGUEZ | 614 | 11 | 825 | | | 9/18/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/16/23 | 140 | 141 | 70 | 10:50 | EDUARDO DEL VALLE | 616 | 11 | 825 | | | 9/18/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/16/23 | 141 | 142 | 52 | 11:08 | EDUARDO DEL VALLE | 616 | 11 | 825 | | | 9/18/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/16/23 | 142 | 143 | 34 | 11:15 | JOSE RODRIGUEZ | 614 | 11 | 825 | | | 9/18/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/16/23 | 143 | 144 | 15 | 11:27 | EDUARDO DEL VALLE | 616 | 11 | 825 | | | 9/18/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/16/23 | 144 | 145 | 22 | 9:24 | JOSE RODRIGUEZ | 614 | 11 | 825 | | | 9/18/23 | Air Test | 30 | 5 | 30 | | Pass |

# ECApplications
# Seam Control Form

**Project Name:** Minnkota Power Cooperative, Inc. **Job #** 233013 **Superintendent:** Octavio Rivas

**Material Type:** 60 Mil HDPE SS Textured / Smooth Liner **Primary** X **Pond** - **Air Pressure Test** 30 PSI

**Job Description:** Celll 5 Phase 1B **Secondary** **Cell** X **Air Pressure Hold Time** 5 Minutes

**Reported By** Daniel Martinez **Pad** - **Allowable Air Pressure Loss** 2 PSI

**62,571** **Total LF of Welding to Date Combined** **Extrusion LF Weld Total To Date** **2,075** **Fusion LF Weld Total To Date** **60,496**

| Weld Date | Seam Number | | Seam Length | Weld Time | Operator Name / ID | Mach Number | Mach Speed | Mach Temp | Preheat Temp | Ambient Temp | Test Date | Test Type | PSI IN | Time (Mins) | PSI OUT | PSI Loss | Test Results |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9/16/23 | 145 | 146 | 21 | 16:40 | EDUARDO DEL VALLE | 616 | 12 | 825 | | | 9/18/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/16/23 | 146 | 147 | 51 | 16:26 | EDUARDO DEL VALLE | 616 | 12 | 825 | | | 9/18/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/16/23 | 147 | 148 | 84 | 16:00 | EDUARDO DEL VALLE | 616 | 12 | 825 | | | 9/18/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/16/23 | 148 | 149 | 116 | 15:37 | JOSE RODRIGUEZ | 614 | 12 | 825 | | | 9/18/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/16/23 | 149 | 150 | 147 | 15:18 | EDUARDO DEL VALLE | 616 | 12 | 825 | | | 9/27/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/16/23 | 150 | 151 | 179 | 14:52 | EDUARDO DEL VALLE | 616 | 12 | 825 | | | 9/27/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/16/23 | 151 | 152 | 214 | 14:39 | JOSE RODRIGUEZ | 614 | 12 | 825 | | | 9/27/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/16/23 | 152 | 153 | 245 | 14:15 | EDUARDO DEL VALLE | 616 | 12 | 825 | | | 9/27/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/18/23 | 153 | 154 | 282 | 9:01 | EDUARDO DEL VALLE | 964 | 11 | 825 | | | 9/27/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/18/23 | 154 | 155 | 283 | 9:42 | EDUARDO DEL VALLE | 964 | 11 | 825 | | | 9/27/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/18/23 | 155 | 156 | 160 | 10:45 | EDUARDO DEL VALLE | 964 | 11 | 825 | | | 9/27/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/18/23 | 156 | 158 | 124 | 10:55 | JOSE RODRIGUEZ | 614 | 11 | 825 | | | 9/27/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/18/23 | 158 | 159 | 289 | 11:28 | EDUARDO DEL VALLE | 964 | 11 | 825 | | | 9/27/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/18/23 | 159 | 160 | 160 | 11:48 | JOSE RODRIGUEZ | 614 | 11 | 825 | | | 9/27/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/18/23 | 160 | 161 | 120 | 14:07 | EDUARDO DEL VALLE | 614 | 11 | 825 | | | 9/27/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/18/23 | 160 | 162 | 160 | 13:55 | EDUARDO DEL VALLE | 964 | 12 | 825 | | | 9/27/23 | Air Test | 30 | 5 | 30 | | Pass |

# ECApplications
## Seam Control Form

**Project Name:** Minnkota Power Cooperative, Inc. **Job #** 233013 **Superintendent:** Octavio Rivas

**Material Type:** 60 Mil HDPE SS Textured / Smooth Liner **Primary** X **Pond** -

**Job Description:** Celll 5 Phase 1B **Secondary** **Cell** X

**Reported By** Daniel Martinez **Pad** -

**Air Pressure Test** 30 PSI

**Air Pressure Hold Time** 5 Minutes

**Allowable Air Pressure Loss** 2 PSI

**62,571** **Total LF of Welding to Date Combined** **Extrusion LF Weld Total To Date** **2,075** **Fusion LF Weld Total To Date** **60,496**

| Weld Date | Seam Number | | Seam Length | Weld Time | Operator Name / ID | Mach Number | Mach Speed | Mach Temp | Preheat Temp | Ambient Temp | Test Date | Test Type | PSI IN | Time (Mins) | PSI OUT | PSI Loss | Test Results |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9/18/23 | 162 | 163 | 295 | 14:21 | JOSE RODRIGUEZ | 614 | 12 | 825 | | | 9/27/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/18/23 | 163 | 164 | 130 | 14:50 | EDUARDO DEL VALLE | 964 | 12 | 825 | | | 9/27/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/18/23 | 164 | 166 | 130 | 15:15 | JOSE RODRIGUEZ | 614 | 12 | 825 | | | 9/27/23 | Air Test | 30 | 5 | 29 | 1 | Pass |
| 9/18/23 | 166 | 167 | 301 | 15:35 | EDUARDO DEL VALLE | 964 | 12 | 825 | | | 9/27/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/18/23 | 167 | 168 | 149 | 16:08 | JOSE RODRIGUEZ | 614 | 12 | 825 | | | 9/27/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/18/23 | 157 | 158 | 148 | 11:09 | JOSE RODRIGUEZ | 614 | 11 | 825 | | | 9/27/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/18/23 | 155 | 157 | 160 | 10:58 | EDUARDO DEL VALLE | 964 | 11 | 825 | | | 9/27/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/18/23 | 159 | 161 | 145 | 12:00 | JOSE RODRIGUEZ | 614 | 11 | 825 | | | 9/27/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/18/23 | 163 | 165 | 160 | 15:03 | EDUARDO DEL VALLE | 964 | 12 | 825 | | | 9/27/23 | Air Test | 30 | 5 | 29 | 1 | Pass |
| 9/18/23 | 165 | 166 | 160 | 15:38 | JOSE RODRIGUEZ | 614 | 11 | 825 | | | 9/27/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/18/23 | 167 | 169 | 159 | 16:25 | JOSE RODRIGUEZ | 614 | 11 | 825 | | | 9/27/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/18/23 | 156 | 157 | 23.5 | 10:37 | EDUARDO DEL VALLE | 964 | 11 | 825 | | | 9/27/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/18/23 | 160 | 161 | 23.5 | 11:40 | JOSE RODRIGUEZ | 614 | 11 | 825 | | | 9/27/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/18/23 | 168 | 169 | 23.5 | 15:54 | EDUARDO DEL VALLE | 614 | 11 | 825 | | | 9/27/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/18/23 | 164 | 165 | 23.5 | 14:39 | EDUARDO DEL VALLE | 964 | 12 | 825 | | | 9/27/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/18/23 | 143 | 146 | 31 | 9:24 | JOSE RODRIGUEZ | 614 | 10 | 825 | | | 9/27/23 | Air Test | 30 | 5 | 30 | | Pass |

# ECApplications
# Seam Control Form

**Project Name:** Minnkota Power Cooperative, Inc. **Job #** 233013 **Superintendent:** Octavio Rivas

**Material Type:** 60 Mil HDPE SS Textured / Smooth Liner **Primary** X **Pond** - **Air Pressure Test** 30 PSI

**Job Description:** Celll 5 Phase 1B **Secondary** **Cell** X **Air Pressure Hold Time** 5 Minutes

**Reported By** Daniel Martinez **Pad** - **Allowable Air Pressure Loss** 2 PSI

**62,571** **Total LF of Welding to Date Combined** **Extrusion LF Weld Total To Date** **2,075** **Fusion LF Weld Total To Date** **60,496**

| Weld Date | Seam Number | | Seam Length | Weld Time | Operator Name / ID | Mach Number | Mach Speed | Mach Temp | Preheat Temp | Ambient Temp | Test Date | Test Type | PSI IN | Time (Mins) | PSI OUT | PSI Loss | Test Results |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9/18/23 | 143 | 147 | 9 | 9:34 | JOSE RODRIGUEZ | 614 | 10 | 825 | | | 9/27/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/18/23 | 142 | 147 | 20 | 9:36 | JOSE RODRIGUEZ | 614 | 10 | 825 | | | 9/27/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/18/23 | 141 | 147 | 20 | 9:38 | JOSE RODRIGUEZ | 614 | 10 | 825 | | | 9/27/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/18/23 | 140 | 148 | 28 | 10:06 | JOSE RODRIGUEZ | 614 | 10 | 825 | | | 9/27/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/18/23 | 141 | 148 | 22 | 10:04 | JOSE RODRIGUEZ | 614 | 10 | 825 | | | 9/27/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/18/23 | 149 | 139 | 29 | 10:08 | JOSE RODRIGUEZ | 614 | 10 | 825 | | | 9/27/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/18/23 | 149 | 140 | 13 | 10:10 | JOSE RODRIGUEZ | 614 | 10 | 825 | | | 9/27/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/18/23 | 150 | 138 | 17 | 10:12 | JOSE RODRIGUEZ | 614 | 10 | 825 | | | 9/18/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/18/23 | 150 | 137 | 27 | 10:14 | JOSE RODRIGUEZ | 614 | 10 | 825 | | | 9/18/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/18/23 | 151 | 137 | 7 | 10:18 | JOSE RODRIGUEZ | 614 | 10 | 825 | | | 9/18/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/18/23 | 151 | 136 | 30 | 10:24 | JOSE RODRIGUEZ | 614 | 10 | 825 | | | 9/18/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/18/23 | 152 | 136 | 5 | 10:26 | JOSE RODRIGUEZ | 614 | 10 | 825 | | | 9/18/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/18/23 | 152 | 135 | 25 | 10:28 | JOSE RODRIGUEZ | 614 | 10 | 825 | | | 9/18/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/18/23 | 152 | 134 | 16 | 10:30 | JOSE RODRIGUEZ | 614 | 10 | 825 | | | 9/18/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/18/23 | 153 | 134 | 15 | 10:33 | JOSE RODRIGUEZ | 614 | 10 | 825 | | | 9/18/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/18/23 | 153 | 133 | 30 | 10:34 | JOSE RODRIGUEZ | 614 | 10 | 825 | | | 9/18/23 | Air Test | 30 | 5 | 30 | | Pass |

# ECApplications
# Seam Control Form

**Project Name:** Minnkota Power Cooperative, Inc. **Job #** 233013 **Superintendent:** Octavio Rivas

**Material Type:** 60 Mil HDPE SS Textured / Smooth Liner **Primary** X **Pond** - **Air Pressure Test** 30 PSI

**Job Description:** Celll 5 Phase 1B **Secondary** **Cell** X **Air Pressure Hold Time** 5 Minutes

**Reported By** Daniel Martinez **Pad** - **Allowable Air Pressure Loss** 2 PSI

**62,571** **Total LF of Welding to Date Combined** **Extrusion LF Weld Total To Date** **2,075** **Fusion LF Weld Total To Date** **60,496**

| Weld Date | Seam Number | | Seam Length | Weld Time | Operator Name / ID | Mach Number | Mach Speed | Mach Temp | Preheat Temp | Ambient Temp | Test Date | Test Type | PSI IN | Time (Mins) | PSI OUT | PSI Loss | Test Results |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9/18/23 | 131 | 133 | 42 | 8:20 | EDUARDO DEL VALLE | 964 | 11 | 825 | | | 9/26/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/19/20 | 144 | 146 | 17 | 11:03 | JOSE RODRIGUEZ | 614 | 10 | 825 | | | 9/20/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/19/20 | 170 | 171 | 12 | 11:26 | EDUARDO DEL VALLE | 964 | 12 | 825 | | | 9/20/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/19/20 | 171 | 172 | 35 | 11:14 | EDUARDO DEL VALLE | 964 | 12 | 825 | | | 9/20/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/19/20 | 172 | 173 | 56 | 11:05 | JOSE RODRIGUEZ | 614 | 11 | 825 | | | 9/20/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/19/20 | 173 | 174 | 85 | 10:41 | EDUARDO DEL VALLE | 964 | 12 | 825 | | | 9/20/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/19/20 | 174 | 175 | 109 | 10:35 | JOSE RODRIGUEZ | 614 | 11 | 825 | | | 9/20/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/19/20 | 175 | 176 | 133 | 10:09 | EDUARDO DEL VALLE | 964 | 12 | 825 | | | 9/20/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/19/20 | 176 | 177 | 157 | 10:02 | JOSE RODRIGUEZ | 614 | 11 | 825 | | | 9/20/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/19/20 | 177 | 178 | 183 | 9:43 | EDUARDO DEL VALLE | 964 | 12 | 825 | | | 9/20/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/19/20 | 178 | 179 | 192 | 9:26 | JOSE RODRIGUEZ | 614 | 11 | 825 | | | 9/20/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/19/20 | 179 | 180 | 203 | 13:34 | EDUARDO DEL VALLE | 964 | 12 | 825 | | | 9/20/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/19/20 | 180 | 181 | 213 | 14:03 | JOSE RODRIGUEZ | 614 | 11 | 825 | | | 9/20/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/19/20 | 181 | 182 | 223 | 14:32 | EDUARDO DEL VALLE | 964 | 12 | 825 | | | 9/20/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/12/23 | 44 | 55 | 23.5 | 18:12 | JOSE RODRIGUEZ | 614 | 12 | 800 | | | 9/12/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/12/23 | 44 | 56 | 23.5 | 18:08 | JOSE RODRIGUEZ | 614 | 12 | 800 | | | 9/12/23 | Air Test | 30 | 5 | 30 | | Pass |

# ECApplications
# Seam Control Form

**Project Name:** Minnkota Power Cooperative, Inc. **Job #** 233013 **Superintendent:** Octavio Rivas

**Material Type:** 60 Mil HDPE SS Textured / Smooth Liner **Primary** X **Pond** - **Air Pressure Test** 30 PSI

**Job Description:** Celll 5 Phase 1B **Secondary** **Cell** X **Air Pressure Hold Time** 5 Minutes

**Reported By** Daniel Martinez **Pad** - **Allowable Air Pressure Loss** 2 PSI

**62,571** **Total LF of Welding to Date Combined** **Extrusion LF Weld Total To Date** **2,075** **Fusion LF Weld Total To Date** **60,496**

| Weld Date | Seam Number | | Seam Length | Weld Time | Operator Name / ID | Mach Number | Mach Speed | Mach Temp | Preheat Temp | Ambient Temp | Test Date | Test Type | PSI IN | Time (Mins) | PSI OUT | PSI Loss | Test Results |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9/12/23 | 44 | 57 | 23.5 | 18:06 | JOSE RODRIGUEZ | 614 | 12 | 800 | | | 9/12/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/12/23 | 44 | 58 | 23.5 | 18:04 | JOSE RODRIGUEZ | 614 | 12 | 800 | | | 9/12/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/12/23 | 44 | 59 | 23.5 | 18:02 | JOSE RODRIGUEZ | 614 | 12 | 800 | | | 9/12/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/12/23 | 44 | 61 | 23.5 | 18:00 | JOSE RODRIGUEZ | 614 | 12 | 800 | | | 9/12/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/12/23 | 44 | 63 | 23.5 | 17:52 | JOSE RODRIGUEZ | 614 | 12 | 800 | | | 9/12/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/12/23 | 44 | 65 | 23.5 | 17:50 | JOSE RODRIGUEZ | 614 | 12 | 800 | | | 9/12/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/12/23 | 44 | 67 | 23.5 | 17:48 | JOSE RODRIGUEZ | 614 | 12 | 800 | | | 9/12/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/12/23 | 44 | 68 | 23.5 | 17:46 | JOSE RODRIGUEZ | 614 | 12 | 800 | | | 9/12/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/12/23 | 44 | 69 | 23.5 | 17:44 | JOSE RODRIGUEZ | 614 | 12 | 800 | | | 9/12/23 | Air Test | 30 | 5 | 29 | 1 | Pass |
| 9/12/23 | 44 | 70 | 23.5 | 17:42 | JOSE RODRIGUEZ | 614 | 12 | 800 | | | 9/12/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/12/23 | 44 | 71 | 23.5 | 17:40 | JOSE RODRIGUEZ | 614 | 12 | 800 | | | 9/12/23 | Air Test | 30 | 5 | 29 | 1 | Pass |
| 9/12/23 | 44 | 72 | 23.5 | 17:35 | JOSE RODRIGUEZ | 614 | 12 | 800 | | | 9/12/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/12/23 | 44 | 73 | 23.5 | 17:13 | JOSE RODRIGUEZ | 614 | 12 | 800 | | | 9/12/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/12/23 | 44 | 75 | 23.5 | 17:10 | JOSE RODRIGUEZ | 614 | 12 | 800 | | | 9/12/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/12/23 | 44 | 77 | 23.5 | 16:43 | JOSE RODRIGUEZ | 614 | 12 | 800 | | | 9/12/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/12/23 | 44 | 79 | 23.5 | 16:36 | JOSE RODRIGUEZ | 614 | 12 | 800 | | | 9/12/23 | Air Test | 30 | 5 | 30 | | Pass |

# ECApplications
# Seam Control Form

**Project Name:** Minnkota Power Cooperative, Inc. **Job #** 233013 **Superintendent:** Octavio Rivas

**Material Type:** 60 Mil HDPE SS Textured / Smooth Liner **Primary** X **Pond** - **Air Pressure Test** 30 PSI

**Job Description:** Celll 5 Phase 1B **Secondary** **Cell** X **Air Pressure Hold Time** 5 Minutes

**Reported By** Daniel Martinez **Pad** - **Allowable Air Pressure Loss** 2 PSI

**62,571** **Total LF of Welding to Date Combined** **Extrusion LF Weld Total To Date** **2,075** **Fusion LF Weld Total To Date** **60,496**

| Weld Date | Seam Number | | Seam Length | Weld Time | Operator Name / ID | Mach Number | Mach Speed | Mach Temp | Preheat Temp | Ambient Temp | Test Date | Test Type | PSI IN | Time (Mins) | PSI OUT | PSI Loss | Test Results |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9/12/23 | 44 | 81 | 23.5 | 16:32 | JOSE RODRIGUEZ | 614 | 12 | 800 | | | 9/12/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/12/23 | 44 | 83 | 12 | 16:34 | JOSE RODRIGUEZ | 614 | 12 | 800 | | | 9/12/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/20/23 | 54 | 182 | 23.5 | 10:50 | GONZALO SUAREZ | 715 | | 512 | 802 | | 9/20/23 | Vacuum | | | | | Pass |
| 9/20/23 | 289 | 290 | 190 | 14:00 | GUILLERMO BENITEZ | 716 | | 513 | 803 | | 9/20/23 | Vacuum | | | | | Pass |
| 9/20/23 | 179 | 54 | 23.5 | 14:18 | GONZALO SUAREZ | 717 | | 514 | 804 | | 9/20/23 | Vacuum | | | | | Pass |
| 9/21/23 | 188 | 83 | 11 | 17:28 | EDUARDO DEL VALLE | 964 | 12 | 825 | | | 9/26/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/21/23 | 188 | 85 | 23.5 | 17:32 | EDUARDO DEL VALLE | 964 | 12 | 825 | | | 9/26/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/21/23 | 188 | 86 | 23.5 | 17:34 | EDUARDO DEL VALLE | 964 | 12 | 825 | | | 9/26/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/21/23 | 188 | 87 | 23.5 | 17:35 | EDUARDO DEL VALLE | 964 | 12 | 825 | | | 9/26/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/21/23 | 188 | 89 | 23.5 | 17:37 | EDUARDO DEL VALLE | 964 | 12 | 825 | | | 9/26/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/21/23 | 189 | 90 | 23.5 | 17:40 | EDUARDO DEL VALLE | 964 | 12 | 825 | | | 9/26/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/21/23 | 189 | 91 | 23.5 | 17:42 | EDUARDO DEL VALLE | 964 | 12 | 825 | | | 9/26/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/21/23 | 189 | 93 | 23.5 | 17:44 | EDUARDO DEL VALLE | 964 | 12 | 825 | | | 9/26/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/21/23 | 189 | 95 | 23.5 | 17:47 | EDUARDO DEL VALLE | 964 | 12 | 825 | | | 9/26/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/21/23 | 189 | 96 | 23.5 | 17:49 | EDUARDO DEL VALLE | 964 | 12 | 825 | | | 9/26/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/21/23 | 183 | 184 | 540 | 11:12 | EDUARDO DEL VALLE | 964 | 12 | 825 | | | 9/26/23 | Air Test | 30 | 5 | 30 | | Pass |

# ECApplications
# Seam Control Form

**Project Name:** Minnkota Power Cooperative, Inc. **Job #** 233013 **Superintendent:** Octavio Rivas

**Material Type:** 60 Mil HDPE SS Textured / Smooth Liner **Primary** X **Pond** - **Air Pressure Test** 30 PSI

**Job Description:** Celll 5 Phase 1B **Secondary** **Cell** X **Air Pressure Hold Time** 5 Minutes

**Reported By** Daniel Martinez **Pad** - **Allowable Air Pressure Loss** 2 PSI

**62,571** **Total LF of Welding to Date Combined** **Extrusion LF Weld Total To Date** **2,075** **Fusion LF Weld Total To Date** **60,496**

| Weld Date | Seam Number | | Seam Length | Weld Time | Operator Name / ID | Mach Number | Mach Speed | Mach Temp | Preheat Temp | Ambient Temp | Test Date | Test Type | PSI IN | Time (Mins) | PSI OUT | PSI Loss | Test Results |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9/21/23 | 184 | 185 | 540 | 11:48 | JOSE RODRIGUEZ | 614 | 12 | 825 | | | 9/26/23 | Air Test | 30 | 5 | 29 | 1 | Pass |
| 9/21/23 | 185 | 186 | 540 | 14:21 | EDUARDO DEL VALLE | 964 | 11 | 825 | | | 9/26/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/21/23 | 186 | 187 | 540 | 14:53 | JOSE RODRIGUEZ | 614 | 12 | 825 | | | 9/26/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/21/23 | 44 | 188 | 16 | 17:42 | JOSE RODRIGUEZ | 614 | 12 | 825 | | | 9/26/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/21/23 | 44 | 183 | 8 | 17:41 | JOSE RODRIGUEZ | 614 | 12 | 825 | | | 9/26/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/21/23 | 45 | 183 | 16 | 17:40 | JOSE RODRIGUEZ | 614 | 12 | 825 | | | 9/26/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/21/23 | 45 | 184 | 8 | 17:39 | JOSE RODRIGUEZ | 614 | 12 | 825 | | | 9/26/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/21/23 | 46 | 184 | 16 | 17:38 | JOSE RODRIGUEZ | 614 | 12 | 825 | | | 9/26/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/21/23 | 46 | 185 | 8 | 17:37 | JOSE RODRIGUEZ | 614 | 12 | 825 | | | 9/26/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/21/23 | 47 | 185 | 16 | 17:36 | JOSE RODRIGUEZ | 614 | 12 | 825 | | | 9/26/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/21/23 | 47 | 186 | 8 | 18:11 | JOSE RODRIGUEZ | 614 | 12 | 825 | | | 9/26/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/21/23 | 48 | 186 | 8 | 18:07 | JOSE RODRIGUEZ | 614 | 12 | 825 | | | 9/26/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/21/23 | 48 | 187 | 16 | 18:06 | JOSE RODRIGUEZ | 614 | 12 | 825 | | | 9/26/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/21/23 | 49 | 187 | 8 | 13:56 | JOSE RODRIGUEZ | 614 | 12 | 825 | | | 9/26/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/21/23 | 189 | 97 | 23.5 | 16:32 | JOSE RODRIGUEZ | 614 | 12 | 850 | | | 9/26/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/21/23 | 189 | 99 | 8.5 | 16:17 | JOSE RODRIGUEZ | 614 | 12 | 850 | | | 9/26/23 | Air Test | 30 | 5 | 30 | | Pass |

# ECApplications
# Seam Control Form

**Project Name:** Minnkota Power Cooperative, Inc. **Job #** 233013 **Superintendent:** Octavio Rivas

**Material Type:** 60 Mil HDPE SS Textured / Smooth Liner **Primary** X **Pond** - **Air Pressure Test** 30 PSI

**Job Description:** Celll 5 Phase 1B **Secondary** **Cell** X **Air Pressure Hold Time** 5 Minutes

**Reported By** Daniel Martinez **Pad** - **Allowable Air Pressure Loss** 2 PSI

**62,571** **Total LF of Welding to Date Combined** **Extrusion LF Weld Total To Date** **2,075** **Fusion LF Weld Total To Date** **60,496**

| Weld Date | Seam Number | | Seam Length | Weld Time | Operator Name / ID | Mach Number | Mach Speed | Mach Temp | Preheat Temp | Ambient Temp | Test Date | Test Type | PSI IN | Time (Mins) | PSI OUT | PSI Loss | Test Results |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9/22/23 | 49 | 190 | 16 | 13:54 | EDUARDO DEL VALLE | 964 | 11 | 825 | | | 9/26/23 | Air Test | 30 | 5 | 28 | 2 | Pass |
| 9/22/23 | 50 | 190 | 8 | 13:53 | EDUARDO DEL VALLE | 964 | 11 | 825 | | | 9/26/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/22/23 | 50 | 191 | 16 | 13:52 | EDUARDO DEL VALLE | 964 | 11 | 825 | | | 9/26/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/22/23 | 51 | 191 | 16 | 13:51 | EDUARDO DEL VALLE | 964 | 11 | 825 | | | 9/26/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/22/23 | 51 | 192 | 8 | 13:50 | EDUARDO DEL VALLE | 964 | 11 | 825 | | | 9/26/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/22/23 | 52 | 192 | 16 | 13:49 | EDUARDO DEL VALLE | 964 | 11 | 825 | | | 9/26/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/22/23 | 52 | 193 | 8 | 13:48 | EDUARDO DEL VALLE | 964 | 11 | 825 | | | 9/26/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/22/23 | 53 | 193 | 16 | 13:25 | EDUARDO DEL VALLE | 964 | 11 | 825 | | | 9/26/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/22/23 | 187 | 190 | 540 | 9:00 | EDUARDO DEL VALLE | 964 | 11 | 825 | | | 9/26/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/22/23 | 190 | 191 | 541 | 9:28 | JOSE RODRIGUEZ | 614 | 11 | 825 | | | 9/26/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/22/23 | 191 | 192 | 542 | 10:25 | EDUARDO DEL VALLE | 964 | 11 | 825 | | | 9/26/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/22/23 | 192 | 193 | 543 | 10:56 | JOSE RODRIGUEZ | 614 | 11 | 825 | | | 9/26/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/21/23 | 97 | 188 | 23.5 | 16:22 | EDUARDO DEL VALLE | 964 | 11 | 825 | | | 9/26/23 | Air Test | 30 | 5 | 29 | 1 | Pass |
| 9/21/23 | 99 | 183 | 23.5 | 16:17 | EDUARDO DEL VALLE | 964 | 11 | 825 | | | 9/26/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/21/23 | 101 | 183 | 23.5 | 16:15 | EDUARDO DEL VALLE | 964 | 11 | 825 | | | 9/26/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/21/23 | 102 | 183 | 23.5 | 16:13 | EDUARDO DEL VALLE | 964 | 11 | 825 | | | 9/26/23 | Air Test | 30 | 5 | 30 | | Pass |

# ECApplications
# Seam Control Form

**Project Name:** Minnkota Power Cooperative, Inc. **Job #** 233013 **Superintendent:** Octavio Rivas

**Material Type:** 60 Mil HDPE SS Textured / Smooth Liner **Primary** X **Pond** - **Air Pressure Test** 30 PSI

**Job Description:** Celll 5 Phase 1B **Secondary** **Cell** X **Air Pressure Hold Time** 5 Minutes

**Reported By** Daniel Martinez **Pad** - **Allowable Air Pressure Loss** 2 PSI

**62,571** **Total LF of Welding to Date Combined** **Extrusion LF Weld Total To Date** **2,075** **Fusion LF Weld Total To Date** **60,496**

| Weld Date | Seam Number | | Seam Length | Weld Time | Operator Name / ID | Mach Number | Mach Speed | Mach Temp | Preheat Temp | Ambient Temp | Test Date | Test Type | PSI IN | Time (Mins) | PSI OUT | PSI Loss | Test Results |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9/21/23 | 103 | 183 | 23.5 | 16:11 | EDUARDO DEL VALLE | 964 | 11 | 825 | | | 9/26/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/21/23 | 105 | 183 | 23.5 | 16:08 | EDUARDO DEL VALLE | 964 | 11 | 825 | | | 9/26/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/21/23 | 107 | 183 | 23.5 | 16:06 | EDUARDO DEL VALLE | 964 | 11 | 825 | | | 9/26/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/21/23 | 108 | 183 | 23.5 | 16:04 | EDUARDO DEL VALLE | 964 | 11 | 825 | | | 9/26/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/21/23 | 109 | 183 | 23.5 | 16:02 | EDUARDO DEL VALLE | 964 | 11 | 825 | | | 9/26/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/21/23 | 111 | 183 | 23.5 | 15:59 | EDUARDO DEL VALLE | 964 | 11 | 825 | | | 9/26/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/21/23 | 112 | 183 | 23.5 | 15:57 | EDUARDO DEL VALLE | 964 | 11 | 825 | | | 9/26/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/21/23 | 113 | 183 | 23.5 | 15:54 | EDUARDO DEL VALLE | 964 | 11 | 825 | | | 9/26/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/21/23 | 115 | 183 | 23.5 | 15:53 | EDUARDO DEL VALLE | 964 | 11 | 825 | | | 9/26/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/21/23 | 188 | 183 | 118 | 17:28 | JOSE RODRIGUEZ | 614 | 12 | 825 | | | 9/26/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/21/23 | 188 | 189 | 23.5 | 16:15 | JOSE RODRIGUEZ | 614 | 12 | 825 | | | 9/26/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/21/23 | 183 | 189 | 115 | 16:21 | JOSE RODRIGUEZ | 614 | 12 | 825 | | | 9/26/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/30/23 | 194 | 195 | 270 | 9:53 | EDUARDO DEL VALLE | 964 | 11 | 830 | | | 9/30/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/30/23 | 195 | 196 | 270 | 10:05 | JOSE RODRIGUEZ | 614 | 11 | 830 | | | 9/30/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/30/23 | 196 | 197 | 255 | 10:48 | EDUARDO DEL VALLE | 964 | 11 | 830 | | | 9/30/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/30/23 | 197 | 198 | 240 | 11:10 | JOSE RODRIGUEZ | 614 | 11 | 830 | | | 9/30/23 | Air Test | 30 | 5 | 30 | | Pass |

# ECApplications
# Seam Control Form

**Project Name:** Minnkota Power Cooperative, Inc. **Job #** 233013 **Superintendent:** Octavio Rivas

**Material Type:** 60 Mil HDPE SS Textured / Smooth Liner **Primary** X **Pond** - **Air Pressure Test** 30 PSI

**Job Description:** Celll 5 Phase 1B **Secondary** **Cell** X **Air Pressure Hold Time** 5 Minutes

**Reported By** Daniel Martinez **Pad** - **Allowable Air Pressure Loss** 2 PSI

**62,571** **Total LF of Welding to Date Combined** **Extrusion LF Weld Total To Date** **2,075** **Fusion LF Weld Total To Date** **60,496**

| Weld Date | Seam Number | | Seam Length | Weld Time | Operator Name / ID | Mach Number | Mach Speed | Mach Temp | Preheat Temp | Ambient Temp | Test Date | Test Type | PSI IN | Time (Mins) | PSI OUT | PSI Loss | Test Results |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9/30/23 | 198 | 199 | 251 | 11:33 | EDUARDO DEL VALLE | 964 | 11 | 830 | | | 9/30/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/30/23 | 199 | 200 | 251 | 13:52 | EDUARDO DEL VALLE | 964 | 11 | 830 | | | 9/30/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/30/23 | 200 | 201 | 262 | 14:04 | JOSE RODRIGUEZ | 614 | 11 | 830 | | | 9/30/23 | Air Test | 30 | 5 | 29 | 1 | Pass |
| 9/30/23 | 201 | 202 | 262 | 14:25 | EDUARDO DEL VALLE | 964 | 11 | 830 | | | 9/30/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/30/23 | 196 | 203 | 14 | 15:17 | EDUARDO DEL VALLE | 964 | 11 | 830 | | | 9/30/23 | Air Test | 30 | 5 | 29 | 1 | Pass |
| 9/30/23 | 197 | 203 | 23.5 | 15:10 | EDUARDO DEL VALLE | 964 | 11 | 830 | | | 9/30/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/30/23 | 198 | 203 | 14 | 15:22 | EDUARDO DEL VALLE | 964 | 11 | 830 | | | 9/30/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/30/23 | 198 | 204 | 30 | 15:41 | EDUARDO DEL VALLE | 964 | 11 | 830 | | | 9/30/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/30/23 | 199 | 204 | 23.5 | 15:33 | EDUARDO DEL VALLE | 964 | 11 | 830 | | | 9/30/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/30/23 | 200 | 204 | 30 | 15:44 | EDUARDO DEL VALLE | 964 | 11 | 830 | | | 9/30/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/30/23 | 200 | 205 | 12 | 15:56 | EDUARDO DEL VALLE | 964 | 11 | 830 | | | 9/30/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/30/23 | 201 | 205 | 23.5 | 16:22 | EDUARDO DEL VALLE | 964 | 11 | 830 | | | 9/30/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/30/23 | 202 | 205 | 12 | 16:02 | EDUARDO DEL VALLE | 964 | 11 | 830 | | | 9/30/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/30/23 | 194 | 206 | 7 | 16:24 | EDUARDO DEL VALLE | 964 | 11 | 830 | | | 9/30/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/30/23 | 195 | 206 | 23.5 | 16:08 | EDUARDO DEL VALLE | 964 | 11 | 830 | | | 9/30/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/30/23 | 196 | 206 | 7 | 16:14 | EDUARDO DEL VALLE | 964 | 11 | 830 | | | 9/30/23 | Air Test | 30 | 5 | 30 | | Pass |

# ECApplications
# Seam Control Form

**Project Name:** Minnkota Power Cooperative, Inc. **Job #** 233013 **Superintendent:** Octavio Rivas

**Material Type:** 60 Mil HDPE SS Textured / Smooth Liner **Primary** X **Pond** - **Air Pressure Test** 30 PSI

**Job Description:** Celll 5 Phase 1B **Secondary** **Cell** X **Air Pressure Hold Time** 5 Minutes

**Reported By** Daniel Martinez **Pad** - **Allowable Air Pressure Loss** 2 PSI

**62,571** **Total LF of Welding to Date Combined** **Extrusion LF Weld Total To Date** **2,075** **Fusion LF Weld Total To Date** **60,496**

| Weld Date | Seam Number | | Seam Length | Weld Time | Operator Name / ID | Mach Number | Mach Speed | Mach Temp | Preheat Temp | Ambient Temp | Test Date | Test Type | PSI IN | Time (Mins) | PSI OUT | PSI Loss | Test Results |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9/30/23 | 183 | 194 | 23.5 | 16:47 | GONZALO SUAREZ | 713 | | 510 | 800 | | 10/2/23 | Vacuum | | | | | Pass |
| 9/30/23 | 206 | 184 | 23.5 | 16:55 | GONZALO SUAREZ | 713 | | 510 | 800 | | 10/2/23 | Vacuum | | | | | Pass |
| 9/30/23 | 185 | 196 | 23.5 | 17:03 | GONZALO SUAREZ | 713 | | 510 | 800 | | 10/2/23 | Vacuum | | | | | Pass |
| 9/30/23 | 186 | 197 | 23.5 | 18:23 | GONZALO SUAREZ | 713 | | 510 | 800 | | 10/2/23 | Vacuum | | | | | Pass |
| 9/30/23 | 187 | 198 | 23.5 | 18:32 | GONZALO SUAREZ | 713 | | 510 | 800 | | 10/2/23 | Vacuum | | | | | Pass |
| 9/30/23 | 190 | 199 | 23.5 | 18:41 | BRANDON GOULD | 535 | | 485 | 475 | | 10/2/23 | Vacuum | | | | | Pass |
| 9/30/23 | 191 | 200 | 23.5 | 18:30 | BRANDON GOULD | 535 | | 485 | 475 | | 10/2/23 | Vacuum | | | | | Pass |
| 9/30/23 | 192 | 201 | 23.5 | 18:10 | BRANDON GOULD | 535 | | 485 | 475 | | 10/2/23 | Vacuum | | | | | Pass |
| 9/30/23 | 193 | 202 | 23.5 | 17:55 | BRANDON GOULD | 535 | | 485 | 475 | | 10/2/23 | Vacuum | | | | | Pass |
| 9/19/23 | 171 | 43 | 34 | 15:54 | JOSE RODRIGUEZ | 614 | 10 | 825 | | | 9/20/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/19/23 | 172 | 43 | 35 | 15:56 | JOSE RODRIGUEZ | 614 | 10 | 825 | | | 9/20/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/19/23 | 173 | 43 | 35 | 16:08 | JOSE RODRIGUEZ | 614 | 10 | 825 | | | 9/20/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/19/23 | 174 | 43 | 35 | 16:12 | JOSE RODRIGUEZ | 614 | 10 | 825 | | | 9/20/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/19/23 | 175 | 43 | 35 | 15:15 | JOSE RODRIGUEZ | 614 | 10 | 825 | | | 9/20/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/19/23 | 176 | 43 | 35 | 16:19 | JOSE RODRIGUEZ | 614 | 10 | 825 | | | 9/20/23 | Air Test | 30 | 5 | 30 | | Pass |
| 9/19/23 | 177 | 43 | 35 | 16:33 | JOSE RODRIGUEZ | 614 | 10 | 825 | | | 9/20/23 | Air Test | 30 | 5 | 30 | | Pass |

# ECApplications
# Seam Control Form

**Project Name:** Minnkota Power Cooperative, Inc. **Job #** 233013 **Superintendent:** Octavio Rivas

**Material Type:** 60 Mil HDPE SS Textured / Smooth Liner **Primary** X **Pond** -

**Job Description:** Celll 5 Phase 1B **Secondary** **Cell** X

**Reported By** Daniel Martinez **Pad** -

**Air Pressure Test** 30 PSI

**Air Pressure Hold Time** 5 Minutes

**Allowable Air Pressure Loss** 2 PSI

**62,571** **Total LF of Welding to Date Combined** **Extrusion LF Weld Total To Date** **2,075** **Fusion LF Weld Total To Date** **60,496**

| Weld Date | Seam Number | | Seam Length | Weld Time | Operator Name / ID | Mach Number | Mach Speed | Mach Temp | Preheat Temp | Ambient Temp | Test Date | Test Type | PSI IN | Time (Mins) | PSI OUT | PSI Loss | Test Results |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9/20/23 | 178 | 43 | 35 | 14:40 | GONZALO SUAREZ | 713 | | 510 | 700 | | 9/20/23 | Vacuum | | | | | Pass |
| 9/20/23 | 179 | 43 | 37 | 14:18 | GONZALO SUAREZ | 713 | | 510 | 700 | | 9/20/23 | Vacuum | | | | | Pass |
| 9/20/23 | 180 | 54 | 28 | 14:00 | GONZALO SUAREZ | 713 | | 510 | 700 | | 9/20/23 | Vacuum | | | | | Pass |
| 9/20/23 | 181 | 54 | 32 | 11:10 | GONZALO SUAREZ | 713 | | 510 | 700 | | 9/20/23 | Vacuum | | | | | Pass |
| 9/20/23 | 182 | 54 | 36 | 10:50 | GONZALO SUAREZ | 713 | | 510 | 700 | | 9/20/23 | Vacuum | | | | | Pass |
| 10/4/23 | 117 | 194 | 23.5 | 10:40 | GONZALO SUAREZ | 713 | | 510 | 800 | | 10/4/23 | Vacuum | | | | | Pass |
| 10/4/23 | 118 | 194 | 23.5 | 10:31 | GONZALO SUAREZ | 713 | | 510 | 800 | | 10/4/23 | Vacuum | | | | | Pass |
| 10/2/23 | 119 | 194 | 23.5 | 14:02 | GONZALO SUAREZ | 713 | | 510 | 800 | | 10/4/23 | Vacuum | | | | | Pass |
| 10/2/23 | 121 | 194 | 23.5 | 13:50 | GONZALO SUAREZ | 713 | | 510 | 800 | | 10/4/23 | Vacuum | | | | | Pass |
| 10/2/23 | 123 | 194 | 23.5 | 13:38 | GONZALO SUAREZ | 713 | | 510 | 800 | | 10/4/23 | Vacuum | | | | | Pass |
| 10/2/23 | 124 | 194 | 23.5 | 11:53 | GONZALO SUAREZ | 713 | | 510 | 800 | | 10/4/23 | Vacuum | | | | | Pass |
| 10/2/23 | 125 | 194 | 23.5 | 11:38 | GONZALO SUAREZ | 713 | | 510 | 800 | | 10/4/23 | Vacuum | | | | | Pass |
| 10/2/23 | 127 | 194 | 23.5 | 11:21 | GONZALO SUAREZ | 713 | | 510 | 800 | | 10/4/23 | Vacuum | | | | | Pass |
| 10/2/23 | 129 | 194 | 23.5 | 10:58 | GONZALO SUAREZ | 713 | | 510 | 800 | | 10/4/23 | Vacuum | | | | | Pass |
| 10/2/23 | 130 | 194 | 23.5 | 10:14 | GONZALO SUAREZ | 713 | | 510 | 800 | | 10/4/23 | Vacuum | | | | | Pass |
| 10/2/23 | 131 | 194 | 23.5 | 9:55 | GONZALO SUAREZ | 713 | | 510 | 800 | | 10/4/23 | Vacuum | | | | | Pass |

# ECApplications
# Seam Control Form

**Project Name:** Minnkota Power Cooperative, Inc. **Job #** 233013 **Superintendent:** Octavio Rivas

**Material Type:** 60 Mil HDPE SS Textured / Smooth Liner **Primary** X **Pond** - **Air Pressure Test** 30 PSI

**Job Description:** Celll 5 Phase 1B **Secondary** **Cell** X **Air Pressure Hold Time** 5 Minutes

**Reported By** Daniel Martinez **Pad** - **Allowable Air Pressure Loss** 2 PSI

**62,571** **Total LF of Welding to Date Combined** **Extrusion LF Weld Total To Date** **2,075** **Fusion LF Weld Total To Date** **60,496**

| Weld Date | Seam Number | | Seam Length | Weld Time | Operator Name / ID | Mach Number | Mach Speed | Mach Temp | Preheat Temp | Ambient Temp | Test Date | Test Type | PSI IN | Time (Mins) | PSI OUT | PSI Loss | Test Results |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10/2/23 | 165 | 202 | 23.5 | 9:20 | BRANDON GOULD | 535 | | 485 | 475 | | 10/2/23 | Vacuum | | | | | Pass |
| 10/2/23 | 163 | 205 | 23.5 | 11:34 | BRANDON GOULD | 535 | | 486 | 476 | | 10/2/23 | Vacuum | | | | | Pass |
| 10/2/23 | 162 | 200 | 23.5 | 11:50 | BRANDON GOULD | 535 | | 487 | 477 | | 10/2/23 | Vacuum | | | | | Pass |
| 10/2/23 | 161 | 204 | 23.5 | 13:42 | BRANDON GOULD | 535 | | 488 | 478 | | 10/2/23 | Vacuum | | | | | Pass |
| 10/2/23 | 159 | 198 | 23.5 | 13:35 | BRANDON GOULD | 535 | | 489 | 479 | | 10/2/23 | Vacuum | | | | | Pass |
| 10/4/23 | 158 | 203 | 23.5 | 13:10 | GONZALO SUAREZ | 713 | | 510 | 800 | | 10/4/23 | Vacuum | | | | | Pass |
| 10/4/23 | 157 | 196 | 23.5 | 13:20 | GONZALO SUAREZ | 713 | | 510 | 800 | | 10/4/23 | Vacuum | | | | | Pass |
| 10/4/23 | 155 | 195 | 23.5 | 15:16 | GONZALO SUAREZ | 713 | | 510 | 800 | | 10/4/23 | Vacuum | | | | | Pass |
| 10/4/23 | 154 | 194 | 23.5 | 15:47 | GONZALO SUAREZ | 713 | | 510 | 800 | | 10/4/23 | Vacuum | | | | | Pass |
| 10/7/23 | 168 | 207 | 160 | 10:20 | JOSE RODRIGUEZ | 614 | 11 | 850 | | | 10/9/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/7/23 | 169 | 207 | 147 | 10:37 | JOSE RODRIGUEZ | 614 | 11 | 850 | | | 10/9/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/7/23 | 207 | 208 | 296 | 10:38 | EDUARDO DEL VALLE | 964 | 11 | 850 | | | 10/9/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/7/23 | 208 | 209 | 273 | 11:06 | JOSE RODRIGUEZ | 614 | 11 | 850 | | | 10/9/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/7/23 | 209 | 210 | 250 | 10:37 | EDUARDO DEL VALLE | 964 | 11 | 850 | | | 10/9/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/7/23 | 210 | 211 | 220 | 11:43 | JOSE RODRIGUEZ | 614 | 11 | 850 | | | 10/9/23 | Air Test | 30 | 5 | 29 | 1 | Pass |
| 10/7/23 | 211 | 212 | 188 | 13:47 | EDUARDO DEL VALLE | 964 | 11 | 850 | | | 10/9/23 | Air Test | 30 | 5 | 30 | | Pass |

# ECApplications
## Seam Control Form

**Project Name:** Minnkota Power Cooperative, Inc. **Job #** 233013 **Superintendent:** Octavio Rivas

**Material Type:** 60 Mil HDPE SS Textured / Smooth Liner **Primary** X **Pond** - **Air Pressure Test** 30 PSI

**Job Description:** Celll 5 Phase 1B **Secondary** **Cell** X **Air Pressure Hold Time** 5 Minutes

**Reported By** Daniel Martinez **Pad** - **Allowable Air Pressure Loss** 2 PSI

**62,571** **Total LF of Welding to Date Combined** **Extrusion LF Weld Total To Date** **2,075** **Fusion LF Weld Total To Date** **60,496**

| Weld Date | Seam Number | | Seam Length | Weld Time | Operator Name / ID | Mach Number | Mach Speed | Mach Temp | Preheat Temp | Ambient Temp | Test Date | Test Type | PSI IN | Time (Mins) | PSI OUT | PSI Loss | Test Results |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10/7/23 | 212 | 213 | 145 | 13:54 | JOSE RODRIGUEZ | 614 | 11 | 850 | | | 10/9/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/7/23 | 213 | 214 | 124 | 14:20 | EDUARDO DEL VALLE | 964 | 11 | 850 | | | 10/9/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/7/23 | 214 | 215 | 92 | 14:27 | JOSE RODRIGUEZ | 614 | 11 | 850 | | | 10/9/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/7/23 | 215 | 216 | 60 | 14:40 | JOSE RODRIGUEZ | 614 | 11 | 850 | | | 10/9/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/9/23 | 216 | 217 | 26 | 14:40 | GONZALO SUAREZ | 713 | | 510 | 800 | | 10/9/23 | Vacuum | | | | | Pass |
| 10/8/23 | 217 | 218 | 11 | 11:37 | JOSE RODRIGUEZ | 614 | 12 | 830 | | | 10/9/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/8/23 | 218 | 219 | 29 | 11:39 | EDUARDO DEL VALLE | 964 | 12 | 830 | | | 10/9/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/8/23 | 219 | 220 | 47 | 11:26 | JOSE RODRIGUEZ | 614 | 12 | 830 | | | 10/9/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/8/23 | 220 | 221 | 66 | 11:25 | EDUARDO DEL VALLE | 964 | 12 | 830 | | | 10/9/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/8/23 | 221 | 222 | 84 | 11:11 | JOSE RODRIGUEZ | 614 | 12 | 830 | | | 10/9/23 | Air Test | 30 | 5 | 29 | 1 | Pass |
| 10/8/23 | 222 | 223 | 104 | 11:07 | EDUARDO DEL VALLE | 964 | 12 | 830 | | | 10/9/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/8/23 | 223 | 224 | 122 | 10:49 | JOSE RODRIGUEZ | 614 | 12 | 830 | | | 10/9/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/8/23 | 224 | 225 | 139 | 10:41 | EDUARDO DEL VALLE | 964 | 12 | 830 | | | 10/9/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/8/23 | 225 | 226 | 158 | 10:18 | JOSE RODRIGUEZ | 614 | 12 | 830 | | | 10/9/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/8/23 | 226 | 227 | 179 | 10:12 | EDUARDO DEL VALLE | 964 | 12 | 830 | | | 10/9/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/8/23 | 227 | 228 | 196 | 9:47 | JOSE RODRIGUEZ | 614 | 12 | 830 | | | 10/9/23 | Air Test | 30 | 5 | 30 | | Pass |

# ECApplications
# Seam Control Form

**Project Name:** Minnkota Power Cooperative, Inc. **Job #** 233013 **Superintendent:** Octavio Rivas

**Material Type:** 60 Mil HDPE SS Textured / Smooth Liner **Primary** X **Pond** - **Air Pressure Test** 30 PSI

**Job Description:** Celll 5 Phase 1B **Secondary** **Cell** X **Air Pressure Hold Time** 5 Minutes

**Reported By** Daniel Martinez **Pad** - **Allowable Air Pressure Loss** 2 PSI

**62,571** **Total LF of Welding to Date Combined** **Extrusion LF Weld Total To Date** **2,075** **Fusion LF Weld Total To Date** **60,496**

| Weld Date | Seam Number | | Seam Length | Weld Time | Operator Name / ID | Mach Number | Mach Speed | Mach Temp | Preheat Temp | Ambient Temp | Test Date | Test Type | PSI IN | Time (Mins) | PSI OUT | PSI Loss | Test Results |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10/8/23 | 228 | 229 | 223 | 9:43 | EDUARDO DEL VALLE | 964 | 12 | 830 | | | 10/9/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/8/23 | 229 | 230 | 240 | 14:19 | EDUARDO DEL VALLE | 964 | 12 | 830 | | | 10/9/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/8/23 | 230 | 231 | 240 | 15:04 | JOSE RODRIGUEZ | 614 | 12 | 830 | | | 10/9/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/8/23 | 231 | 232 | 180 | 16:06 | JOSE RODRIGUEZ | 614 | 12 | 830 | | | 10/9/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/8/23 | 232 | 233 | 23.5 | 16:40 | JOSE RODRIGUEZ | 614 | 12 | 830 | | | 10/9/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/8/23 | 233 | 234 | 60 | 16:45 | JOSE RODRIGUEZ | 614 | 12 | 830 | | | 10/9/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/8/23 | 234 | 235 | 240 | 17:15 | JOSE RODRIGUEZ | 614 | 12 | 830 | | | 10/9/23 | Air Test | 30 | 5 | 28 | 2 | Pass |
| 10/8/23 | 233 | 231 | 58 | 16:45 | JOSE RODRIGUEZ | 614 | 11 | 850 | | | 10/9/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/8/23 | 232 | 234 | 180 | 17:00 | JOSE RODRIGUEZ | 614 | 11 | 850 | | | 10/9/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/9/23 | 235 | 236 | 242 | 9:47 | EDUARDO DEL VALLE | 614 | 11 | 850 | | | 10/9/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/9/23 | 236 | 238 | 181 | 10:37 | EDUARDO DEL VALLE | 614 | 11 | 850 | | | 10/9/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/9/23 | 236 | 237 | 58 | 10:55 | EDUARDO DEL VALLE | 614 | 11 | 850 | | | 10/9/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/9/23 | 237 | 238 | 23.5 | 10:25 | EDUARDO DEL VALLE | 614 | 11 | 850 | | | 10/9/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/9/23 | 238 | 239 | 181 | 11:25 | EDUARDO DEL VALLE | 614 | 11 | 850 | | | 10/9/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/9/23 | 237 | 239 | 58 | 11:45 | EDUARDO DEL VALLE | 614 | 11 | 850 | | | 10/9/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/9/23 | 239 | 240 | 180 | 13:39 | JOSE RODRIGUEZ | 614 | 11 | 850 | | | 10/9/23 | Air Test | 30 | 5 | 30 | | Pass |

# ECApplications
# Seam Control Form

**Project Name:** Minnkota Power Cooperative, Inc. **Job #** 233013 **Superintendent:** Octavio Rivas

**Material Type:** 60 Mil HDPE SS Textured / Smooth Liner **Primary** X **Pond** - **Air Pressure Test** 30 PSI

**Job Description:** Celll 5 Phase 1B **Secondary** **Cell** X **Air Pressure Hold Time** 5 Minutes

**Reported By** Daniel Martinez **Pad** - **Allowable Air Pressure Loss** 2 PSI

**62,571** **Total LF of Welding to Date Combined** **Extrusion LF Weld Total To Date** **2,075** **Fusion LF Weld Total To Date** **60,496**

| Weld Date | Seam Number | | Seam Length | Weld Time | Operator Name / ID | Mach Number | Mach Speed | Mach Temp | Preheat Temp | Ambient Temp | Test Date | Test Type | PSI IN | Time (Mins) | PSI OUT | PSI Loss | Test Results |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10/9/23 | 239 | 241 | 60 | 14:10 | JOSE RODRIGUEZ | 614 | 11 | 850 | | | 10/9/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/9/23 | 240 | 241 | 23.5 | 14:08 | JOSE RODRIGUEZ | 614 | 11 | 850 | | | 10/9/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/9/23 | 240 | 242 | 180 | 14:38 | EDUARDO DEL VALLE | 614 | 11 | 850 | | | 10/9/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/9/23 | 241 | 242 | 60 | 14:58 | EDUARDO DEL VALLE | 614 | 11 | 850 | | | 10/9/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/9/23 | 242 | 244 | 183 | 15:34 | EDUARDO DEL VALLE | 614 | 11 | 850 | | | 10/9/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/9/23 | 242 | 243 | 56 | 15:50 | EDUARDO DEL VALLE | 614 | 11 | 850 | | | 10/9/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/9/23 | 243 | 244 | 23.5 | 15:25 | JOSE RODRIGUEZ | 614 | 11 | 850 | | | 10/9/23 | Air Test | 30 | 5 | 29 | 1 | Pass |
| 10/9/23 | 244 | 245 | 183 | 17:26 | JOSE RODRIGUEZ | 614 | 11 | 850 | | | 10/9/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/9/23 | 243 | 245 | 56 | 17:48 | JOSE RODRIGUEZ | 614 | 11 | 850 | | | 10/9/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/10/23 | 245 | 246 | 184 | 9:20 | JOSE RODRIGUEZ | 614 | 11 | 850 | | | 10/9/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/10/23 | 245 | 247 | 74 | 9:45 | JOSE RODRIGUEZ | 614 | 11 | 850 | | | 10/9/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/10/23 | 246 | 248 | 182 | 10:24 | JOSE RODRIGUEZ | 614 | 11 | 850 | | | 10/11/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/10/23 | 248 | 250 | 182 | 11:20 | JOSE RODRIGUEZ | 614 | 11 | 850 | | | 10/11/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/10/23 | 250 | 251 | 182 | 13:45 | EDUARDO DEL VALLE | 614 | 11 | 850 | | | 10/11/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/10/23 | 251 | 252 | 182 | 14:41 | EDUARDO DEL VALLE | 614 | 11 | 850 | | | 10/11/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/10/23 | 252 | 254 | 182 | 15:15 | GUILLERMO BENITEZ | 614 | 11 | 850 | | | 10/11/23 | Air Test | 30 | 5 | 30 | | Pass |

# ECApplications
# Seam Control Form

**Project Name:** Minnkota Power Cooperative, Inc. **Job #** 233013 **Superintendent:** Octavio Rivas

**Material Type:** 60 Mil HDPE SS Textured / Smooth Liner **Primary** X **Pond** - **Air Pressure Test** 30 PSI

**Job Description:** Celll 5 Phase 1B **Secondary** **Cell** X **Air Pressure Hold Time** 5 Minutes

**Reported By** Daniel Martinez **Pad** - **Allowable Air Pressure Loss** 2 PSI

**62,571** **Total LF of Welding to Date Combined** **Extrusion LF Weld Total To Date** **2,075** **Fusion LF Weld Total To Date** **60,496**

| Weld Date | Seam Number | | Seam Length | Weld Time | Operator Name / ID | Mach Number | Mach Speed | Mach Temp | Preheat Temp | Ambient Temp | Test Date | Test Type | PSI IN | Time (Mins) | PSI OUT | PSI Loss | Test Results |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10/10/23 | 254 | 256 | 182 | 16:44 | EDUARDO DEL VALLE | 614 | 11 | 850 | | | 10/11/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/10/23 | 256 | 257 | 182 | 17:18 | GUILLERMO BENITEZ | 614 | 11 | 850 | | | 10/11/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/10/23 | 257 | 258 | 182 | 17:17 | EDUARDO DEL VALLE | 614 | 11 | 850 | | | 10/11/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/10/23 | 258 | 260 | 182 | 18:06 | EDUARDO DEL VALLE | 614 | 11 | 850 | | | 10/11/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/10/23 | 247 | 248 | 73 | 10:45 | JOSE RODRIGUEZ | 614 | 11 | 850 | | | 10/11/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/10/23 | 248 | 249 | 73 | 11:50 | JOSE RODRIGUEZ | 614 | 11 | 850 | | | 10/11/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/10/23 | 249 | 251 | 73 | 14:05 | EDUARDO DEL VALLE | 614 | 11 | 850 | | | 10/11/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/10/23 | 251 | 253 | 73 | 15:02 | EDUARDO DEL VALLE | 614 | 11 | 850 | | | 10/11/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/10/23 | 253 | 254 | 73 | 15:50 | GUILLERMO BENITEZ | 614 | 11 | 850 | | | 10/11/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/10/23 | 254 | 255 | 73 | 16:14 | EDUARDO DEL VALLE | 614 | 11 | 850 | | | 10/11/23 | Air Test | 30 | 5 | 29 | 1 | Pass |
| 10/10/23 | 255 | 257 | 73 | 18:05 | GUILLERMO BENITEZ | 614 | 11 | 850 | | | 10/11/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/10/23 | 257 | 259 | 73 | 17:40 | EDUARDO DEL VALLE | 614 | 11 | 850 | | | 10/11/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/10/23 | 259 | 260 | 73 | 18:27 | EDUARDO DEL VALLE | 614 | 11 | 850 | | | 10/11/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/10/23 | 249 | 250 | 23.5 | 11:43 | JOSE RODRIGUEZ | 614 | 11 | 850 | | | 10/11/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/10/23 | 252 | 253 | 23.5 | 14:29 | EDUARDO DEL VALLE | 614 | 11 | 850 | | | 10/11/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/10/23 | 255 | 256 | 23.5 | 16:00 | GUILLERMO BENITEZ | 614 | 11 | 850 | | | 10/11/23 | Air Test | 30 | 5 | 30 | | Pass |

# ECApplications
## Seam Control Form

**Project Name:** Minnkota Power Cooperative, Inc. **Job #** 233013 **Superintendent:** Octavio Rivas

**Material Type:** 60 Mil HDPE SS Textured / Smooth Liner **Primary** X **Pond** - **Air Pressure Test** 30 PSI

**Job Description:** Celll 5 Phase 1B **Secondary** **Cell** X **Air Pressure Hold Time** 5 Minutes

**Reported By** Daniel Martinez **Pad** - **Allowable Air Pressure Loss** 2 PSI

**62,571** **Total LF of Welding to Date Combined** **Extrusion LF Weld Total To Date** **2,075** **Fusion LF Weld Total To Date** **60,496**

| Weld Date | Seam Number | | Seam Length | Weld Time | Operator Name / ID | Mach Number | Mach Speed | Mach Temp | Preheat Temp | Ambient Temp | Test Date | Test Type | PSI IN | Time (Mins) | PSI OUT | PSI Loss | Test Results |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10/10/23 | 258 | 259 | 23.5 | 17:05 | EDUARDO DEL VALLE | 614 | 11 | 850 | | | 10/11/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/11/23 | 202 | 261 | 280 | 11:03 | JOSE RODRIGUEZ | 963 | 11 | 850 | | | 10/11/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/11/23 | 261 | 262 | 540 | 11:55 | EDUARDO DEL VALLE | 614 | 11 | 850 | | | 10/11/23 | Air Test | 30 | 5 | 28 | 2 | Pass |
| 10/11/23 | 262 | 263 | 300 | 14:54 | JOSE RODRIGUEZ | 963 | 11 | 850 | | | 10/11/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/11/23 | 263 | 264 | 23.5 | 16:04 | JOSE RODRIGUEZ | 963 | 11 | 850 | | | 10/11/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/11/23 | 264 | 262 | 36 | 16:18 | JOSE RODRIGUEZ | 963 | 11 | 850 | | | 10/11/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/11/23 | 264 | 247 | 23.5 | 18:10 | BRANDON GOULD | 535 | | 505 | 485 | | 10/11/23 | Vacuum | | | | | Pass |
| 10/14/23 | 260 | 265 | 245 | 9:21 | JOSE RODRIGUEZ | 963 | 5 | 850 | | | 10/11/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/14/23 | 265 | 266 | 190 | 10:08 | GUILLERMO BENITEZ | 64 | 4.5 | 850 | | | 10/11/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/14/23 | 266 | 268 | 180 | 10:10 | EDUARDO DEL VALLE | 614 | 9.5 | 850 | | | 10/19/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/14/23 | 268 | 270 | 180 | 11:00 | JOSE RODRIGUEZ | 963 | 5 | 850 | | | 10/19/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/14/23 | 270 | 271 | 190 | 11:10 | EDUARDO DEL VALLE | 614 | 9.5 | 850 | | | 10/19/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/14/23 | 271 | 272 | 190 | 10:40 | GUILLERMO BENITEZ | 64 | 4.5 | 850 | | | 10/19/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/14/23 | 272 | 274 | 265 | 14:06 | JOSE RODRIGUEZ | 963 | 5 | 850 | | | 10/19/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/14/23 | 274 | 275 | 265 | 14:24 | EDUARDO DEL VALLE | 614 | 9.5 | 850 | | | 10/19/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/14/23 | 275 | 276 | 166 | 14:48 | GUILLERMO BENITEZ | 64 | 4.5 | 850 | | | 10/19/23 | Air Test | 30 | 5 | 30 | | Pass |

# ECApplications
# Seam Control Form

**Project Name:** Minnkota Power Cooperative, Inc. **Job #** 233013 **Superintendent:** Octavio Rivas

**Material Type:** 60 Mil HDPE SS Textured / Smooth Liner **Primary** X **Pond** -

**Job Description:** Celll 5 Phase 1B **Secondary** **Cell** X

**Reported By** Daniel Martinez **Pad** -

**Air Pressure Test** 30 PSI

**Air Pressure Hold Time** 5 Minutes

**Allowable Air Pressure Loss** 2 PSI

**62,571** **Total LF of Welding to Date Combined** **Extrusion LF Weld Total To Date** **2,075** **Fusion LF Weld Total To Date** **60,496**

| Weld Date | Seam Number | | Seam Length | Weld Time | Operator Name / ID | Mach Number | Mach Speed | Mach Temp | Preheat Temp | Ambient Temp | Test Date | Test Type | PSI IN | Time (Mins) | PSI OUT | PSI Loss | Test Results |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10/14/23 | 276 | 278 | 166 | 15:51 | EDUARDO DEL VALLE | 614 | 9 | 850 | | | 10/19/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/14/23 | 278 | 280 | 167 | 16:00 | JOSE RODRIGUEZ | 963 | 5 | 850 | | | 10/19/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/14/23 | 280 | 281 | 167 | 17:10 | JOSE RODRIGUEZ | 963 | 5 | 850 | | | 10/19/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/14/23 | 281 | 282 | 168 | 17:26 | JOSE RODRIGUEZ | 963 | 5 | 850 | | | 10/19/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/14/23 | 265 | 267 | 60 | 10:45 | GUILLERMO BENITEZ | 64 | 4.5 | 850 | | | 10/19/23 | Air Test | 30 | 5 | 29 | 1 | Pass |
| 10/14/23 | 267 | 268 | 60 | 10:33 | EDUARDO DEL VALLE | 614 | 9.5 | 850 | | | 10/19/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/14/23 | 268 | 269 | 69 | 11:35 | JOSE RODRIGUEZ | 963 | 5 | 850 | | | 10/19/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/14/23 | 269 | 271 | 69 | 11:32 | EDUARDO DEL VALLE | 614 | 9.5 | 850 | | | 10/19/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/14/23 | 271 | 273 | 57 | 12:16 | GUILLERMO BENITEZ | 64 | 4.5 | 850 | | | 10/19/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/14/23 | 273 | 274 | 57 | 14:42 | JOSE RODRIGUEZ | 963 | 5 | 850 | | | 10/19/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/14/23 | 275 | 277 | 100 | 15:22 | GUILLERMO BENITEZ | 64 | 4 | 850 | | | 10/19/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/14/23 | 277 | 278 | 100 | 16:10 | EDUARDO DEL VALLE | 614 | 9 | 850 | | | 10/19/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/14/23 | 278 | 279 | 100 | 16:32 | JOSE RODRIGUEZ | 963 | 5 | 850 | | | 10/19/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/14/23 | 279 | 281 | 100 | 17:45 | JOSE RODRIGUEZ | 963 | 5 | 850 | | | 10/19/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/14/23 | 266 | 267 | 23.5 | 9:48 | GUILLERMO BENITEZ | 64 | 4.5 | 850 | | | 10/19/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/14/23 | 269 | 270 | 23.5 | 10:44 | JOSE RODRIGUEZ | 963 | 5 | 850 | | | 10/19/23 | Air Test | 30 | 5 | 30 | | Pass |

# ECApplications
# Seam Control Form

**Project Name:** Minnkota Power Cooperative, Inc. **Job #** 233013 **Superintendent:** Octavio Rivas

**Material Type:** 60 Mil HDPE SS Textured / Smooth Liner **Primary** X **Pond** - **Air Pressure Test** 30 PSI

**Job Description:** Celll 5 Phase 1B **Secondary** **Cell** X **Air Pressure Hold Time** 5 Minutes

**Reported By** Daniel Martinez **Pad** - **Allowable Air Pressure Loss** 2 PSI

**62,571** **Total LF of Welding to Date Combined** **Extrusion LF Weld Total To Date** **2,075** **Fusion LF Weld Total To Date** **60,496**

| Weld Date | Seam Number | | Seam Length | Weld Time | Operator Name / ID | Mach Number | Mach Speed | Mach Temp | Preheat Temp | Ambient Temp | Test Date | Test Type | PSI IN | Time (Mins) | PSI OUT | PSI Loss | Test Results |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10/14/23 | 272 | 273 | 23.5 | 11:25 | GUILLERMO BENITEZ | 64 | 4.5 | 850 | | | 10/19/23 | Air Test | 30 | 5 | 28 | 2 | Pass |
| 10/14/23 | 276 | 277 | 23.5 | 15:05 | JOSE RODRIGUEZ | 963 | 5 | 850 | | | 10/19/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/14/23 | 279 | 280 | 23.5 | 16:16 | JOSE RODRIGUEZ | 963 | 5 | 850 | | | 10/19/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/15/23 | 282 | 284 | 168 | 9:55 | JOSE RODRIGUEZ | 963 | 5 | 850 | | | 10/19/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/15/23 | 284 | 285 | 240 | 10:07 | EDUARDO DEL VALLE | 614 | 9 | 850 | | | 10/19/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/15/23 | 285 | 286 | 187 | 10:38 | GUILLERMO BENITEZ | 64 | 4.5 | 850 | | | 10/19/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/15/23 | 286 | 288 | 200 | 11:12 | EDUARDO DEL VALLE | 614 | 9 | 850 | | | 10/19/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/15/23 | 288 | 289 | 265 | 13:23 | JOSE RODRIGUEZ | 963 | 5 | 850 | | | 10/19/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/15/23 | 290 | 291 | 23.5 | 14:00 | GUILLERMO BENITEZ | 64 | 4.5 | 850 | | | 10/19/23 | Air Test | 30 | 5 | 29 | 1 | Pass |
| 10/15/23 | 291 | 292 | 60 | 14:33 | GUILLERMO BENITEZ | 64 | 4.5 | 850 | | | 10/19/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/15/23 | 281 | 283 | 65 | 17:58 | EDUARDO DEL VALLE | 614 | 9 | 850 | | | 10/19/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/15/23 | 283 | 284 | 65 | 17:58 | JOSE RODRIGUEZ | 963 | 5 | 850 | | | 10/19/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/15/23 | 285 | 287 | 65 | 11:12 | GUILLERMO BENITEZ | 64 | 4.5 | 850 | | | 10/19/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/15/23 | 287 | 288 | 65 | 11:33 | EDUARDO DEL VALLE | 614 | 9 | 850 | | | 10/19/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/15/23 | 289 | 291 | 65 | 14:30 | GUILLERMO BENITEZ | 64 | 4.5 | 850 | | | 10/19/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/15/23 | 282 | 283 | 23.5 | 18:08 | JOSE RODRIGUEZ | 963 | 5 | 850 | | | 10/19/23 | Air Test | 30 | 5 | 30 | | Pass |

# ECApplications
# Seam Control Form

**Project Name:** Minnkota Power Cooperative, Inc. **Job #** 233013 **Superintendent:** Octavio Rivas

**Material Type:** 60 Mil HDPE SS Textured / Smooth Liner **Primary** X **Pond** - **Air Pressure Test** 30 PSI

**Job Description:** Celll 5 Phase 1B **Secondary** **Cell** X **Air Pressure Hold Time** 5 Minutes

**Reported By** Daniel Martinez **Pad** - **Allowable Air Pressure Loss** 2 PSI

**62,571** **Total LF of Welding to Date Combined** **Extrusion LF Weld Total To Date** **2,075** **Fusion LF Weld Total To Date** **60,496**

| Weld Date | Seam Number | | Seam Length | Weld Time | Operator Name / ID | Mach Number | Mach Speed | Mach Temp | Preheat Temp | Ambient Temp | Test Date | Test Type | PSI IN | Time (Mins) | PSI OUT | PSI Loss | Test Results |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10/15/23 | 286 | 287 | 23.5 | 10:53 | EDUARDO DEL VALLE | 614 | 9 | 850 | | | 10/19/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/15/23 | 290 | 292 | 180 | 14:15 | EDUARDO DEL VALLE | 614 | 9 | 850 | | | 10/19/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/16/23 | 292 | 293 | 253 | 8:59 | JOSE RODRIGUEZ | 963 | 5 | 850 | | | 10/19/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/16/23 | 293 | 294 | 251 | 9:59 | GUILLERMO BENITEZ | 64 | 4.5 | 850 | | | 10/19/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/16/23 | 294 | 296 | 186 | 10:59 | EDUARDO DEL VALLE | 614 | 9 | 850 | | | 10/19/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/16/23 | 296 | 297 | 186 | 10:32 | JOSE RODRIGUEZ | 963 | 5 | 850 | | | 10/19/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/16/23 | 297 | 298 | 252 | 10:45 | GUILLERMO BENITEZ | 64 | 4.5 | 850 | | | 10/19/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/16/23 | 298 | 300 | 186 | 10:25 | EDUARDO DEL VALLE | 614 | 9 | 850 | | | 10/19/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/16/23 | 300 | 301 | 186 | 11:28 | JOSE RODRIGUEZ | 963 | 5 | 850 | | | 10/19/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/16/23 | 301 | 302 | 250 | 13:47 | JOSE RODRIGUEZ | 963 | 5 | 850 | | | 10/19/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/16/23 | 302 | 82 | 250 | 15:40 | JOSE RODRIGUEZ | 963 | 5 | 850 | | | 10/19/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/16/23 | 294 | 295 | 67 | 11:00 | EDUARDO DEL VALLE | 614 | 9 | 850 | | | 10/19/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/16/23 | 295 | 297 | 67 | 10:53 | JOSE RODRIGUEZ | 963 | 5 | 850 | | | 10/19/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/16/23 | 298 | 299 | 63 | 11:19 | EDUARDO DEL VALLE | 614 | 9 | 850 | | | 10/19/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/16/23 | 299 | 301 | 63 | 11:57 | JOSE RODRIGUEZ | 963 | 5 | 850 | | | 10/19/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/16/23 | 295 | 296 | 23.5 | 10:10 | JOSE RODRIGUEZ | 963 | 5 | 850 | | | 10/19/23 | Air Test | 30 | 5 | 30 | | Pass |

# ECApplications
# Seam Control Form

**Project Name:** Minnkota Power Cooperative, Inc. **Job #** 233013 **Superintendent:** Octavio Rivas

**Material Type:** 60 Mil HDPE SS Textured / Smooth Liner **Primary** X **Pond** -

**Job Description:** Celll 5 Phase 1B **Secondary** **Cell** X

**Reported By** Daniel Martinez **Pad** -

**Air Pressure Test** 30 PSI

**Air Pressure Hold Time** 5 Minutes

**Allowable Air Pressure Loss** 2 PSI

**62,571** **Total LF of Welding to Date Combined** **Extrusion LF Weld Total To Date** **2,075** **Fusion LF Weld Total To Date** **60,496**

| Weld Date | Seam Number | | Seam Length | Weld Time | Operator Name / ID | Mach Number | Mach Speed | Mach Temp | Preheat Temp | Ambient Temp | Test Date | Test Type | PSI IN | Time (Mins) | PSI OUT | PSI Loss | Test Results |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10/16/23 | 299 | 300 | 23.5 | 11:11 | JOSE RODRIGUEZ | 963 | 5 | 850 | | | 10/19/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/17/23 | 303 | 304 | 247 | 11:05 | EDUARDO DEL VALLE | 614 | 9 | 850 | | | 10/19/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/17/23 | 304 | 293 | 260 | 11:37 | JOSE RODRIGUEZ | 963 | 5 | 850 | | | 10/19/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/17/23 | 53 | 305 | 402 | 13:38 | JOSE RODRIGUEZ | 963 | 5 | 850 | | | 10/19/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/12/23 | 263 | 228 | 23.5 | 17:41 | GONZALO SUAREZ | 713 | | 510 | 800 | | 10/13/23 | Vacuum | | | | | Pass |
| 10/12/23 | 263 | 229 | 23.5 | 17:43 | GONZALO SUAREZ | 713 | | 510 | 800 | | 10/13/23 | Vacuum | | | | | Pass |
| 10/12/23 | 263 | 230 | 23.5 | 17:51 | GONZALO SUAREZ | 713 | | 510 | 800 | | 10/13/23 | Vacuum | | | | | Pass |
| 10/12/23 | 263 | 231 | 23.5 | 18:06 | GONZALO SUAREZ | 713 | | 510 | 800 | | 10/13/23 | Vacuum | | | | | Pass |
| 10/13/23 | 263 | 233 | 23.5 | 11:26 | GONZALO SUAREZ | 713 | | 510 | 800 | | 10/13/23 | Vacuum | | | | | Pass |
| 10/13/23 | 263 | 234 | 23.5 | 11:15 | GONZALO SUAREZ | 713 | | 510 | 800 | | 10/13/23 | Vacuum | | | | | Pass |
| 10/13/23 | 263 | 235 | 23.5 | 11:06 | GONZALO SUAREZ | 713 | | 510 | 800 | | 10/13/23 | Vacuum | | | | | Pass |
| 10/13/23 | 263 | 236 | 23.5 | 10:56 | GONZALO SUAREZ | 713 | | 510 | 800 | | 10/13/23 | Vacuum | | | | | Pass |
| 10/13/23 | 263 | 237 | 23.5 | 10:47 | GONZALO SUAREZ | 713 | | 510 | 800 | | 10/13/23 | Vacuum | | | | | Pass |
| 10/13/23 | 263 | 239 | 23.5 | 10:39 | GONZALO SUAREZ | 713 | | 510 | 800 | | 10/13/23 | Vacuum | | | | | Pass |
| 10/13/23 | 263 | 241 | 23.5 | 10:25 | GONZALO SUAREZ | 713 | | 510 | 800 | | 10/13/23 | Vacuum | | | | | Pass |
| 10/13/23 | 263 | 242 | 23.5 | 11:10 | GONZALO SUAREZ | 713 | | 510 | 800 | | 10/13/23 | Vacuum | | | | | Pass |

# ECApplications
# Seam Control Form

**Project Name:** Minnkota Power Cooperative, Inc. **Job #** 233013 **Superintendent:** Octavio Rivas

**Material Type:** 60 Mil HDPE SS Textured / Smooth Liner **Primary** X **Pond** - **Air Pressure Test** 30 PSI

**Job Description:** Celll 5 Phase 1B **Secondary** **Cell** X **Air Pressure Hold Time** 5 Minutes

**Reported By** Daniel Martinez **Pad** - **Allowable Air Pressure Loss** 2 PSI

**62,571** **Total LF of Welding to Date Combined** **Extrusion LF Weld Total To Date** **2,075** **Fusion LF Weld Total To Date** **60,496**

| Weld Date | Seam Number | | Seam Length | Weld Time | Operator Name / ID | Mach Number | Mach Speed | Mach Temp | Preheat Temp | Ambient Temp | Test Date | Test Type | PSI IN | Time (Mins) | PSI OUT | PSI Loss | Test Results |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10/13/23 | 263 | 243 | 23.5 | 10:50 | GONZALO SUAREZ | 713 | | 510 | 800 | | 10/13/23 | Vacuum | | | | | Pass |
| 10/13/23 | 263 | 245 | 11 | 10:30 | GONZALO SUAREZ | 713 | | 510 | 800 | | 10/13/23 | Vacuum | | | | | Pass |
| 10/13/23 | 264 | 245 | 13 | 10:30 | BRANDON GOULD | 535 | | 525 | 515 | | 10/13/23 | Vacuum | | | | | Pass |
| 10/13/23 | 262 | 248 | 23.5 | 17:30 | BRANDON GOULD | 535 | | 525 | 515 | | 10/13/23 | Vacuum | | | | | Pass |
| 10/13/23 | 262 | 249 | 23.5 | 17:02 | BRANDON GOULD | 535 | | 525 | 515 | | 10/13/23 | Vacuum | | | | | Pass |
| 10/13/23 | 262 | 251 | 23.5 | 16:20 | BRANDON GOULD | 535 | | 525 | 515 | | 10/13/23 | Vacuum | | | | | Pass |
| 10/13/23 | 262 | 253 | 23.5 | 16:00 | BRANDON GOULD | 535 | | 525 | 515 | | 10/13/23 | Vacuum | | | | | Pass |
| 10/13/23 | 262 | 254 | 23.5 | 16:04 | BRANDON GOULD | 535 | | 525 | 515 | | 10/13/23 | Vacuum | | | | | Pass |
| 10/13/23 | 262 | 255 | 23.5 | 15:46 | BRANDON GOULD | 535 | | 525 | 515 | | 10/13/23 | Vacuum | | | | | Pass |
| 10/13/23 | 262 | 257 | 23.5 | 15:31 | BRANDON GOULD | 535 | | 525 | 515 | | 10/13/23 | Vacuum | | | | | Pass |
| 10/13/23 | 262 | 259 | 23.5 | 15:42 | GONZALO SUAREZ | 713 | | 510 | 800 | | 10/13/23 | Vacuum | | | | | Pass |
| 10/13/23 | 262 | 260 | 23.5 | 14:52 | GONZALO SUAREZ | 713 | | 510 | 800 | | 10/13/23 | Vacuum | | | | | Pass |
| 10/17/23 | 303 | 265 | 23.5 | 11:21 | EDUARDO DEL VALLE | 614 | 9 | 850 | | | 10/17/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/17/23 | 303 | 267 | 23.5 | 11:24 | EDUARDO DEL VALLE | 614 | 9 | 850 | | | 10/17/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/17/23 | 303 | 268 | 23.5 | 11:28 | EDUARDO DEL VALLE | 614 | 9 | 850 | | | 10/17/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/17/23 | 303 | 269 | 23.5 | 11:29 | EDUARDO DEL VALLE | 614 | 9 | 850 | | | 10/17/23 | Air Test | 30 | 5 | 30 | | Pass |

# ECApplications
# Seam Control Form

**Project Name:** Minnkota Power Cooperative, Inc. **Job #** 233013 **Superintendent:** Octavio Rivas

**Material Type:** 60 Mil HDPE SS Textured / Smooth Liner **Primary** X **Pond** - **Air Pressure Test** 30 PSI

**Job Description:** Celll 5 Phase 1B **Secondary** **Cell** X **Air Pressure Hold Time** 5 Minutes

**Reported By** Daniel Martinez **Pad** - **Allowable Air Pressure Loss** 2 PSI

**62,571** **Total LF of Welding to Date Combined** **Extrusion LF Weld Total To Date** **2,075** **Fusion LF Weld Total To Date** **60,496**

| Weld Date | Seam Number | Seam Length | Weld Time | Operator Name / ID | Mach Number | Mach Speed | Mach Temp | Preheat Temp | Ambient Temp | Test Date | Test Type | PSI IN | Time (Mins) | PSI OUT | PSI Loss | Test Results |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10/17/23 | 303 271 | 23.5 | 11:31 | EDUARDO DEL VALLE | 614 | 9 | 850 | | | 10/17/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/17/23 | 303 273 | 23.5 | 11:34 | EDUARDO DEL VALLE | 614 | 9 | 850 | | | 10/17/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/17/23 | 304 274 | 23.5 | 13:23 | EDUARDO DEL VALLE | 614 | 9 | 850 | | | 10/17/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/17/23 | 304 275 | 23.5 | 13:25 | EDUARDO DEL VALLE | 614 | 9 | 850 | | | 10/17/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/17/23 | 304 277 | 23.5 | 13:27 | EDUARDO DEL VALLE | 614 | 9 | 850 | | | 10/17/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/17/23 | 304 278 | 23.5 | 13:30 | EDUARDO DEL VALLE | 614 | 9 | 850 | | | 10/17/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/17/23 | 304 279 | 23.5 | 13:33 | EDUARDO DEL VALLE | 614 | 9 | 850 | | | 10/17/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/17/23 | 304 281 | 23.5 | 13:35 | EDUARDO DEL VALLE | 614 | 9 | 850 | | | 10/17/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/17/23 | 305 283 | 23.5 | 15:12 | EDUARDO DEL VALLE | 614 | 9 | 850 | | | 10/17/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/17/23 | 305 284 | 23.5 | 15:15 | EDUARDO DEL VALLE | 614 | 9 | 850 | | | 10/17/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/17/23 | 305 285 | 23.5 | 15:18 | EDUARDO DEL VALLE | 614 | 9 | 850 | | | 10/17/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/17/23 | 305 287 | 23.5 | 15:21 | EDUARDO DEL VALLE | 614 | 9 | 850 | | | 10/17/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/17/23 | 305 288 | 23.5 | 15:25 | EDUARDO DEL VALLE | 614 | 9 | 850 | | | 10/17/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/17/23 | 305 289 | 23.5 | 15:27 | EDUARDO DEL VALLE | 614 | 9 | 850 | | | 10/17/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/17/23 | 305 291 | 23.5 | 15:30 | EDUARDO DEL VALLE | 614 | 9 | 850 | | | 10/17/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/17/23 | 305 292 | 23.5 | 15:33 | EDUARDO DEL VALLE | 614 | 9 | 850 | | | 10/17/23 | Air Test | 30 | 5 | 30 | | Pass |

# ECApplications
# Seam Control Form

**Project Name:** Minnkota Power Cooperative, Inc. **Job #** 233013 **Superintendent:** Octavio Rivas

**Material Type:** 60 Mil HDPE SS Textured / Smooth Liner **Primary** X **Pond** -

**Job Description:** Celll 5 Phase 1B **Secondary** **Cell** X

**Reported By** Daniel Martinez **Pad** -

**Air Pressure Test** 30 PSI

**Air Pressure Hold Time** 5 Minutes

**Allowable Air Pressure Loss** 2 PSI

**62,571** **Total LF of Welding to Date Combined** **Extrusion LF Weld Total To Date** **2,075** **Fusion LF Weld Total To Date** **60,496**

| Weld Date | Seam Number | | Seam Length | Weld Time | Operator Name / ID | Mach Number | Mach Speed | Mach Temp | Preheat Temp | Ambient Temp | Test Date | Test Type | PSI IN | Time (Mins) | PSI OUT | PSI Loss | Test Results |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10/17/23 | 305 | 293 | 23.5 | 15:35 | EDUARDO DEL VALLE | 614 | 9 | 850 | | | 10/17/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/17/23 | 305 | 294 | 23.5 | 15:38 | EDUARDO DEL VALLE | 614 | 9 | 850 | | | 10/17/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/17/23 | 305 | 295 | 23.5 | 15:44 | EDUARDO DEL VALLE | 614 | 9 | 850 | | | 10/17/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/17/23 | 305 | 297 | 23.5 | 15:46 | EDUARDO DEL VALLE | 614 | 9 | 850 | | | 10/17/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/17/23 | 305 | 299 | 23.5 | 15:49 | EDUARDO DEL VALLE | 614 | 9 | 850 | | | 10/17/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/17/23 | 305 | 301 | 23.5 | 15:52 | EDUARDO DEL VALLE | 614 | 9 | 850 | | | 10/17/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/17/23 | 305 | 302 | 23.5 | 15:55 | EDUARDO DEL VALLE | 614 | 9 | 850 | | | 10/17/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/9/23 | 216 | 218 | 13 | 14:51 | GONZALO SUAREZ | 713 | | 510 | 800 | | 10/19/23 | Vacuum | | | | | Pass |
| 10/9/23 | 215 | 218 | 13 | 15:13 | GONZALO SUAREZ | 713 | | 510 | 800 | | 10/19/23 | Vacuum | | | | | Pass |
| 10/9/23 | 215 | 219 | 27 | 15:19 | GONZALO SUAREZ | 713 | | 510 | 800 | | 10/19/23 | Vacuum | | | | | Pass |
| 10/9/23 | 214 | 219 | 11 | 16:22 | GONZALO SUAREZ | 713 | | 510 | 800 | | 10/19/23 | Vacuum | | | | | Pass |
| 10/9/23 | 214 | 220 | 26 | 16:26 | GONZALO SUAREZ | 713 | | 510 | 800 | | 10/19/23 | Vacuum | | | | | Pass |
| 10/9/23 | 213 | 221 | 26 | 16:36 | GONZALO SUAREZ | 713 | | 510 | 800 | | 10/19/23 | Vacuum | | | | | Pass |
| 10/9/23 | 213 | 222 | 19 | 16:54 | GONZALO SUAREZ | 614 | 11 | 510 | | | 10/9/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/9/23 | 212 | 223 | 29 | 16:59 | JOSE RODRIGUEZ | 614 | 11 | 850 | | | 10/9/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/9/23 | 212 | 224 | 9 | 16:55 | JOSE RODRIGUEZ | 614 | 11 | 850 | | | 10/9/23 | Air Test | 30 | 5 | 30 | | Pass |

# ECApplications
# Seam Control Form

**Project Name:** Minnkota Power Cooperative, Inc. **Job #** 233013 **Superintendent:** Octavio Rivas

**Material Type:** 60 Mil HDPE SS Textured / Smooth Liner **Primary** X **Pond** - **Air Pressure Test** 30 PSI

**Job Description:** Celll 5 Phase 1B **Secondary** **Cell** X **Air Pressure Hold Time** 5 Minutes

**Reported By** Daniel Martinez **Pad** - **Allowable Air Pressure Loss** 2 PSI

**62,571** **Total LF of Welding to Date Combined** **Extrusion LF Weld Total To Date** **2,075** **Fusion LF Weld Total To Date** **60,496**

| Weld Date | Seam Number | | Seam Length | Weld Time | Operator Name / ID | Mach Number | Mach Speed | Mach Temp | Preheat Temp | Ambient Temp | Test Date | Test Type | PSI IN | Time (Mins) | PSI OUT | PSI Loss | Test Results |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10/9/23 | 211 | 224 | 19 | 16:55 | JOSE RODRIGUEZ | 614 | 11 | 850 | | | 10/9/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/9/23 | 211 | 225 | 13 | 16:52 | JOSE RODRIGUEZ | 614 | 11 | 850 | | | 10/9/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/9/23 | 210 | 225 | 21 | 16:50 | JOSE RODRIGUEZ | 614 | 11 | 850 | | | 10/9/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/9/23 | 210 | 226 | 13 | 16:44 | JOSE RODRIGUEZ | 614 | 11 | 850 | | | 10/9/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/9/23 | 209 | 226 | 23 | 16:48 | JOSE RODRIGUEZ | 614 | 11 | 850 | | | 10/9/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/9/23 | 209 | 227 | 9 | 16:46 | JOSE RODRIGUEZ | 614 | 11 | 850 | | | 10/9/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/9/23 | 208 | 227 | 24 | 16:44 | JOSE RODRIGUEZ | 614 | 11 | 850 | | | 10/9/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/9/23 | 208 | 228 | 7 | 16:45 | JOSE RODRIGUEZ | 614 | 11 | 850 | | | 10/9/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/9/23 | 207 | 263 | 27 | 16:43 | JOSE RODRIGUEZ | 614 | 11 | 850 | | | 10/9/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/9/23 | 228 | 207 | 23.5 | 16:35 | JOSE RODRIGUEZ | 614 | 11 | 850 | | | 10/9/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/12/23 | 166 | 261 | 23.5 | 16:11 | GONZALO SUAREZ | 713 | | 510 | 800 | | 10/13/23 | Vacuum | | | | | Pass |
| 10/12/23 | 167 | 262 | 23.5 | 16:02 | GONZALO SUAREZ | 713 | | 510 | 800 | | 10/13/23 | Vacuum | | | | | Pass |
| 10/12/23 | 169 | 263 | 23.5 | 17:43 | GONZALO SUAREZ | 713 | | 510 | 800 | | 10/13/23 | Vacuum | | | | | Pass |
| 10/13/23 | 248 | 264 | 23.5 | 16:17 | BRANDON GOULD | 713 | | 510 | 800 | | 10/13/23 | Vacuum | | | | | Pass |
| 10/17/23 | 261 | 304 | 23.5 | 11:30 | GONZALO SUAREZ | 713 | | 510 | 800 | | 10/17/23 | Vacuum | | | | | Pass |
| 10/17/23 | 262 | 303 | 23.5 | 11:48 | GONZALO SUAREZ | 713 | | 510 | 800 | | 10/17/23 | Vacuum | | | | | Pass |

# ECApplications
# Seam Control Form

**Project Name:** Minnkota Power Cooperative, Inc. **Job #** 233013 **Superintendent:** Octavio Rivas

**Material Type:** 60 Mil HDPE SS Textured / Smooth Liner **Primary** X **Pond** - **Air Pressure Test** 30 PSI

**Job Description:** Celll 5 Phase 1B **Secondary** **Cell** X **Air Pressure Hold Time** 5 Minutes

**Reported By** Daniel Martinez **Pad** - **Allowable Air Pressure Loss** 2 PSI

**62,571** **Total LF of Welding to Date Combined** **Extrusion LF Weld Total To Date** **2,075** **Fusion LF Weld Total To Date** **60,496**

| Weld Date | Seam Number | | Seam Length | Weld Time | Operator Name / ID | Mach Number | Mach Speed | Mach Temp | Preheat Temp | Ambient Temp | Test Date | Test Type | PSI IN | Time (Mins) | PSI OUT | PSI Loss | Test Results |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10/19/23 | 274 | 303 | 23.5 | 10:20 | GONZALO SUAREZ | 713 | | 510 | 800 | | 10/19/23 | Vacuum | | | | | Pass |
| 10/19/23 | 53 | 304 | 23.5 | 10:45 | GONZALO SUAREZ | 713 | | 510 | 800 | | 10/19/23 | Vacuum | | | | | Pass |
| 10/19/23 | 305 | 281 | 23.5 | 11:00 | GONZALO SUAREZ | 713 | | 510 | 800 | | 10/19/23 | Vacuum | | | | | Pass |
| 10/19/23 | 305 | 298 | 23.5 | 15:58 | GONZALO SUAREZ | 713 | | 510 | 800 | | 10/19/23 | Vacuum | | | | | Pass |
| 10/16/23 | 299 | 298 | 63 | 11:19 | EDUARDO DEL VALLE | 614 | 9 | 850 | | | 10/19/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/16/23 | 299 | 301 | 63 | 11:57 | EDUARDO DEL VALLE | 615 | 9 | 850 | | | 10/19/23 | Air Test | 30 | 5 | 30 | | Pass |
| 10/17/23 | 305 | 33 | 23.5 | 11:35 | GONZALO SUAREZ | 713 | | 510 | 800 | | 9/20/23 | Vacuum | | | | | Pass |
| 10/17/23 | 302 | 34 | 23.5 | 11:48 | GONZALO SUAREZ | 714 | | 511 | 801 | | 9/20/23 | Vacuum | | | | | Pass |
| | | | | | | | | | | | | | | | | | |
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# ECApplications

## Destructive Sample Information

**Project Name:** Minnkota Power Cooperative, Inc. **Job #** 233013 **Superintendent:** Octavio Rivas

**Material Type:** 60 Mil HDPE SS Textured / Smooth Liner **Primary** X **Pond**

**Job Description:** Celll 5 Phase 1B **Secondary** **Cell** X

**Reported By :** Daniel Martinez **Pad**

**Peel Test Extrusion Minimum** 78 **PPI**

**Peel Test Fusion Minimum** 91 **PPI**

**Shear Test Minimum** 120 **PPI**

| DS No | Seam Number | | Weld Date | Operator Name / ID | Mach No | Mach Speed | Mach Temp | Preheat Temp | Amb Temp | Peel Extrusion 1 | 2 | 3 | 4 | 5 | | Peel Wedge 1 | 2 | 3 | 4 | 5 | Shear 1 | 2 | 3 | 4 | 5 | Test Result |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 3 | 4 | 7/20/23 | EDUARDO DEL VALLE | 616 | 12 | 800 | | | | | | | | A | 99 | 101 | 114 | 99 | 96 | 144 | 146 | 153 | 152 | 144 | Pass |
| | | | | | | | | | | | | | | | B | 96 | 103 | 99 | 101 | 97 | | | | | | |
| 2 | 4 | 5 | 7/20/23 | JAVIER MEZA | 614 | 12 | 800 | | | | | | | | A | 112 | 111 | 111 | 99 | 98 | 148 | 146 | 142 | 138 | 143 | Pass |
| | | | | | | | | | | | | | | | B | 115 | 110 | 109 | 108 | 109 | | | | | | |
| 3 | 7 | 8 | 7/20/23 | EDUARDO DEL VALLE | 616 | 12 | 800 | | | | | | | | A | 102 | 106 | 110 | 101 | 102 | 146 | 142 | 138 | 152 | 149 | Pass |
| | | | | | | | | | | | | | | | B | 103 | 106 | 103 | 110 | 106 | | | | | | |
| 4 | 9 | 10 | 7/20/23 | JAVIER MEZA | 614 | 12 | 800 | | | | | | | | A | 116 | 98 | 120 | 115 | 118 | 146 | 140 | 139 | 149 | 151 | Pass |
| | | | | | | | | | | | | | | | B | 106 | 119 | 111 | 105 | 109 | | | | | | |
| 5 | 16 | 17 | 7/20/23 | EDUARDO DEL VALLE | 616 | 12 | 800 | | | | | | | | A | 105 | 107 | 123 | 109 | 121 | 149 | 152 | 147 | 160 | 153 | Pass |
| | | | | | | | | | | | | | | | B | 126 | 120 | 114 | 104 | 110 | | | | | | |
| 6 | 21 | 22 | 7/21/23 | JAVIER MEZA | 614 | 12 | 800 | | | | | | | | A | 105 | 116 | 111 | 119 | 104 | 150 | 146 | 146 | 157 | 149 | Pass |
| | | | | | | | | | | | | | | | B | 121 | 113 | 120 | 112 | 114 | | | | | | |
| 7 | 28 | 29 | 7/21/23 | JAVIER MEZA | 614 | 12 | 800 | | | | | | | | A | 107 | 109 | 108 | 105 | 116 | 153 | 150 | 150 | 148 | 158 | Pass |
| | | | | | | | | | | | | | | | B | 100 | 100 | 118 | 108 | 112 | | | | | | |
| 8 | 29 | 30 | 7/21/23 | EDUARDO DEL VALLE | 616 | 12 | 800 | | | | | | | | A | 113 | 121 | 113 | 112 | 111 | 157 | 152 | 157 | 150 | 154 | Pass |
| | | | | | | | | | | | | | | | B | 109 | 97 | 123 | 113 | 115 | | | | | | |
| 9 | 44 | 45 | 7/24/23 | JAVIER MEZA | 614 | 14 | 800 | | | | | | | | A | 119 | 108 | 112 | 106 | 113 | 152 | 141 | 155 | 152 | 151 | Pass |
| | | | | | | | | | | | | | | | B | 113 | 106 | 124 | 113 | 118 | | | | | | |
| 10 | 45 | 46 | 7/24/23 | EDUARDO DEL VALLE | 616 | 14 | 800 | | | | | | | | A | 109 | 102 | 116 | 104 | 113 | 154 | 151 | 149 | 140 | 147 | Pass |
| | | | | | | | | | | | | | | | B | 114 | 103 | 98 | 115 | 111 | | | | | | |
| 11 | 46 | 47 | 7/24/23 | JAVIER MEZA | 614 | 14 | 800 | | | | | | | | A | 112 | 108 | 114 | 108 | 119 | 141 | 153 | 151 | 151 | 149 | Pass |
| | | | | | | | | | | | | | | | B | 119 | 106 | 109 | 115 | 114 | | | | | | |
| 12 | 47 | 48 | 7/25/23 | EDUARDO DEL VALLE | 616 | 13 | 800 | | | | | | | | A | 115 | 105 | 104 | 110 | 109 | 156 | 149 | 143 | 153 | 149 | Pass |
| | | | | | | | | | | | | | | | B | 123 | 108 | 107 | 103 | 107 | | | | | | |
| 13 | 48 | 49 | 7/25/23 | JAVIER MEZA | 614 | 13 | 800 | | | | | | | | A | 113 | 104 | 103 | 99 | 108 | 140 | 151 | 147 | 143 | 150 | Pass |
| | | | | | | | | | | | | | | | B | 111 | 106 | 104 | 120 | 119 | | | | | | |
| 14 | 49 | 50 | 7/25/23 | EDUARDO DEL VALLE | 616 | 13 | 800 | | | | | | | | A | 102 | 113 | 109 | 113 | 108 | 146 | 144 | 153 | 147 | 151 | Pass |
| | | | | | | | | | | | | | | | B | 120 | 103 | 116 | 98 | 112 | | | | | | |
| 15 | 50 | 51 | 7/25/23 | JAVIER MEZA | 614 | 13 | 800 | | | | | | | | A | 100 | 102 | 107 | 104 | 98 | 153 | 147 | 141 | 149 | 147 | Pass |
| | | | | | | | | | | | | | | | B | 115 | 111 | 114 | 118 | 112 | | | | | | |
| 16 | 51 | 52 | 7/25/23 | EDUARDO DEL VALLE | 616 | 13 | 800 | | | | | | | | A | 113 | 99 | 118 | 110 | 100 | 142 | 142 | 142 | 147 | 151 | Pass |
| | | | | | | | | | | | | | | | B | 107 | 103 | 102 | 101 | 105 | | | | | | |
| 17 | 8 | 9 | 7/20/23 | EDUARDO DEL VALLE | 616 | 12 | 800 | | | | | | | | A | 103 | 99 | 96 | 99 | 93 | 151 | 147 | 143 | 139 | 150 | Pass |
| | | | | | | | | | | | | | | | B | 101 | 99 | 102 | 96 | 99 | | | | | | |
| 18 | 46 | 6 | 7/26/23 | EDUARDO DEL VALLE | 616 | 12 | 800 | | | | | | | | A | 96 | 97 | 103 | 105 | 99 | 147 | 143 | 149 | 151 | 149 | Pass |
| | | | | | | | | | | | | | | | B | 104 | 106 | 98 | 96 | 110 | | | | | | |

# ECApplications

## Destructive Sample Information

**Project Name:** Minnkota Power Cooperative, Inc. **Job #** 233013 **Superintendent:** Octavio Rivas

**Material Type:** 60 Mil HDPE SS Textured / Smooth Liner

**Job Description:** Celll 5 Phase 1B

**Reported By :** Daniel Martinez

| | | | | |
|---|---|---|---|---|
| **Primary** | X | **Pond** | | |
| **Secondary** | | **Cell** | X | |
| | | **Pad** | | |

| | | |
|---|---|---|
| **Peel Test Extrusion Minimum** | 78 | **PPI** |
| **Peel Test Fusion Minimum** | 91 | **PPI** |
| **Shear Test Minimum** | 120 | **PPI** |

| DS No | Seam Number | | Weld Date | Operator Name / ID | Mach No | Mach Speed | Mach Temp | Preheat Temp | Amb Temp | Peel Extrusion 1 | 2 | 3 | 4 | 5 | | Peel Wedge 1 | 2 | 3 | 4 | 5 | Shear 1 | 2 | 3 | 4 | 5 | Test Result |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 19 | 51 | 31 | 7/26/23 | EDUARDO DEL VALLE | 616 | 12 | 800 | | | | | | | | A | 115 | 95 | 118 | 110 | 119 | 157 | 163 | 151 | 149 | 157 | Pass |
| | | | | | | | | | | | | | | | B | 93 | 105 | 112 | 113 | 108 | | | | | | |
| 20 | 52 | 53 | 7/25/23 | JAVIER MEZA | 614 | 13 | 800 | | | | | | | | A | 120 | 112 | 107 | 103 | 114 | 161 | 141 | 164 | 157 | 161 | Pass |
| | | | | | | | | | | | | | | | B | 107 | 122 | 111 | 123 | 104 | | | | | | |
| 21 | 32 | 53 | 7/26/23 | EDUARDO DEL VALLE | 616 | 12 | 800 | | | | | | | | A | 109 | 114 | 105 | 110 | 107 | 157 | 161 | 143 | 143 | 151 | Pass |
| | | | | | | | | | | | | | | | B | 117 | 121 | 121 | 110 | 119 | | | | | | |
| 22 | 1 | 31 | 7/21/23 | EDUARDO DEL VALLE | 616 | 12 | 800 | | | | | | | | A | 107 | 103 | 95 | 105 | 104 | 149 | 153 | 160 | 147 | 149 | Pass |
| | | | | | | | | | | | | | | | B | 102 | 103 | 115 | 97 | 105 | | | | | | |
| 23 | 32 | 33 | 7/25/23 | EDUARDO DEL VALLE | 616 | 13 | 800 | | | | | | | | A | 107 | 99 | 99 | 97 | 97 | 151 | 164 | 154 | 153 | 163 | Pass |
| | | | | | | | | | | | | | | | B | 112 | 96 | 101 | 93 | 99 | | | | | | |
| 24 | 35 | 36 | 7/22/23 | JAVIER MEZA | 614 | 14 | 800 | | | | | | | | A | 100 | 96 | 106 | 108 | 99 | 140 | 147 | 143 | 151 | 148 | Pass |
| | | | | | | | | | | | | | | | B | 110 | 98 | 105 | 117 | 112 | | | | | | |
| 25 | 56 | 57 | 9/10/23 | EDUARDO DEL VALLE | 616 | 12 | 800 | | | | | | | | A | 116 | 116 | 116 | 107 | 139 | 184 | 179 | 183 | 187 | 186 | Pass |
| | | | | | | | | | | | | | | | B | 120 | 109 | 142 | 114 | 115 | | | | | | |
| 26 | 58 | 60 | 9/10/23 | JOSE RODRIGUEZ | 6`14 | 12 | 800 | | | | | | | | A | 112 | 102 | 114 | 108 | 120 | 145 | 138 | 157 | 157 | 143 | Pass |
| | | | | | | | | | | | | | | | B | 125 | 105 | 127 | 102 | 115 | | | | | | |
| 27 | 62 | 64 | 9/10/23 | EDUARDO DEL VALLE | 616 | 12 | 800 | | | | | | | | A | 115 | 112 | 116 | 116 | 120 | 156 | 157 | 147 | 139 | 157 | Pass |
| | | | | | | | | | | | | | | | B | 115 | 109 | 117 | 114 | 119 | | | | | | |
| 28 | 63 | 65 | 9/10/23 | EDUARDO DEL VALLE | 616 | 12 | 800 | | | | | | | | A | 110 | 104 | 109 | 104 | 103 | 165 | 165 | 172 | 169 | 158 | Pass |
| | | | | | | | | | | | | | | | B | 110 | 104 | 122 | 110 | 120 | | | | | | |
| 29 | 68 | 69 | 9/10/23 | JOSE RODRIGUEZ | 614 | 12 | 800 | | | | | | | | A | 130 | 135 | 128 | 123 | 134 | 154 | 161 | 168 | 160 | 162 | Pass |
| | | | | | | | | | | | | | | | B | 116 | 108 | 116 | 113 | 119 | | | | | | |
| 30 | 70 | 71 | 9/10/23 | EDUARDO DEL VALLE | 616 | 11 | 800 | | | | | | | | A | 116 | 104 | 125 | 112 | 114 | 170 | 162 | 165 | 160 | 167 | Pass |
| | | | | | | | | | | | | | | | B | 122 | 121 | 111 | 124 | 115 | | | | | | |
| 31 | 72 | 73 | 9/11/23 | EDUARDO DEL VALLE | 616 | 12 | 800 | | | | | | | | A | 116 | 125 | 118 | 120 | 128 | 163 | 160 | 158 | 153 | 165 | Pass |
| | | | | | | | | | | | | | | | B | 115 | 118 | 122 | 113 | 111 | | | | | | |
| 32 | 76 | 78 | 9/11/23 | EDUARDO DEL VALLE | 616 | 12 | 800 | | | | | | | | A | 111 | 102 | 108 | 113 | 107 | 159 | 147 | 167 | 152 | 167 | Pass |
| | | | | | | | | | | | | | | | B | 114 | 106 | 127 | 111 | 113 | | | | | | |
| 33 | 79 | 81 | 9/11/23 | EDUARDO DEL VALLE | 616 | 11 | 800 | | | | | | | | A | 124 | 112 | 112 | 117 | 120 | 166 | 174 | 158 | 157 | 166 | Pass |
| | | | | | | | | | | | | | | | B | 111 | 116 | 121 | 119 | 109 | | | | | | |
| 34 | 82 | 83 | 9/11/23 | JOSE RODRIGUEZ | 614 | 12 | 800 | | | | | | | | A | 103 | 111 | 126 | 113 | 111 | 166 | 163 | 164 | 154 | 165 | Pass |
| | | | | | | | | | | | | | | | B | 120 | 109 | 119 | 113 | 118 | | | | | | |
| 35 | 86 | 88 | 9/11/23 | JOSE RODRIGUEZ | 614 | 12 | 800 | | | | | | | | A | 125 | 113 | 113 | 104 | 120 | 163 | 1`68 | 162 | 159 | 166 | Pass |
| | | | | | | | | | | | | | | | B | 111 | 126 | 111 | 116 | 130 | | | | | | |
| 36 | 89 | 90 | 9/13/23 | EDUARDO DEL VALLE | 616 | 11 | 825 | | | | | | | | A | 119 | 116 | 117 | 110 | 126 | 182 | 183 | 179 | 184 | 185 | Pass |
| | | | | | | | | | | | | | | | B | 126 | 101 | 113 | 107 | 122 | | | | | | |

# ECApplications

## Destructive Sample Information

**Project Name:** Minnkota Power Cooperative, Inc. **Job #** 233013 **Superintendent:** Octavio Rivas

**Material Type:** 60 Mil HDPE SS Textured / Smooth Liner

**Job Description:** Celll 5 Phase 1B

**Reported By :** Daniel Martinez

| | | | | | |
|---|---|---|---|---|---|
| **Primary** | X | **Pond** | | **Peel Test Extrusion Minimum** | 78 PPI |
| **Secondary** | | **Cell** | X | **Peel Test Fusion Minimum** | 91 PPI |
| | | **Pad** | | **Shear Test Minimum** | 120 PPI |

| DS No | Seam Number | | Weld Date | Operator Name / ID | Mach No | Mach Speed | Mach Temp | Preheat Temp | Amb Temp | Peel Extrusion 1 | 2 | 3 | 4 | 5 | | Peel Wedge 1 | 2 | 3 | 4 | 5 | Shear 1 | 2 | 3 | 4 | 5 | Test Result |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 37 | 92 | 93 | 9/13/23 | GUILLERMO BENITEZ | 616 | 11 | 825 | | | | | | | | A | 115 | 132 | 101 | 124 | 101 | 173 | 173 | 169 | 164 | 178 | Pass |
| | | | | | | | | | | | | | | | B | 116 | 127 | 112 | 117 | 108 | | | | | | |
| 38 | 94 | 96 | 9/13/23 | GUILLERMO BENITEZ | 616 | 11 | 825 | | | | | | | | A | 112 | 116 | 122 | 115 | 121 | 180 | 179 | 178 | 175 | 179 | Pass |
| | | | | | | | | | | | | | | | B | 117 | 101 | 112 | 113 | 120 | | | | | | |
| 39 | 98 | 99 | 9/13/23 | GUILLERMO BENITEZ | 616 | 11 | 825 | | | | | | | | A | 128 | 130 | 118 | 123 | 111 | 183 | 179 | 179 | 168 | 1`57 | Pass |
| | | | | | | | | | | | | | | | B | 123 | 109 | 121 | 112 | 124 | | | | | | |
| 40 | 100 | 102 | 9/13/23 | GUILLERMO BENITEZ | 616 | 11 | 825 | | | | | | | | A | 130 | 130 | 130 | 121 | 132 | 175 | 172 | 160 | 169 | 172 | Pass |
| | | | | | | | | | | | | | | | B | 123 | 125 | 117 | 114 | 115 | | | | | | |
| 41 | 104 | 105 | 9/13/23 | GUILLERMO BENITEZ | 616 | 12 | 825 | | | | | | | | A | 116 | 116 | 124 | 116 | 119 | `178 | 1`81 | 189 | 1`79 | 177 | Pass |
| | | | | | | | | | | | | | | | B | 116 | 107 | 120 | 100 | 114 | | | | | | |
| 42 | 106 | 108 | 9/13/23 | GUILLERMO BENITEZ | 616 | 12 | 825 | | | | | | | | A | 119 | 114 | 121 | 119 | 118 | 167 | 183 | 169 | 176 | 183 | Pass |
| | | | | | | | | | | | | | | | B | 123 | 126 | 146 | 114 | 127 | | | | | | |
| 43 | 110 | 111 | 9/13/23 | GUILLERMO BENITEZ | 616 | 12 | 825 | | | | | | | | A | 113 | 108 | 128 | 117 | 136 | 154 | 168 | 149 | 170 | 166 | Pass |
| | | | | | | | | | | | | | | | B | 128 | 117 | 122 | 144 | 115 | | | | | | |
| 44 | 114 | 115 | 9/13/23 | GUILLERMO BENITEZ | 616 | 12 | 825 | | | | | | | | A | 126 | 125 | 125 | 112 | 110 | 158 | 163 | 159 | 156 | 166 | Pass |
| | | | | | | | | | | | | | | | B | 109 | 106 | 113 | 103 | 110 | | | | | | |
| 45 | 116 | 118 | 9/14/23 | GUILLERMO BENITEZ | 616 | 11 | 825 | | | | | | | | A | 113 | 109 | 123 | 130 | 112 | 153 | 169 | 158 | 169 | 173 | Pass |
| | | | | | | | | | | | | | | | B | 131 | 120 | 115 | 108 | 119 | | | | | | |
| 46 | 120 | 121 | 9/14/23 | GUILLERMO BENITEZ | 616 | 11 | 825 | | | | | | | | A | 125 | 123 | 125 | 117 | 109 | 170 | 162 | 1`69 | 158 | 163 | Pass |
| | | | | | | | | | | | | | | | B | 102 | 105 | 115 | 107 | 128 | | | | | | |
| 47 | 122 | 124 | 9/14/23 | GUILLERMO BENITEZ | 616 | 12 | 825 | | | | | | | | A | 144 | 109 | 118 | 115 | 118 | 165 | 148 | 149 | 162 | 157 | Pass |
| | | | | | | | | | | | | | | | B | 130 | 131 | 154 | 134 | 123 | | | | | | |
| 48 | 126 | 127 | 9/14/23 | GUILLERMO BENITEZ | 616 | 12 | 825 | | | | | | | | A | 128 | 125 | 124 | 109 | 117 | 168 | 156 | 152 | 151 | 149 | Pass |
| | | | | | | | | | | | | | | | B | 108 | 104 | 106 | 104 | 109 | | | | | | |
| 49 | 130 | 132 | 9/14/23 | JOSE RODRIGUEZ | 614 | 12 | 825 | | | | | | | | A | 124 | 100 | 117 | 115 | 121 | 169 | 172 | 157 | 157 | 164 | Pass |
| | | | | | | | | | | | | | | | B | 114 | 109 | 121 | 104 | 110 | | | | | | |
| 50 | 133 | 134 | 9/14/23 | EDUARDO DEL VALLE | 616 | 12 | 825 | | | | | | | | A | 116 | 110 | 130 | 108 | 117 | 171 | 168 | 170 | 166 | 168 | Pass |
| | | | | | | | | | | | | | | | B | 119 | 116 | 127 | 119 | 136 | | | | | | |
| 51 | 136 | 137 | 9/16/23 | EDUARDO DEL VALLE | 616 | 11 | 840 | | | | | | | | A | 118 | 110 | 115 | 117 | 110 | 167 | 159 | 169 | 169 | 166 | Pass |
| | | | | | | | | | | | | | | | B | 113 | 104 | 113 | 118 | 113 | | | | | | |
| 52 | 142 | 143 | 9/16/23 | EDUARDO DEL VALLE | 616 | 11 | 840 | | | | | | | | A | 108 | 103 | 120 | 99 | 120 | 169 | 168 | 173 | 179 | 169 | Pass |
| | | | | | | | | | | | | | | | B | 123 | 124 | 113 | 124 | 134 | | | | | | |
| 53 | 150 | 151 | 9/16/23 | EDUARDO DEL VALLE | 616 | 11 | 840 | | | | | | | | A | 124 | 102 | 112 | 110 | 125 | 169 | 154 | 169 | 156 | 154 | Pass |
| | | | | | | | | | | | | | | | B | 110 | 132 | 118 | 112 | 111 | | | | | | |
| 54 | 152 | 153 | 9/16/23 | EDUARDO DEL VALLE | 616 | 13 | 840 | | | | | | | | A | 113 | 111 | 111 | 111 | 118 | 164 | 167 | 153 | 172 | 156 | Pass |
| | | | | | | | | | | | | | | | B | 114 | 102 | 110 | 112 | 116 | | | | | | |

# ECApplications

## Destructive Sample Information

**Project Name:** Minnkota Power Cooperative, Inc. **Job #** 233013 **Superintendent:** Octavio Rivas

**Material Type:** 60 Mil HDPE SS Textured / Smooth Liner

**Job Description:** Celll 5 Phase 1B

**Reported By :** Daniel Martinez

| | | | | |
|---|---|---|---|---|
| **Primary** | X | **Pond** | | |
| **Secondary** | | **Cell** | X | |
| | | **Pad** | | |

| | | |
|---|---|---|
| **Peel Test Extrusion Minimum** | 78 | **PPI** |
| **Peel Test Fusion Minimum** | 91 | **PPI** |
| **Shear Test Minimum** | 120 | **PPI** |

| DS No | Seam Number | | Weld Date | Operator Name / ID | Mach No | Mach Speed | Mach Temp | Preheat Temp | Amb Temp | Peel Extrusion 1 | 2 | 3 | 4 | 5 | | Peel Wedge 1 | 2 | 3 | 4 | 5 | Shear 1 | 2 | 3 | 4 | 5 | Test Result |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 55 | 154 | 155 | 9/18/23 | EDUARDO DEL VALLE | 616 | 11 | 840 | | | | | | | | A | 112 | 109 | 122 | 121 | 125 | 157 | 158 | 162 | 163 | 166 | Pass |
| | | | | | | | | | | | | | | | B | 117 | 100 | 120 | 99 | 108 | | | | | | |
| 56 | 156 | 158 | 9/18/23 | JOSE RODRIGUEZ | 614 | 10 | 840 | | | | | | | | A | 135 | 112 | 120 | 116 | 113 | 158 | 167 | 177 | 166 | 162 | Pass |
| | | | | | | | | | | | | | | | B | 136 | 122 | 129 | 121 | 115 | | | | | | |
| 57 | 159 | 160 | 9/18/23 | JOSE RODRIGUEZ | 614 | 11 | 840 | | | | | | | | A | 127 | 112 | 132 | 126 | 106 | 169 | 173 | 175 | 165 | 160 | Pass |
| | | | | | | | | | | | | | | | B | 133 | 129 | 108 | 116 | 112 | | | | | | |
| 58 | 160 | 162 | 9/18/23 | EDUARDO DEL VALLE | 964 | 11 | 840 | | | | | | | | A | 124 | 112 | 120 | 112 | 115 | 158 | 160 | 158 | 153 | 169 | Pass |
| | | | | | | | | | | | | | | | B | 127 | 125 | 124 | 123 | 123 | | | | | | |
| 59 | 163 | 164 | 9/18/23 | EDUARDO DEL VALLE | 964 | 12 | 840 | | | | | | | | A | 127 | 112 | 114 | 111 | 118 | 160 | 159 | 162 | 169 | 168 | Pass |
| | | | | | | | | | | | | | | | B | 117 | 110 | 110 | `107 | 112 | | | | | | |
| 60 | 166 | 167 | 9/18/23 | EDUARDO DEL VALLE | 964 | 12 | 840 | | | | | | | | A | 113 | 121 | 101 | 107 | 124 | 155 | 156 | 168 | 163 | 159 | Pass |
| | | | | | | | | | | | | | | | B | 110 | 108 | 119 | 117 | 116 | | | | | | |
| 61 | 167 | 168 | 9/18/23 | JOSE RODRIGUEZ | 964 | 12 | 825 | | | | | | | | A | 104 | 104 | 110 | 107 | 125 | 159 | 157 | 161 | 160 | 157 | Pass |
| | | | | | | | | | | | | | | | B | 117 | 130 | 99 | 109 | 108 | | | | | | |
| 62 | 176 | 177 | 9/19/23 | JOSE RODRIGUEZ | 964 | 11 | 825 | | | | | | | | A | 126 | 107 | 106 | 112 | 111 | 156 | 155 | 173 | 182 | 169 | Pass |
| | | | | | | | | | | | | | | | B | 116 | 112 | 106 | 113 | 114 | | | | | | |
| 63 | 179 | 180 | 9/19/23 | EDUARDO DEL VALLE | 964 | 13 | 825 | | | | | | | | A | 126 | 106 | 117 | 121 | 116 | 161 | 157 | 151 | 156 | 159 | Pass |
| | | | | | | | | | | | | | | | B | 119 | 114 | 108 | 116 | 121 | | | | | | |
| 64 | 181 | 182 | 9/19/23 | EDUARDO DEL VALLE | 964 | 13 | 825 | | | | | | | | A | 113 | 98 | 124 | 111 | 121 | 157 | 155 | 151 | 150 | 157 | Pass |
| | | | | | | | | | | | | | | | B | 101 | 105 | 122 | 116 | 112 | | | | | | |
| 65 | 83 | 44 | 9/21/23 | EDUARDO DEL VALLE | 964 | 12 | 825 | | | | | | | | A | 125 | 116 | 118 | 100 | 114 | 170 | 157 | 157 | 158 | 163 | Pass |
| | | | | | | | | | | | | | | | B | 119 | 119 | 130 | 130 | 138 | | | | | | |
| 66 | 188 | 183 | 9/21/23 | JOSE RODRIGUEZ | 614 | 12 | 825 | | | | | | | | A | 116 | 116 | 128 | 127 | 122 | 175 | 170 | 167 | 154 | 163 | Pass |
| | | | | | | | | | | | | | | | B | 121 | 122 | 127 | 128 | 132 | | | | | | |
| 67 | 183 | 184 | 9/21/23 | EDUARDO DEL VALLE | 964 | 12 | 825 | | | | | | | | A | 116 | 121 | 120 | 114 | 117 | 166 | 170 | 167 | 169 | 171 | Pass |
| | | | | | | | | | | | | | | | B | 121 | 114 | 116 | 123 | 100 | | | | | | |
| 68 | 184 | 185 | 9/21/23 | JOSE RODRIGUEZ | 614 | 12 | 825 | | | | | | | | A | 109 | 118 | 134 | 124 | 108 | 167 | 156 | 159 | 170 | 170 | Pass |
| | | | | | | | | | | | | | | | B | 114 | 121 | 115 | 125 | 122 | | | | | | |
| 69 | 185 | 186 | 9/21/23 | EDUARDO DELVALLE | 964 | 12 | 825 | | | | | | | | A | 118 | 114 | 129 | 119 | 116 | 168 | 158 | 160 | 162 | 164 | Pass |
| | | | | | | | | | | | | | | | B | 117 | 106 | 126 | 112 | 117 | | | | | | |
| 70 | 186 | 187 | 9/21/23 | JOSE RODRIGUEZ | 614 | 12 | 825 | | | | | | | | A | 112 | 122 | 130 | 138 | 133 | 158 | 149 | 152 | 167 | 166 | Pass |
| | | | | | | | | | | | | | | | B | 124 | 113 | 113 | 113 | 119 | | | | | | |
| 71 | 187 | 190 | 9/22/23 | EDUARDO DEL VALLE | 964 | 11 | 830 | | | | | | | | A | 115 | 121 | 111 | 126 | 128 | 158 | 163 | 158 | 164 | 164 | Pass |
| | | | | | | | | | | | | | | | B | 108 | 105 | 126 | 115 | 112 | | | | | | |
| 72 | 190 | 191 | 9/22/23 | JOSE RODRIGUEZ | 614 | 11 | 830 | | | | | | | | A | 136 | 114 | 127 | 120 | 118 | 170 | 169 | 174 | 173 | 168 | Pass |
| | | | | | | | | | | | | | | | B | 121 | 139 | 117 | 109 | 108 | | | | | | |

# ECApplications

## Destructive Sample Information

**Project Name:** Minnkota Power Cooperative, Inc. **Job #** 233013 **Superintendent:** Octavio Rivas

**Material Type:** 60 Mil HDPE SS Textured / Smooth Liner

**Job Description:** Celll 5 Phase 1B

**Reported By :** Daniel Martinez

| | | | | | |
|---|---|---|---|---|---|
| **Primary** | X | **Pond** | | **Peel Test Extrusion Minimum** | 78 PPI |
| **Secondary** | | **Cell** | X | **Peel Test Fusion Minimum** | 91 PPI |
| | | **Pad** | | **Shear Test Minimum** | 120 PPI |

| DS No | Seam Number | | Weld Date | Operator Name / ID | Mach No | Mach Speed | Mach Temp | Preheat Temp | Amb Temp | Peel Extrusion 1 | 2 | 3 | 4 | 5 | | Peel Wedge 1 | 2 | 3 | 4 | 5 | Shear 1 | 2 | 3 | 4 | 5 | Test Result |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 73 | 191 | 192 | 9/22/23 | EDUARDO DEL VALLE | 964 | 11 | 830 | | | | | | | | A | 123 | 123 | 123 | 134 | 130 | 167 | 165 | 163 | 166 | 168 | Pass |
| | | | | | | | | | | | | | | | B | 135 | 110 | 117 | 119 | 113 | | | | | | |
| 74 | 192 | 193 | 9/22/23 | JOSE RODRIGUEZ | 614 | 11 | 830 | | | | | | | | A | 109 | 111 | 113 | 115 | 117 | 170 | 171 | 168 | 158 | 159 | Pass |
| | | | | | | | | | | | | | | | B | 131 | 132 | 124 | 126 | 131 | | | | | | |
| 75 | 192 | 193 | 9/21/23 | JOSE RODRIGUEZ | 614 | 11 | 830 | | | | | | | | A | 121 | 111 | 122 | 119 | 114 | 158 | 157 | 154 | 158 | 153 | Pass |
| | | | | | | | | | | | | | | | B | 120 | 121 | 104 | 106 | 124 | | | | | | |
| 76 | 115 | 183 | 9/21/23 | EDUARDO DEL VALLE | 964 | 12 | 830 | | | | | | | | A | 129 | 121 | 130 | 114 | 122 | 160 | 160 | 164 | 168 | 154 | Pass |
| | | | | | | | | | | | | | | | B | 117 | 122 | 119 | 110 | 120 | | | | | | |
| 17-A | 8 | 9 | 7/20/23 | EDUARDO DEL VALLE | 616 | 12 | 800 | | | | | | | | A | 125 | 119 | 123 | 118 | 111 | 175 | 176 | 173 | 170 | 169 | Pass |
| | | | | | | | | | | | | | | | B | 115 | 117 | 111 | 119 | 118 | | | | | | |
| 17-B | 1 | 2 | 7/20/23 | EDUARDO DEL VALLE | 616 | 12 | 800 | | | | | | | | A | 112 | 107 | 113 | 109 | 102 | 173 | 169 | 158 | 170 | 167 | Pass |
| | | | | | | | | | | | | | | | B | 110 | 108 | 107 | 111 | 128 | | | | | | |
| 29-A | 68 | 69 | 9/10/23 | JOSE RODRIGUEZ | 614 | 12 | 800 | | | | | | | | A | 128 | 120 | 125 | 126 | 123 | `159 | 163 | 158 | 165 | 166 | Pass |
| | | | | | | | | | | | | | | | B | 112 | 112 | 136 | 131 | 108 | | | | | | |
| 29-B | 66 | 67 | 9/10/23 | JOSE RODRIGUEZ | 614 | 12 | 800 | | | | | | | | A | 97 | 109 | 123 | 117 | 130 | 167 | 157 | 169 | 179 | 164 | Pass |
| | | | | | | | | | | | | | | | B | 108 | 104 | 123 | 118 | 123 | | | | | | |
| 76-A | 115 | 183 | 9/21/23 | EDUARDO DEL VALLE | 964 | 12 | 830 | | | | | | | | A | 123 | 121 | 119 | 114 | 112 | 163 | 160 | 158 | 153 | 158 | Pass |
| | | | | | | | | | | | | | | | B | 109 | 113 | 102 | 109 | 124 | | | | | | |
| 76-B | 185 | 186 | 9/21/23 | EDUARDO DEL VALLE | 964 | 12 | 830 | | | | | | | | A | 114 | 102 | 99 | 105 | 112 | 165 | 159 | 153 | 162 | 160 | Pass |
| | | | | | | | | | | | | | | | B | 123 | 119 | 121 | 116 | 102 | | | | | | |
| 77 | 194 | 195 | 9/30/23 | EDUARDO DEL VALLE | 964 | 11 | 830 | | | | | | | | A | 117 | 112 | 119 | 115 | 118 | 169 | 168 | 169 | 171 | 170 | Pass |
| | | | | | | | | | | | | | | | B | 117 | 114 | 118 | 117 | 117 | | | | | | |
| 78 | 196 | 203 | 9/30/23 | EDUARDO DEL VALLE | 965 | 11 | 830 | | | | | | | | A | 128 | 127 | 124 | 132 | 114 | 167 | 159 | 172 | 169 | 175 | Pass |
| | | | | | | | | | | | | | | | B | 119 | 109 | 127 | 118 | 117 | | | | | | |
| 79 | 198 | 204 | 9/30/23 | EDUARDO DEL VALLE | 966 | 11 | 830 | | | | | | | | A | 119 | 117 | 117 | 119 | 113 | 167 | 158 | 169 | 154 | 157 | Pass |
| | | | | | | | | | | | | | | | B | 126 | 126 | 123 | 112 | 123 | | | | | | |
| 80 | 200 | 205 | 9/30/23 | EDUARDO DEL VALLE | 967 | 11 | 830 | | | | | | | | A | 133 | 127 | 111 | 121 | 114 | 167 | 165 | 169 | 172 | 170 | Pass |
| | | | | | | | | | | | | | | | B | 131 | 135 | 108 | 117 | 117 | | | | | | |
| 81 | 201 | 202 | 9/30/23 | EDUARDO DEL VALLE | 968 | 11 | 830 | | | | | | | | A | 131 | 129 | 127 | 136 | 127 | 168 | 166 | 175 | 173 | 171 | Pass |
| | | | | | | | | | | | | | | | B | 118 | 108 | 112 | 113 | 143 | | | | | | |
| 82 | 168 | 207 | 10/7/23 | JOSE RODRIGUEZ | 614 | 11 | 850 | | | | | | | | A | 132 | 132 | 133 | 134 | 111 | 199 | 201 | 202 | 193 | 203 | Pass |
| | | | | | | | | | | | | | | | B | 125 | 132 | 144 | 129 | 98 | | | | | | |
| 83 | 207 | 208 | 10/7/23 | EDUARDO DEL VALLE | 964 | 11 | 850 | | | | | | | | A | 130 | 115 | 124 | 129 | 128 | 209 | 201 | 200 | 200 | 198 | Pass |
| | | | | | | | | | | | | | | | B | 130 | 117 | 128 | 128 | 139 | | | | | | |
| 84 | 209 | 210 | 10/7/23 | EDUARDO DEL VALLE | 964 | 11 | 850 | | | | | | | | A | 124 | 124 | 120 | 113 | 128 | 198 | 199 | 201 | 200 | 198 | Pass |
| | | | | | | | | | | | | | | | B | 142 | 117 | 121 | 118 | 132 | | | | | | |

# ECApplications

## Destructive Sample Information

**Project Name:** Minnkota Power Cooperative, Inc. **Job #** 233013 **Superintendent:** Octavio Rivas

**Material Type:** 60 Mil HDPE SS Textured / Smooth Liner **Primary** X **Pond** **Peel Test Extrusion Minimum** 78 PPI

**Job Description:** Celll 5 Phase 1B **Secondary** **Cell** X **Peel Test Fusion Minimum** 91 PPI

**Reported By :** Daniel Martinez **Pad** **Shear Test Minimum** 120 PPI

| DS No | Seam Number | | Weld Date | Operator Name / ID | Mach No | Mach Speed | Mach Temp | Preheat Temp | Amb Temp | Peel Extrusion 1 | 2 | 3 | 4 | 5 | | Peel Wedge 1 | 2 | 3 | 4 | 5 | Shear 1 | 2 | 3 | 4 | 5 | Test Result |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 85 | 211 | 212 | 10/7/23 | EDUARDO DEL VALLE | 964 | 11 | 850 | | | | | | | | A | 126 | 120 | 137 | 131 | 139 | 203 | 200 | 201 | 206 | 200 | Pass |
| | | | | | | | | | | | | | | | B | 131 | 139 | 128 | 126 | 131 | | | | | | |
| 86 | 214 | 215 | 10/7/23 | JOSE RODRIGUEZ | 614 | 11 | 830 | | | | | | | | A | 119 | 123 | 121 | 116 | 111 | 197 | 198 | 201 | 199 | 191 | Pass |
| | | | | | | | | | | | | | | | B | 141 | 138 | 128 | 142 | 150 | | | | | | |
| 87 | 223 | 224 | 10/8/23 | JOSE RODRIGUEZ | 614 | 11 | 850 | | | | | | | | A | 146 | 132 | 154 | 137 | 138 | 198 | 196 | 199 | 200 | 192 | Pass |
| | | | | | | | | | | | | | | | B | 134 | 141 | 123 | 128 | 132 | | | | | | |
| 88 | 227 | 228 | 10/8/23 | JOSE RODRIGUEZ | 614 | 11 | 850 | | | | | | | | A | 155 | 117 | 122 | 140 | 139 | 197 | 199 | 201 | 200 | 198 | Pass |
| | | | | | | | | | | | | | | | B | 118 | 140 | 147 | 122 | 123 | | | | | | |
| 89 | 229 | 230 | 10/8/23 | EDUARDO DEL VALLE | 964 | 12 | 830 | | | | | | | | A | 130 | 132 | 126 | 120 | 127 | 196 | 194 | 196 | 202 | 198 | Pass |
| | | | | | | | | | | | | | | | B | 126 | 120 | 135 | 124 | 140 | | | | | | |
| 90 | 231 | 232 | 10/8/23 | JOSE RODRIGUEZ | 614 | 11 | 830 | | | | | | | | A | 124 | 134 | 122 | 131 | 119 | 188 | 186 | 189 | 188 | 190 | Pass |
| | | | | | | | | | | | | | | | B | 120 | 121 | 126 | 119 | 124 | | | | | | |
| 91 | 234 | 235 | 10/9/23 | JOSE RODRIGUEZ | 614 | 11 | 830 | | | | | | | | A | 137 | 131 | 139 | 124 | 139 | 193 | 191 | 190 | 195 | 199 | Pass |
| | | | | | | | | | | | | | | | B | 114 | 112 | 138 | 122 | 130 | | | | | | |
| 92 | 236 | 238 | 10/9/34 | EDUARDO DEL VALLE | 614 | 11 | 830 | | | | | | | | A | 139 | 124 | 150 | 123 | 128 | 187 | 189 | 187 | 186 | 186 | Pass |
| | | | | | | | | | | | | | | | B | 139 | 123 | 120 | 123 | 113 | | | | | | |
| 93 | 239 | 240 | 10/9/23 | JOSE RODRIGUEZ | 614 | 11 | 850 | | | | | | | | A | 140 | 146 | 131 | 133 | 143 | 190 | 187 | 195 | 184 | 189 | Pass |
| | | | | | | | | | | | | | | | B | 129 | 124 | 97 | 137 | 108 | | | | | | |
| 94 | 242 | 244 | 10/9/23 | JOSE RODRIGUEZ | 614 | 11 | 850 | | | | | | | | A | 126 | 129 | 132 | 128 | 102 | 180 | 180 | 189 | 180 | 181 | Pass |
| | | | | | | | | | | | | | | | B | 121 | 121 | 125 | 127 | 123 | | | | | | |
| 95 | 246 | 248 | 10/10/23 | JOSE RODRIGUEZ | 614 | 11 | 850 | | | | | | | | A | 119 | 110 | 100 | 112 | 124 | 198 | 194 | 198 | 193 | 193 | Pass |
| | | | | | | | | | | | | | | | B | 125 | 116 | 121 | 116 | 129 | | | | | | |
| 96 | 250 | 251 | 10/10/23 | EDUARDO DEL VALLE | 614 | 11 | 850 | | | | | | | | A | 124 | 119 | 118 | 148 | 103 | 196 | 187 | 190 | 190 | 194 | Pass |
| | | | | | | | | | | | | | | | B | 118 | 112 | 119 | 115 | 121 | | | | | | |
| 97 | 252 | 254 | 10/10/23 | GUILLERMO BENITEZ | 963 | 5 | 850 | | | | | | | | A | 106 | 114 | 111 | 134 | 149 | 189 | 189 | 194 | 191 | 194 | Pass |
| | | | | | | | | | | | | | | | B | 118 | 122 | 124 | 116 | 122 | | | | | | |
| 98 | 256 | 257 | 10/10/23 | GUILLERMO BENITEZ | 963 | 5 | 850 | | | | | | | | A | 117 | 108 | 98 | 110 | 122 | 196 | 198 | 196 | 195 | 196 | Pass |
| | | | | | | | | | | | | | | | B | 123 | 114 | 119 | 114 | 127 | | | | | | |
| 99 | 258 | 260 | 10/10/23 | EDUARDO DEL VALLE | 614 | 9 | 850 | | | | | | | | A | 116 | 113 | 127 | 109 | 124 | 174 | 180 | 181 | 190 | 179 | Pass |
| | | | | | | | | | | | | | | | B | 126 | 120 | 129 | 118 | 118 | | | | | | |
| 100 | 216 | 217 | 10/9/23 | GONZALO SUAREZ | 713 | | 510 | 800 | | 108 | 104 | 111 | 109 | 100 | A | | | | | | 162 | 160 | 161 | 168 | 168 | Pass |
| | | | | | | | | | | | | | | | B | | | | | | | | | | |
| 101 | 212 | 223 | 10/9/23 | GONZALO SUAREZ | 713 | | 510 | 800 | | 137 | 143 | 164 | 163 | 113 | A | | | | | | 174 | 170 | 178 | 176 | 169 | Pass |
| | | | | | | | | | | | | | | | B | | | | | | | | | | |
| 102 | 193 | 261 | 10/11/23 | JOSE RODRIGUEZ | 963 | 5 | 850 | | | | | | | | A | 119 | 160 | 133 | 121 | 151 | 193 | 197 | 197 | 196 | 198 | Pass |
| | | | | | | | | | | | | | | | B | 136 | 126 | 112 | 144 | 131 | | | | | | |

# ECApplications

## Destructive Sample Information

**Project Name:** Minnkota Power Cooperative, Inc. **Job #** 233013 **Superintendent:** Octavio Rivas

**Material Type:** 60 Mil HDPE SS Textured / Smooth Liner **Primary** X **Pond**

**Job Description:** Celll 5 Phase 1B **Secondary** **Cell** X

**Reported By :** Daniel Martinez **Pad**

**Peel Test Extrusion Minimum** 78 **PPI**

**Peel Test Fusion Minimum** 91 **PPI**

**Shear Test Minimum** 120 **PPI**

| DS No | Seam Number | | Weld Date | Operator Name / ID | Mach No | Mach Speed | Mach Temp | Preheat Temp | Amb Temp | Peel Extrusion 1 | 2 | 3 | 4 | 5 | | Peel Wedge 1 | 2 | 3 | 4 | 5 | Shear 1 | 2 | 3 | 4 | 5 | Test Result |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 103 | 261 | 262 | 10/11/23 | EDUARDO DEL VALLE | 614 | 9 | 850 | | | | | | | | A | 120 | 121 | 121 | 130 | 146 | 187 | 185 | 189 | 178 | 178 | Pass |
| | | | | | | | | | | | | | | | B | 135 | 124 | 128 | 113 | 124 | | | | | | |
| 104 | 262 | 260 | 10/11/23 | BRANDON GOULD | 535 | | 505 | 485 | | 132 | 124 | 165 | 152 | 136 | A | | | | | | 184 | 182 | 179 | 175 | 184 | Pass |
| | | | | | | | | | | | | | | | B | | | | | | | | | | | |
| 105 | 263 | 233 | 10/13/23 | GONZALO SUAREZ | 713 | | 510 | 800 | | 126 | 118 | 123 | 118 | 119 | A | | | | | | 178 | 180 | 176 | 181 | 183 | Pass |
| | | | | | | | | | | | | | | | B | | | | | | | | | | | |
| 84-A | 209 | 210 | 10/10/23 | EDUARDO DEL VALLE | 614 | 11 | 850 | | | | | | | | A | 125 | 118 | 120 | 152 | 148 | 186 | 184 | 189 | 193 | 199 | Pass |
| | | | | | | | | | | | | | | | B | 121 | 119 | 128 | 123 | 123 | | | | | | |
| 84-B | 207 | 208 | 10/7/23 | EDUARDO DEL VALLE | 964 | 11 | 850 | | | | | | | | A | 127 | 127 | 129 | 135 | 121 | 186 | 193 | 192 | 187 | 197 | Pass |
| | | | | | | | | | | | | | | | B | 121 | 120 | 145 | 124 | 142 | | | | | | |
| 93-A | 239 | 240 | 10/9/23 | JOSE RODRIGUEZ | 614 | 11 | 850 | | | | | | | | A | 136 | 120 | 129 | 141 | 131 | 191 | 189 | 185 | 191 | 187 | Pass |
| | | | | | | | | | | | | | | | B | 133 | 144 | 131 | 132 | 132 | | | | | | |
| 93-B | 238 | 239 | 10/9/23 | EDUARDO DEL VALLE | 614 | 11 | 850 | | | | | | | | A | 124 | 111 | 131 | 142 | 108 | 187 | 181 | 187 | 183 | 191 | Pass |
| | | | | | | | | | | | | | | | B | 131 | 105 | 133 | 113 | 131 | | | | | | |
| 96-A | 250 | 251 | 10/10/23 | EDUARDO DEL VALLE | 614 | 11 | 850 | | | | | | | | A | 143 | 133 | 130 | 125 | 135 | 196 | 199 | 197 | 201 | 200 | Pass |
| | | | | | | | | | | | | | | | B | 125 | 131 | 119 | 127 | 115 | | | | | | |
| 96-B | 248 | 249 | 10/10/23 | EDUARDO DEL VALLE | 614 | 11 | 850 | | | | | | | | A | 145 | 125 | 123 | 123 | 121 | 203 | 209 | 199 | 199 | 198 | Pass |
| | | | | | | | | | | | | | | | B | 133 | 115 | 124 | 116 | 109 | | | | | | |
| 106 | 265 | 266 | 10/14/23 | GUILLERMO BENITEZ | 64 | 4.5 | 850 | | | | | | | | A | 127 | 149 | 148 | 125 | 132 | 194 | 193 | 193 | 191 | 199 | Pass |
| | | | | | | | | | | | | | | | B | 134 | 137 | 133 | 132 | 126 | | | | | | |
| 107 | 268 | 270 | 10/14/23 | JOSE RODRIGUEZ | 963 | 5 | 850 | | | | | | | | A | 134 | 135 | 119 | 123 | 131 | 167 | 171 | 171 | 170 | 172 | Pass |
| | | | | | | | | | | | | | | | B | 119 | 123 | 110 | 125 | 112 | | | | | | |
| 108 | 271 | 272 | 10/14/23 | GUILLERMO BENITEZ | 64 | 4.5 | 850 | | | | | | | | A | 128 | 143 | 116 | 130 | 114 | 172 | 171 | 199 | 171 | 169 | Pass |
| | | | | | | | | | | | | | | | B | 140 | 125 | 146 | 123 | 123 | | | | | | |
| 109 | 274 | 275 | 10/14/23 | EDUARDO DEL VALLE | 614 | 9 | 850 | | | | | | | | A | 106 | 103 | 117 | 121 | 136 | 171 | 164 | 165 | 167 | 169 | Pass |
| | | | | | | | | | | | | | | | B | 98 | 113 | 115 | 113 | 108 | | | | | | |
| 110 | 276 | 278 | 10/14/23 | EDUARDO DEL VALLE | 614 | 9 | 850 | | | | | | | | A | 114 | 115 | 107 | 107 | 109 | 163 | 176 | 157 | 165 | 160 | Pass |
| | | | | | | | | | | | | | | | B | 105 | 110 | 109 | 113 | 103 | | | | | | |
| 111 | 280 | 281 | 10/14/23 | JOSE RODRIGUEZ | 963 | 4 | 850 | | | | | | | | A | 112 | 114 | 116 | 123 | 121 | 157 | 153 | 151 | 154 | 161 | Pass |
| | | | | | | | | | | | | | | | B | 121 | 135 | 126 | 113 | 118 | | | | | | |
| 112 | 282 | 284 | 10/14/23 | JOSE RODRIGUEZ | 963 | 4 | 850 | | | | | | | | A | 123 | 142 | 112 | 110 | 118 | 168 | 173 | 169 | 172 | 158 | Pass |
| | | | | | | | | | | | | | | | B | 118 | 112 | 124 | 125 | 123 | | | | | | |
| 113 | 285 | 286 | 10/14/23 | GUILLERMO BENITEZ | 64 | 4.5 | 850 | | | | | | | | A | 118 | 111 | 98 | 103 | 98 | 156 | 159 | 163 | 162 | 162 | Pass |
| | | | | | | | | | | | | | | | B | 107 | 99 | 103 | 106 | 113 | | | | | | |
| 114 | 288 | 289 | 10/15/23 | JOSE RODRIGUEZ | 963 | 5 | 850 | | | | | | | | A | 114 | 113 | 110 | 111 | 133 | 199 | 198 | 190 | 201 | 200 | Pass |
| | | | | | | | | | | | | | | | B | 143 | 118 | 114 | 115 | 132 | | | | | | |

# ECApplications

## Destructive Sample Information

**Project Name:** Minnkota Power Cooperative, Inc. **Job #** 233013 **Superintendent:** Octavio Rivas

**Material Type:** 60 Mil HDPE SS Textured / Smooth Liner

**Job Description:** Celll 5 Phase 1B

**Reported By :** Daniel Martinez

| | | | | | |
|---|---|---|---|---|---|
| **Primary** | X | **Pond** | | **Peel Test Extrusion Minimum** | 78 PPI |
| **Secondary** | | **Cell** | X | **Peel Test Fusion Minimum** | 91 PPI |
| | | **Pad** | | **Shear Test Minimum** | 120 PPI |

| DS No | Seam Number | | Weld Date | Operator Name / ID | Mach No | Mach Speed | Mach Temp | Preheat Temp | Amb Temp | Peel Extrusion 1 | 2 | 3 | 4 | 5 | | Peel Wedge 1 | 2 | 3 | 4 | 5 | Shear 1 | 2 | 3 | 4 | 5 | Test Result |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 115 | 290 | 292 | 10/15/23 | EDUARDO DEL VALLE | 614 | 10 | 850 | | | | | | | | A | 115 | 108 | 115 | 124 | 113 | 182 | 183 | 181 | 186 | 189 | Pass |
| | | | | | | | | | | | | | | | B | 118 | 112 | 110 | 98 | 109 | | | | | | |
| 116 | 293 | 294 | 10/16/23 | GUILLERMO BENITEZ | 64 | 4.5 | 850 | | | | | | | | A | 142 | 157 | 161 | 155 | 150 | 190 | 184 | 191 | 194 | 188 | Pass |
| | | | | | | | | | | | | | | | B | 133 | 147 | 147 | 135 | 137 | | | | | | |
| 117 | 296 | 297 | 10/16/23 | JOSE RODRIGUEZ | 963 | 5 | 850 | | | | | | | | A | 132 | 134 | 145 | 112 | 118 | 191 | 182 | 186 | 190 | 183 | Pass |
| | | | | | | | | | | | | | | | B | 133 | 128 | 122 | 141 | 150 | | | | | | |
| 118 | 298 | 300 | 10/16/23 | EDUARDO DEL VALLE | 614 | 9 | 850 | | | | | | | | A | 116 | 121 | 140 | 123 | 133 | 187 | 189 | 169 | 197 | 189 | Pass |
| | | | | | | | | | | | | | | | B | 112 | 129 | 113 | 118 | 128 | | | | | | |
| 119 | 301 | 302 | 10/16/23 | JOSE RODRIGUEZ | 963 | 5 | 850 | | | | | | | | A | 99 | 102 | 116 | 115 | 111 | 172 | 171 | 167 | 169 | 171 | Pass |
| | | | | | | | | | | | | | | | B | 107 | 117 | 111 | 113 | 122 | | | | | | |
| 120 | 181 | 304 | 10/17/23 | EDUARDO DEL VALLE | 614 | 9 | 850 | | | | | | | | A | 101 | 102 | 133 | 117 | 132 | 182 | 188 | 178 | 178 | 179 | Pass |
| | | | | | | | | | | | | | | | B | 119 | 142 | 108 | 113 | 137 | | | | | | |
| 121 | 305 | 53 | 10/17/23 | JOSE RODRIGUEZ | 963 | 5 | 850 | | | | | | | | A | 135 | 147 | 125 | 126 | 137 | 199 | 200 | 198 | 197 | 198 | Pass |
| | | | | | | | | | | | | | | | B | 132 | 125 | 126 | 134 | 125 | | | | | | |
| 93-A-1 | 239 | 240 | 10/9/23 | JOSE RODRIGUEZ | 614 | 11 | 850 | | | | | | | | A | 117 | 109 | 104 | 119 | 123 | 167 | 171 | 168 | 169 | 168 | Pass |
| | | | | | | | | | | | | | | | B | 101 | 124 | 113 | 105 | 102 | | | | | | |
| 120-A | 304 | 181 | 10/17/23 | EDUARDO DE VALLE | 614 | 9 | 850 | | | | | | | | A | 129 | 104 | 124 | 127 | 129 | 169 | 173 | 169 | 173 | 182 | Pass |
| | | | | | | | | | | | | | | | B | 122 | 127 | 130- | 129 | 130 | | | | | | |
| 120-B | 304 | 179 | 10/17/23 | EDUARDO DEL VALLE | 614 | 9 | 850 | | | | | | | | A | 101 | 119 | 123 | 118 | 114 | 179 | 183 | 164 | 180 | 181 | Pass |
| | | | | | | | | | | | | | | | B | 98 | 112 | 109 | 105 | 121 | | | | | | |
| 122 | 300 | 301 | 9/16/23 | JOSE RODRIGUEZ | 963 | 5 | 850 | | | | | | | | A | 117 | 113 | 101 | 108 | 119 | 168 | 163 | 159 | 169 | 174 | Pass |
| | | | | | | | | | | | | | | | B | 131 | 124 | 112 | 120 | 103 | | | | | | |
| 123 | 304 | 305 | 10/18/23 | GONZALO SUAREZ | 713 | | 510 | 800 | | 107 | 147 | 131 | 121 | 112 | A | | | | | | 188 | 180 | 186 | 186 | 181 | Pass |
| | | | | | | | | | | | | | | | B | | | | | | | | | | | |
| 124 | 292 | 293 | 10/16/23 | JOSE RODRIGUEZ | 963 | 5 | 850 | | | | | | | | A | 117 | 110 | 122 | 132 | 116 | 191 | 194 | 190 | 195 | 196 | Pass |
| | | | | | | | | | | | | | | | B | 121 | 132 | 154 | 149 | 125 | | | | | | |
| 125 | 294 | 296 | 10/16/23 | EDUARDO DE VALLE | 614 | 9 | 850 | | | | | | | | A | 129 | 122 | 136 | 134 | 147 | 188 | 188 | 193 | 185 | 188 | Pass |
| | | | | | | | | | | | | | | | B | 136 | 130 | 111 | 120 | 135 | | | | | | |
| 126 | 297 | 298 | 10/16/23 | GUILLERMO BENITEZ | 64 | 4.5 | 850 | | | | | | | | A | 119 | 129 | 143 | 135 | 115 | 187 | 184 | 181 | 168 | 184 | Pass |
| | | | | | | | | | | | | | | | B | 121 | 128 | 129 | 135 | 124 | | | | | | |
| | | | | | | | | | | | | | | | A | | | | | | | | | | | |
| | | | | | | | | | | | | | | | B | | | | | | | | | | | |
| | | | | | | | | | | | | | | | A | | | | | | | | | | | |
| | | | | | | | | | | | | | | | B | | | | | | | | | | | |
| | | | | | | | | | | | | | | | A | | | | | | | | | | | |
| | | | | | | | | | | | | | | | B | | | | | | | | | | | |
| | | | | | | | | | | | | | | | A | | | | | | | | | | | |
| | | | | | | | | | | | | | | | B | | | | | | | | | | | |

# ECApplications
## Repair Report

**Project Name** Minnkota Power Cooperative, Inc. **Job # :** 233013 **Superintendent:** Octavio Rivas

**Material Type:** 60 Mil HDPE SS Textured / Smooth Liner **Primary** X **Pond**

**Job Description:** Celll 5 Phase 1B **Secondary** **Cell** X

**Reported by :** Daniel Martinez **Pad**

**SF Patch Material** 3843

**LF Welded** 4832.00

**Damage Codes**

| | | | | |
|---|---|---|---|---|
| CR --Crease | FS --Failed Seam | MatD --Material Defect | LL --Lost Lap | CF --Custom Fit |
| DS --Destruct Sample | WR --Wrinkle | WS --Welder Restart | MD --Mechanical Damage | PB --Pipe Boot |
| SI --Subgrade Irregularity | AV --Airvent | RW --Roller Wrinkle | DO --Damage By Others | BO --Burn Out |
| SJ --Seam Joint | AO --Add On | CS --Concrete Structure | | AT -Air Test |

**Location Abbreviations**

BOS - Beginning of Seam
EOS - End of Seam
TOS - Toe of Seam
SJ - Seam Joint
ANT - Anchor Trench

| Test Type | Abbrv. | Repair Types |
|---|---|---|
| Vacuum | *S=South | C--Cap Strip |
| Air Test | *N=North | P--Patch |
| Spark | *W=West | B--Extrusion Bead |
| Air Lance | *E=East | |

| Repair Number | Damage Code | Seam Number | Panel Number | Location | Repair Type | Patch (Feet) | | | Bead (Inches) | Date Welded | Operator Name | Machine Number | Test Type | Test Results | Date Complete |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | DO | 2/3 | | WAT.4'E | P | 4 | x | 2 | | 7/21/23 | FRANCISCO NUNEZ | 264 | Vacuum | Pass | 7/24/23 |
| 2 | DS-1 | 3/4 | | WAT.4'/E | P | 4 | x | 2 | | 7/21/23 | FRANCISCO NUNEZ | 264 | Vacuum | Pass | 7/24/23 |
| 3 | DS-2 | 4/5 | | WAT.4'/E | P | 4 | x | 2 | | 7/21/23 | FRANCISCO NUNEZ | 264 | Vacuum | Pass | 7/24/23 |
| 4 | DS-3 | 7/8 | | WAT.4'/E | P | 4 | x | 2 | | 7/21/23 | FRANCISCO NUNEZ | 264 | Vacuum | Pass | 7/24/23 |
| 5 | DS-4 | 9/10 | | WAT.B.O.S | P | 4 | x | 2 | | 7/21/23 | FRANCISCO NUNEZ | 264 | Vacuum | Pass | 7/24/23 |
| 6 | DS0-5 | 16/17 | | WAT.B.O.S | P | 4 | x | 2 | | 7/21/23 | FRANCISCO NUNEZ | 264 | Vacuum | Pass | 7/24/23 |
| 7 | SJ | | | 18/19/20 | P | 2 | x | 2 | | 7/21/23 | FRANCISCO NUNEZ | 264 | Vacuum | Pass | 7/24/23 |
| 8 | SJ | | | 18/20/21 | P | 3 | x | 2 | | 7/21/23 | FRANCISCO NUNEZ | 264 | Vacuum | Pass | 7/24/23 |
| 9 | SJ | | | 17/18/21 | P | 2 | x | 2 | | 7/21/23 | FRANCISCO NUNEZ | 264 | Vacuum | Pass | 7/24/23 |
| 10 | SJ | | | 17/21/22 | P | 2 | x | 2 | | 7/21/23 | FRANCISCO NUNEZ | 264 | Vacuum | Pass | 7/24/23 |
| 11 | SJ | | | 16/17/22 | P | 2 | x | 2 | | 7/21/23 | FRANCISCO NUNEZ | 264 | Vacuum | Pass | 7/24/23 |
| 12 | SJ | | | 16/22/23 | P | 3 | x | 2 | | 7/21/23 | FRANCISCO NUNEZ | 264 | Vacuum | Pass | 7/24/23 |
| 13 | SJ | | | 15/16/23 | P | 2 | x | 2 | | 7/21/23 | GONZALO SUAREZ | 666 | Vacuum | Pass | 7/24/23 |
| 14 | SJ | | | 15/23/24 | P | 2 | x | 2 | | 7/21/23 | GONZALO SUAREZ | 666 | Vacuum | Pass | 7/24/23 |
| 15 | SJ | | | 14/15/24 | P | 2 | x | 2 | | 7/21/23 | GONZALO SUAREZ | 666 | Vacuum | Pass | 7/24/23 |
| 16 | SJ | | | 14/24/25 | P | 3 | x | 2 | | 7/21/23 | GONZALO SUAREZ | 666 | Vacuum | Pass | 7/24/23 |
| 17 | SJ | | | 13/14/25 | P | 3 | x | 2 | | 7/21/23 | GONZALO SUAREZ | 666 | Vacuum | Pass | 7/24/23 |
| 18 | SJ | | | 13/25/26 | P | 3 | x | 2 | | 7/21/23 | GONZALO SUAREZ | 666 | Vacuum | Pass | 7/24/23 |
| 19 | SJ | | | 12/13/2026 | P | 2 | x | 2 | | 7/21/23 | GONZALO SUAREZ | 666 | Vacuum | Pass | 7/24/23 |
| 20 | SJ | | | 12/26/2027 | P | 2 | x | 2 | | 7/21/23 | GONZALO SUAREZ | 666 | Vacuum | Pass | 7/24/23 |
| 21 | SJ | | | 11/12/2027 | P | 3 | x | 2 | | 7/21/23 | GONZALO SUAREZ | 666 | Vacuum | Pass | 7/24/23 |
| 22 | SJ | | | 10/11/27/28 | P | 6 | x | 8 | | 7/21/23 | GONZALO SUAREZ | 666 | Vacuum | Pass | 7/24/23 |
| 23 | DO | 10/28 | | 22'/SW | P | 2 | x | 2 | | 7/21/23 | GONZALO SUAREZ | 666 | Vacuum | Pass | 7/24/23 |
| 24 | SJ | | | 9/28/10/29 | P | 4 | x | 2 | | 7/21/23 | GONZALO SUAREZ | 666 | Vacuum | Pass | 7/24/23 |
| 25 | BO | 26/27 | | 130'N/S | P | 14 | x | 2 | | 7/21/23 | GONZALO SUAREZ | 666 | Vacuum | Pass | 7/24/23 |
| 26 | DS-7 | 28/29 | | NAT.B.O.S | P | 5 | x | 2 | | 7/21/23 | GONZALO SUAREZ | 666 | Vacuum | Pass | 7/24/23 |

# ECApplications
## Repair Report

**Project Name** Minnkota Power Cooperative, Inc. **Job # :** 233013 **Superintendent:** Octavio Rivas

**Material Type:** 60 Mil HDPE SS Textured / Smooth Liner **Primary** X **Pond** **SF Patch Material** 3843

**Job Description:** Celll 5 Phase 1B **Secondary** **Cell** X **LF Welded** 4832.00

**Reported by :** Daniel Martinez **Pad**

**Damage Codes**

| | | | | | |
|---|---|---|---|---|---|
| CR --Crease | FS --Failed Seam | MatD --Material Defect | LL --Lost Lap | CF --Custom Fit | |
| DS --Destruct Sample | WR --Wrinkle | WS --Welder Restart | MD --Mechanical Damage | PB --Pipe Boot | |
| SI --Subgrade Irregularity | AV --Airvent | RW --Roller Wrinkle | DO --Damage By Others | BO --Burn Out | |
| SJ --Seam Joint | AO --Add On | CS --Concrete Structure | | AT -Air Test | |

**Location Abbreviations**

| | | |
|---|---|---|
| BOS - Beginning of Seam | EOS - End of Seam | TOS - Toe of Seam |
| SJ - Seam Joint | ANT - Anchor Trench | |

| Test Type | Abbrv. | Repair Types |
|---|---|---|
| Vacuum | *S=South | C--Cap Strip |
| Air Test | *N=North | P--Patch |
| Spark | *W=West | B--Extrusion Bead |
| Air Lance | *E=East | |

| Repair Number | Damage Code | Seam Number | Panel Number | Location | Repair Type | Patch (Feet) | | | Bead (Inches) | Date Welded | Operator Name | Machine Number | Test Type | Test Results | Date Complete |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 27 | DS-8 | 29/30 | | NAT.B.O.S | P | 5 | x | 2 | | 7/21/23 | GONZALO SUAREZ | 666 | Vacuum | Pass | 7/24/23 |
| 28 | DO | 29/30 | 29 | 16'S | P | 2 | x | 2 | | 7/21/23 | GONZALO SUAREZ | 666 | Vacuum | Pass | 7/24/23 |
| 29 | DO | 1/31 | 1 | 236'E | P | 2 | x | 2 | | 7/21/23 | FRANCISCO NUNEZ | 264 | Vacuum | Pass | 7/24/23 |
| 30 | DO | 1/31 | 1 | 232'E | P | 2 | x | 2 | | 7/21/23 | FRANCISCO NUNEZ | 264 | Vacuum | Pass | 7/24/23 |
| 31 | DO | 1/31 | 1 | 224'E | P | 2 | x | 2 | | 7/21/23 | FRANCISCO NUNEZ | 264 | Vacuum | Pass | 7/24/23 |
| 32 | DO | 31/32 | | 210'E | P | 2 | x | 2 | | 7/21/23 | FRANCISCO NUNEZ | 264 | Vacuum | Pass | 7/24/23 |
| 33 | DO | 31/32 | | 265'E | P | 5 | x | 3 | | 7/21/23 | FRANCISCO NUNEZ | 264 | Vacuum | Pass | 7/24/23 |
| 34 | DO | 33/34 | | 230'E | P | 6 | x | 2 | | 7/21/23 | FRANCISCO NUNEZ | 264 | Vacuum | Pass | 7/24/23 |
| 35 | SJ | | | 34/35/43 | P | 4 | x | 4 | | 7/21/23 | FRANCISCO NUNEZ | 264 | Vacuum | Pass | 7/24/23 |
| 36 | SJ | | | 35/36/43 | P | 2 | x | 2 | | 7/21/23 | FRANCISCO NUNEZ | 264 | Vacuum | Pass | 7/24/23 |
| 37 | SJ | | | 36/37/43 | P | 3 | x | 2 | | 7/21/23 | FRANCISCO NUNEZ | 264 | Vacuum | Pass | 7/24/23 |
| 38 | SJ | | | 37/38/43 | P | 2 | x | 2 | | 7/21/23 | FRANCISCO NUNEZ | 264 | Vacuum | Pass | 7/24/23 |
| 39 | SJ | | | 38/39/43 | P | 2 | x | 2 | | 7/21/23 | FRANCISCO NUNEZ | 264 | Vacuum | Pass | 7/24/23 |
| 40 | SJ | | | 39/40/43 | P | 4 | x | 2 | | 7/21/23 | FRANCISCO NUNEZ | 264 | Vacuum | Pass | 7/24/23 |
| 41 | SJ | | | 40/41/43 | P | 3 | x | 2 | | 7/21/23 | FRANCISCO NUNEZ | 264 | Vacuum | Pass | 7/24/23 |
| 42 | SJ | | | 41/42/43 | P | 3 | x | 2 | | 7/21/23 | FRANCISCO NUNEZ | 264 | Vacuum | Pass | 7/24/23 |
| 43 | AT | 1/31 | | WAT.B.O.S | P | 7 | x | 2 | | 7/21/23 | FRANCISCO NUNEZ | 264 | Vacuum | Pass | 7/24/23 |
| 44 | WS | 1/31 | | 71'W/E | P | 2 | x | 2 | | 7/21/23 | FRANCISCO NUNEZ | 264 | Vacuum | Pass | 7/24/23 |
| 45 | DO | 33/34 | | 263'W/E | P | 5 | x | 2 | | 7/25/23 | FRANCISCO NUNEZ | 264 | Vacuum | Pass | 7/26/23 |
| 46 | SJ | | | 34/43/54 | P | 2 | x | 2 | | 7/25/23 | FRANCISCO NUNEZ | 264 | Vacuum | Pass | 7/26/23 |
| 47 | SJ | | | 8/9/29/30 | P | 9 | x | 6 | | 7/26/23 | FRANCISCO NUNEZ | 264 | Vacuum | Pass | 7/26/23 |
| 48 | SJ | | | 7/8/44/45 | P | 7 | x | 5 | | 7/26/23 | FRANCISCO NUNEZ | 264 | Vacuum | Pass | 7/26/23 |
| 49 | SJ | | | 6/7/45/46 | P | 5 | x | 5 | | 7/26/23 | FRANCISCO NUNEZ | 264 | Vacuum | Pass | 7/26/23 |
| 50 | DS-18 | 46/6 | | MOS. | P | 6 | x | 2 | | 7/26/23 | FRANCISCO NUNEZ | 264 | Vacuum | Pass | 7/26/23 |
| 51 | SJ | | | 5/6/46/47 | P | 7 | x | 5 | | 7/26/23 | FRANCISCO NUNEZ | 264 | Vacuum | Pass | 7/26/23 |
| 52 | SJ | | | 4/5/47/48 | P | 7 | x | 5 | | 7/26/23 | FRANCISCO NUNEZ | 264 | Vacuum | Pass | 7/26/23 |

# ECApplications
## Repair Report

**Project Name** Minnkota Power Cooperative, Inc. **Job # :** 233013 **Superintendent:** Octavio Rivas

**Material Type:** 60 Mil HDPE SS Textured / Smooth Liner **Primary** X **Pond** **SF Patch Material** 3843

**Job Description:** Celll 5 Phase 1B **Secondary** **Cell** X **LF Welded** 4832.00

**Reported by :** Daniel Martinez **Pad**

**Damage Codes**

| | | | | |
|---|---|---|---|---|
| CR --Crease | FS --Failed Seam | MatD --Material Defect | LL --Lost Lap | CF --Custom Fit |
| DS --Destruct Sample | WR --Wrinkle | WS --Welder Restart | MD --Mechanical Damage | PB --Pipe Boot |
| SI --Subgrade Irregularity | AV --Airvent | RW --Roller Wrinkle | DO --Damage By Others | BO --Burn Out |
| SJ --Seam Joint | AO --Add On | CS --Concrete Structure | | AT -Air Test |

**Location Abbreviations**

| | | | |
|---|---|---|---|
| BOS - Beginning of Seam | **Test Type** | **Abbrv.** | **Repair Types** |
| EOS - End of Seam | Vacuum | *S=South | C--Cap Strip |
| TOS - Toe of Seam | Air Test | *N=North | P--Patch |
| SJ - Seam Joint | Spark | *W=West | B--Extrusion Bead |
| ANT - Anchor Trench | Air Lance | *E=East | |

| Repair Number | Damage Code | Seam Number | Panel Number | Location | Repair Type | Patch (Feet) | | | Bead (Inches) | Date Welded | Operator Name | Machine Number | Test Type | Test Results | Date Complete |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 53 | SJ | | | 3/4/48/49 | P | 4 | x | 4 | | 7/26/23 | FRANCISCO NUNEZ | 264 | Vacuum | Pass | 7/26/23 |
| 54 | SJ | | | 2/3/49/50 | P | 5 | x | 3 | | 7/26/23 | FRANCISCO NUNEZ | 264 | Vacuum | Pass | 7/26/23 |
| 55 | SJ | | | 1/2/56/57 | P | 5 | x | 5 | | 7/26/23 | FRANCISCO NUNEZ | 264 | Vacuum | Pass | 7/26/23 |
| 56 | DS-19 | 51/31 | | 28'W/E | P | 6 | x | 2 | | 7/26/23 | FRANCISCO NUNEZ | 264 | Vacuum | Pass | 7/26/23 |
| 57 | DS-16 | 51/52 | | E.O.S. | P | 6 | x | 2 | | 7/26/23 | BRANDON GOULD | 535 | Vacuum | Pass | 7/26/23 |
| 58 | SJ | | | 31/32/52/53 | P | 5 | x | 2 | | 7/26/23 | BRANDON GOULD | 535 | Vacuum | Pass | 7/26/23 |
| 59 | DS-20 | 52/53 | | 9'W/E | P | 5 | x | 2 | | 7/26/23 | BRANDON GOULD | 535 | Vacuum | Pass | 7/26/23 |
| 60 | DO | 44/45 | 44 | 398'W/E.6'S/N | P | 5 | x | 3 | | 7/26/23 | BRANDON GOULD | 535 | Vacuum | Pass | 7/26/23 |
| 61 | DO | 44/45 | 45 | 345'W/E.19'N/S | P | 4 | x | 2 | | 7/26/23 | BRANDON GOULD | 535 | Vacuum | Pass | 7/26/23 |
| 62 | DO | 46/47 | 47 | 266'W/E.14'N/S | P | 2 | x | 2 | | 7/26/23 | BRANDON GOULD | 535 | Vacuum | Pass | 7/26/23 |
| 63 | DS-22 | 1/31 | | WAT.4'E | P | 5 | x | 2 | | 7/26/23 | BRANDON GOULD | 535 | Vacuum | Pass | 7/26/23 |
| 64 | DS-23 | 32/33 | | WAT.4'E | P | 5 | x | 2 | | 7/26/23 | BRANDON GOULD | 535 | Vacuum | Pass | 7/26/23 |
| 65 | DS-24 | 35/36 | | WAT.4'E | P | 5 | x | 2 | | 7/26/23 | BRANDON GOULD | 535 | Vacuum | Pass | 7/26/23 |
| 66 | SJ | | | 43/70/71 | P | 2 | x | 2 | | 9/20/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 9/26/23 |
| 67 | SJ | | | 47/71/72 | P | 2 | x | 2 | | 9/20/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 9/26/23 |
| 68 | SJ | | | 47/72/73 | P | 5 | x | 2 | | 9/20/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 9/26/23 |
| 69 | SJ | | | 43/73/74 | P | 2 | x | 2 | | 9/20/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 9/26/23 |
| 70 | SJ | | | 43/74/75 | P | 2 | x | 2 | | 9/20/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 9/26/23 |
| 71 | SJ | | | 43/75/76 | P | 2 | x | 2 | | 9/20/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 9/26/23 |
| 72 | SJ | | | 43/76/77 | P | 11 | x | 2 | | 9/20/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 9/26/23 |
| 73 | SJ | | | 43/77/78 | P | 2 | x | 2 | | 9/20/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 9/26/23 |
| 74 | SJ | | | 43/73/54 | P | 4 | x | 4 | | 9/20/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 9/26/23 |
| 75 | SJ | | | 43/54/78 | P | 4 | x | 3 | | 9/20/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 9/26/23 |
| 76 | SJ | | | 54/78/79 | P | 2 | x | 2 | | 9/20/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 9/26/23 |
| 77 | SJ | | | 54/79/80 | P | 2 | x | 2 | | 9/20/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 9/26/23 |
| 78 | SJ | | | 54/80/81 | P | 2 | x | 2 | | 9/20/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 9/26/23 |

# ECApplications
## Repair Report

**Project Name** Minnkota Power Cooperative, Inc. **Job # :** 233013 **Superintendent:** Octavio Rivas

**Material Type:** 60 Mil HDPE SS Textured / Smooth Liner **Primary** X **Pond** **SF Patch Material** 3843

**Job Description:** Celll 5 Phase 1B **Secondary** **Cell** X **LF Welded** 4832.00

**Reported by :** Daniel Martinez **Pad**

**Damage Codes**

| | | | | |
|---|---|---|---|---|
| CR --Crease | FS --Failed Seam | MatD --Material Defect | LL --Lost Lap | CF --Custom Fit |
| DS --Destruct Sample | WR --Wrinkle | WS --Welder Restart | MD --Mechanical Damage | PB --Pipe Boot |
| SI --Subgrade Irregularity | AV --Airvent | RW --Roller Wrinkle | DO --Damage By Others | BO --Burn Out |
| SJ --Seam Joint | AO --Add On | CS --Concrete Structure | | AT -Air Test |

**Location Abbreviations**

BOS - Beginning of Seam
EOS - End of Seam
TOS - Toe of Seam
SJ - Seam Joint
ANT - Anchor Trench

| Test Type | Abbrv. | Repair Types |
|---|---|---|
| Vacuum | *S=South | C--Cap Strip |
| Air Test | *N=North | P--Patch |
| Spark | *W=West | B--Extrusion Bead |
| Air Lance | *E=East | |

| Repair Number | Damage Code | Seam Number | Panel Number | Location | Repair Type | Patch (Feet) | | | Bead (Inches) | Date Welded | Operator Name | Machine Number | Test Type | Test Results | Date Complete |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 79 | SJ | | | 54/81/82 | P | 2 | x | 2 | | 9/20/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 9/26/23 |
| 80 | BO | 81/82 | | 89'S/N | P | 2 | x | 2 | | 9/20/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 9/26/23 |
| 81 | BO | 81/82 | | 128'S/N | P | 2 | x | 2 | | 9/20/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 9/26/23 |
| 82 | SJ | | | 30/44/55 | P | 4 | x | 4 | | 9/20/23 | BRANDON GOULD | 535 | Vacuum | Pass | 9/26/23 |
| 83 | DO | | 30 | SJ/30/55.15'S/N | P | 2 | x | 2 | | 9/20/23 | BRANDON GOULD | 535 | Vacuum | Pass | 9/26/23 |
| 84 | SJ | | | 55/56/94 | P | 2 | x | 2 | | 9/20/23 | BRANDON GOULD | 535 | Vacuum | Pass | 9/26/23 |
| 85 | SJ | | | 56/57/44 | P | 2 | x | 2 | | 9/20/23 | BRANDON GOULD | 535 | Vacuum | Pass | 9/26/23 |
| 86 | SJ | | | 57/58/44 | P | 2 | x | 2 | | 9/20/23 | BRANDON GOULD | 535 | Vacuum | Pass | 9/26/23 |
| 87 | SJ | | | 58/59/44 | P | 2 | x | 2 | | 9/20/23 | BRANDON GOULD | 535 | Vacuum | Pass | 9/26/23 |
| 88 | SJ | | | 59/61/44 | P | 2 | x | 2 | | 9/20/23 | BRANDON GOULD | 535 | Vacuum | Pass | 9/26/23 |
| 89 | SJ | | | 61/63/44 | P | 2 | x | 2 | | 9/20/23 | BRANDON GOULD | 535 | Vacuum | Pass | 9/26/23 |
| 90 | DS-28 | 63/65 | | 63/65/44 | P | 6 | x | 3 | | 9/20/23 | BRANDON GOULD | 535 | Vacuum | Pass | 9/26/23 |
| 91 | SJ | | | 65/67/44 | P | 2 | x | 2 | | 9/20/23 | BRANDON GOULD | 535 | Vacuum | Pass | 9/26/23 |
| 92 | DO | 67/44 | 67 | 10'W/E.5'N/S | P | 2 | x | 2 | | 9/20/23 | BRANDON GOULD | 535 | Vacuum | Pass | 9/26/23 |
| 93 | SJ | | | 67/68/44 | P | 2 | x | 2 | | 9/20/23 | BRANDON GOULD | 535 | Vacuum | Pass | 9/26/23 |
| 94 | SJ | | | 68/69/44 | P | 2 | x | 2 | | 9/20/23 | BRANDON GOULD | 535 | Vacuum | Pass | 9/26/23 |
| 95 | SJ | | | 69/70/44 | P | 2 | x | 2 | | 9/20/23 | BRANDON GOULD | 535 | Vacuum | Pass | 9/26/23 |
| 96 | SJ | | | 70/71/44 | P | 2 | x | 2 | | 9/20/23 | BRANDON GOULD | 535 | Vacuum | Pass | 9/26/23 |
| 97 | SJ | | | 71/72/44 | P | 2 | x | 2 | | 9/20/23 | BRANDON GOULD | 535 | Vacuum | Pass | 9/26/23 |
| 98 | BO | 71/72 | | 220'S/N | P | 4 | x | 2 | | 9/20/23 | BRANDON GOULD | 535 | Vacuum | Pass | 9/26/23 |
| 99 | DS-31 | 72/73 | | 72/73/44 | P | 6 | x | 3 | | 9/20/23 | BRANDON GOULD | 535 | Vacuum | Pass | 9/26/23 |
| 100 | SJ | | | 73/75/44 | P | 2 | x | 2 | | 9/20/23 | BRANDON GOULD | 535 | Vacuum | Pass | 9/26/23 |
| 101 | SJ | | | 75/77/44 | P | 2 | x | 2 | | 9/20/23 | BRANDON GOULD | 535 | Vacuum | Pass | 9/26/23 |
| 102 | SJ | | | 77/79/44 | P | 4 | x | 2 | | 9/20/23 | BRANDON GOULD | 535 | Vacuum | Pass | 9/26/23 |
| 103 | DS-33 | 79/81 | | 79/81/44 | P | 8 | x | 4 | | 9/20/23 | BRANDON GOULD | 535 | Vacuum | Pass | 9/26/23 |
| 104 | SJ | | | 81/83/44 | P | 2 | x | 2 | | 9/20/23 | BRANDON GOULD | 535 | Vacuum | Pass | 9/26/23 |

# ECApplications
## Repair Report

**Project Name** Minnkota Power Cooperative, Inc. **Job # :** 233013 **Superintendent:** Octavio Rivas

**Material Type:** 60 Mil HDPE SS Textured / Smooth Liner **Primary** X **Pond** **SF Patch Material** 3843

**Job Description:** Celll 5 Phase 1B **Secondary** **Cell** X **LF Welded** 4832.00

**Reported by :** Daniel Martinez **Pad**

**Damage Codes**

| | | | | |
|---|---|---|---|---|
| CR --Crease | FS --Failed Seam | MatD --Material Defect | LL --Lost Lap | CF --Custom Fit |
| DS --Destruct Sample | WR --Wrinkle | WS --Welder Restart | MD --Mechanical Damage | PB --Pipe Boot |
| SI --Subgrade Irregularity | AV --Airvent | RW --Roller Wrinkle | DO --Damage By Others | BO --Burn Out |
| SJ --Seam Joint | AO --Add On | CS --Concrete Structure | | AT -Air Test |

**Location Abbreviations**

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| BOS - Beginning of Seam | **Test Type** | **Abbrv.** | **Repair Types** |
| EOS - End of Seam | Vacuum | *S=South | C--Cap Strip |
| TOS - Toe of Seam | Air Test | *N=North | P--Patch |
| SJ - Seam Joint | Spark | *W=West | B--Extrusion Bead |
| ANT - Anchor Trench | Air Lance | *E=East | |

| Repair Number | Damage Code | Seam Number | Panel Number | Location | Repair Type | Patch (Feet) | | | Bead (Inches) | Date Welded | Operator Name | Machine Number | Test Type | Test Results | Date Complete |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 105 | SJ | | | 81/82/83 | P | 5 | x | 3 | | 9/12/23 | BRANDON GOULD | 535 | Vacuum | Pass | 9/26/23 |
| 106 | SJ | | | 77/78/79/80 | P | 5 | x | 3 | | 9/12/23 | BRANDON GOULD | 535 | Vacuum | Pass | 9/26/23 |
| 107 | SJ | | | 75/76/77/78 | P | 9 | x | 4 | | 9/12/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 9/26/23 |
| 108 | SJ | | | 73/74/75/76 | P | 9 | x | 3 | | 9/12/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 9/26/23 |
| 109 | SJ | | | 72/73/74 | P | 6 | x | 3 | | 9/12/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 9/26/23 |
| 110 | BO | 69/70 | | 40'S/N | P | 3 | x | 2 | | 9/12/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 9/26/23 |
| 111 | DO | 67/68 | 67 | 20'S/N.9'E/W | P | 2 | x | 2 | | 9/12/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 9/26/23 |
| 112 | DO | 67/68 | 67 | 22'S/N.12'E/W | P | 2 | x | 2 | | 9/12/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 9/26/23 |
| 113 | DO | 67/68 | 67 | 9'S/N.9/E/W | P | 2 | x | 2 | | 9/12/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 9/26/23 |
| 114 | DO | 67/44 | 67 | 9'S/N.9/E/W | P | 2 | x | 2 | | 9/12/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 9/26/23 |
| 115 | SJ | | | 65/66/67 | P | 4 | x | 2 | | 9/12/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 9/26/23 |
| 116 | SJ | | | 62/63/64/65 | P | 2 | x | 2 | | 9/12/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 9/26/23 |
| 117 | SJ | | | 60/61/62/63 | P | 2 | x | 2 | | 9/12/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 9/26/23 |
| 118 | SJ | | | 58/59/60/61 | P | 2 | x | 2 | | 9/12/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 9/26/23 |
| 119 | SJ | | | 58/59/60 | P | 2 | x | 2 | | 9/12/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 9/26/23 |
| 120 | SJ | | | 83/84/85 | P | 4 | x | 4 | | 9/12/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 9/26/23 |
| 121 | SJ | | | 84/85/86 | P | 5 | x | 2 | | 9/12/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 9/26/23 |
| 122 | SJ | | | 86/87/88 | P | 4 | x | 4 | | 9/12/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 9/26/23 |
| 123 | SJ | | | 87/88/89 | P | 10 | x | 2 | | 9/12/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 9/26/23 |
| 124 | SJ | | | 90/91/92 | P | 9 | x | 3 | | 9/12/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 9/26/23 |
| 125 | AT | 43/170 | | SAT.B.O.S | P | 9 | x | 2 | | 9/12/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 9/27/23 |
| 126 | SJ | | | 51/53/193 | P | 5 | x | 2 | | 9/12/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 9/27/23 |
| 127 | DS-75 | 192/93 | | 5'W/E | P | 5 | x | 2 | | 9/27/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 9/27/23 |
| 128 | SJ | | | 192/193/52 | P | 2 | x | 2 | | 9/26/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 9/27/23 |
| 129 | SJ | | | 51/52/192 | P | 2 | x | 2 | | 9/26/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 9/27/23 |
| 130 | SJ | | | 51/191/192 | P | 5 | x | 2 | | 9/26/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 9/27/23 |

# ECApplications
## Repair Report

**Project Name** Minnkota Power Cooperative, Inc. **Job # :** 233013 **Superintendent:** Octavio Rivas

**Material Type:** 60 Mil HDPE SS Textured / Smooth Liner **Primary** X **Pond**

**Job Description:** Celll 5 Phase 1B **Secondary** **Cell** X

**Reported by :** Daniel Martinez **Pad**

**SF Patch Material** 3843

**LF Welded** 4832.00

**Damage Codes**

| | | | | |
|---|---|---|---|---|
| CR --Crease | FS --Failed Seam | MatD --Material Defect | LL --Lost Lap | CF --Custom Fit |
| DS --Destruct Sample | WR --Wrinkle | WS --Welder Restart | MD --Mechanical Damage | PB --Pipe Boot |
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| Test Type | Abbrv. | Repair Types |
|---|---|---|
| Vacuum | *S=South | C--Cap Strip |
| Air Test | *N=North | P--Patch |
| Spark | *W=West | B--Extrusion Bead |
| Air Lance | *E=East | |

| Repair Number | Damage Code | Seam Number | Panel Number | Location | Repair Type | Patch (Feet) | | | Bead (Inches) | Date Welded | Operator Name | Machine Number | Test Type | Test Results | Date Complete |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 131 | SJ | | | 50/51/191 | P | 2 | x | 2 | | 9/26/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 9/27/23 |
| 132 | SJ | | | 50/190/191 | P | 2 | x | 2 | | 9/27/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 9/27/23 |
| 133 | SJ | | | 49/50/190 | P | 2 | x | 2 | | 9/27/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 9/27/23 |
| 134 | SJ | | | 49/187/190 | P | 2 | x | 2 | | 9/27/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 9/27/23 |
| 135 | SJ | | | 48/49/187 | P | 2 | x | 2 | | 9/27/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 9/27/23 |
| 136 | SJ | | | 48/186/187 | P | 2 | x | 2 | | 9/27/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 9/27/23 |
| 137 | SJ | | | 47/48/186 | P | 2 | x | 2 | | 9/27/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 9/27/23 |
| 138 | SJ | | | 47/47/48 | P | 4 | x | 3 | | 9/27/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 9/27/23 |
| 139 | SJ | | | 47/186/187 | P | 6 | x | 3 | | 9/27/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 9/27/23 |
| 140 | SJ | | | 46/47/185 | P | 2 | x | 2 | | 9/27/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 9/27/23 |
| 141 | DS-68 | 184/185 | | 46/184/185 | P | 7 | x | 3 | | 9/27/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 9/28/23 |
| 142 | SJ | | | 45/46/184 | P | 2 | x | 2 | | 9/27/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 9/28/23 |
| 143 | DS-67 | 183/184 | | 45/183/184 | P | 7 | x | 2 | | 9/27/23 | GUILLERMO BENITEZ | 264 | Vacuum | Pass | 9/28/23 |
| 144 | SJ | | | 44/45/183 | P | 2 | x | 2 | | 9/27/23 | GUILLERMO BENITEZ | 264 | Vacuum | Pass | 9/28/23 |
| 145 | DS-66 | 188/183 | | 188/183/44 | P | 7 | x | 2 | | 9/27/23 | GUILLERMO BENITEZ | 264 | Vacuum | Pass | 9/28/23 |
| 146 | SJ | | | 44/83/81/188 | P | 7 | x | 7 | | 9/27/23 | GUILLERMO BENITEZ | 264 | Vacuum | Pass | 9/28/23 |
| 147 | SJ | | | 83/85/188 | P | 4 | x | 2 | | 9/27/23 | GUILLERMO BENITEZ | 264 | Vacuum | Pass | 9/28/23 |
| 148 | SJ | | | 85/86/188 | P | 2 | x | 2 | | 9/27/23 | GUILLERMO BENITEZ | 264 | Vacuum | Pass | 9/28/23 |
| 149 | SJ | | | 86/87/188 | P | 2 | x | 2 | | 9/27/23 | GUILLERMO BENITEZ | 264 | Vacuum | Pass | 9/28/23 |
| 150 | SJ | | | 87/89/188 | P | 2 | x | 2 | | 9/27/23 | GUILLERMO BENITEZ | 264 | Vacuum | Pass | 9/28/23 |
| 151 | SJ | | | 89/90/188 | P | 2 | x | 2 | | 9/27/23 | GUILLERMO BENITEZ | 264 | Vacuum | Pass | 9/28/23 |
| 152 | SJ | | | 188/189/90 | P | 2 | x | 2 | | 9/27/23 | GUILLERMO BENITEZ | 264 | Vacuum | Pass | 9/28/23 |
| 153 | SJ | | | 188/189/183 | P | 2 | x | 2 | | 9/27/23 | GUILLERMO BENITEZ | 264 | Vacuum | Pass | 9/28/23 |
| 154 | SJ | | | 90/91/183 | P | 2 | x | 2 | | 9/27/23 | GUILLERMO BENITEZ | 264 | Vacuum | Pass | 9/28/23 |
| 155 | SJ | | | 91/93/183 | P | 2 | x | 2 | | 9/27/23 | GUILLERMO BENITEZ | 264 | Vacuum | Pass | 9/28/23 |
| 156 | SJ | | | 93/95/183 | P | 2 | x | 2 | | 9/27/23 | GUILLERMO BENITEZ | 264 | Vacuum | Pass | 9/28/23 |

# ECApplications
## Repair Report

**Project Name** Minnkota Power Cooperative, Inc. **Job # :** 233013 **Superintendent:** Octavio Rivas

**Material Type:** 60 Mil HDPE SS Textured / Smooth Liner **Primary** X **Pond** **SF Patch Material** 3843

**Job Description:** Celll 5 Phase 1B **Secondary** **Cell** X **LF Welded** 4832.00

**Reported by :** Daniel Martinez **Pad**

**Damage Codes**

| | | | | |
|---|---|---|---|---|
| CR --Crease | FS --Failed Seam | MatD --Material Defect | LL --Lost Lap | CF --Custom Fit |
| DS --Destruct Sample | WR --Wrinkle | WS --Welder Restart | MD --Mechanical Damage | PB --Pipe Boot |
| SI --Subgrade Irregularity | AV --Airvent | RW --Roller Wrinkle | DO --Damage By Others | BO --Burn Out |
| SJ --Seam Joint | AO --Add On | CS --Concrete Structure | | AT -Air Test |

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| BOS - Beginning of Seam | **Test Type** | **Abbrv.** | **Repair Types** |
| EOS - End of Seam | Vacuum | *S=South | C--Cap Strip |
| TOS - Toe of Seam | Air Test | *N=North | P--Patch |
| SJ - Seam Joint | Spark | *W=West | B--Extrusion Bead |
| ANT - Anchor Trench | Air Lance | *E=East | |

| Repair Number | Damage Code | Seam Number | Panel Number | Location | Repair Type | Patch (Feet) | | | Bead (Inches) | Date Welded | Operator Name | Machine Number | Test Type | Test Results | Date Complete |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 157 | SJ | | | 95/96/183 | P | 2 | x | 2 | | 9/27/23 | GUILLERMO BENITEZ | 264 | Vacuum | Pass | 9/28/23 |
| 158 | DO | 96/183 | | 10'E/W | P | 6 | x | 2 | | 9/27/23 | GUILLERMO BENITEZ | 264 | Vacuum | Pass | 9/28/23 |
| 159 | SJ | | | 96/97/183 | P | 5 | x | 2 | | 9/27/23 | GUILLERMO BENITEZ | 264 | Vacuum | Pass | 9/28/23 |
| 160 | SJ | | | 97/99/183 | P | 2 | x | 2 | | 9/27/23 | GUILLERMO BENITEZ | 264 | Vacuum | Pass | 9/28/23 |
| 161 | SJ | | | 99/188 | P | 3 | x | 3 | | 9/27/23 | GUILLERMO BENITEZ | 264 | Vacuum | Pass | 9/28/23 |
| 162 | SJ | | | 99/101/183 | P | 5 | x | 2 | | 9/27/23 | GUILLERMO BENITEZ | 264 | Vacuum | Pass | 9/28/23 |
| 163 | SJ | | | 101/102/183 | P | 2 | x | 2 | | 9/27/23 | GUILLERMO BENITEZ | 264 | Vacuum | Pass | 9/28/23 |
| 164 | SJ | | | 102/103/188 | P | 2 | x | 2 | | 9/27/23 | GUILLERMO BENITEZ | 264 | Vacuum | Pass | 9/28/23 |
| 165 | SJ | | | 103/105/188 | P | 2 | x | 2 | | 9/27/23 | GUILLERMO BENITEZ | 264 | Vacuum | Pass | 9/28/23 |
| 166 | SJ | | | 105/107/188 | P | 2 | x | 2 | | 9/27/23 | GUILLERMO BENITEZ | 264 | Vacuum | Pass | 9/28/23 |
| 167 | SJ | | | 107/108/189 | P | 2 | x | 2 | | 9/27/23 | GUILLERMO BENITEZ | 264 | Vacuum | Pass | 9/28/23 |
| 168 | SJ | | | 108/109/183 | P | 2 | x | 2 | | 9/27/23 | GUILLERMO BENITEZ | 264 | Vacuum | Pass | 9/28/23 |
| 169 | SJ | | | 109/111/183 | P | 2 | x | 2 | | 9/27/23 | GUILLERMO BENITEZ | 264 | Vacuum | Pass | 9/28/23 |
| 170 | SJ | | | 111/112/183 | P | 2 | x | 2 | | 9/27/23 | GUILLERMO BENITEZ | 264 | Vacuum | Pass | 9/28/23 |
| 171 | SJ | | | 112/113/183 | P | 2 | x | 2 | | 9/27/23 | GUILLERMO BENITEZ | 264 | Vacuum | Pass | 9/28/23 |
| 172 | SJ | | | 113/115/183 | P | 2 | x | 2 | | 9/27/23 | GUILLERMO BENITEZ | 264 | Vacuum | Pass | 9/28/23 |
| 173 | DO | 189/90 | 90 | 5'W/E.3'S/N | P | 2 | x | 2 | | 9/27/23 | GUILLERMO BENITEZ | 264 | Vacuum | Pass | 9/28/23 |
| 174 | SJ | | | 91/92/93 | P | 5 | x | 3 | | 9/27/23 | GUILLERMO BENITEZ | 264 | Vacuum | Pass | 10/4/23 |
| 175 | SJ | | | 93/94/95 | P | 7 | x | 3 | | 9/26/23 | GUILLERMO BENITEZ | 264 | Vacuum | Pass | 10/4/23 |
| 176 | SJ | | | 94/95/96 | P | 6 | x | 3 | | 9/26/23 | GUILLERMO BENITEZ | 264 | Vacuum | Pass | 10/4/23 |
| 177 | SJ | | | 96/97/98 | P | 9 | x | 3 | | 9/26/23 | GUILLERMO BENITEZ | 264 | Vacuum | Pass | 10/4/23 |
| 178 | SJ | | | 97/98/99 | P | 6 | x | 3 | | 9/26/23 | GUILLERMO BENITEZ | 264 | Vacuum | Pass | 10/4/23 |
| 179 | SJ | | | 99/100/101 | P | 10 | x | 3 | | 9/26/23 | GUILLERMO BENITEZ | 264 | Vacuum | Pass | 10/4/23 |
| 180 | SJ | | | 100/101/102 | P | 10 | x | 3 | | 9/26/23 | GUILLERMO BENITEZ | 264 | Vacuum | Pass | 10/4/23 |
| 181 | SJ | | | 102/103/104 | P | 5 | x | 3 | | 9/26/23 | GUILLERMO BENITEZ | 264 | Vacuum | Pass | 10/4/23 |
| 182 | SJ | | | 103/104/105 | P | 10 | x | 2 | | 9/26/23 | GUILLERMO BENITEZ | 264 | Vacuum | Pass | 10/4/23 |

# ECApplications
## Repair Report

**Project Name** Minnkota Power Cooperative, Inc. **Job # :** 233013 **Superintendent:** Octavio Rivas

**Material Type:** 60 Mil HDPE SS Textured / Smooth Liner **Primary** X **Pond** **SF Patch Material** 3843

**Job Description:** Celll 5 Phase 1B **Secondary** **Cell** X **LF Welded** 4832.00

**Reported by :** Daniel Martinez **Pad**

**Damage Codes**

| | | | | |
|---|---|---|---|---|
| CR --Crease | FS --Failed Seam | MatD --Material Defect | LL --Lost Lap | CF --Custom Fit |
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| Repair Number | Damage Code | Seam Number | Panel Number | Location | Repair Type | Patch (Feet) | | | Bead (Inches) | Date Welded | Operator Name | Machine Number | Test Type | Test Results | Date Complete |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 183 | SJ | | | 105/106/107 | P | 7 | x | 3 | | 9/26/23 | GUILLERMO BENITEZ | 264 | Vacuum | Pass | 10/4/23 |
| 184 | SJ | | | 106/107/108 | P | 8 | x | 4 | | 9/26/23 | GUILLERMO BENITEZ | 264 | Vacuum | Pass | 10/4/23 |
| 185 | SJ | | | 108/109/110 | P | 7 | x | 3 | | 9/26/23 | GUILLERMO BENITEZ | 264 | Vacuum | Pass | 10/4/23 |
| 186 | SJ | | | 109/110/111 | P | 7 | x | 3 | | 9/26/23 | GUILLERMO BENITEZ | 264 | Vacuum | Pass | 10/4/23 |
| 187 | SJ | | | 112/113/114 | P | 4 | x | 2 | | 9/26/23 | GUILLERMO BENITEZ | 264 | Vacuum | Pass | 10/4/23 |
| 188 | SJ | | | 113/114/115 | P | 5 | x | 3 | | 9/26/23 | GUILLERMO BENITEZ | 264 | Vacuum | Pass | 10/4/23 |
| 189 | SJ | | | 115/116/117 | P | 5 | x | 2 | | 9/26/23 | GUILLERMO BENITEZ | 264 | Vacuum | Pass | 10/4/23 |
| 190 | SJ | | | 116/117/118 | P | 7 | x | 2 | | 9/26/23 | GUILLERMO BENITEZ | 264 | Vacuum | Pass | 10/4/23 |
| 191 | SJ | | | 118/119/120 | P | 6 | x | 3 | | 9/26/23 | GUILLERMO BENITEZ | 264 | Vacuum | Pass | 10/4/23 |
| 192 | SJ | | | 119/120/121 | P | 6 | x | 3 | | 9/26/23 | GUILLERMO BENITEZ | 264 | Vacuum | Pass | 10/4/23 |
| 193 | SJ | | | 121/122/123 | P | 8 | x | 3 | | 9/26/23 | GUILLERMO BENITEZ | 264 | Vacuum | Pass | 10/4/23 |
| 194 | SJ | | | 122/123/124 | P | 6 | x | 3 | | 9/26/23 | GUILLERMO BENITEZ | 264 | Vacuum | Pass | 10/4/23 |
| 195 | SJ | | | 124/125/126 | P | 6 | x | 2 | | 9/26/23 | GUILLERMO BENITEZ | 264 | Vacuum | Pass | 10/5/23 |
| 196 | SJ | | | 126/125/127 | P | 6 | x | 3 | | 9/26/23 | GUILLERMO BENITEZ | 264 | Vacuum | Pass | 10/5/23 |
| 197 | SJ | | | 127/128/129 | P | 8 | x | 3 | | 9/26/23 | GUILLERMO BENITEZ | 264 | Vacuum | Pass | 10/5/23 |
| 198 | SJ | | | 128/129/130 | P | 6 | x | 3 | | 9/26/23 | GUILLERMO BENITEZ | 264 | Vacuum | Pass | 10/5/23 |
| 199 | SJ | | | 130/131/132 | P | 8 | x | 3 | | 9/26/23 | GUILLERMO BENITEZ | 264 | Vacuum | Pass | 10/5/23 |
| 200 | SJ | | | 131/132/133 | P | 4 | x | 2 | | 9/26/23 | GUILLERMO BENITEZ | 264 | Vacuum | Pass | 10/5/23 |
| 201 | BO | 131/133 | | 33'N/S. | P | 4 | x | 2 | | 9/20/23 | GUILLERMO BENITEZ | 264 | Vacuum | Pass | 10/5/23 |
| 202 | SJ | | | 133/134/153 | P | 2 | x | 2 | | 9/20/23 | GUILLERMO BENITEZ | 264 | Vacuum | Pass | 10/5/23 |
| 203 | SJ | | | 134/152/153 | P | 3 | x | 2 | | 9/20/23 | GUILLERMO BENITEZ | 264 | Vacuum | Pass | 10/5/23 |
| 204 | SJ | | | 134/135/152 | P | 2 | x | 2 | | 9/26/23 | GUILLERMO BENITEZ | 264 | Vacuum | Pass | 10/5/23 |
| 205 | SJ | | | 135/151/152 | P | 2 | x | 2 | | 9/26/23 | GUILLERMO BENITEZ | 264 | Vacuum | Pass | 10/5/23 |
| 206 | SJ | | | 135/136/151 | P | 2 | x | 2 | | 9/28/23 | GUILLERMO BENITEZ | 264 | Vacuum | Pass | 10/2/23 |
| 207 | SJ | | | 136/137/151 | P | 2 | x | 2 | | 9/28/23 | GUILLERMO BENITEZ | 264 | Vacuum | Pass | 10/2/23 |
| 208 | SJ | | | 137/150/151 | P | 3 | x | 3 | | 9/28/23 | GUILLERMO BENITEZ | 264 | Vacuum | Pass | 10/2/23 |

# ECApplications
## Repair Report

**Project Name** Minnkota Power Cooperative, Inc. **Job # :** 233013 **Superintendent:** Octavio Rivas

**Material Type:** 60 Mil HDPE SS Textured / Smooth Liner **Primary** X **Pond** **SF Patch Material** 3843

**Job Description:** Celll 5 Phase 1B **Secondary** **Cell** X **LF Welded** 4832.00

**Reported by :** Daniel Martinez **Pad**

**Damage Codes**

CR --Crease FS --Failed Seam MatD --Material Defect LL --Lost Lap CF --Custom Fit
DS --Destruct Sample WR --Wrinkle WS --Welder Restart MD --Mechanical Damage PB --Pipe Boot
SI --Subgrade Irregularity AV --Airvent RW --Roller Wrinkle DO --Damage By Others BO --Burn Out
SJ --Seam Joint AO --Add On CS --Concrete Structure AT -Air Test

**Location Abbreviations**

BOS - Beginning of Seam
EOS - End of Seam
TOS - Toe of Seam
SJ - Seam Joint
ANT - Anchor Trench

| Test Type | Abbrv. | Repair Types |
|---|---|---|
| Vacuum | *S=South | C--Cap Strip |
| Air Test | *N=North | P--Patch |
| Spark | *W=West | B--Extrusion Bead |
| Air Lance | *E=East | |

| Repair Number | Damage Code | Seam Number | Panel Number | Location | Repair Type | Patch (Feet) | | | Bead (Inches) | Date Welded | Operator Name | Machine Number | Test Type | Test Results | Date Complete |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 209 | DO | 136/137 | | 111'N/S | P | 2 | x | 2 | | 9/28/23 | GUILLERMO BENITEZ | 264 | Vacuum | Pass | 10/2/23 |
| 210 | SJ | | | 137/138/150 | P | 2 | x | 2 | | 9/28/23 | GUILLERMO BENITEZ | 264 | Vacuum | Pass | 10/2/23 |
| 211 | SJ | | | 138/139/149 | P | 2 | x | 2 | | 9/28/23 | GUILLERMO BENITEZ | 264 | Vacuum | Pass | 10/2/23 |
| 212 | AT | 30/55 | | NAT.B.O.S | P | 5 | x | 3 | | 9/28/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 10/2/23 |
| 213 | DS-26 | 58/60 | | NAT.B.O.S | P | 6 | x | 2 | | 9/28/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 10/2/23 |
| 214 | DS-27 | 62/64 | | NAT.B.O.S | P | 6 | x | 2 | | 9/28/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 10/2/23 |
| 215 | BO | 66/67 | | NAT.5'S | P | 6 | x | 2 | | 9/28/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 10/2/23 |
| 216 | DS-29 | 68/69 | | NAT.B.O.S | P | 8 | x | 2 | | 9/28/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 10/2/23 |
| 217 | AT | 99/100 | | NAT.B.O.S | P | 6 | x | 2 | | 9/28/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 10/2/23 |
| 218 | AT | 118/120 | | NAT.B.O.S | P | 6 | x | 2 | | 9/28/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 10/2/23 |
| 219 | SJ | | | 144/145/143/146 | P | 5 | x | 2 | | 9/28/23 | GUILLERMO BENITEZ | 264 | Vacuum | Pass | 10/2/23 |
| 220 | SJ | | | 142/143/146 | P | 2 | x | 2 | | 9/28/23 | GUILLERMO BENITEZ | 264 | Vacuum | Pass | 10/2/23 |
| 221 | SJ | | | 142/146/147 | P | 2 | x | 2 | | 9/28/23 | GUILLERMO BENITEZ | 264 | Vacuum | Pass | 10/2/23 |
| 222 | SJ | | | 141/142/147 | P | 4 | x | 2 | | 9/28/23 | GUILLERMO BENITEZ | 264 | Vacuum | Pass | 10/2/23 |
| 223 | SJ | | | 141/147/148 | P | 2 | x | 2 | | 9/28/23 | GUILLERMO BENITEZ | 264 | Vacuum | Pass | 10/2/23 |
| 224 | SJ | | | 140/141/148 | P | 3 | x | 2 | | 9/28/23 | GUILLERMO BENITEZ | 264 | Vacuum | Pass | 10/2/23 |
| 225 | DO | 140/148 | | 8'E/W | P | 4 | x | 4 | | 9/28/23 | GUILLERMO BENITEZ | 264 | Vacuum | Pass | 10/2/23 |
| 226 | DO | 140/148 | 140 | 15'E/W.5'S/N | P | 12 | x | 2 | | 9/28/23 | GUILLERMO BENITEZ | 264 | Vacuum | Pass | 10/2/23 |
| 227 | SJ | | | 139/140/148/149 | P | 4 | x | 2 | | 9/28/23 | GUILLERMO BENITEZ | 264 | Vacuum | Pass | 10/2/23 |
| 228 | DO | 139/140 | 139 | 23'E/W.2'S/N | P | 2 | x | 2 | | 9/28/23 | GUILLERMO BENITEZ | 264 | Vacuum | Pass | 10/2/23 |
| 229 | DO | 139/140 | 139 | 25'E/W.2'S/N | P | 2 | x | 2 | | 9/28/23 | GUILLERMO BENITEZ | 264 | Vacuum | Pass | 10/2/23 |
| 230 | SJ | | | 155/156/157 | P | 2 | x | 2 | | 9/28/23 | GUILLERMO BENITEZ | 264 | Vacuum | Pass | 10/2/23 |
| 231 | SJ | | | 156/157/158 | P | 2 | x | 2 | | 9/28/23 | GUILLERMO BENITEZ | 264 | Vacuum | Pass | 10/2/23 |
| 232 | SJ | | | 159/160/161 | P | 2 | x | 2 | | 9/28/23 | GUILLERMO BENITEZ | 264 | Vacuum | Pass | 10/2/23 |
| 233 | SJ | | | 160/161/162 | P | 2 | x | 2 | | 9/28/23 | GUILLERMO BENITEZ | 264 | Vacuum | Pass | 10/2/23 |
| 234 | SJ | | | 163/164/165 | P | 2 | x | 2 | | 9/28/23 | GUILLERMO BENITEZ | 264 | Vacuum | Pass | 10/2/23 |

# ECApplications
## Repair Report

**Project Name** Minnkota Power Cooperative, Inc. **Job # :** 233013 **Superintendent:** Octavio Rivas

**Material Type:** 60 Mil HDPE SS Textured / Smooth Liner **Primary** X **Pond** **SF Patch Material** 3843

**Job Description:** Celll 5 Phase 1B **Secondary** **Cell** X **LF Welded** 4832.00

**Reported by :** Daniel Martinez **Pad**

**Damage Codes**

CR --Crease FS --Failed Seam MatD --Material Defect LL --Lost Lap CF --Custom Fit
DS --Destruct Sample WR --Wrinkle WS --Welder Restart MD --Mechanical Damage PB --Pipe Boot
SI --Subgrade Irregularity AV --Airvent RW --Roller Wrinkle DO --Damage By Others BO --Burn Out
SJ --Seam Joint AO --Add On CS --Concrete Structure AT -Air Test

**Location Abbreviations**

BOS - Beginning of Seam
EOS - End of Seam
TOS - Toe of Seam
SJ - Seam Joint
ANT - Anchor Trench

| Test Type | Abbrv. | Repair Types |
|---|---|---|
| Vacuum | *S=South | C--Cap Strip |
| Air Test | *N=North | P--Patch |
| Spark | *W=West | B--Extrusion Bead |
| Air Lance | *E=East | |

| Repair Number | Damage Code | Seam Number | Panel Number | Location | Repair Type | Patch (Feet) | | | Bead (Inches) | Date Welded | Operator Name | Machine Number | Test Type | Test Results | Date Complete |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 235 | SJ | | | 164/165/166 | P | 2 | x | 2 | | 9/28/23 | GUILLERMO BENITEZ | 264 | Vacuum | Pass | 10/2/23 |
| 236 | SJ | | | 167/168/169 | P | 2 | x | 2 | | 9/28/23 | GUILLERMO BENITEZ | 264 | Vacuum | Pass | 10/2/23 |
| 237 | DO | 99/183 | 99 | 10'W/E.3'S/N | P | 2 | x | 2 | | 9/28/23 | GUILLERMO BENITEZ | 264 | Vacuum | Pass | 10/2/23 |
| 238 | DS-29-A | 68/69 | | NAT.B.O.S..CAP-2 | C | 8 | x | 2 | | 9/28/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 10/2/23 |
| 239 | DS-17-A | 8/9 | | WAT.7'E..CAP-1 | C | 6 | x | 2 | | 9/28/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 10/2/23 |
| 240 | DS-17-B | 5/6 | | WAT.7'E. | P | 6 | x | 2 | | 9/28/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 10/2/23 |
| 241 | DS-74 | 192/193 | | 192/193/201/202 | P | 8 | x | 2 | | 10/2/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 10/2/23 |
| 242 | DS-73 | 191/192 | | 191/192/200/201 | P | 2 | x | 2 | | 10/2/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 10/2/23 |
| 243 | DO | 191/200 | 191 | 10'S/N.1'W/E | P | 3 | x | 2 | | 10/2/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 10/2/23 |
| 244 | DO | 191/200 | 191 | 10'S/N.5'W/E | P | 2 | x | 2 | | 10/2/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 10/2/23 |
| 245 | DO | 191/200 | 191 | 10'S/N.9'W/E | P | 6 | x | 2 | | 10/2/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 10/2/23 |
| 246 | DS-72 | 190/191 | | 190/191/199/200 | P | 3 | x | 2 | | 10/2/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 10/2/23 |
| 247 | DS-71 | 187/190 | | 187/190/198/199 | P | 7 | x | 2 | | 10/2/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 10/2/23 |
| 248 | DS-69 | 185/186 | | 185/186/197 | P | 4 | x | 2 | | 10/2/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 10/2/23 |
| 249 | SJ | | | 185/196/197 | P | 2 | x | 2 | | 10/2/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 10/2/23 |
| 250 | | | | 184/185/196/106 | P | 3 | x | 2 | | 10/2/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 10/2/23 |
| 251 | | | | 206/195/196 | P | 3 | x | 3 | | 10/2/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 10/2/23 |
| 252 | | | | 194/195/206 | P | 2 | x | 2 | | 10/2/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 10/2/23 |
| 253 | DS-76-A | 115/183 | | 115/183/149 CAP -3 | C | 20 | x | 4 | | 10/2/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 10/2/23 |
| 254 | | | | 118/119/194 | P | 2 | x | 2 | | 10/2/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 10/2/23 |
| 255 | | | | 119/121/194 | P | 2 | x | 2 | | 10/2/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 10/2/23 |
| 256 | | | | 121/123/194 | P | 2 | x | 2 | | 10/2/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 10/2/23 |
| 257 | | | | 123/124/194 | P | 2 | x | 2 | | 10/2/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 10/2/23 |
| 258 | | | | 124/125/194 | P | 2 | x | 2 | | 10/2/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 10/2/23 |
| 259 | | | | 125/126/194 | P | 2 | x | 2 | | 10/2/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 10/2/23 |
| 260 | DO | 125/194 | | 12'E/W | P | 2 | x | 2 | | 10/2/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 10/2/23 |

# ECApplications
## Repair Report

**Project Name** Minnkota Power Cooperative, Inc. **Job # :** 233013 **Superintendent:** Octavio Rivas

**Material Type:** 60 Mil HDPE SS Textured / Smooth Liner **Primary** X **Pond** **SF Patch Material** 3843

**Job Description:** Celll 5 Phase 1B **Secondary** **Cell** X **LF Welded** 4832.00

**Reported by :** Daniel Martinez **Pad**

**Damage Codes**

| | | | | |
|---|---|---|---|---|
| CR --Crease | FS --Failed Seam | MatD --Material Defect | LL --Lost Lap | CF --Custom Fit |
| DS --Destruct Sample | WR --Wrinkle | WS --Welder Restart | MD --Mechanical Damage | PB --Pipe Boot |
| SI --Subgrade Irregularity | AV --Airvent | RW --Roller Wrinkle | DO --Damage By Others | BO --Burn Out |
| SJ --Seam Joint | AO --Add On | CS --Concrete Structure | | AT -Air Test |

**Location Abbreviations**

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ANT - Anchor Trench

| Test Type | Abbrv. | Repair Types |
|---|---|---|
| Vacuum | *S=South | C--Cap Strip |
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| Air Lance | *E=East | |

| Repair Number | Damage Code | Seam Number | Panel Number | Location | Repair Type | Patch (Feet) | | | Bead (Inches) | Date Welded | Operator Name | Machine Number | Test Type | Test Results | Date Complete |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 261 | DS-76-B | 185/186 | | 30'W/E | P | 6 | x | 2 | | 10/4/23 | BRANDON GOULD | 535 | Vacuum | Pass | 10/4/23 |
| 262 | DO | 127/194 | | 10'W/E | P | 2 | x | 2 | | 10/4/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 10/4/23 |
| 263 | SJ | | | 127/129/194 | P | 5 | x | 3 | | 10/4/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 10/4/23 |
| 264 | SJ | | | 129/130/194 | P | 2 | x | 2 | | 10/4/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 10/4/23 |
| 265 | SJ | | | 131/133/153/154 | P | 2 | x | 2 | | 10/4/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 10/4/23 |
| 266 | DO | 200/201 | 200 | 10'W/E.9'S/N | P | 2 | x | 2 | | 10/4/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 10/4/23 |
| 267 | DO | 200/201 | 200 | 12'W/E.11'S/N | P | 2 | x | 2 | | 10/4/23 | BRANDON GOULD | 535 | Vacuum | Pass | 10/4/23 |
| 268 | SJ | | | 165/163/202/205 | P | 3 | x | 2 | | 10/4/23 | BRANDON GOULD | 535 | Vacuum | Pass | 10/4/23 |
| 269 | SJ | | | 201/202/205 | P | 3 | x | 3 | | 10/2/23 | BRANDON GOULD | 535 | Vacuum | Pass | 10/4/23 |
| 270 | SJ | | | 200/201/205 | P | 2 | x | 2 | | 10/2/23 | BRANDON GOULD | 535 | Vacuum | Pass | 10/4/23 |
| 271 | SJ | | | 200/205/162/163 | P | 3 | x | 2 | | 10/2/23 | BRANDON GOULD | 535 | Vacuum | Pass | 10/4/23 |
| 272 | DO | 200/201 | 200 | 13'E/W.10'S/N | P | 2 | x | 2 | | 10/2/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 10/4/23 |
| 273 | SJ | | | 200/199/204 | P | 2 | x | 2 | | 10/2/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 10/4/23 |
| 274 | SJ | | | 199/204/198 | P | 2 | x | 2 | | 10/2/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 10/4/23 |
| 275 | DS-58 | 161/162 | | 161/162/200/204 | P | 7 | x | 2 | | 10/2/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 10/4/23 |
| 276 | SJ | | | 159/161/199/204 | P | 2 | x | 2 | | 10/2/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 10/4/23 |
| 277 | SJ | | | 1`99/198/203 | P | 4 | x | 4 | | 10/4/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 10/4/23 |
| 278 | SJ | | | 158/159/198/203 | P | 2 | x | 2 | | 10/4/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 10/4/23 |
| 279 | SJ | | | 197/196/203 | P | 3 | x | 3 | | 10/4/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 10/4/23 |
| 280 | SJ | | | 203/196/157/158 | P | 4 | x | 3 | | 10/4/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 10/4/23 |
| 281 | DO | 196/157 | 196 | 12'S/N.5'E/W | P | 2 | x | 2 | | 10/4/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 10/4/23 |
| 282 | SJ | | | 195/196/155/157 | P | 3 | x | 2 | | 10/4/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 10/4/23 |
| 283 | SJ | | | 194/195/154/155 | P | 3 | x | 2 | | 10/4/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 10/4/23 |
| 284 | SJ | | | 155/157/195/196 | P | 2 | x | 2 | | 10/4/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 10/4/23 |
| 285 | SJ | | | 157/158/196/203 | P | 3 | x | 2 | | 10/4/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 10/4/23 |
| 286 | DS-78 | 196/203 | | 5'E/W | P | 6 | x | 2 | | 10/4/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 10/4/23 |

# ECApplications
## Repair Report

**Project Name** Minnkota Power Cooperative, Inc. **Job # :** 233013 **Superintendent:** Octavio Rivas

**Material Type:** 60 Mil HDPE SS Textured / Smooth Liner **Primary** X **Pond** **SF Patch Material** 3843

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**Reported by :** Daniel Martinez **Pad**

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| Air Test | *N=North | P--Patch |
| Spark | *W=West | B--Extrusion Bead |
| Air Lance | *E=East | |

| Repair Number | Damage Code | Seam Number | Panel Number | Location | Repair Type | Patch (Feet) | | | Bead (Inches) | Date Welded | Operator Name | Machine Number | Test Type | Test Results | Date Complete |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 287 | SJ | | | 158/159/203/198 | P | 2 | x | 2 | | 10/4/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 10/4/23 |
| 288 | SJ | | | 198/197/203 | P | 3 | x | 3 | | 10/4/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 10/4/23 |
| 289 | SJ | | | 196/197/203 | P | 2 | x | 2 | | 10/4/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 10/4/23 |
| 290 | DS-79 | 198/204 | | 5'E/W | P | 6 | x | 2 | | 10/4/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 10/4/23 |
| 291 | DS-80 | 200/205 | | 5'E/W | P | 6 | x | 2 | | 10/4/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 10/4/23 |
| 292 | DS-81 | 201/202 | | 5'E/W | P | 6 | x | 2 | | 10/4/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 10/4/23 |
| 293 | SJ | | | 214/215/219/220 | P | 4 | x | 3 | | 10/9/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 10/13/23 |
| 294 | SJ | | | 211/212/223 | P | 4 | x | 3 | | 10/9/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 10/13/23 |
| 295 | DS-101 | 212/223 | | 211/212/223 | P | 5 | x | 2 | | 10/9/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 10/13/23 |
| 296 | SJ | | | 211/223/224 | P | 3 | x | 2 | | 10/9/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 10/13/23 |
| 297 | SJ | | | 211/224/225 | P | 3 | x | 3 | | 10/9/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 10/13/23 |
| 298 | SJ | | | 210/211/225 | P | 2 | x | 2 | | 10/9/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 10/13/23 |
| 299 | SJ | | | 210/225/226 | P | 3 | x | 2 | | 10/9/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 10/13/23 |
| 300 | DS-84-A | 209/210 | | EAT.B.O.S.CAP-4 | C | 8 | | 2 | | 10/17/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 10/13/23 |
| 301 | SJ | | | 209/226/227 | P | 2 | x | 2 | | 10/9/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 10/13/23 |
| 302 | SJ | | | 208/209/227/228 | P | 2 | x | 2 | | 10/9/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 10/13/23 |
| 303 | SJ | | | 207/208/228 | P | 2 | x | 2 | | 10/9/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 10/13/23 |
| 304 | SJ | | | 207/228/229 | P | 2 | x | 2 | | 10/9/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 10/13/23 |
| 305 | D0 | 207/229 | | 10'N/S | P | 2 | x | 2 | | 10/9/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 10/13/23 |
| 306 | SJ | | | 169/207/229/263 | P | 2 | x | 2 | | 10/9/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 10/13/23 |
| 307 | DO | 263 | | 263/169.5'E/W.5'N/S | P | 5 | x | 5 | | 10/9/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 10/13/23 |
| 308 | DO | 261 | | 261/262/5'E/W.8'S/N | P | 2 | x | 2 | | 10/9/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 10/13/23 |
| 309 | DO | 261 | | 261/262/12'8'S/N | P | 2 | x | 2 | | 10/9/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 10/13/23 |
| 310 | DO | 261 | | 261/262/19''8'S/N | P | 2 | x | 2 | | 10/9/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 10/13/23 |
| 311 | SJ | | | 202/165/166/261 | P | 2 | x | 2 | | 10/9/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 10/13/23 |
| 312 | SJ | | | 263/264/262 | P | 3 | x | 2 | | 10/9/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 10/13/23 |

# ECApplications
## Repair Report

**Project Name** Minnkota Power Cooperative, Inc. **Job # :** 233013 **Superintendent:** Octavio Rivas

**Material Type:** 60 Mil HDPE SS Textured / Smooth Liner **Primary** X **Pond** **SF Patch Material** 3843

**Job Description:** Celll 5 Phase 1B **Secondary** **Cell** X **LF Welded** 4832.00

**Reported by :** Daniel Martinez **Pad**

**Damage Codes**

CR --Crease FS --Failed Seam MatD --Material Defect LL --Lost Lap CF --Custom Fit
DS --Destruct Sample WR --Wrinkle WS --Welder Restart MD --Mechanical Damage PB --Pipe Boot
SI --Subgrade Irregularity AV --Airvent RW --Roller Wrinkle DO --Damage By Others BO --Burn Out
SJ --Seam Joint AO --Add On CS --Concrete Structure AT -Air Test

**Location Abbreviations**

BOS - Beginning of Seam
EOS - End of Seam
TOS - Toe of Seam
SJ - Seam Joint
ANT - Anchor Trench

| Test Type | Abbrv. | Repair Types |
|---|---|---|
| Vacuum | *S=South | C--Cap Strip |
| Air Test | *N=North | P--Patch |
| Spark | *W=West | B--Extrusion Bead |
| Air Lance | *E=East | |

| Repair Number | Damage Code | Seam Number | Panel Number | Location | Repair Type | Patch (Feet) | | | Bead (Inches) | Date Welded | Operator Name | Machine Number | Test Type | Test Results | Date Complete |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 313 | SJ | | | 264/247/262 | P | 2 | x | 2 | | 10/9/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 10/13/23 |
| 314 | SJ | | | 293/202/261 | P | 6 | x | 2 | | 10/13/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 10/13/23 |
| 315 | DS-105 | 263/233 | | 12'E/W | P | 6 | x | 2 | | 10/13/23 | BRANDON GOULD | 535 | Vacuum | Pass | 10/13/23 |
| 316 | DO | 241/263 | | B.O.S. | P | 12 | x | 2 | | 10/13/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 10/13/23 |
| 317 | DO | 242/263 | 242 | 10'E/W.8'N/S | P | 2 | x | 2 | | 10/12/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 10/13/23 |
| 318 | DO | 242/263 | 242 | 19'E/W.20'N/S | P | 2 | x | 2 | | 10/12/23 | BRANDON GOULD | 535 | Vacuum | Pass | 10/13/23 |
| 319 | DO | 243/263 | 243 | 2'N/S4'W/E | P | 2 | x | 2 | | 10/12/23 | BRANDON GOULD | 535 | Vacuum | Pass | 10/13/23 |
| 320 | SJ | | | 264/247/262 | P | 2 | x | 2 | | 10/12/23 | BRANDON GOULD | 535 | Vacuum | Pass | 10/13/23 |
| 321 | SJ | | | 264/263/262 | P | 2 | x | 2 | | 10/12/23 | BRANDON GOULD | 535 | Vacuum | Pass | 10/13/23 |
| 322 | SJ | | | 248/249/267 | P | 6 | x | 2 | | 10/12/23 | BRANDON GOULD | 535 | Vacuum | Pass | 10/13/23 |
| 323 | SJ | | | 254/255/262 | P | 5 | x | 2 | | 10/12/23 | BRANDON GOULD | 535 | Vacuum | Pass | 10/13/23 |
| 324 | SJ | | | 232/233/234 | P | 3 | x | 3 | | 10/10/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 10/13/23 |
| 325 | SJ | | | 236/237/238 | P | 3 | x | 2 | | 10/10/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 10/13/23 |
| 326 | SJ | | | 237/238/239 | P | 3 | x | 2 | | 10/10/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 10/13/23 |
| 327 | SJ | | | 239/240/241 | P | 4 | x | 2 | | 10/10/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 10/13/23 |
| 328 | SJ | | | 240/241/242 | P | 2 | x | 2 | | 10/10/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 10/13/23 |
| 329 | SJ | | | 242/243/244 | P | 2 | x | 2 | | 10/10/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 10/13/23 |
| 330 | SJ | | | 243/244/245 | P | 2 | x | 2 | | 10/13/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 10/13/23 |
| 331 | SJ | | | 246/247/248/ | P | 2 | x | 2 | | 10/13/23 | BRANDON GOULD | 535 | Vacuum | Pass | 10/13/23 |
| 332 | SJ | | | 248/249/250 | P | 4 | x | 2 | | 10/13/23 | BRANDON GOULD | 535 | Vacuum | Pass | 10/13/23 |
| 333 | SJ | | | 249/250/251 | P | 2 | x | 2 | | 10/13/23 | BRANDON GOULD | 535 | Vacuum | Pass | 10/13/23 |
| 334 | SJ | | | 251/252/253 | P | 2 | x | 2 | | 10/13/23 | BRANDON GOULD | 535 | Vacuum | Pass | 10/13/23 |
| 335 | SJ | | | 305/295/297 | P | 4 | x | 2 | | 10/19/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 10/19/23 |
| 336 | SJ | | | 281/283/305 | P | 2 | x | 2 | | 10/19/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 10/19/23 |
| 337 | SJ | | | 304/305/53 | P | 3 | x | 3 | | 10/19/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 10/19/23 |
| 338 | DS-121 | 305/53 | | 13'E/W. | P | 6 | x | 2 | | 10/19/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 10/19/23 |

# ECApplications
## Repair Report

**Project Name** Minnkota Power Cooperative, Inc. **Job # :** 233013 **Superintendent:** Octavio Rivas

**Material Type:** 60 Mil HDPE SS Textured / Smooth Liner **Primary** X **Pond**

**Job Description:** Celll 5 Phase 1B **Secondary** **Cell** X

**Reported by :** Daniel Martinez **Pad**

**SF Patch Material** 3843

**LF Welded** 4832.00

**Damage Codes**

| | | | | | |
|---|---|---|---|---|---|
| CR --Crease | FS --Failed Seam | MatD --Material Defect | LL --Lost Lap | CF --Custom Fit | |
| DS --Destruct Sample | WR --Wrinkle | WS --Welder Restart | MD --Mechanical Damage | PB --Pipe Boot | |
| SI --Subgrade Irregularity | AV --Airvent | RW --Roller Wrinkle | DO --Damage By Others | BO --Burn Out | |
| SJ --Seam Joint | AO --Add On | CS --Concrete Structure | | AT -Air Test | |

**Location Abbreviations**

BOS - Beginning of Seam
EOS - End of Seam
TOS - Toe of Seam
SJ - Seam Joint
ANT - Anchor Trench

| Test Type | Abbrv. | Repair Types |
|---|---|---|
| Vacuum | *S=South | C--Cap Strip |
| Air Test | *N=North | P--Patch |
| Spark | *W=West | B--Extrusion Bead |
| Air Lance | *E=East | |

| Repair Number | Damage Code | Seam Number | Panel Number | Location | Repair Type | Patch (Feet) | | | Bead (Inches) | Date Welded | Operator Name | Machine Number | Test Type | Test Results | Date Complete |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 339 | DO | 305/53 | | 65'W/E.2'S/N | P | 2 | x | 2 | | 10/19/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 10/19/23 |
| 340 | DO | 305/53 | 53 | 20'W/E.2'S/N | P | 2 | x | 2 | | 10/19/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 10/19/23 |
| 341 | DO | 305/53 | | 10'W/E | P | 20 | x | 12 | | 10/19/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 10/19/23 |
| 342 | SJ | | | 282/281/304 | P | 2 | x | 2 | | 10/19/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 10/19/23 |
| 343 | DS-120 | 281/304 | | 279/281/304.CAP-7 | C | 16 | x | 2 | | 10/19/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 10/19/23 |
| 344 | SJ | | | 53/304/305 | P | 3 | x | 3 | | 10/17/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 10/19/23 |
| 345 | SJ | | | 193/53/304 | P | 3 | x | 3 | | 10/17/23 | BRANDON GOULD | 535 | Vacuum | Pass | 10/19/23 |
| 346 | SJ | | | 261/262/303/304 | P | 2 | x | 2 | | 10/17/23 | BRANDON GOULD | 535 | Vacuum | Pass | 10/19/23 |
| 347 | DS-104 | 260/262 | | 260/262/303 | P | 8 | x | 2 | | 10/17/23 | BRANDON GOULD | 535 | Vacuum | Pass | 10/19/23 |
| 348 | DO | 268/269 | | 12'N/S | P | 2 | x | 2 | | 10/17/23 | BRANDON GOULD | 535 | Vacuum | Pass | 10/19/23 |
| 349 | DO | 268/269 | 268 | 13/N/S.4'W/E | P | 2 | x | 2 | | 10/17/23 | BRANDON GOULD | 535 | Vacuum | Pass | 10/19/23 |
| 350 | DO | 269/271 | 269 | 14/\'N/S8'W/E | P | 8 | x | 2 | | 10/17/23 | BRANDON GOULD | 535 | Vacuum | Pass | 10/19/23 |
| 351 | SJ | | | 273/274/303 | P | 3 | x | 3 | | 10/17/23 | BRANDON GOULD | 535 | Vacuum | Pass | 10/19/23 |
| 352 | SJ | | | 274/303/304 | P | 5 | x | 2 | | 10/17/23 | BRANDON GOULD | 535 | Vacuum | Pass | 10/19/23 |
| 353 | BO | 277/278 | | 30'N/S | P | 7 | x | 2 | | 10/17/23 | BRANDON GOULD | 535 | Vacuum | Pass | 10/19/23 |
| 354 | DS-84-B | 207/208 | | 228/207/208 | P | 6 | x | 2 | | 10/17/23 | BRANDON GOULD | 535 | Vacuum | Pass | 10/19/23 |
| 355 | DS-39-B | 238/239 | | SAT.B.O.S | P | 2 | x | 2 | | 10/19/23 | BRANDON GOULD | 535 | Vacuum | Pass | 10/19/23 |
| 356 | DO | 245/246 | | 12'S/N | P | 4 | x | 2 | | 10/19/23 | BRANDON GOULD | 535 | Vacuum | Pass | 10/19/23 |
| 357 | SJ | | | 245/246/247 | P | 6 | x | 2 | | 10/19/23 | BRANDON GOULD | 535 | Vacuum | Pass | 10/19/23 |
| 358 | DS-96-B | 248/249 | | 248/249/250 | P | 6 | x | 2 | | 10/19/23 | BRANDON GOULD | 535 | Vacuum | Pass | 10/19/23 |
| 359 | DO | 248/250 | | 265'S/N | P | 6 | x | 2 | | 10/19/23 | BRANDON GOULD | 535 | Vacuum | Pass | 10/19/23 |
| 360 | DO | 252/253 | 253 | 10'E/W.6'N/S | P | 5 | x | 2 | | 10/13/23 | BRANDON GOULD | 535 | Vacuum | Pass | 10/19/23 |
| 361 | SJ | | | 252/253/254 | P | 2 | x | 2 | | 10/13/23 | BRANDON GOULD | 535 | Vacuum | Pass | 10/19/23 |
| 362 | SJ | | | 254/255/256 | P | 2 | x | 2 | | 10/13/23 | BRANDON GOULD | 535 | Vacuum | Pass | 10/19/23 |
| 363 | SJ | | | 255/256/257 | P | 2 | x | 2 | | 10/13/23 | BRANDON GOULD | 535 | Vacuum | Pass | 10/19/23 |
| 364 | DO | 256/257 | 256 | 15'S/N.7'E/W | P | 2 | x | 2 | | 10/13/23 | BRANDON GOULD | 535 | Vacuum | Pass | 10/19/23 |

# ECApplications
## Repair Report

**Project Name** Minnkota Power Cooperative, Inc. **Job # :** 233013 **Superintendent:** Octavio Rivas

**Material Type:** 60 Mil HDPE SS Textured / Smooth Liner **Primary** X **Pond**

**Job Description:** Celll 5 Phase 1B **Secondary** **Cell** X

**Reported by :** Daniel Martinez **Pad**

**SF Patch Material** 3843

**LF Welded** 4832.00

**Damage Codes**

CR --Crease FS --Failed Seam MatD --Material Defect LL --Lost Lap CF --Custom Fit
DS --Destruct Sample WR --Wrinkle WS --Welder Restart MD --Mechanical Damage PB --Pipe Boot
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| Test Type | Abbrv. | Repair Types |
|---|---|---|
| Vacuum | *S=South | C--Cap Strip |
| Air Test | *N=North | P--Patch |
| Spark | *W=West | B--Extrusion Bead |
| Air Lance | *E=East | |

| Repair Number | Damage Code | Seam Number | Panel Number | Location | Repair Type | Patch (Feet) | | | Bead (Inches) | Date Welded | Operator Name | Machine Number | Test Type | Test Results | Date Complete |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 365 | SJ | | | 257/258/259 | P | 2 | x | 2 | | 10/13/23 | BRANDON GOULD | 535 | Vacuum | Pass | 10/19/23 |
| 366 | DO | 256/257 | 257 | 40'S/N | P | 2 | x | 2 | | 10/13/23 | BRANDON GOULD | 535 | Vacuum | Pass | 10/19/23 |
| 367 | DO | 257/259 | 257 | 25'N/S.2'W/E | P | 2 | x | 2 | | 10/13/23 | BRANDON GOULD | 535 | Vacuum | Pass | 10/19/23 |
| 368 | DO | 257/259 | 257 | 24'N/S4'W/E | P | 2 | x | 2 | | 10/13/23 | BRANDON GOULD | 535 | Vacuum | Pass | 10/19/23 |
| 369 | SJ | | | 258/259/260 | P | 2 | x | 2 | | 10/13/23 | BRANDON GOULD | 535 | Vacuum | Pass | 10/19/23 |
| 370 | SJ | | | 276/277/278 | P | 2 | x | 2 | | 10/19/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 10/19/23 |
| 371 | FS | 280/279 | | 280/279 | P | 2 | x | 2 | | 10/20/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 10/19/23 |
| 372 | SJ | | | 281/282/283 | P | 2 | x | 2 | | 10/20/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 10/19/23 |
| 373 | SJ | | | 282/283/284 | P | 2 | x | 2 | | 10/20/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 10/19/23 |
| 374 | SJ | | | 285/286/287 | P | 2 | x | 2 | | 10/19/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 10/19/23 |
| 375 | SJ | | | 287/288/286 | P | 2 | x | 2 | | 10/19/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 10/19/23 |
| 376 | SJ | | | 289/290/291 | P | 2 | x | 2 | | 10/19/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 10/19/23 |
| 377 | SJ | | | 290/291/292 | P | 2 | x | 2 | | 10/19/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 10/19/23 |
| 378 | SJ | | | 294/295/296 | P | 2 | x | 2 | | 10/19/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 10/19/23 |
| 379 | SJ | | | 295/296/297 | P | 2 | x | 2 | | 10/19/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 10/19/23 |
| 380 | SJ | | | 298/299/300 | P | 2 | x | 2 | | 10/19/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 10/19/23 |
| 381 | SJ | | | 299/300/301 | P | 2 | x | 2 | | 10/19/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 10/19/23 |
| 382 | WS | 301/302 | | 45'S/N | P | 2 | x | 2 | | 10/21/23 | BRANDON GOULD | 535 | Vacuum | Pass | 10/21/23 |
| 383 | BO | 293/294 | | 30'S/N | P | 2 | x | 2 | | 10/21/23 | BRANDON GOULD | 535 | Vacuum | Pass | 10/21/23 |
| 384 | BO | 293/294 | | 16'S/N | P | 2 | x | 2 | | 10/21/23 | BRANDON GOULD | 535 | Vacuum | Pass | 10/21/23 |
| 385 | BO | 292/293 | | 8'N/S | P | 2 | x | 2 | | 10/21/23 | BRANDON GOULD | 535 | Vacuum | Pass | 10/21/23 |
| 386 | DO | 289/290 | | 44'S/N | P | 2 | x | 2 | | 10/21/23 | BRANDON GOULD | 535 | Vacuum | Pass | 10/21/23 |
| 387 | DO | 285/286 | | 60'S/N | P | 2 | x | 2 | | 10/21/23 | BRANDON GOULD | 535 | Vacuum | Pass | 10/21/23 |
| 388 | AT | 300/301 | | SAT.B.O.S | P | 2 | x | 2 | | 10/21/23 | BRANDON GOULD | 535 | Vacuum | Pass | 10/21/23 |
| 389 | DS-93-A | 239/240 | | SAT.B.O.S..CAP-5 | C | 18 | x | 2 | | 10/21/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 10/21/23 |
| 390 | DS-90 | 231/232 | | SAT.B.O.S | P | 2 | x | 2 | | 10/21/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 10/21/23 |

# ECApplications
## Repair Report

**Project Name** Minnkota Power Cooperative, Inc. **Job # :** 233013 **Superintendent:** Octavio Rivas

**Material Type:** 60 Mil HDPE SS Textured / Smooth Liner **Primary** X **Pond** **SF Patch Material** 3843

**Job Description:** Celll 5 Phase 1B **Secondary** **Cell** X **LF Welded** 4832.00

**Reported by :** Daniel Martinez **Pad**

**Damage Codes**

| | | | | |
|---|---|---|---|---|
| CR --Crease | FS --Failed Seam | MatD --Material Defect | LL --Lost Lap | CF --Custom Fit |
| DS --Destruct Sample | WR --Wrinkle | WS --Welder Restart | MD --Mechanical Damage | PB --Pipe Boot |
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| Test Type | Abbrv. | Repair Types |
|---|---|---|
| Vacuum | *S=South | C--Cap Strip |
| Air Test | *N=North | P--Patch |
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| Air Lance | *E=East | |

| Repair Number | Damage Code | Seam Number | Panel Number | Location | Repair Type | Patch (Feet) | | | Bead (Inches) | Date Welded | Operator Name | Machine Number | Test Type | Test Results | Date Complete |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 391 | AT | 182/302 | | SAT.B.O.S | P | 2 | x | 2 | | 10/21/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 10/21/23 |
| 392 | DS-126 | 297/298 | | SAT.6'/N | P | 2 | x | 2 | | 10/24/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 10/24/23 |
| 393 | DS-125 | 294/296 | | SAT.6'/N | P | 2 | x | 2 | | 10/24/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 10/24/23 |
| 394 | DS-124 | 293/292 | | SAT.6'/N | P | 2 | x | 2 | | 10/24/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 10/24/23 |
| 395 | DS-123 | 304/305 | | SAT.6'/N | P | 2 | x | 2 | | 10/24/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 10/24/23 |
| 396 | DS-122 | 300/301 | | SAT.10'N | P | 2 | x | 2 | | 10/24/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 10/24/23 |
| 397 | MD | 280/281 | | SAT.15/N | P | 2 | x | 2 | | 10/21/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 10/21/23 |
| 398 | DS-96-A | 250/251 | | SAT.12N..CAP-6 | P | 6 | x | 2 | | 10/23/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 10/23/23 |
| 399 | DS-93-A | 239/240 | | 15'N | P | 2 | x | 2 | | 10/23/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 10/23/23 |
| 400 | DS-100 | 217/216 | | 8'W/ | P | 2 | x | 2 | | 10/9/23 | GONZALO SUAREZ | 713 | Vacuum | Pass | 10/9/23 |

# Destructive Testing – 3rd Party Laboratory Results

Date: 2023-07-25

**Mail To:**
**Joseph Grosz**
**Minnkota Power Cooperative, Inc.**

**, ,**

e-mail:jgrosz@minnkota.com

**Bill To:**

**Minnkota Power Cooperative, Inc.**
**Project# 723817**

Dear Mr. Grosz,

Thank you for consulting with TRI/Environmental, Inc. (TRI) for your geosynthetics testing needs. TRI is pleased to submit this final report for laboratory testing.

| | |
|---|---|
| **Project:** | **Minnkota Power - Milton R. Young Station Cell 5, Phase 1B** |
| TRI Job Reference Number: | **78620** |
| Material(s) Tested: | (8) Heat Fusion Weld Seam(s) |
| Test(s) Requested: | SAME DAY Peel and Shear<br>(ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.) |

| Codes: | |
|---|---|
| AD | Adhesion Failure (100% Peel) |
| BRK | Break in sheeting away from Seam edge. |
| SE | Break in sheeting at edge of seam. |
| AD-BRK | Break in sheeting after some adhesion failure - partial peel. |
| SIP | Separation in the plane of the sheet (leaving the bond intact). |
| FTB | Film tearing bond (all non "AD" failures). |
| NON-FTB | 100% peel. |

If you have any questions or require any additional information, please call us at 1-800-880-8378.
Sincerely,
sigfile
geolab

Geosynthetic Services Division
http://www.geosyntheticstestinc.com

The testing herein is based upon accepted industry practice as well as the test method listed. Test results reported herein do not apply to samples other than those tested. TRI neither accepts responsibility for nor makes claim as to the final use and purpose of the material. TRI observes and maintains client confidentiality. TRI limits reproduction of this report, except in full, without prior approval of TRI.

## DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
## TRI Client: Minnkota Power Cooperative, Inc.
## Project: Minnkota Power - Milton R. Young Station Cell 5, Phase 1B

**Material: 60 mil. HDPE**
**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)**
**TRI Log#: 78620**

| | TEST REPLICATE NUMBER | | | | | |
|---|---|---|---|---|---|---|
| PARAMETER | 1 | 2 | 3 | 4 | 5 | MEAN |
| **Sample ID: DS-1 \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 135 | 128 | 115 | 129 | 127 | **127** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 122 | 132 | 115 | 122 | 116 | **121** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 172 | 166 | 170 | 167 | 164 | **168** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |
| **Sample ID: DS-2 \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 121 | 120 | 123 | 123 | 129 | **123** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 128 | 121 | 123 | 127 | 125 | **125** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 161 | 167 | 166 | 159 | 160 | **163** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |

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## DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
## TRI Client: Minnkota Power Cooperative, Inc.
## Project: Minnkota Power - Milton R. Young Station Cell 5, Phase 1B

**Material: 60 mil. HDPE**
**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)**
**TRI Log#: 78620**

| | TEST REPLICATE NUMBER | | | | | |
|---|---|---|---|---|---|---|
| PARAMETER | 1 | 2 | 3 | 4 | 5 | MEAN |
| **Sample ID: DS-3 \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 125 | 129 | 122 | 124 | 123 | **125** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 119 | 121 | 123 | 120 | 120 | **121** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 171 | 166 | 165 | 165 | 168 | **167** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |
| **Sample ID: DS-4 \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 115 | 124 | 112 | 128 | 115 | **119** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 132 | 129 | 129 | 131 | 123 | **129** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 164 | 167 | 164 | 167 | 171 | **167** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |

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## DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
## TRI Client: Minnkota Power Cooperative, Inc.
## Project: Minnkota Power - Milton R. Young Station Cell 5, Phase 1B

**Material: 60 mil. HDPE**
**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)**
**TRI Log#: 78620**

| | TEST REPLICATE NUMBER | | | | | |
|---|---|---|---|---|---|---|
| PARAMETER | 1 | 2 | 3 | 4 | 5 | MEAN |
| **Sample ID: DS-5 \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 130 | 114 | 130 | 128 | 114 | **123** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 130 | 121 | 132 | 121 | 123 | **125** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 172 | 172 | 168 | 174 | 166 | **170** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |
| **Sample ID: DS-6 \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 123 | 116 | 121 | 120 | 116 | **119** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 127 | 125 | 127 | 113 | 126 | **124** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 168 | 167 | 164 | 165 | 165 | **166** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |

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## DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
## TRI Client: Minnkota Power Cooperative, Inc.
## Project: Minnkota Power - Milton R. Young Station Cell 5, Phase 1B

**Material: 60 mil. HDPE**
**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)**
**TRI Log#: 78620**

| | TEST REPLICATE NUMBER | | | | | |
|---|---|---|---|---|---|---|
| PARAMETER | 1 | 2 | 3 | 4 | 5 | MEAN |
| **Sample ID: DS-7 \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 127 | 121 | 126 | 122 | 132 | **126** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 117 | 113 | 128 | 112 | 131 | **120** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 170 | 169 | 165 | 166 | 165 | **167** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |
| **Sample ID: DS-8 \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 112 | 120 | 123 | 130 | 122 | **121** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 136 | 128 | 134 | 128 | 134 | **132** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 172 | 172 | 167 | 168 | 167 | **169** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |

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Date: 2023-07-27

**Mail To:**
**Joseph Grosz**
**Minnkota Power Cooperative, Inc.**

**, ,**

e-mail:jgrosz@minnkota.com

**Bill To:**

**Minnkota Power Cooperative, Inc.**
**Project# 723817**

Dear Mr. Grosz,

Thank you for consulting with TRI/Environmental, Inc. (TRI) for your geosynthetics testing needs. TRI is pleased to submit this final report for laboratory testing.

| | |
|---|---|
| **Project:** | **Minnkota Power - Milton R. Young Station Cell 5, Phase 1B** |
| TRI Job Reference Number: | **78647** |
| Material(s) Tested: | (16) Heat Fusion Weld Seam(s) |
| Test(s) Requested: | SAME DAY Peel and Shear<br>(ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.) |

| Codes: | |
|---|---|
| AD | Adhesion Failure (100% Peel) |
| BRK | Break in sheeting away from Seam edge. |
| SE | Break in sheeting at edge of seam. |
| AD-BRK | Break in sheeting after some adhesion failure - partial peel. |
| SIP | Separation in the plane of the sheet (leaving the bond intact). |
| FTB | Film tearing bond (all non "AD" failures). |
| NON-FTB | 100% peel. |

If you have any questions or require any additional information, please call us at 1-800-880-8378.
Sincerely,
sigfile
geolab

Geosynthetic Services Division
http://www.geosyntheticstestinc.com

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## DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
## TRI Client: Minnkota Power Cooperative, Inc.
## Project: Minnkota Power - Milton R. Young Station Cell 5, Phase 1B

**Material: 60 mil. HDPE**
**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)**
**TRI Log#: 78647**

| | TEST REPLICATE NUMBER | | | | | |
|---|---|---|---|---|---|---|
| PARAMETER | 1 | 2 | 3 | 4 | 5 | MEAN |
| **Sample ID: DS-9 \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 135 | 134 | 133 | 136 | 134 | **134** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 133 | 134 | 133 | 134 | 134 | **134** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 176 | 162 | 175 | 172 | 173 | **172** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |
| **Sample ID: DS-10 \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 122 | 133 | 125 | 123 | 124 | **125** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 125 | 133 | 137 | 133 | 126 | **131** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 179 | 178 | 172 | 176 | 174 | **176** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |

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## DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
## TRI Client: Minnkota Power Cooperative, Inc.
## Project: Minnkota Power - Milton R. Young Station Cell 5, Phase 1B

**Material: 60 mil. HDPE**
**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)**
**TRI Log#: 78647**

| | TEST REPLICATE NUMBER | | | | | |
|---|---|---|---|---|---|---|
| PARAMETER | 1 | 2 | 3 | 4 | 5 | MEAN |
| **Sample ID: DS-11 \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 130 | 141 | 122 | 141 | 125 | **132** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 128 | 123 | 125 | 123 | 126 | **125** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 179 | 176 | 168 | 174 | 175 | **174** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |
| **Sample ID: DS-12 \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 131 | 123 | 122 | 124 | 128 | **126** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 126 | 126 | 116 | 114 | 122 | **121** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 171 | 160 | 170 | 170 | 171 | **168** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |

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## DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
## TRI Client: Minnkota Power Cooperative, Inc.
## Project: Minnkota Power - Milton R. Young Station Cell 5, Phase 1B

**Material: 60 mil. HDPE**
**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)**
**TRI Log#: 78647**

| | TEST REPLICATE NUMBER | | | | | |
|---|---|---|---|---|---|---|
| PARAMETER | 1 | 2 | 3 | 4 | 5 | MEAN |
| **Sample ID: DS-13 \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 120 | 121 | 126 | 116 | 129 | **122** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 135 | 141 | 123 | 127 | 125 | **130** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 171 | 163 | 157 | 160 | 156 | **161** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |
| **Sample ID: DS-14 \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 95 | 133 | 84 | 132 | 110 | **111** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 133 | 134 | 125 | 121 | 122 | **127** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 168 | 169 | 165 | 166 | 165 | **167** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |

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## DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
## TRI Client: Minnkota Power Cooperative, Inc.
## Project: Minnkota Power - Milton R. Young Station Cell 5, Phase 1B

**Material: 60 mil. HDPE**
**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)**
**TRI Log#: 78647**

| | TEST REPLICATE NUMBER | | | | | |
|---|---|---|---|---|---|---|
| PARAMETER | 1 | 2 | 3 | 4 | 5 | MEAN |
| **Sample ID: DS-15 \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 119 | 125 | 112 | 121 | 127 | **121** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 113 | 127 | 117 | 126 | 115 | **120** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 173 | 173 | 168 | 170 | 169 | **171** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |
| **Sample ID: DS-16 \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 125 | 156 | 123 | 124 | 122 | **130** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 116 | 118 | 133 | 121 | 138 | **125** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 176 | 173 | 172 | 175 | 174 | **174** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |

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## DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
## TRI Client: Minnkota Power Cooperative, Inc.
## Project: Minnkota Power - Milton R. Young Station Cell 5, Phase 1B

**Material: 60 mil. HDPE**
**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)**
**TRI Log#: 78647**

| | TEST REPLICATE NUMBER | | | | | |
|---|---|---|---|---|---|---|
| PARAMETER | 1 | 2 | 3 | 4 | 5 | MEAN |
| **Sample ID: DS-17 \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 112 | 111 | 127 | 116 | 136 | **120** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 137 | 122 | 140 | 45 | 145 | **118** |
| Peel Incursion (%) | <5 | <5 | <5 | 100 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | AD | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | NON-FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 176 | 178 | 169 | 176 | 173 | **174** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |
| **Sample ID: DS-18 \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 136 | 130 | 127 | 128 | 137 | **132** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 134 | 134 | 143 | 140 | 143 | **139** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 160 | 160 | 161 | 158 | 162 | **160** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |

The testing herein is based upon accepted industry practice as well as the test method listed. Test results reported herein do not apply to samples other than those tested. TRI neither accepts responsibility for nor makes claim as to the final use and purpose of the material. TRI observes and maintains client confidentiality. TRI limits reproduction of this report, except in full, without prior approval of TRI.

## DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
## TRI Client: Minnkota Power Cooperative, Inc.
## Project: Minnkota Power - Milton R. Young Station Cell 5, Phase 1B

**Material: 60 mil. HDPE**
**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)**
**TRI Log#: 78647**

| | TEST REPLICATE NUMBER | | | | | |
|---|---|---|---|---|---|---|
| PARAMETER | 1 | 2 | 3 | 4 | 5 | MEAN |
| **Sample ID: DS-19 \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 133 | 143 | 129 | 142 | 138 | **137** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 129 | 128 | 134 | 139 | 134 | **133** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 178 | 177 | 177 | 174 | 176 | **176** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |
| **Sample ID: DS-20 \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 123 | 138 | 135 | 137 | 131 | **133** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 131 | 128 | 123 | 125 | 129 | **127** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 178 | 171 | 175 | 174 | 178 | **175** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |

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## DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
## TRI Client: Minnkota Power Cooperative, Inc.
## Project: Minnkota Power - Milton R. Young Station Cell 5, Phase 1B

**Material: 60 mil. HDPE**
**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)**
**TRI Log#: 78647**

| | TEST REPLICATE NUMBER | | | | | |
|---|---|---|---|---|---|---|
| PARAMETER | 1 | 2 | 3 | 4 | 5 | MEAN |
| **Sample ID: DS-21 \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 120 | 135 | 118 | 132 | 117 | **124** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 136 | 135 | 115 | 131 | 115 | **126** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 171 | 168 | 167 | 165 | 167 | **168** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |
| **Sample ID: DS-22 \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 119 | 112 | 118 | 134 | 122 | **121** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 121 | 123 | 131 | 125 | 136 | **127** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 172 | 168 | 169 | 169 | 171 | **170** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |

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## DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
## TRI Client: Minnkota Power Cooperative, Inc.
## Project: Minnkota Power - Milton R. Young Station Cell 5, Phase 1B

**Material: 60 mil. HDPE**
**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)**
**TRI Log#: 78647**

| | TEST REPLICATE NUMBER | | | | | |
|---|---|---|---|---|---|---|
| PARAMETER | 1 | 2 | 3 | 4 | 5 | MEAN |
| **Sample ID: DS-23 \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 127 | 129 | 130 | 123 | 134 | **129** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 117 | 122 | 119 | 121 | 119 | **120** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 170 | 168 | 169 | 168 | 172 | **169** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |
| **Sample ID: DS-24 \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 125 | 137 | 132 | 126 | 131 | **130** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 117 | 134 | 128 | 117 | 131 | **125** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 166 | 166 | 163 | 164 | 170 | **166** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |

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Date: 2023-09-14

**Mail To:**
**Joseph Grosz**
**Minnkota Power Cooperative, Inc.**

**, ,**

e-mail:jgrosz@minnkota.com

**Bill To:**

**Minnkota Power Cooperative, Inc.**
**Project# 723817**

Dear Mr. Grosz,

Thank you for consulting with TRI/Environmental, Inc. (TRI) for your geosynthetics testing needs. TRI is pleased to submit this final report for laboratory testing.

| | |
|---|---|
| **Project:** | **Minnkota Power - Milton R. Young Station Cell 5, Phase 1B** |
| TRI Job Reference Number: | **79163** |
| Material(s) Tested: | (10) Heat Fusion Weld Seam(s) |
| Test(s) Requested: | SAME DAY Peel and Shear<br>(ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.) |

| Codes: | |
|---|---|
| AD | Adhesion Failure (100% Peel) |
| BRK | Break in sheeting away from Seam edge. |
| SE | Break in sheeting at edge of seam. |
| AD-BRK | Break in sheeting after some adhesion failure - partial peel. |
| SIP | Separation in the plane of the sheet (leaving the bond intact). |
| FTB | Film tearing bond (all non "AD" failures). |
| NON-FTB | 100% peel. |

If you have any questions or require any additional information, please call us at 1-800-880-8378.
Sincerely,
sigfile
geolab

Geosynthetic Services Division
http://www.geosyntheticstestinc.com

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## DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
## TRI Client: Minnkota Power Cooperative, Inc.
## Project: Minnkota Power - Milton R. Young Station Cell 5, Phase 1B

**Material: 60 mil. HDPE**
**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)**
**TRI Log#: 79163**

| | TEST REPLICATE NUMBER | | | | | |
|---|---|---|---|---|---|---|
| PARAMETER | 1 | 2 | 3 | 4 | 5 | MEAN |
| **Sample ID: DS-26 \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 122 | 115 | 133 | 127 | 127 | **125** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 136 | 138 | 145 | 121 | 118 | **132** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 169 | 169 | 193 | 170 | 175 | **175** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |
| **Sample ID: DS-27 \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 125 | 134 | 144 | 131 | 132 | **133** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 125 | 136 | 140 | 120 | 111 | **126** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 170 | 168 | 188 | 169 | 171 | **173** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |

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## DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
## TRI Client: Minnkota Power Cooperative, Inc.
## Project: Minnkota Power - Milton R. Young Station Cell 5, Phase 1B

**Material: 60 mil. HDPE**
**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)**
**TRI Log#: 79163**

| | TEST REPLICATE NUMBER | | | | | |
|---|---|---|---|---|---|---|
| PARAMETER | 1 | 2 | 3 | 4 | 5 | MEAN |
| **Sample ID: DS-28 \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 132 | 132 | 148 | 134 | 130 | **135** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 119 | 133 | 131 | 130 | 133 | **129** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 178 | 178 | 193 | 173 | 174 | **179** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |
| **Sample ID: DS-29 \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 124 | 126 | 137 | 128 | 130 | **129** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 140 | 110 | 142 | 135 | 139 | **133** |
| Peel Incursion (%) | <5 | 100 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | AD | SE | SE | SE | |
| Peel NSF Failure Code | FTB | NON-FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 168 | 169 | 184 | 169 | 168 | **172** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |

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## DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
## TRI Client: Minnkota Power Cooperative, Inc.
## Project: Minnkota Power - Milton R. Young Station Cell 5, Phase 1B

**Material: 60 mil. HDPE**
**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)**
**TRI Log#: 79163**

| | TEST REPLICATE NUMBER | | | | | |
|---|---|---|---|---|---|---|
| PARAMETER | 1 | 2 | 3 | 4 | 5 | MEAN |
| **Sample ID: DS-30 \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 121 | 128 | 134 | 132 | 122 | **127** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 129 | 125 | 164 | 123 | 142 | **137** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 168 | 167 | 187 | 169 | 170 | **172** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |
| **Sample ID: DS-31 \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 120 | 121 | 145 | 128 | 137 | **130** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 132 | 115 | 139 | 121 | 132 | **128** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 169 | 174 | 190 | 169 | 170 | **174** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |

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## DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
## TRI Client: Minnkota Power Cooperative, Inc.
## Project: Minnkota Power - Milton R. Young Station Cell 5, Phase 1B

**Material: 60 mil. HDPE**
**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)**
**TRI Log#: 79163**

| | TEST REPLICATE NUMBER | | | | | |
|---|---|---|---|---|---|---|
| PARAMETER | 1 | 2 | 3 | 4 | 5 | MEAN |
| **Sample ID: DS-32 \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 133 | 131 | 145 | 131 | 124 | **133** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 123 | 122 | 147 | 126 | 137 | **131** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 176 | 172 | 197 | 173 | 173 | **178** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |
| **Sample ID: DS-33 \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 134 | 125 | 141 | 128 | 128 | **131** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 123 | 122 | 137 | 135 | 123 | **128** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 175 | 177 | 191 | 173 | 173 | **178** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |

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## DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
## TRI Client: Minnkota Power Cooperative, Inc.
## Project: Minnkota Power - Milton R. Young Station Cell 5, Phase 1B

**Material: 60 mil. HDPE**
**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)**
**TRI Log#: 79163**

| | TEST REPLICATE NUMBER | | | | | |
|---|---|---|---|---|---|---|
| PARAMETER | 1 | 2 | 3 | 4 | 5 | MEAN |
| **Sample ID: DS-34 \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 123 | 138 | 133 | 128 | 139 | **132** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 130 | 135 | 141 | 117 | 137 | **132** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 172 | 171 | 186 | 167 | 169 | **173** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |
| **Sample ID: DS-35 \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 137 | 130 | 148 | 131 | 135 | **136** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 149 | 150 | 161 | 148 | 149 | **151** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 171 | 175 | 189 | 170 | 172 | **175** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |

The testing herein is based upon accepted industry practice as well as the test method listed. Test results reported herein do not apply to samples other than those tested. TRI neither accepts responsibility for nor makes claim as to the final use and purpose of the material. TRI observes and maintains client confidentiality. TRI limits reproduction of this report, except in full, without prior approval of TRI.

Date: 2023-09-22

**Mail To:**
**Joseph Grosz**
**Minnkota Power Cooperative, Inc.**

**, ,**

**Bill To:**

**Minnkota Power Cooperative, Inc.**
**Project# 723817**

e-mail:
jgrosz@minnkota.com sgilbraith@minnkota.com

Dear Mr. Grosz,

Thank you for consulting with TRI/Environmental, Inc. (TRI) for your geosynthetics testing needs. TRI is pleased to submit this final report for laboratory testing.

| | |
|---|---|
| **Project:** | **Minnkota Power - Milton R. Young Station Cell 5, Phase 1B** |
| TRI Job Reference Number: | **79254** |
| Material(s) Tested: | (30) Heat Fusion Weld Seam(s) |
| Test(s) Requested: | SAME DAY Peel and Shear<br>(ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.) |

| Codes: | |
|---|---|
| AD | Adhesion Failure (100% Peel) |
| BRK | Break in sheeting away from Seam edge. |
| SE | Break in sheeting at edge of seam. |
| AD-BRK | Break in sheeting after some adhesion failure - partial peel. |
| SIP | Separation in the plane of the sheet (leaving the bond intact). |
| FTB | Film tearing bond (all non "AD" failures). |
| NON-FTB | 100% peel. |

If you have any questions or require any additional information, please call us at 1-800-880-8378.
Sincerely,
sigfile
geolab

Geosynthetic Services Division
http://www.geosyntheticstestinc.com

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## DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
## TRI Client: Minnkota Power Cooperative, Inc.
## Project: Minnkota Power - Milton R. Young Station Cell 5, Phase 1B

**Material: 60 mil. HDPE**
**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)**
**TRI Log#: 79254**

| | TEST REPLICATE NUMBER | | | | | |
|---|---|---|---|---|---|---|
| PARAMETER | 1 | 2 | 3 | 4 | 5 | MEAN |
| **Sample ID: DS-25 \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 127 | 130 | 135 | 120 | 124 | **127** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 121 | 126 | 127 | 115 | 119 | **122** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 170 | 169 | 189 | 169 | 176 | **175** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |
| **Sample ID: DS-36 \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 127 | 155 | 151 | 111 | 152 | **139** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 118 | 129 | 131 | 119 | 133 | **126** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 168 | 169 | 185 | 174 | 173 | **174** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |

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## DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
## TRI Client: Minnkota Power Cooperative, Inc.
## Project: Minnkota Power - Milton R. Young Station Cell 5, Phase 1B

**Material: 60 mil. HDPE**
**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)**
**TRI Log#: 79254**

| | TEST REPLICATE NUMBER | | | | | |
|---|---|---|---|---|---|---|
| PARAMETER | 1 | 2 | 3 | 4 | 5 | MEAN |
| **Sample ID: DS-37 \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 127 | 132 | 146 | 128 | 127 | **132** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 137 | 142 | 147 | 133 | 135 | **139** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 170 | 167 | 172 | 167 | 173 | **170** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |
| **Sample ID: DS-38 \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 139 | 145 | 150 | 135 | 136 | **141** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 127 | 133 | 133 | 130 | 123 | **129** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 169 | 169 | 186 | 173 | 176 | **175** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |

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## DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
## TRI Client: Minnkota Power Cooperative, Inc.
## Project: Minnkota Power - Milton R. Young Station Cell 5, Phase 1B

**Material: 60 mil. HDPE**
**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)**
**TRI Log#: 79254**

| | TEST REPLICATE NUMBER | | | | | |
|---|---|---|---|---|---|---|
| PARAMETER | 1 | 2 | 3 | 4 | 5 | MEAN |
| **Sample ID: DS-39 \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 122 | 133 | 134 | 115 | 132 | **127** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 131 | 123 | 141 | 129 | 128 | **130** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 171 | 167 | 178 | 172 | 178 | **173** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |
| **Sample ID: DS-40 \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 117 | 120 | 127 | 132 | 132 | **126** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 120 | 121 | 132 | 118 | 120 | **122** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 165 | 170 | 189 | 173 | 176 | **175** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |

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## DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
## TRI Client: Minnkota Power Cooperative, Inc.
## Project: Minnkota Power - Milton R. Young Station Cell 5, Phase 1B

**Material: 60 mil. HDPE**
**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)**
**TRI Log#: 79254**

| | TEST REPLICATE NUMBER | | | | | |
|---|---|---|---|---|---|---|
| PARAMETER | 1 | 2 | 3 | 4 | 5 | MEAN |
| **Sample ID: DS-41 \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 140 | 116 | 151 | 117 | 133 | **131** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 124 | 121 | 145 | 118 | 116 | **125** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 170 | 171 | 189 | 175 | 177 | **176** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |
| **Sample ID: DS-42 \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 136 | 134 | 142 | 121 | 134 | **133** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 123 | 126 | 128 | 120 | 117 | **123** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 168 | 167 | 189 | 173 | 175 | **174** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |

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## DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
## TRI Client: Minnkota Power Cooperative, Inc.
## Project: Minnkota Power - Milton R. Young Station Cell 5, Phase 1B

**Material: 60 mil. HDPE**
**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)**
**TRI Log#: 79254**

| | TEST REPLICATE NUMBER | | | | | |
|---|---|---|---|---|---|---|
| PARAMETER | 1 | 2 | 3 | 4 | 5 | MEAN |
| **Sample ID: DS-43 \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 96 | 123 | 147 | 123 | 129 | **124** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 111 | 118 | 120 | 112 | 111 | **114** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 174 | 169 | 187 | 171 | 176 | **175** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |
| **Sample ID: DS-44 \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 136 | 119 | 132 | 132 | 127 | **129** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 107 | 113 | 151 | 109 | 136 | **123** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 167 | 168 | 183 | 171 | 171 | **172** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |

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## DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
## TRI Client: Minnkota Power Cooperative, Inc.
## Project: Minnkota Power - Milton R. Young Station Cell 5, Phase 1B

**Material: 60 mil. HDPE**
**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)**
**TRI Log#: 79254**

| | TEST REPLICATE NUMBER | | | | | |
|---|---|---|---|---|---|---|
| PARAMETER | 1 | 2 | 3 | 4 | 5 | MEAN |
| **Sample ID: DS-45 \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 144 | 139 | 156 | 143 | 126 | **142** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 119 | 119 | 143 | 131 | 121 | **127** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 167 | 167 | 186 | 167 | 168 | **171** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |
| **Sample ID: DS-46 \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 120 | 122 | 129 | 124 | 118 | **123** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 126 | 139 | 142 | 129 | 119 | **131** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 168 | 165 | 186 | 169 | 173 | **172** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |

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## DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
## TRI Client: Minnkota Power Cooperative, Inc.
## Project: Minnkota Power - Milton R. Young Station Cell 5, Phase 1B

**Material: 60 mil. HDPE**
**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)**
**TRI Log#: 79254**

| | TEST REPLICATE NUMBER | | | | | |
|---|---|---|---|---|---|---|
| PARAMETER | 1 | 2 | 3 | 4 | 5 | MEAN |
| **Sample ID: DS-47 \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 122 | 114 | 132 | 113 | 120 | **120** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 107 | 139 | 136 | 129 | 113 | **125** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 166 | 165 | 182 | 170 | 172 | **171** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |
| **Sample ID: DS-48 \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 135 | 139 | 146 | 128 | 131 | **136** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 103 | 124 | 128 | 124 | 120 | **120** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 169 | 169 | 187 | 175 | 174 | **175** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |

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## DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
## TRI Client: Minnkota Power Cooperative, Inc.
## Project: Minnkota Power - Milton R. Young Station Cell 5, Phase 1B

**Material: 60 mil. HDPE**
**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)**
**TRI Log#: 79254**

| | TEST REPLICATE NUMBER | | | | | |
|---|---|---|---|---|---|---|
| PARAMETER | 1 | 2 | 3 | 4 | 5 | MEAN |
| **Sample ID: DS-49 \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 156 | 145 | 142 | 138 | 141 | **144** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 114 | 114 | 143 | 113 | 113 | **119** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 168 | 168 | 187 | 172 | 174 | **174** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |
| **Sample ID: DS-50 \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 148 | 125 | 160 | 144 | 134 | **142** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 116 | 126 | 121 | 121 | 112 | **119** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 167 | 172 | 193 | 169 | 169 | **174** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |

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## DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
## TRI Client: Minnkota Power Cooperative, Inc.
## Project: Minnkota Power - Milton R. Young Station Cell 5, Phase 1B

**Material: 60 mil. HDPE**
**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)**
**TRI Log#: 79254**

| | TEST REPLICATE NUMBER | | | | | |
|---|---|---|---|---|---|---|
| PARAMETER | 1 | 2 | 3 | 4 | 5 | MEAN |
| **Sample ID: DS-51 \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 149 | 142 | 145 | 136 | 137 | **142** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 124 | 133 | 139 | 134 | 125 | **131** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 172 | 177 | 197 | 174 | 174 | **179** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |
| **Sample ID: DS-52 \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 147 | 140 | 158 | 141 | 147 | **147** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 129 | 133 | 136 | 126 | 125 | **130** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 171 | 172 | 188 | 172 | 177 | **176** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |

The testing herein is based upon accepted industry practice as well as the test method listed. Test results reported herein do not apply to samples other than those tested. TRI neither accepts responsibility for nor makes claim as to the final use and purpose of the material. TRI observes and maintains client confidentiality. TRI limits reproduction of this report, except in full, without prior approval of TRI.

## DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
## TRI Client: Minnkota Power Cooperative, Inc.
## Project: Minnkota Power - Milton R. Young Station Cell 5, Phase 1B

**Material: 60 mil. HDPE**
**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)**
**TRI Log#: 79254**

| | TEST REPLICATE NUMBER | | | | | |
|---|---|---|---|---|---|---|
| PARAMETER | 1 | 2 | 3 | 4 | 5 | MEAN |
| **Sample ID: DS-53 \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 129 | 122 | 142 | 121 | 124 | **128** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 116 | 115 | 134 | 111 | 116 | **118** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 168 | 169 | 188 | 174 | 177 | **175** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |
| **Sample ID: DS-54 \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 123 | 118 | 118 | 121 | 120 | **120** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 126 | 126 | 131 | 134 | 137 | **131** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 163 | 170 | 167 | 172 | 168 | **168** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |

The testing herein is based upon accepted industry practice as well as the test method listed. Test results reported herein do not apply to samples other than those tested. TRI neither accepts responsibility for nor makes claim as to the final use and purpose of the material. TRI observes and maintains client confidentiality. TRI limits reproduction of this report, except in full, without prior approval of TRI.

## DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
## TRI Client: Minnkota Power Cooperative, Inc.
## Project: Minnkota Power - Milton R. Young Station Cell 5, Phase 1B

**Material: 60 mil. HDPE**
**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)**
**TRI Log#: 79254**

| | TEST REPLICATE NUMBER | | | | | |
|---|---|---|---|---|---|---|
| PARAMETER | 1 | 2 | 3 | 4 | 5 | MEAN |
| **Sample ID: DS-55 \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 120 | 126 | 139 | 144 | 129 | **132** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 115 | 113 | 122 | 94 | 120 | **113** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 174 | 175 | 171 | 171 | 168 | **172** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |
| **Sample ID: DS-56 \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 120 | 125 | 114 | 122 | 121 | **120** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 132 | 121 | 116 | 123 | 129 | **124** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 175 | 171 | 170 | 167 | 167 | **170** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |

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## DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
## TRI Client: Minnkota Power Cooperative, Inc.
## Project: Minnkota Power - Milton R. Young Station Cell 5, Phase 1B

**Material: 60 mil. HDPE**
**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)**
**TRI Log#: 79254**

| | TEST REPLICATE NUMBER | | | | | |
|---|---|---|---|---|---|---|
| PARAMETER | 1 | 2 | 3 | 4 | 5 | MEAN |
| **Sample ID: DS-57 \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 129 | 127 | 106 | 127 | 103 | **118** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 135 | 128 | 116 | 122 | 120 | **124** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 171 | 174 | 168 | 168 | 163 | **169** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |
| **Sample ID: DS-58 \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 132 | 128 | 130 | 140 | 138 | **134** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 119 | 124 | 135 | 123 | 129 | **126** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 172 | 170 | 167 | 167 | 164 | **168** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |

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## DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
## TRI Client: Minnkota Power Cooperative, Inc.
## Project: Minnkota Power - Milton R. Young Station Cell 5, Phase 1B

**Material: 60 mil. HDPE**
**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)**
**TRI Log#: 79254**

| | TEST REPLICATE NUMBER | | | | | |
|---|---|---|---|---|---|---|
| PARAMETER | 1 | 2 | 3 | 4 | 5 | MEAN |
| **Sample ID: DS-59 \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 135 | 131 | 129 | 134 | 126 | **131** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 123 | 123 | 130 | 123 | 130 | **126** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 171 | 170 | 167 | 167 | 165 | **168** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |
| **Sample ID: DS-60 \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 130 | 123 | 133 | 142 | 144 | **134** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 124 | 116 | 123 | 127 | 126 | **123** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 171 | 172 | 167 | 169 | 164 | **169** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |

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## DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
## TRI Client: Minnkota Power Cooperative, Inc.
## Project: Minnkota Power - Milton R. Young Station Cell 5, Phase 1B

**Material: 60 mil. HDPE**
**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)**
**TRI Log#: 79254**

| | TEST REPLICATE NUMBER | | | | | |
|---|---|---|---|---|---|---|
| PARAMETER | 1 | 2 | 3 | 4 | 5 | MEAN |
| **Sample ID: DS-61 \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 123 | 116 | 124 | 134 | 128 | **125** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 127 | 124 | 126 | 124 | 134 | **127** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 171 | 168 | 165 | 166 | 164 | **167** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |
| **Sample ID: DS-62 \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 153 | 128 | 132 | 127 | 147 | **137** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 126 | 121 | 117 | 119 | 119 | **120** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 172 | 171 | 167 | 167 | 164 | **168** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |

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## DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
## TRI Client: Minnkota Power Cooperative, Inc.
## Project: Minnkota Power - Milton R. Young Station Cell 5, Phase 1B

**Material: 60 mil. HDPE**
**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)**
**TRI Log#: 79254**

| | TEST REPLICATE NUMBER | | | | | |
|---|---|---|---|---|---|---|
| PARAMETER | 1 | 2 | 3 | 4 | 5 | MEAN |
| **Sample ID: DS-63 \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 131 | 125 | 116 | 135 | 136 | **129** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 132 | 133 | 129 | 128 | 135 | **131** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 174 | 174 | 169 | 169 | 167 | **171** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |
| **Sample ID: DS-64 \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 132 | 129 | 136 | 129 | 132 | **132** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 120 | 118 | 117 | 119 | 119 | **119** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 167 | 168 | 167 | 171 | 169 | **168** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |

The testing herein is based upon accepted industry practice as well as the test method listed. Test results reported herein do not apply to samples other than those tested. TRI neither accepts responsibility for nor makes claim as to the final use and purpose of the material. TRI observes and maintains client confidentiality. TRI limits reproduction of this report, except in full, without prior approval of TRI.

Date: 2023-10-02

**Mail To:**
**Joseph Grosz**
**Minnkota Power Cooperative, Inc.**

**, ,**

**Bill To:**

**Minnkota Power Cooperative, Inc.**
**Project# 723817**

e-mail:
jgrosz@minnkota.com sgilbraith@minnkota.com

Dear Mr. Grosz,

Thank you for consulting with TRI/Environmental, Inc. (TRI) for your geosynthetics testing needs. TRI is pleased to submit this final report for laboratory testing.

| | |
|---|---|
| **Project:** | **Minnkota Power - Milton R. Young Station Cell 5, Phase 1B** |
| TRI Job Reference Number: | **79329** |
| Material(s) Tested: | (15) Heat Fusion Weld Seam(s) |
| Test(s) Requested: | SAME DAY Peel and Shear<br>(ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.) |

| Codes: | |
|---|---|
| AD | Adhesion Failure (100% Peel) |
| BRK | Break in sheeting away from Seam edge. |
| SE | Break in sheeting at edge of seam. |
| AD-BRK | Break in sheeting after some adhesion failure - partial peel. |
| SIP | Separation in the plane of the sheet (leaving the bond intact). |
| FTB | Film tearing bond (all non "AD" failures). |
| NON-FTB | 100% peel. |

If you have any questions or require any additional information, please call us at 1-800-880-8378.
Sincerely,

Nicole Saucedo

Geosynthetic Services Division
http://www.geosyntheticstestinc.com

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## DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
## TRI Client: Minnkota Power Cooperative, Inc.
## Project: Minnkota Power - Milton R. Young Station Cell 5, Phase 1B

**Material: 60 mil. HDPE**
**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)**
**TRI Log#: 79329**

| | TEST REPLICATE NUMBER | | | | | |
|---|---|---|---|---|---|---|
| PARAMETER | 1 | 2 | 3 | 4 | 5 | MEAN |
| **Sample ID: DS-17A \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 125 | 126 | 124 | 123 | 122 | **124** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 126 | 135 | 127 | 129 | 127 | **129** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 171 | 173 | 172 | 170 | 175 | **172** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |
| **Sample ID: DS-29A \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 130 | 131 | 130 | 131 | 128 | **130** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 121 | 127 | 119 | 118 | 123 | **122** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 170 | 173 | 167 | 168 | 167 | **169** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |

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## DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
## TRI Client: Minnkota Power Cooperative, Inc.
## Project: Minnkota Power - Milton R. Young Station Cell 5, Phase 1B

**Material: 60 mil. HDPE**
**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)**
**TRI Log#: 79329**

| | TEST REPLICATE NUMBER | | | | | |
|---|---|---|---|---|---|---|
| PARAMETER | 1 | 2 | 3 | 4 | 5 | MEAN |
| **Sample ID: DS-29B \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 103 | 124 | 116 | 90 | 130 | **113** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 129 | 119 | 129 | 132 | 131 | **128** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 165 | 169 | 166 | 166 | 167 | **167** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |
| **Sample ID: DS-65 \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 113 | 125 | 123 | 118 | 117 | **119** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 129 | 137 | 140 | 140 | 134 | **136** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 164 | 166 | 166 | 163 | 166 | **165** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |

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## DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
## TRI Client: Minnkota Power Cooperative, Inc.
## Project: Minnkota Power - Milton R. Young Station Cell 5, Phase 1B

**Material: 60 mil. HDPE**
**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)**
**TRI Log#: 79329**

| | TEST REPLICATE NUMBER | | | | | |
|---|---|---|---|---|---|---|
| PARAMETER | 1 | 2 | 3 | 4 | 5 | MEAN |
| **Sample ID: DS-66 \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 134 | 131 | 135 | 131 | 130 | **132** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 150 | 138 | 131 | 142 | 145 | **141** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 172 | 175 | 171 | 172 | 172 | **172** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |
| **Sample ID: DS-67 \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 119 | 133 | 143 | 137 | 126 | **132** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 108 | 121 | 110 | 114 | 116 | **114** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 172 | 169 | 168 | 170 | 169 | **170** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |

The testing herein is based upon accepted industry practice as well as the test method listed. Test results reported herein do not apply to samples other than those tested. TRI neither accepts responsibility for nor makes claim as to the final use and purpose of the material. TRI observes and maintains client confidentiality. TRI limits reproduction of this report, except in full, without prior approval of TRI.

## DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
## TRI Client: Minnkota Power Cooperative, Inc.
## Project: Minnkota Power - Milton R. Young Station Cell 5, Phase 1B

**Material: 60 mil. HDPE**
**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)**
**TRI Log#: 79329**

| | TEST REPLICATE NUMBER | | | | | |
|---|---|---|---|---|---|---|
| PARAMETER | 1 | 2 | 3 | 4 | 5 | MEAN |
| **Sample ID: DS-68 \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 127 | 137 | 138 | 135 | 139 | **135** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 129 | 120 | 111 | 131 | 137 | **126** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 175 | 171 | 169 | 170 | 172 | **171** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |
| **Sample ID: DS-69 \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 129 | 126 | 131 | 132 | 130 | **130** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 114 | 127 | 125 | 122 | 119 | **121** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 171 | 171 | 169 | 171 | 170 | **170** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |

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## DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
## TRI Client: Minnkota Power Cooperative, Inc.
## Project: Minnkota Power - Milton R. Young Station Cell 5, Phase 1B

**Material: 60 mil. HDPE**
**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)**
**TRI Log#: 79329**

| | TEST REPLICATE NUMBER | | | | | |
|---|---|---|---|---|---|---|
| PARAMETER | 1 | 2 | 3 | 4 | 5 | MEAN |
| **Sample ID: DS-70 \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 131 | 141 | 126 | 147 | 127 | **134** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 132 | 132 | 142 | 127 | 130 | **133** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 175 | 171 | 171 | 174 | 173 | **173** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |
| **Sample ID: DS-71 \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 124 | 131 | 131 | 127 | 144 | **131** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 128 | 114 | 129 | 116 | 119 | **121** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 174 | 171 | 171 | 173 | 172 | **172** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |

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## DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
## TRI Client: Minnkota Power Cooperative, Inc.
## Project: Minnkota Power - Milton R. Young Station Cell 5, Phase 1B

**Material: 60 mil. HDPE**
**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)**
**TRI Log#: 79329**

| | TEST REPLICATE NUMBER | | | | | |
|---|---|---|---|---|---|---|
| PARAMETER | 1 | 2 | 3 | 4 | 5 | MEAN |
| **Sample ID: DS-72 \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 125 | 148 | 147 | 141 | 139 | **140** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 126 | 128 | 133 | 123 | 128 | **128** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 176 | 171 | 172 | 173 | 171 | **173** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |
| **Sample ID: DS-73 \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 142 | 148 | 136 | 121 | 124 | **134** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 115 | 134 | 116 | 152 | 142 | **132** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 172 | 172 | 170 | 170 | 171 | **171** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |

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## DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
## TRI Client: Minnkota Power Cooperative, Inc.
## Project: Minnkota Power - Milton R. Young Station Cell 5, Phase 1B

**Material: 60 mil. HDPE**
**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)**
**TRI Log#: 79329**

| | TEST REPLICATE NUMBER | | | | | |
|---|---|---|---|---|---|---|
| PARAMETER | 1 | 2 | 3 | 4 | 5 | MEAN |
| **Sample ID: DS-74 \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 126 | 130 | 141 | 125 | 127 | **130** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 128 | 136 | 135 | 134 | 135 | **134** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 177 | 176 | 176 | 181 | 182 | **178** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |
| **Sample ID: DS-75 \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 122 | 128 | 125 | 132 | 126 | **127** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 118 | 146 | 126 | 121 | 135 | **129** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 175 | 171 | 170 | 172 | 171 | **172** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |

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## DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
## TRI Client: Minnkota Power Cooperative, Inc.
## Project: Minnkota Power - Milton R. Young Station Cell 5, Phase 1B

**Material: 60 mil. HDPE**
**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)**
**TRI Log#: 79329**

| | TEST REPLICATE NUMBER | | | | | |
|---|---|---|---|---|---|---|
| PARAMETER | 1 | 2 | 3 | 4 | 5 | MEAN |
| **Sample ID: DS-76 \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 143 | 94 | 132 | 117 | 106 | **118** |
| Peel Incursion (%) | <5 | 35 | <5 | <5 | 30 | |
| Peel Locus Of Failure Code | SE | AD-BRK | SE | SE | AD-BRK | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 130 | 121 | 119 | 130 | 124 | **125** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 169 | 170 | 168 | 167 | 169 | **169** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |

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Date: 2023-10-02

**Mail To:**
**Joseph Grosz**
**Minnkota Power Cooperative, Inc.**

**, ,**

**Bill To:**

**Minnkota Power Cooperative, Inc.**
**Project# 723817**

e-mail:
jgrosz@minnkota.com sgilbraith@minnkota.com

Dear Mr. Grosz,

Thank you for consulting with TRI/Environmental, Inc. (TRI) for your geosynthetics testing needs. TRI is pleased to submit this final report for laboratory testing.

| | |
|---|---|
| **Project:** | **Minnkota Power - Milton R. Young Station Cell 5, Phase 1B** |
| TRI Job Reference Number: | **79331** |
| Material(s) Tested: | (2) Heat Fusion Weld Seam(s) |
| Test(s) Requested: | SAME DAY Peel and Shear<br>(ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.) |

| Codes: | |
|---|---|
| AD | Adhesion Failure (100% Peel) |
| BRK | Break in sheeting away from Seam edge. |
| SE | Break in sheeting at edge of seam. |
| AD-BRK | Break in sheeting after some adhesion failure - partial peel. |
| SIP | Separation in the plane of the sheet (leaving the bond intact). |
| FTB | Film tearing bond (all non "AD" failures). |
| NON-FTB | 100% peel. |

If you have any questions or require any additional information, please call us at 1-800-880-8378.
Sincerely,

Nicole Saucedo

Geosynthetic Services Division
http://www.geosyntheticstestinc.com

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## DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
## TRI Client: Minnkota Power Cooperative, Inc.
## Project: Minnkota Power - Milton R. Young Station Cell 5, Phase 1B

**Material: 60 mil. HDPE**
**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)**
**TRI Log#: 79331**

| | TEST REPLICATE NUMBER | | | | | |
|---|---|---|---|---|---|---|
| PARAMETER | 1 | 2 | 3 | 4 | 5 | MEAN |
| **Sample ID: DS-17 Archive \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 118 | 126 | 134 | 127 | 115 | **124** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 133 | 134 | 147 | 141 | 137 | **138** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 173 | 172 | 188 | 169 | 178 | **176** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |
| **Sample ID: DS-29 Archive \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 133 | 141 | 157 | 136 | 137 | **141** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 120 | 121 | 132 | 121 | 126 | **124** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 157 | 153 | 180 | 158 | 166 | **163** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |

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Date: 2023-10-04

**Mail To:**
**Joseph Grosz**
**Minnkota Power Cooperative, Inc.**

**, ,**

**Bill To:**

**Minnkota Power Cooperative, Inc.**
**Project# 723817**

e-mail:
jgrosz@minnkota.com sgilbraith@minnkota.com

Dear Mr. Grosz,

Thank you for consulting with TRI/Environmental, Inc. (TRI) for your geosynthetics testing needs. TRI is pleased to submit this final report for laboratory testing.

| | |
|---|---|
| **Project:** | **Minnkota Power - Milton R. Young Station Cell 5, Phase 1B** |
| TRI Job Reference Number: | **79356** |
| Material(s) Tested: | (4) Heat Fusion Weld Seam(s) |
| Test(s) Requested: | SAME DAY Peel and Shear<br>(ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.) |

| Codes: | |
|---|---|
| AD | Adhesion Failure (100% Peel) |
| BRK | Break in sheeting away from Seam edge. |
| SE | Break in sheeting at edge of seam. |
| AD-BRK | Break in sheeting after some adhesion failure - partial peel. |
| SIP | Separation in the plane of the sheet (leaving the bond intact). |
| FTB | Film tearing bond (all non "AD" failures). |
| NON-FTB | 100% peel. |

If you have any questions or require any additional information, please call us at 1-800-880-8378.
Sincerely,
sigfile
geolab

Geosynthetic Services Division
http://www.geosyntheticstestinc.com

The testing herein is based upon accepted industry practice as well as the test method listed. Test results reported herein do not apply to samples other than those tested. TRI neither accepts responsibility for nor makes claim as to the final use and purpose of the material. TRI observes and maintains client confidentiality. TRI limits reproduction of this report, except in full, without prior approval of TRI.

## DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
## TRI Client: Minnkota Power Cooperative, Inc.
## Project: Minnkota Power - Milton R. Young Station Cell 5, Phase 1B

**Material: 60 mil. HDPE**
**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)**
**TRI Log#: 79356**

| | TEST REPLICATE NUMBER | | | | | |
|---|---|---|---|---|---|---|
| PARAMETER | 1 | 2 | 3 | 4 | 5 | MEAN |
| **Sample ID: DS-17B \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 125 | 122 | 145 | 126 | 138 | **131** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 124 | 119 | 146 | 120 | 126 | **127** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 169 | 169 | 189 | 172 | 170 | **174** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |
| **Sample ID: DS-76A \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 135 | 144 | 149 | 142 | 134 | **141** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 150 | 141 | 143 | 135 | 140 | **142** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 158 | 156 | 178 | 157 | 163 | **162** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |

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## DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
## TRI Client: Minnkota Power Cooperative, Inc.
## Project: Minnkota Power - Milton R. Young Station Cell 5, Phase 1B

**Material: 60 mil. HDPE**
**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)**
**TRI Log#: 79356**

| | TEST REPLICATE NUMBER | | | | | |
|---|---|---|---|---|---|---|
| PARAMETER | 1 | 2 | 3 | 4 | 5 | MEAN |
| **Sample ID: DS-76B \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 121 | 125 | 139 | 131 | 124 | **128** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 133 | 136 | 141 | 134 | 135 | **136** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 171 | 169 | 187 | 170 | 167 | **173** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |
| **Sample ID: DS-76-Archive \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 125 | 132 | 128 | 124 | 126 | **127** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 123 | 133 | 145 | 126 | 131 | **132** |
| Peel Incursion (%) | 40 | <5 | <5 | 60 | <5 | |
| Peel Locus Of Failure Code | AD-BRK | SE | SE | AD-BRK | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 172 | 167 | 166 | 167 | 168 | **168** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |

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Date: 2023-10-06

**Mail To:**
**Joseph Grosz**
**Minnkota Power Cooperative, Inc.**

**, ,**

**Bill To:**

**Minnkota Power Cooperative, Inc.**
**Project# 723817**

e-mail:
jgrosz@minnkota.com sgilbraith@minnkota.com

Dear Mr. Grosz,

Thank you for consulting with TRI/Environmental, Inc. (TRI) for your geosynthetics testing needs. TRI is pleased to submit this final report for laboratory testing.

| | |
|---|---|
| **Project:** | **Minnkota Power - Milton R. Young Station Cell 5, Phase 1B** |
| TRI Job Reference Number: | **79387** |
| Material(s) Tested: | (5) Heat Fusion Weld Seam(s) |
| Test(s) Requested: | SAME DAY Peel and Shear<br>(ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.) |

| Codes: | |
|---|---|
| AD | Adhesion Failure (100% Peel) |
| BRK | Break in sheeting away from Seam edge. |
| SE | Break in sheeting at edge of seam. |
| AD-BRK | Break in sheeting after some adhesion failure - partial peel. |
| SIP | Separation in the plane of the sheet (leaving the bond intact). |
| FTB | Film tearing bond (all non "AD" failures). |
| NON-FTB | 100% peel. |

If you have any questions or require any additional information, please call us at 1-800-880-8378.
Sincerely,
sigfile
geolab

Geosynthetic Services Division
http://www.geosyntheticstestinc.com

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## DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
## TRI Client: Minnkota Power Cooperative, Inc.
## Project: Minnkota Power - Milton R. Young Station Cell 5, Phase 1B

**Material: 60 mil. HDPE**
**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)**
**TRI Log#: 79387**

| | TEST REPLICATE NUMBER | | | | | |
|---|---|---|---|---|---|---|
| PARAMETER | 1 | 2 | 3 | 4 | 5 | MEAN |
| **Sample ID: DS-77 \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 117 | 136 | 140 | 130 | 132 | **131** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 153 | 122 | 130 | 129 | 140 | **135** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 165 | 173 | 173 | 173 | 173 | **171** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |
| **Sample ID: DS-78 \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 132 | 127 | 135 | 130 | 134 | **132** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 136 | 137 | 132 | 135 | 138 | **136** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 174 | 174 | 173 | 179 | 179 | **176** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |

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## DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
## TRI Client: Minnkota Power Cooperative, Inc.
## Project: Minnkota Power - Milton R. Young Station Cell 5, Phase 1B

**Material: 60 mil. HDPE**
**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)**
**TRI Log#: 79387**

| | TEST REPLICATE NUMBER | | | | | |
|---|---|---|---|---|---|---|
| PARAMETER | 1 | 2 | 3 | 4 | 5 | MEAN |
| **Sample ID: DS-79 \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 126 | 127 | 129 | 142 | 131 | **131** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 132 | 115 | 114 | 117 | 132 | **122** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 170 | 169 | 168 | 173 | 174 | **171** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |
| **Sample ID: DS-80 \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 130 | 128 | 131 | 134 | 131 | **131** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 130 | 137 | 126 | 137 | 131 | **132** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 169 | 169 | 173 | 169 | 175 | **171** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |

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## DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
## TRI Client: Minnkota Power Cooperative, Inc.
## Project: Minnkota Power - Milton R. Young Station Cell 5, Phase 1B

**Material: 60 mil. HDPE**
**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)**
**TRI Log#: 79387**

| | TEST REPLICATE NUMBER | | | | | |
|---|---|---|---|---|---|---|
| PARAMETER | 1 | 2 | 3 | 4 | 5 | MEAN |
| **Sample ID: DS-81 \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 120 | 128 | 111 | 116 | 119 | **119** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 121 | 121 | 126 | 129 | 127 | **125** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 167 | 168 | 167 | 174 | 173 | **170** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |

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Date: 2023-10-11

**Mail To:**
**Joseph Grosz**
**Minnkota Power Cooperative, Inc.**

**, ,**

**Bill To:**

**Minnkota Power Cooperative, Inc.**
**Project# 723817**

e-mail:
jgrosz@minnkota.com sgilbraith@minnkota.com

Dear Mr. Grosz,

Thank you for consulting with TRI/Environmental, Inc. (TRI) for your geosynthetics testing needs. TRI is pleased to submit this final report for laboratory testing.

| | |
|---|---|
| **Project:** | **Minnkota Power - Milton R. Young Station Cell 5, Phase 1B** |
| TRI Job Reference Number: | **79438** |
| Material(s) Tested: | (13) Heat Fusion Weld Seam(s) |
| Test(s) Requested: | SAME DAY Peel and Shear<br>(ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.) |

| Codes: | |
|---|---|
| AD | Adhesion Failure (100% Peel) |
| BRK | Break in sheeting away from Seam edge. |
| SE | Break in sheeting at edge of seam. |
| AD-BRK | Break in sheeting after some adhesion failure - partial peel. |
| SIP | Separation in the plane of the sheet (leaving the bond intact). |
| FTB | Film tearing bond (all non "AD" failures). |
| NON-FTB | 100% peel. |

If you have any questions or require any additional information, please call us at 1-800-880-8378.
Sincerely,
sigfile
geolab

Geosynthetic Services Division
http://www.geosyntheticstestinc.com

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## DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
## TRI Client: Minnkota Power Cooperative, Inc.
## Project: Minnkota Power - Milton R. Young Station Cell 5, Phase 1B

**Material: 60 mil. HDPE**
**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)**
**TRI Log#: 79438**

| | TEST REPLICATE NUMBER | | | | | |
|---|---|---|---|---|---|---|
| PARAMETER | 1 | 2 | 3 | 4 | 5 | MEAN |
| **Sample ID: DS-82 \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 147 | 145 | 151 | 137 | 151 | **146** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 132 | 137 | 139 | 132 | 139 | **136** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 171 | 171 | 170 | 175 | 176 | **173** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |
| **Sample ID: DS-83 \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 134 | 133 | 134 | 135 | 133 | **134** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 130 | 135 | 132 | 133 | 131 | **132** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 173 | 173 | 173 | 177 | 179 | **175** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |

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## DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
## TRI Client: Minnkota Power Cooperative, Inc.
## Project: Minnkota Power - Milton R. Young Station Cell 5, Phase 1B

**Material: 60 mil. HDPE**
**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)**
**TRI Log#: 79438**

| | TEST REPLICATE NUMBER | | | | | |
|---|---|---|---|---|---|---|
| PARAMETER | 1 | 2 | 3 | 4 | 5 | MEAN |
| **Sample ID: DS-84 \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 118 | 119 | 116 | 126 | 110 | **118** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | 100 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | AD | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | NON-FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 128 | 136 | 129 | 130 | 128 | **130** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 174 | 172 | 173 | 177 | 178 | **175** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |
| **Sample ID: DS-85 \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 140 | 156 | 140 | 142 | 144 | **144** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 129 | 121 | 138 | 123 | 128 | **128** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 173 | 174 | 173 | 179 | 179 | **176** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |

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## DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
## TRI Client: Minnkota Power Cooperative, Inc.
## Project: Minnkota Power - Milton R. Young Station Cell 5, Phase 1B

**Material: 60 mil. HDPE**
**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)**
**TRI Log#: 79438**

| | TEST REPLICATE NUMBER | | | | | |
|---|---|---|---|---|---|---|
| PARAMETER | 1 | 2 | 3 | 4 | 5 | MEAN |
| **Sample ID: DS-86 \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 113 | 121 | 115 | 116 | 118 | **117** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 131 | 132 | 135 | 133 | 132 | **133** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 173 | 175 | 173 | 177 | 179 | **175** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |
| **Sample ID: DS-87 \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 109 | 114 | 115 | 106 | 121 | **113** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 131 | 128 | 125 | 127 | 127 | **128** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 174 | 173 | 173 | 178 | 177 | **175** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |

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## DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
## TRI Client: Minnkota Power Cooperative, Inc.
## Project: Minnkota Power - Milton R. Young Station Cell 5, Phase 1B

**Material: 60 mil. HDPE**
**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)**
**TRI Log#: 79438**

| | TEST REPLICATE NUMBER | | | | | |
|---|---|---|---|---|---|---|
| PARAMETER | 1 | 2 | 3 | 4 | 5 | MEAN |
| **Sample ID: DS-88 \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 114 | 124 | 126 | 137 | 118 | **124** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 131 | 134 | 131 | 134 | 138 | **134** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 177 | 176 | 175 | 181 | 182 | **178** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |
| **Sample ID: DS-89 \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 123 | 125 | 134 | 126 | 128 | **127** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 119 | 124 | 134 | 128 | 137 | **128** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 174 | 176 | 175 | 177 | 181 | **177** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |

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## DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
## TRI Client: Minnkota Power Cooperative, Inc.
## Project: Minnkota Power - Milton R. Young Station Cell 5, Phase 1B

**Material: 60 mil. HDPE**
**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)**
**TRI Log#: 79438**

| | TEST REPLICATE NUMBER | | | | | |
|---|---|---|---|---|---|---|
| PARAMETER | 1 | 2 | 3 | 4 | 5 | MEAN |
| **Sample ID: DS-90 \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 132 | 129 | 133 | 123 | 128 | **129** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 126 | 124 | 123 | 133 | 130 | **127** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 169 | 168 | 168 | 173 | 174 | **170** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |
| **Sample ID: DS-91 \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 125 | 131 | 133 | 131 | 130 | **130** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 126 | 130 | 129 | 129 | 130 | **129** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 175 | 175 | 174 | 178 | 177 | **176** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |

The testing herein is based upon accepted industry practice as well as the test method listed. Test results reported herein do not apply to samples other than those tested. TRI neither accepts responsibility for nor makes claim as to the final use and purpose of the material. TRI observes and maintains client confidentiality. TRI limits reproduction of this report, except in full, without prior approval of TRI.

## DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
## TRI Client: Minnkota Power Cooperative, Inc.
## Project: Minnkota Power - Milton R. Young Station Cell 5, Phase 1B

**Material: 60 mil. HDPE**
**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)**
**TRI Log#: 79438**

| | TEST REPLICATE NUMBER | | | | | |
|---|---|---|---|---|---|---|
| PARAMETER | 1 | 2 | 3 | 4 | 5 | MEAN |
| **Sample ID: DS-92 \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 117 | 123 | 115 | 127 | 124 | **121** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 127 | 133 | 125 | 132 | 130 | **129** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 171 | 170 | 171 | 176 | 176 | **173** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |
| **Sample ID: DS-93 \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 72 | 139 | 113 | 134 | 132 | **118** |
| Peel Incursion (%) | 100 | <5 | 10 | <5 | <5 | |
| Peel Locus Of Failure Code | AD | SE | AD-BRK | SE | SE | |
| Peel NSF Failure Code | NON-FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 98 | 139 | 118 | 137 | 134 | **125** |
| Peel Incursion (%) | 100 | <5 | 100 | <5 | <5 | |
| Peel Locus Of Failure Code | AD | SE | AD | SE | SE | |
| Peel NSF Failure Code | NON-FTB | FTB | NON-FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 172 | 173 | 173 | 180 | 179 | **175** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |

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## DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
## TRI Client: Minnkota Power Cooperative, Inc.
## Project: Minnkota Power - Milton R. Young Station Cell 5, Phase 1B

**Material: 60 mil. HDPE**
**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)**
**TRI Log#: 79438**

| | TEST REPLICATE NUMBER | | | | | |
|---|---|---|---|---|---|---|
| PARAMETER | 1 | 2 | 3 | 4 | 5 | MEAN |
| **Sample ID: DS-94 \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 141 | 144 | 157 | 137 | 132 | **142** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 121 | 135 | 120 | 120 | 121 | **123** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 172 | 171 | 171 | 175 | 177 | **173** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |

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Date: 2023-10-13

**Mail To:**
**Joseph Grosz**
**Minnkota Power Cooperative, Inc.**

**, ,**

**Bill To:**

**Minnkota Power Cooperative, Inc.**
**Project# 723817**

e-mail:
jgrosz@minnkota.com sgilbraith@minnkota.com

Dear Mr. Grosz,

Thank you for consulting with TRI/Environmental, Inc. (TRI) for your geosynthetics testing needs. TRI is pleased to submit this final report for laboratory testing.

| | |
|---|---|
| **Project:** | **Minnkota Power - Milton R. Young Station Cell 5, Phase 1B** |
| TRI Job Reference Number: | **79462** |
| Material(s) Tested: | (7) Heat Fusion Weld Seam(s)<br>(3) Single Extrusion Weld Seam(s) |
| Test(s) Requested: | SAME DAY Peel and Shear<br>(ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.) |

| Codes: | |
|---|---|
| AD | Adhesion Failure (100% Peel) |
| BRK | Break in sheeting away from Seam edge. |
| SE | Break in sheeting at edge of seam. |
| AD-BRK | Break in sheeting after some adhesion failure - partial peel. |
| SIP | Separation in the plane of the sheet (leaving the bond intact). |
| FTB | Film tearing bond (all non "AD" failures). |
| NON-FTB | 100% peel. |

If you have any questions or require any additional information, please call us at 1-800-880-8378.
Sincerely,
sigfile
geolab

Geosynthetic Services Division
http://www.geosyntheticstestinc.com

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## DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
## TRI Client: Minnkota Power Cooperative, Inc.
## Project: Minnkota Power - Milton R. Young Station Cell 5, Phase 1B

**Material: 60 mil. HDPE**
**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)**
**TRI Log#: 79462**

| | TEST REPLICATE NUMBER | | | | | |
|---|---|---|---|---|---|---|
| PARAMETER | 1 | 2 | 3 | 4 | 5 | MEAN |
| **Sample ID: DS-95 \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 146 | 111 | 142 | 126 | 145 | **134** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 98 | 106 | 97 | 126 | 97 | **105** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 165 | 164 | 166 | 169 | 169 | **167** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |
| **Sample ID: DS-96 \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 115 | 128 | 111 | 126 | 109 | **118** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 119 | 121 | 82 | 118 | 89 | **106** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 169 | 166 | 167 | 170 | 170 | **168** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |

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## DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
## TRI Client: Minnkota Power Cooperative, Inc.
## Project: Minnkota Power - Milton R. Young Station Cell 5, Phase 1B

**Material: 60 mil. HDPE**
**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)**
**TRI Log#: 79462**

| | TEST REPLICATE NUMBER | | | | | |
|---|---|---|---|---|---|---|
| PARAMETER | 1 | 2 | 3 | 4 | 5 | MEAN |
| **Sample ID: DS-97 \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 97 | 101 | 122 | 129 | 122 | **114** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 121 | 125 | 132 | 121 | 122 | **124** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 171 | 170 | 171 | 172 | 170 | **171** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |
| **Sample ID: DS-98 \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 100 | 103 | 102 | 100 | 103 | **102** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 130 | 133 | 125 | 122 | 134 | **129** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 171 | 170 | 170 | 170 | 175 | **171** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |

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## DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
## TRI Client: Minnkota Power Cooperative, Inc.
## Project: Minnkota Power - Milton R. Young Station Cell 5, Phase 1B

**Material: 60 mil. HDPE**
**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)**
**TRI Log#: 79462**

| | TEST REPLICATE NUMBER | | | | | |
|---|---|---|---|---|---|---|
| PARAMETER | 1 | 2 | 3 | 4 | 5 | MEAN |
| **Sample ID: DS-99 \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 112 | 127 | 113 | 113 | 111 | **115** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 130 | 125 | 125 | 132 | 129 | **128** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 167 | 167 | 167 | 171 | 168 | **168** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |
| **Sample ID: DS-102 \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 124 | 138 | 129 | 123 | 119 | **127** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 124 | 119 | 121 | 132 | 129 | **125** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 166 | 169 | 168 | 168 | 165 | **167** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |

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## DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
## TRI Client: Minnkota Power Cooperative, Inc.
## Project: Minnkota Power - Milton R. Young Station Cell 5, Phase 1B

**Material: 60 mil. HDPE**
**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)**
**TRI Log#: 79462**

| | TEST REPLICATE NUMBER | | | | | |
|---|---|---|---|---|---|---|
| PARAMETER | 1 | 2 | 3 | 4 | 5 | MEAN |
| **Sample ID: DS-103 \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 123 | 125 | 119 | 125 | 124 | **123** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 128 | 129 | 125 | 121 | 115 | **124** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 169 | 167 | 168 | 172 | 171 | **169** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |

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## DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS - SINGLE TRACK
**TRI Client: Minnkota Power Cooperative, Inc.**
**Project: Minnkota Power - Milton R. Young Station Cell 5, Phase 1B**

**Material: 60 mil. HDPE**
**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)**
**TRI Log#: 79462**

| | TEST REPLICATE NUMBER | | | | | |
|---|---|---|---|---|---|---|
| PARAMETER | 1 | 2 | 3 | 4 | 5 | MEAN |
| **Sample ID: DS-100 \| Weld: Single Extrusion** | | | | | | |
| **Side: Peel** | | | | | | **Peel** |
| Peel Strength (ppi) | 105 | 110 | 94 | 128 | 123 | **112** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 167 | 163 | 162 | 170 | 164 | **165** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |
| **Sample ID: DS-101 \| Weld: Single Extrusion** | | | | | | |
| **Side: Peel** | | | | | | **Peel** |
| Peel Strength (ppi) | 125 | 132 | 121 | 110 | 132 | **124** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 159 | 158 | 159 | 160 | 161 | **159** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |
| **Sample ID: DS-104 \| Weld: Single Extrusion** | | | | | | |
| **Side: Peel** | | | | | | **Peel** |
| Peel Strength (ppi) | 158 | 159 | 153 | 155 | 148 | **155** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 164 | 160 | 165 | 167 | 163 | **164** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |

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Date: 2023-10-18

**Mail To:**
**Joseph Grosz**
**Minnkota Power Cooperative, Inc.**

**, ,**

**Bill To:**

**Minnkota Power Cooperative, Inc.**
**Project# 723817**

e-mail:
jgrosz@minnkota.com sgilbraith@minnkota.com

Dear Mr. Grosz,

Thank you for consulting with TRI/Environmental, Inc. (TRI) for your geosynthetics testing needs. TRI is pleased to submit this final report for laboratory testing.

| | |
|---|---|
| **Project:** | **Minnkota Power - Milton R. Young Station Cell 5, Phase 1B** |
| TRI Job Reference Number: | **79497** |
| Material(s) Tested: | (23) Heat Fusion Weld Seam(s)<br>(1) Single Extrusion Weld Seam(s) |
| Test(s) Requested: | SAME DAY Peel and Shear<br>(ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.) |

| Codes: | |
|---|---|
| AD | Adhesion Failure (100% Peel) |
| BRK | Break in sheeting away from Seam edge. |
| SE | Break in sheeting at edge of seam. |
| AD-BRK | Break in sheeting after some adhesion failure - partial peel. |
| SIP | Separation in the plane of the sheet (leaving the bond intact). |
| FTB | Film tearing bond (all non "AD" failures). |
| NON-FTB | 100% peel. |

If you have any questions or require any additional information, please call us at 1-800-880-8378.
Sincerely,
sigfile
geolab

Geosynthetic Services Division
http://www.geosyntheticstestinc.com

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## DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
## TRI Client: Minnkota Power Cooperative, Inc.
## Project: Minnkota Power - Milton R. Young Station Cell 5, Phase 1B

**Material: 60 mil. HDPE**
**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)**
**TRI Log#: 79497**

| | TEST REPLICATE NUMBER | | | | | |
|---|---|---|---|---|---|---|
| PARAMETER | 1 | 2 | 3 | 4 | 5 | MEAN |
| **Sample ID: DS-84A \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 134 | 135 | 134 | 130 | 131 | **133** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 113 | 124 | 118 | 125 | 118 | **120** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 168 | 165 | 167 | 164 | 164 | **166** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |
| **Sample ID: DS-84B \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 119 | 134 | 124 | 125 | 128 | **126** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 124 | 120 | 124 | 128 | 129 | **125** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 165 | 165 | 166 | 169 | 166 | **166** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |

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## DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
## TRI Client: Minnkota Power Cooperative, Inc.
## Project: Minnkota Power - Milton R. Young Station Cell 5, Phase 1B

**Material: 60 mil. HDPE**
**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)**
**TRI Log#: 79497**

| | TEST REPLICATE NUMBER | | | | | |
|---|---|---|---|---|---|---|
| PARAMETER | 1 | 2 | 3 | 4 | 5 | MEAN |
| **Sample ID: DS-84 (Archive) \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 118 | 126 | 110 | 116 | 126 | **119** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 134 | 130 | 124 | 130 | 130 | **130** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 167 | 171 | 167 | 167 | 169 | **168** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |
| **Sample ID: DS-93A \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 125 | 90 | 134 | 133 | 116 | **120** |
| Peel Incursion (%) | <5 | <5 | 100 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | AD | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | NON-FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 102 | 139 | 111 | 131 | 131 | **123** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 167 | 166 | 170 | 167 | 167 | **167** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |

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## DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
## TRI Client: Minnkota Power Cooperative, Inc.
## Project: Minnkota Power - Milton R. Young Station Cell 5, Phase 1B

**Material: 60 mil. HDPE**
**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)**
**TRI Log#: 79497**

| | TEST REPLICATE NUMBER | | | | | |
|---|---|---|---|---|---|---|
| PARAMETER | 1 | 2 | 3 | 4 | 5 | MEAN |
| **Sample ID: DS-93B \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 126 | 120 | 118 | 122 | 121 | **121** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 126 | 110 | 128 | 121 | 106 | **118** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 164 | 166 | 165 | 170 | 167 | **166** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |
| **Sample ID: DS-93 (Archive) \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 135 | 136 | 135 | 134 | 134 | **135** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 129 | 129 | 128 | 131 | 130 | **129** |
| Peel Incursion (%) | 90 | 40 | <5 | 30 | 100 | |
| Peel Locus Of Failure Code | AD-BRK | AD-BRK | SE | AD-BRK | AD | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | NON-FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 168 | 167 | 168 | 170 | 172 | **169** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |

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## DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
## TRI Client: Minnkota Power Cooperative, Inc.
## Project: Minnkota Power - Milton R. Young Station Cell 5, Phase 1B

**Material: 60 mil. HDPE**
**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)**
**TRI Log#: 79497**

| | TEST REPLICATE NUMBER | | | | | |
|---|---|---|---|---|---|---|
| PARAMETER | 1 | 2 | 3 | 4 | 5 | MEAN |
| **Sample ID: DS-96A \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 139 | 136 | 136 | 131 | 121 | **133** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 137 | 140 | 138 | 129 | 128 | **134** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 165 | 162 | 162 | 163 | 165 | **163** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |
| **Sample ID: DS-96B \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 125 | 119 | 126 | 120 | 129 | **124** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 122 | 121 | 115 | 124 | 129 | **122** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 157 | 170 | 172 | 169 | 173 | **168** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |

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## DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
## TRI Client: Minnkota Power Cooperative, Inc.
## Project: Minnkota Power - Milton R. Young Station Cell 5, Phase 1B

**Material: 60 mil. HDPE**
**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)**
**TRI Log#: 79497**

| | TEST REPLICATE NUMBER | | | | | |
|---|---|---|---|---|---|---|
| PARAMETER | 1 | 2 | 3 | 4 | 5 | MEAN |
| **Sample ID: DS-96 (Archive) \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 126 | 125 | 128 | 130 | 132 | **128** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 105 | 123 | 115 | 125 | 125 | **119** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 165 | 168 | 166 | 163 | 164 | **165** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |
| **Sample ID: DS-106 \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 132 | 129 | 137 | 131 | 137 | **133** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 138 | 122 | 132 | 133 | 131 | **131** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 169 | 171 | 170 | 168 | 166 | **169** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |

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## DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
## TRI Client: Minnkota Power Cooperative, Inc.
## Project: Minnkota Power - Milton R. Young Station Cell 5, Phase 1B

**Material: 60 mil. HDPE**
**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)**
**TRI Log#: 79497**

| | TEST REPLICATE NUMBER | | | | | |
|---|---|---|---|---|---|---|
| PARAMETER | 1 | 2 | 3 | 4 | 5 | MEAN |
| **Sample ID: DS-107 \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 132 | 130 | 127 | 121 | 144 | **131** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 132 | 143 | 142 | 139 | 132 | **138** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 169 | 167 | 170 | 169 | 166 | **168** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |
| **Sample ID: DS-108 \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 138 | 134 | 132 | 148 | 138 | **138** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 129 | 134 | 131 | 129 | 127 | **130** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 164 | 167 | 164 | 166 | 164 | **165** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |

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## DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
## TRI Client: Minnkota Power Cooperative, Inc.
## Project: Minnkota Power - Milton R. Young Station Cell 5, Phase 1B

**Material: 60 mil. HDPE**
**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)**
**TRI Log#: 79497**

| | TEST REPLICATE NUMBER | | | | | |
|---|---|---|---|---|---|---|
| PARAMETER | 1 | 2 | 3 | 4 | 5 | MEAN |
| **Sample ID: DS-109 \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 120 | 115 | 119 | 129 | 121 | **121** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 113 | 122 | 130 | 133 | 122 | **124** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 163 | 159 | 160 | 162 | 158 | **160** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |
| **Sample ID: DS-110 \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 120 | 119 | 112 | 117 | 140 | **122** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 117 | 115 | 117 | 109 | 115 | **115** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 160 | 158 | 155 | 158 | 154 | **157** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |

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## DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
## TRI Client: Minnkota Power Cooperative, Inc.
## Project: Minnkota Power - Milton R. Young Station Cell 5, Phase 1B

**Material: 60 mil. HDPE**
**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)**
**TRI Log#: 79497**

| | TEST REPLICATE NUMBER | | | | | |
|---|---|---|---|---|---|---|
| PARAMETER | 1 | 2 | 3 | 4 | 5 | MEAN |
| **Sample ID: DS-111 \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 132 | 136 | 138 | 130 | 134 | **134** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 134 | 149 | 151 | 143 | 131 | **142** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 168 | 165 | 163 | 168 | 167 | **166** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |
| **Sample ID: DS-112 \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 142 | 138 | 135 | 135 | 133 | **137** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 135 | 136 | 132 | 135 | 134 | **134** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 165 | 164 | 164 | 164 | 166 | **165** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |

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## DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
## TRI Client: Minnkota Power Cooperative, Inc.
## Project: Minnkota Power - Milton R. Young Station Cell 5, Phase 1B

**Material: 60 mil. HDPE**
**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)**
**TRI Log#: 79497**

| | TEST REPLICATE NUMBER | | | | | |
|---|---|---|---|---|---|---|
| PARAMETER | 1 | 2 | 3 | 4 | 5 | MEAN |
| **Sample ID: DS-113 \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 135 | 143 | 142 | 140 | 142 | **140** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 140 | 145 | 141 | 139 | 137 | **140** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 176 | 171 | 175 | 171 | 170 | **173** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |
| **Sample ID: DS-114 \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 111 | 113 | 109 | 120 | 118 | **114** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 116 | 108 | 108 | 112 | 110 | **111** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 157 | 158 | 157 | 158 | 159 | **158** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |

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## DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
## TRI Client: Minnkota Power Cooperative, Inc.
## Project: Minnkota Power - Milton R. Young Station Cell 5, Phase 1B

**Material: 60 mil. HDPE**
**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)**
**TRI Log#: 79497**

| | TEST REPLICATE NUMBER | | | | | |
|---|---|---|---|---|---|---|
| PARAMETER | 1 | 2 | 3 | 4 | 5 | MEAN |
| **Sample ID: DS-115 \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 121 | 124 | 127 | 117 | 112 | **120** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 121 | 126 | 117 | 114 | 105 | **117** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 153 | 155 | 153 | 152 | 151 | **153** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |
| **Sample ID: DS-116 \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 139 | 143 | 147 | 146 | 154 | **146** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 129 | 131 | 128 | 126 | 125 | **128** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 169 | 163 | 163 | 167 | 161 | **165** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |

The testing herein is based upon accepted industry practice as well as the test method listed. Test results reported herein do not apply to samples other than those tested. TRI neither accepts responsibility for nor makes claim as to the final use and purpose of the material. TRI observes and maintains client confidentiality. TRI limits reproduction of this report, except in full, without prior approval of TRI.

## DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
## TRI Client: Minnkota Power Cooperative, Inc.
## Project: Minnkota Power - Milton R. Young Station Cell 5, Phase 1B

**Material: 60 mil. HDPE**
**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)**
**TRI Log#: 79497**

| | TEST REPLICATE NUMBER | | | | | |
|---|---|---|---|---|---|---|
| PARAMETER | 1 | 2 | 3 | 4 | 5 | MEAN |
| **Sample ID: DS-117 \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 114 | 117 | 125 | 130 | 118 | **121** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 143 | 141 | 144 | 148 | 141 | **143** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 163 | 140 | 168 | 163 | 163 | **159** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |
| **Sample ID: DS-118 \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 130 | 131 | 141 | 129 | 126 | **131** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 128 | 134 | 128 | 131 | 131 | **130** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 162 | 167 | 164 | 166 | 162 | **164** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |

The testing herein is based upon accepted industry practice as well as the test method listed. Test results reported herein do not apply to samples other than those tested. TRI neither accepts responsibility for nor makes claim as to the final use and purpose of the material. TRI observes and maintains client confidentiality. TRI limits reproduction of this report, except in full, without prior approval of TRI.

## DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
## TRI Client: Minnkota Power Cooperative, Inc.
## Project: Minnkota Power - Milton R. Young Station Cell 5, Phase 1B

**Material: 60 mil. HDPE**
**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)**
**TRI Log#: 79497**

| | TEST REPLICATE NUMBER | | | | | |
|---|---|---|---|---|---|---|
| PARAMETER | 1 | 2 | 3 | 4 | 5 | MEAN |
| **Sample ID: DS-119 \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 111 | 109 | 115 | 112 | 117 | **113** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 124 | 136 | 140 | 136 | 122 | **132** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 162 | 163 | 165 | 161 | 159 | **162** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |

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## DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS - SINGLE TRACK
**TRI Client: Minnkota Power Cooperative, Inc.**
**Project: Minnkota Power - Milton R. Young Station Cell 5, Phase 1B**

**Material: 60 mil. HDPE**
**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)**
**TRI Log#: 79497**

| | TEST REPLICATE NUMBER | | | | | |
|---|---|---|---|---|---|---|
| PARAMETER | 1 | 2 | 3 | 4 | 5 | MEAN |
| **Sample ID: DS-105 \| Weld: Single Extrusion** | | | | | | |
| **Side: Peel** | | | | | | **Peel** |
| Peel Strength (ppi) | 114 | 104 | 111 | 108 | 128 | **113** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 162 | 160 | 158 | 162 | 161 | **161** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |

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Date: 2023-10-19

**Mail To:**
**Joseph Grosz**
**Minnkota Power Cooperative, Inc.**

**, ,**

**Bill To:**

**Minnkota Power Cooperative, Inc.**
**Project# 723817**

e-mail:
jgrosz@minnkota.com sgilbraith@minnkota.com

Dear Mr. Grosz,

Thank you for consulting with TRI/Environmental, Inc. (TRI) for your geosynthetics testing needs. TRI is pleased to submit this final report for laboratory testing.

| | |
|---|---|
| **Project:** | **Minnkota Power - Milton R. Young Station Cell 5, Phase 1B** |
| TRI Job Reference Number: | **79518** |
| Material(s) Tested: | (2) Heat Fusion Weld Seam(s) |
| Test(s) Requested: | SAME DAY Peel and Shear<br>(ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.) |

| Codes: | |
|---|---|
| AD | Adhesion Failure (100% Peel) |
| BRK | Break in sheeting away from Seam edge. |
| SE | Break in sheeting at edge of seam. |
| AD-BRK | Break in sheeting after some adhesion failure - partial peel. |
| SIP | Separation in the plane of the sheet (leaving the bond intact). |
| FTB | Film tearing bond (all non "AD" failures). |
| NON-FTB | 100% peel. |

If you have any questions or require any additional information, please call us at 1-800-880-8378.
Sincerely,
sigfile
geolab

Geosynthetic Services Division
http://www.geosyntheticstestinc.com

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## DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
## TRI Client: Minnkota Power Cooperative, Inc.
## Project: Minnkota Power - Milton R. Young Station Cell 5, Phase 1B

**Material: 60 mil. HDPE**
**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)**
**TRI Log#: 79518**

| | TEST REPLICATE NUMBER | | | | | |
|---|---|---|---|---|---|---|
| PARAMETER | 1 | 2 | 3 | 4 | 5 | MEAN |
| **Sample ID: DS-120 \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 110 | 116 | 128 | 89 | 90 | **107** |
| Peel Incursion (%) | <5 | <5 | <5 | 10 | 100 | |
| Peel Locus Of Failure Code | SE | SE | SE | AD-BRK | AD | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | NON-FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 148 | 149 | 139 | 146 | 143 | **145** |
| Peel Incursion (%) | <5 | <5 | 100 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | AD | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | NON-FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 177 | 170 | 172 | 172 | 173 | **173** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |
| **Sample ID: DS-121 \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 131 | 130 | 128 | 130 | 132 | **130** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 135 | 129 | 133 | 133 | 131 | **132** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 173 | 171 | 172 | 178 | 173 | **173** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |

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Date: 2023-10-21

**Mail To:**
**Joseph Grosz**
**Minnkota Power Cooperative, Inc.**

**, ,**

**Bill To:**

**Minnkota Power Cooperative, Inc.**
**Project# 723817**

e-mail:
jgrosz@minnkota.com sgilbraith@minnkota.com

Dear Mr. Grosz,

Thank you for consulting with TRI/Environmental, Inc. (TRI) for your geosynthetics testing needs. TRI is pleased to submit this final report for laboratory testing.

| | |
|---|---|
| **Project:** | **Minnkota Power - Milton R. Young Station Cell 5, Phase 1B** |
| TRI Job Reference Number: | **79539** |
| Material(s) Tested: | (6) Heat Fusion Weld Seam(s)<br>(1) Single Extrusion Weld Seam(s) |
| Test(s) Requested: | SAME DAY Peel and Shear<br>(ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.) |

| Codes: | |
|---|---|
| AD | Adhesion Failure (100% Peel) |
| BRK | Break in sheeting away from Seam edge. |
| SE | Break in sheeting at edge of seam. |
| AD-BRK | Break in sheeting after some adhesion failure - partial peel. |
| SIP | Separation in the plane of the sheet (leaving the bond intact). |
| FTB | Film tearing bond (all non "AD" failures). |
| NON-FTB | 100% peel. |

If you have any questions or require any additional information, please call us at 1-800-880-8378.
Sincerely,
sigfile
a-login

Geosynthetic Services Division
http://www.geosyntheticstestinc.com

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## DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
## TRI Client: Minnkota Power Cooperative, Inc.
## Project: Minnkota Power - Milton R. Young Station Cell 5, Phase 1B

**Material: 60 mil. HDPE**
**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)**
**TRI Log#: 79539**

| | TEST REPLICATE NUMBER | | | | | |
|---|---|---|---|---|---|---|
| PARAMETER | 1 | 2 | 3 | 4 | 5 | MEAN |
| **Sample ID: DS-93 A (Archive) \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 124 | 137 | 119 | 115 | 128 | **125** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 106 | 99 | 108 | 114 | 118 | **109** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 174 | 168 | 171 | 171 | 171 | **171** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |
| **Sample ID: DS-93 A1 \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 123 | 136 | 141 | 136 | 138 | **135** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 128 | 132 | 127 | 123 | 122 | **126** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 173 | 172 | 175 | 172 | 172 | **173** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |

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## DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
## TRI Client: Minnkota Power Cooperative, Inc.
## Project: Minnkota Power - Milton R. Young Station Cell 5, Phase 1B

**Material: 60 mil. HDPE**
**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)**
**TRI Log#: 79539**

| | TEST REPLICATE NUMBER | | | | | |
|---|---|---|---|---|---|---|
| PARAMETER | 1 | 2 | 3 | 4 | 5 | MEAN |
| **Sample ID: DS-120 Archive \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 124 | 130 | 117 | 120 | 123 | **123** |
| Peel Incursion (%) | <5 | 65 | 25 | 30 | <5 | |
| Peel Locus Of Failure Code | SE | AD-BRK | AD-BRK | AD-BRK | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 136 | 131 | 137 | 137 | 135 | **135** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 164 | 163 | 159 | 157 | 161 | **161** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |
| **Sample ID: DS-120A \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 101 | 108 | 110 | 107 | 104 | **106** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 107 | 114 | 116 | 112 | 114 | **113** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 158 | 160 | 158 | 158 | 161 | **159** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |

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## DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
## TRI Client: Minnkota Power Cooperative, Inc.
## Project: Minnkota Power - Milton R. Young Station Cell 5, Phase 1B

**Material: 60 mil. HDPE**
**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)**
**TRI Log#: 79539**

| | TEST REPLICATE NUMBER | | | | | |
|---|---|---|---|---|---|---|
| PARAMETER | 1 | 2 | 3 | 4 | 5 | MEAN |
| **Sample ID: DS-120B \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 101 | 106 | 107 | 111 | 111 | **107** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 120 | 109 | 106 | 111 | 106 | **110** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 159 | 159 | 159 | 158 | 160 | **159** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |
| **Sample ID: DS-122 \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 135 | 106 | 123 | 108 | 118 | **118** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 133 | 132 | 121 | 129 | 124 | **128** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 171 | 170 | 173 | 169 | 168 | **170** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |

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## DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS - SINGLE TRACK
**TRI Client: Minnkota Power Cooperative, Inc.**
**Project: Minnkota Power - Milton R. Young Station Cell 5, Phase 1B**

**Material: 60 mil. HDPE**
**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)**
**TRI Log#: 79539**

| | TEST REPLICATE NUMBER | | | | | |
|---|---|---|---|---|---|---|
| PARAMETER | 1 | 2 | 3 | 4 | 5 | MEAN |
| **Sample ID: DS-123 \| Weld: Single Extrusion** | | | | | | |
| **Side: Peel** | | | | | | **Peel** |
| Peel Strength (ppi) | 158 | 158 | 157 | 151 | 155 | **156** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 160 | 158 | 158 | 158 | 158 | **158** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |

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Date: 2023-10-24

**Mail To:**
**Joseph Grosz**
**Minnkota Power Cooperative, Inc.**

**, ,**

**Bill To:**

**Minnkota Power Cooperative, Inc.**
**Project# 723817**

e-mail:
jgrosz@minnkota.com sgilbraith@minnkota.com

Dear Mr. Grosz,

Thank you for consulting with TRI/Environmental, Inc. (TRI) for your geosynthetics testing needs. TRI is pleased to submit this final report for laboratory testing.

| | |
|---|---|
| **Project:** | **Minnkota Power - Milton R. Young Station Cell 5, Phase 1B** |
| TRI Job Reference Number: | **79561** |
| Material(s) Tested: | (3) Heat Fusion Weld Seam(s) |
| Test(s) Requested: | SAME DAY Peel and Shear<br>(ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.) |

| Codes: | |
|---|---|
| AD | Adhesion Failure (100% Peel) |
| BRK | Break in sheeting away from Seam edge. |
| SE | Break in sheeting at edge of seam. |
| AD-BRK | Break in sheeting after some adhesion failure - partial peel. |
| SIP | Separation in the plane of the sheet (leaving the bond intact). |
| FTB | Film tearing bond (all non "AD" failures). |
| NON-FTB | 100% peel. |

If you have any questions or require any additional information, please call us at 1-800-880-8378.
Sincerely,
sigfile
geolab

Geosynthetic Services Division
http://www.geosyntheticstestinc.com

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## DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
## TRI Client: Minnkota Power Cooperative, Inc.
## Project: Minnkota Power - Milton R. Young Station Cell 5, Phase 1B

**Material: 60 mil. HDPE**
**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)**
**TRI Log#: 79561**

| | TEST REPLICATE NUMBER | | | | | |
|---|---|---|---|---|---|---|
| PARAMETER | 1 | 2 | 3 | 4 | 5 | MEAN |
| **Sample ID: DS-124 \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 130 | 112 | 106 | 118 | 123 | **118** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 122 | 133 | 128 | 138 | 147 | **134** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 172 | 176 | 170 | 174 | 173 | **173** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |
| **Sample ID: DS-125 \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 131 | 127 | 128 | 129 | 123 | **128** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 134 | 134 | 121 | 129 | 132 | **130** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 176 | 171 | 171 | 173 | 173 | **173** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |

The testing herein is based upon accepted industry practice as well as the test method listed. Test results reported herein do not apply to samples other than those tested. TRI neither accepts responsibility for nor makes claim as to the final use and purpose of the material. TRI observes and maintains client confidentiality. TRI limits reproduction of this report, except in full, without prior approval of TRI.

## DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
## TRI Client: Minnkota Power Cooperative, Inc.
## Project: Minnkota Power - Milton R. Young Station Cell 5, Phase 1B

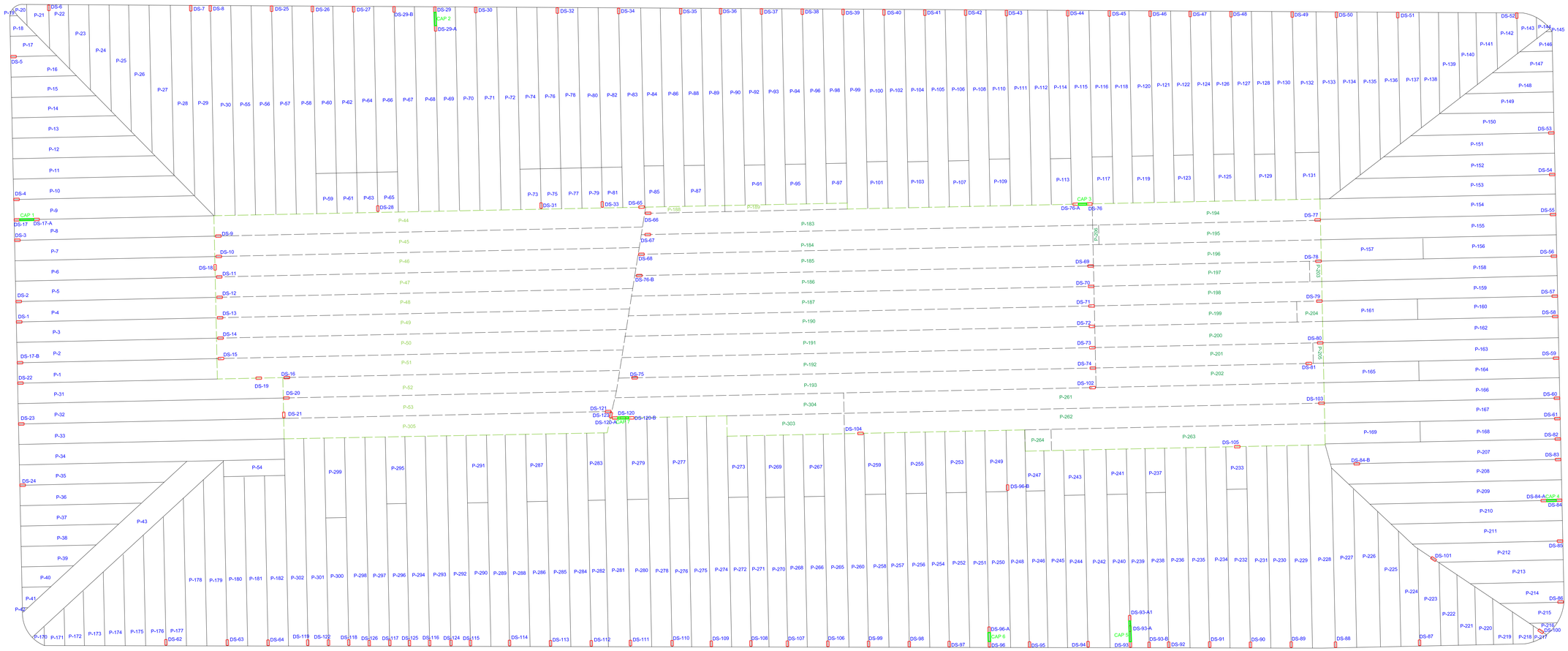
**Material: 60 mil. HDPE**
**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)**
**TRI Log#: 79561**

| | TEST REPLICATE NUMBER | | | | | |
|---|---|---|---|---|---|---|
| PARAMETER | 1 | 2 | 3 | 4 | 5 | MEAN |
| **Sample ID: DS-126 \| Weld: Heat Fusion** | | | | | | |
| **Side: A** | | | | | | **Peel A** |
| Peel Strength (ppi) | 136 | 143 | 139 | 141 | 144 | **141** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Side: B** | | | | | | **Peel B** |
| Peel Strength (ppi) | 142 | 130 | 134 | 145 | 151 | **140** |
| Peel Incursion (%) | <5 | <5 | <5 | <5 | <5 | |
| Peel Locus Of Failure Code | SE | SE | SE | SE | SE | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | |
| **Shear** | | | | | | **Shear** |
| Shear Strength (ppi) | 172 | 175 | 171 | 173 | 171 | **172** |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | |

The testing herein is based upon accepted industry practice as well as the test method listed. Test results reported herein do not apply to samples other than those tested. TRI neither accepts responsibility for nor makes claim as to the final use and purpose of the material. TRI observes and maintains client confidentiality. TRI limits reproduction of this report, except in full, without prior approval of TRI.

# As-Built Drawings

NORTH




REVISIONS/NOTES

# MINNKOTA - COAL COMBUSION WASTE FACILITY

# CELL 5 PHASE 12B GEOMEMBRANE AS-BUILT


ECApplications INC.

901 E. Orangethorpe Ave.
Anaheim, CA 92801
TELEPHONE: (714) 921-9848
FAX: (866) 475-1225
Email: www.ecapplications.com


| | | | |
|---|---|---|---|
| DRAWN BY: RB | CHKD. BY: CF | | DWG. NO: |
| DATE: 10/30/23 | APPRVD. BY: CF | | 1 |
| PLOT SCALE: 1" = 60 | MINNKOTA COAL COMBUSION | | |
| PROJECT NO.: 233013 | | | |

# Material Warranty

# SUBMITTAL CONTROL FORM

DATE: October 30, 2023

SUBMITTAL NO.: 11

PROJECT NUM.: 233013

PROJECT NAME: Minnkota-Coal Combusion Waste Facility-Cell 5 Phase 12B

| | | | |
|---|---|---|---|
| TO: | **Baranko Bros, Inc.** | FROM: | **EC Applications** |
| ATTN: | **Jack Gossen** | | **Ruben Brito** |
| | **3048 Highway 22N** | | **901 E. Orangethorpe Ave.** |
| | **Dickinson, NV 58601** | | **Anaheim, CA 92801** |
| PHONE: | **701-483-5868** | PHONE: | **714-921-9848 X 102** |
| FAX: | **701-483-5960** | FAX: | **866-475-1225** |
| E-MAIL: | **j.gossen@barankoinc.com** | E-MAIL: | **rbrito@ecapps.com** |

**WE ARE SUBMITTING THE ENCLOSED:**

☐ SHOP DRAWINGS ☐ CERTIFICATES OF COMPLIANCE ☐ SAMPLES

☐ MATERIAL DATA ☐ QC INFORMATION ☐ OTHER

**THESE ARE TRANSMITTED FOR:**

☐ APPROVAL ☐ INFORMATION ☐ RESUBMIT

☐ AS REQUESTED ☐ FOR REVIEW

| ITEM NO. | SUBMITTAL DESCRIPTION | NO. OF COPIES | CONTRACT REFERENCE / SPECIFICATION SECTION / DRAWING SHEET NUMBER |
|---|---|---|---|
| | Material and installation warranties. | 1 | Section 310519.16 Subsection 1.04 E-3 |

**NOTE:**

***THE ABOVE SUBMITTED ITEMS HAVE BEEN REVIEWED IN DETAIL AND ARE CORRECT AND IN GENERAL CONFORMANCE WITH THE CONTRACT DRAWINGS AND SPECIFICATIONS EXCEPT AS OTHERWISE STATED.***

*Ruben Brito*

*ECApplications AUTHORIZED SIGNATURE*

***IF THE ABOVE VARIANCES ARE ACCEPTABLE, PLEASE CONFIRM IN WRITING WITHIN TEN (10) DAYS, OTHERWISE ECA WILL PROCEED PER THE PROPOSED VARIANCES.***

**5 Years Material Warranty Letter**
**Project: Minnkota Landfill Cell 5, ND (PO # 23053)**
**Material: SKAPS Geomembrane HD-60S 24**
**Application: Buried**

Warranty Start Date: 10/18/2023

**To Whom It May Concern**

SKAPS Industries, Geomembrane Liner Division, hereby warrants that, at the time of manufacture, all SKAPS Industries manufactured Geomembrane materials will conform to the respective SKAPS Industries published material specifications for such materials and to be able to withstand normal weathering for a period of 5 years. Excluded from the warranty given herein shall be any damage to or failure of the material caused by, but not limited to: acts of God; casualty; catastrophe or severe weather conditions, such as earthquakes, tornadoes, hurricanes, floods, high winds, piercing hail, lightening and fire; the exposure of the material to sharp objects, harmful chemicals, acids, gases or vapors, either known or unknown, or combinations as being harmful thereto; physical abuse to the material caused by vandalism, sabotage, machinery, equipment, people and animals; damage to the material during the transportation, unloading, handling, storage or installation thereof by parties other than SKAPS Industries; excessive pressure or stress from any source, both above and below the material; after installation; subsidence or sub-grade settlement; improper site preparation and engineering, and any use of the material which the manufacturer never intended. As used throughout this warranty, the term "sale" shall mean the date on which the material is shipped from SKAPS Industries manufacturing facility.

Should any significant deterioration or premature loss in use of the material occur during the term hereof which is believed to be covered by this warranty, then SKAPS Industries shall be given prompt written notice of the alleged claim within 30 days after such facts are first observed. Said notice shall be sent by registered or certified mail, return receipt requested, and addressed to SKAPS Industries, Geomembrane Liner Division, 571 Industrial Parkway, Commerce, GA 30529. Should the investigation by SKAPS Industries conclude that any loss of use is the results of a manufacturing defect or other warrantable cause, SKAPS Industries will provide replacement material on a pro-rata basis at the then current market price for the materials.

The warranty described above is strictly limited to sales of the material for commercial or industrial uses only in accordance with SKAPS Industries published material specifications. Said warranty also is the sole and exclusive warranty given for such material and all other warranties; either expressed or implied, including but not limited to any warranty of merchantability or fitness for a particular purpose, are hereby disclaimed. In no event shall SKAPS Industries be liable for any direct, indirect, incidental, specific or consequential damages of any kind or any loss or profits resulting from failure of the material or the breach of this warranty; it being further understood that should said warranty fail in its essential propose, and in that event only, SKAPS Industries liability hereunder shall in no event exceed the sales price of the material actually received from SKAPS by the Original Purchaser thereof.

Said warranty is not effective until all payments due to SKAPS Industries, for materials shipped, are paid in full.

*Perry Vyas*
President
SKAPS Industries

*011904*

**5 Years Material Warranty Letter**
**Project: Minnkota Landfill Cell 5, ND (PO # 23053)**
**Material: SKAPS Geomembrane HD-60T1 24**
**Application: Buried**

Warranty Start Date: 10/18/2023

**To Whom It May Concern**

SKAPS Industries, Geomembrane Liner Division, hereby warrants that, at the time of manufacture, all SKAPS Industries manufactured Geomembrane materials will conform to the respective SKAPS Industries published material specifications for such materials and to be able to withstand normal weathering for a period of 5 years. Excluded from the warranty given herein shall be any damage to or failure of the material caused by, but not limited to: acts of God; casualty; catastrophe or severe weather conditions, such as earthquakes, tornadoes, hurricanes, floods, high winds, piercing hail, lightening and fire; the exposure of the material to sharp objects, harmful chemicals, acids, gases or vapors, either known or unknown, or combinations as being harmful thereto; physical abuse to the material caused by vandalism, sabotage, machinery, equipment, people and animals; damage to the material during the transportation, unloading, handling, storage or installation thereof by parties other than SKAPS Industries; excessive pressure or stress from any source, both above and below the material; after installation; subsidence or sub-grade settlement; improper site preparation and engineering, and any use of the material which the manufacturer never intended. As used throughout this warranty, the term "sale" shall mean the date on which the material is shipped from SKAPS Industries manufacturing facility.

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Said warranty is not effective until all payments due to SKAPS Industries, for materials shipped, are paid in full.

*Perry Vyas*
President
SKAPS Industries

*011904*

ECApplications

# 1 YEAR LIMITED WARRANTY

**PROJECT:** **Minnkota Coal Combusion Waste Facility Cell 5 Phase B**
**LOCATION:** **Center, ND 58530**

**OWNER: Minnkota Power Cooperative, Inc.**
**CONTRACT AMOUNT: $1,447,796.89**
**COMPLETION DATE: 10/25/23**

EC APPLICATIONS, INC. ("EC Applications / ECA"), subject to the terms and conditions set forth below, warrants the above referenced installation shall be installed free from defects in workmanship for a period of one (1) year from the date the installation is completed. This LIMITED WARRANTY extends only to the proper installation of the lining system and does not include damages or defects in the installation caused by entities other than ECA or resulting from Acts of God, or casualty, or catastrophe, including but not limited to, earthquakes, fire, floods, hail, tornados, hurricanes, tropical storms, gale force winds, other events of force majeure or vandalism. Further, this LIMITED WARRANTY does not include damages or defects in the installation resulting from exposure to harmful chemicals, abuse by machinery, equipment or people, excessive pressures or stresses from any source, subsurface or overburdened soil conditions, total or differential soil settlements, or any other cause not within ECA's control.

The extent of ECA.'s liability for breach of this LIMITED WARRANTY shall be limited to repairing or replacing the defective installation workmanship that will result in providing the OWNER with the pro-rated performance remaining under the original period of this LIMITED WARRANTY. ECA shall have the right to inspect and determine the cause of any alleged defect in the installation and to take appropriate steps to repair or replace the installation workmanship if a defect exists and is within the terms of this LIMITED WARRANTY.

This LIMITED WARRANTY will not be effective unless ECA receives written notice, by certified mail, to the PRESIDENT of EC APPLICATIONS, INC. within ninety (90) days after the alleged defect is first discovered, or should have been discovered by the OWNER. Should the required notice not be given, the defect and all warranties shall be deemed to have been waived by OWNER, and OWNER shall have no right of recovery against ECA. In the event repairs or replacement are to be effected, said repairs and/or replacements shall not become due until the area subject to repair or replacement is made available to ECA in a clean, dry and unencumbered condition. This includes, but is not limited to, the repair or replacement area being free from all water, dirt, sludge, waste, residuals, liquids, or overlying material of any kind. In no event will ECA be liable for any costs expended by any person or entity other than ECA on any defective work with respect to the installation. Any repairs, replacements or alterations which affect ECA's original installation work will VOID this LIMITED WARRANTY.

Notwithstanding anything herein to the contrary, ECA's liability under this LIMITED WARRANTY shall in no event exceed the Contract Amount above state. Further, under no circumstances shall EC APPLICATIONS, INC. be liable for any special, direct, indirect or consequential damages arising from loss of production or product, or any other losses, including losses due to personal injuries and product liability owing to the failure of the material or installation. OWNER shall be deemed to have waived its rights under this LIMITED WARRANTY with respect to any repairs, replacements or alterations made by OWNER without the express written consent of EC APPLICATIONS, INC..

EC APPLICATIONS, INC. neither assumes nor authorizes any person other than an officer of ECA to assume for it any other or additional liability in connection with the installation. This LIMITED WARRANTY is extended to the property OWNER only. No rights against ECA will survive an attempted transfer or assignment to any party who does not own the property.

The LIMITED WARRANTY herein is given in lieu of all warranties of merchantability, fitness for purpose, or other warranties or representatives, expressed or implied. By accepting the installation, OWNER waives all other such possible warranties or representations, except those specifically given herein. Correction of nonconformities, in the manner and for the period of time provided above, shall constitute fulfillment of all liabilities of ECA to OWNER, whether based on contract, negligence, strict liability or otherwise with respect to or arising out of the installation of the lining system. The parties hereto expressly agree that the sale hereunder is for commercial or industrial use only. Warranties, if any, concerning the materials incorporated into the lining system are covered, if at all, by separate warranties from the manufacturers or suppliers of such materials and are expressly excluded from the scope of this LIMITED WARRANTY, and OWNER acknowledges and agrees that ECA has made no warranties or representations to it concerning either the availability or sufficiency of any such warranties or representations from manufacturers or suppliers.

Except as expressly stated above, EC APPLICATIONS, INC. makes no warranty of any kind and hereby disclaims all warranties with respect to the installation of the lining system, both expressed and implied, including, but not limited to, implied warranties or merchantability and fitness for a particular purpose.

No terms or conditions other than those stated herein and no agreement or understanding, oral or written, and no course of conduct or performance in any way purporting to modify this LIMITED WARRANTY or to waive ECA's rights hereunder shall be binding on ECA unless the same shall be clearly described in writing that refers to this LIMITED WARRANTY and is signed by an officer of ECA. Additional liabilities created by other documents shall have no force or effect upon this LIMITED WARRANTY or the installation performed by ECA. The laws of the STATE OF CALIFORNIA will govern the rights and duties of the parties under this LIMITED WARRANTY.

**EC APPLICATIONS, INC.:**

BY: TITLE: V.P.

SIGNED: _____ DATED: 10-30-2023

# SUBMITTAL CONTROL FORM

ECApplications

DATE: October 30, 2023
SUBMITTAL NO.: 10
PROJECT NUM.: 233013
PROJECT NAME: Minnkota-Coal Combusion Waste Facility-Cell 5 Phase 12B


TO: **Baranko Bros, Inc.**
ATTN: **Jack Gossen**
**3048 Highway 22N**
**Dickinson, NV 58601**
PHONE: **701-483-5868**
FAX: **701-483-5960**
E-MAIL: **j.gossen@barankoinc.com**

FROM: **EC Applications**
**Ruben Brito**
**901 E. Orangethorpe Ave.**
**Anaheim, CA 92801**
PHONE: **714-921-9848 X 102**
FAX: **866-475-1225**
E-MAIL: **rbrito@ecapps.com**


**WE ARE SUBMITTING THE ENCLOSED:**

☐ SHOP DRAWINGS ☐ CERTIFICATES OF COMPLIANCE ☐ SAMPLES
☐ MATERIAL DATA ☐ QC INFORMATION ☐ OTHER

**THESE ARE TRANSMITTED FOR:**

☐ APPROVAL ☐ INFORMATION ☐ RESUBMIT
☐ AS REQUESTED ☐ FOR REVIEW

| ITEM NO. | SUBMITTAL DESCRIPTION | NO. OF COPIES | CONTRACT REFERENCE / SPECIFICATION SECTION / DRAWING SHEET NUMBER |
|---|---|---|---|
| | Certificate stating the geomembrane has been installed in accordance with the Contract Documents. | 1 | Section 310519.16 Subsection 1.04 E-2 |

**NOTE:**

***THE ABOVE SUBMITTED ITEMS HAVE BEEN REVIEWED IN DETAIL AND ARE CORRECT AND IN GENERAL CONFORMANCE WITH THE CONTRACT DRAWINGS AND SPECIFICATIONS EXCEPT AS OTHERWISE STATED.***

*Ruben Brito*
*ECApplications AUTHORIZED SIGNATURE*

***IF THE ABOVE VARIANCES ARE ACCEPTABLE, PLEASE CONFIRM IN WRITING WITHIN TEN (10) DAYS, OTHERWISE ECA WILL PROCEED PER THE PROPOSED VARIANCES.***

ECApplications INC.

October 30, 2022

Baranko Companies
Attn: Mr. Jack Gossen
3048 Highway 22 N,
Dickinson, ND 58601

RE: Burney Water District WWTP Improvement Project - Geomembrane Certifications

Dear Mr. Gossen,

Erosion Control Applications certifies that the geomembrane has been installed in accordance with the contract documents per section 310519.16.

Christopher Fore

Vice President

650 N. Batavia Street Orange, California 92868
Office (714) 921-9848 Fax (866) 475-1225
www.ECApplications.com

# Appendix I

## Cast-in-Place Concrete Mix Design

PROJECT: **MnKota Power Plant Riser Pipes Concrete Encasement**
AGENCY: Winn Construction
DATE: 8-May-23

Suggested Mix Design: PM4525NA

---

| **PROJECT SPECIFICATIONS:** | Plans Sheet provided by contractor | | |
|---|---|---|---|
| Mix Designation: | Concrete Encasement - Exposure Class S3 (severe sulfate exposure | | |
| Compressive Strength @ 28 days | 4500 | psi | (per ACI 301) |
| Cementitious Content | NG | lbs Min | |
| Size of Coarse Aggregate | 1 | Inch | (per ACI 301) |
| Fly Ash Content | 25% | Max | (per ACI 301) |
| Slump | 4 ± 1 | Inch Max | (per ACI 301) (8 Inch with HRWR) |
| W/C ratio | 0.45 | Max | |

**MATERIALS:**

| | |
|---|---|
| Cement | Holcim Type IL Portland - conforming to ASTM C 595, AASHTO M240 |
| Fly ash | EcoMaterials, Coal Creek Station - conforming to ASTM C 618, AASHTO M295 |
| Fine Aggregate | Conforming to ASTM C33, NDDOT Agg. Specification Sec 802.<br>Source - Rock Ridge Pit # 260, Strata Corp., Detroit Lakes, MN |
| Coarse Aggregate | Conforming to ASTM C33, NDDOT Agg. Specification Sec 802<br>Source - Fisher Pit # 800, Glendive, MT |
| Admixture | MasterPolyheed 1020 - conforming to ASTM C494 supplied by Master Builders<br>MasterGlenium 7500 - conforming to ASTM C494 supplied by Master Builders<br>MasterSet Delvo - conforming to ASTM C494 supplied by Master Builders |

| **Concrete Mix Proportions:** | One Cubic Yard | | |
|---|---|---|---|
| Cement | 435 | pounds | |
| Fly ash | 145 | pounds | |
| Admixture | | | |
| MRWR: MasterPolyheed 1020 | 2.0 | ounces / cwt cementitious* | |
| HRWR: MasterGlenium 7500 | 0.0 | If requested - 1 oz/cwt cementitous/ 1 inch of slump gain* | |
| Other: MasterSet Delvo | 0.0 | If requested, as needed | |
| Coarse Aggregate 1 | 1805 | pounds | |
| Coarse Aggregate 2 | 0 | pounds | |
| Fine Aggregate | 1390 | pounds | |
| Water | 263 | pounds | *31.5 Gallons* |
| W/C Ratio | 0.45 | | |
| Slump | 4 | inch max (8 inch after HRWR) | |
| Cementitous Factor, Nominal | 5.8 | cwt/cubic yard | |
| Air Content, Calculated | 1.5% | Entrapped | |

Note: The batch weights of the aggregate are given on a SSD basis and should be adjusted according to the amount of free moisture in the aggregates.

The amount of Polyheed 1020 & Glenium 7500 may be varied for the desired workability
The amount of Delvo may be varied to maintain the desired set characteristics

Mix Proportions conforming to ACI 211, ACI 301, and ACI 318

Henry Hauge
Technical Services
Strata Corporation

# STRENGTH PERFORMANCE REPORT

**Mix :** PM4525NA - 4500 PSI

| | | | | | |
|---|---|---|---|---|---|
| **Specified Strength** | 4500 | **Strength Type** | Compressive Test | **Report Test Age (RTA)** | 28Day |
| **Number of Tests** | 19 | **Over Design Type** | ACI 318 15-29 Tests | **Within Test CofV Factor** | 1.663 |
| **Average Strength** | 5540 | **SD Correction Factor** | 1.096 | **Within Test SD** | 150 |
| **Standard Deviation** | 410 | **Corrected SD** | 450 | **Within Test CofV** | 2.71 |
| **Degree of Control** | VERY GOOD | **Corrected CofV** | 8.1 | **Within Test CofV Control** | EXCELLENT |
| **Coefficient of Variation** | 7.4 | **f'c + 1.34*s** | 5100 | **Batch-to-Batch SD** | 380 |
| **Skewness** | 0.105 | **f'c + 2.33*s - 500** | 5050 | **Batch-to-Batch CofV** | 6.89 |
| **Kurtosis** | -1.388 | **Required Strength** | 5100 | **Cementitious Content** | |
| **Maximum f'c for Mix** | 4940 | **Safety Factor** | 440 | **Cementitious Efficiency** | |

| | Air Content % | Slump in | Concrete Temp deg F | 7Day Str psi | 28Day Str psi | Str 28Day Run Avg 3 psi | Str 28Day /f'c % |
|---|---|---|---|---|---|---|---|
| **Count** | 18 | 19 | 19 | 19 | 19 | 17 | 19 |
| **Average** | 2.54 | 5.99 | 72 | 4400 | 5540 | 5550 | 123.1 |
| **STDEV** | 0.77 | 1.67 | 7 | 730 | 410 | 300 | 9.2 |
| **COV%** | 30.1 | 28.0 | 9.3 | 16.7 | 7.5 | 5.3 | 7.5 |
| **Range Min** | 1.70 | 2.50 | 56 | 3450 | 4950 | 5020 | 110.0 |
| **Range Max** | 4.00 | 8.75 | 84 | 7090 | 6190 | 6110 | 137.6 |

| Date | Sample | Air Content % | Slump in | Concrete Temp deg F | 7Day Str psi | 28Day Str psi | Str 28Day Run Avg 3 psi | Str 28Day /f'c % |
|---|---|---|---|---|---|---|---|---|
| 1/5/2023 | 40527654 | 2.50 | 3.25 | 70 | 4070 | 5450 | 5320 | 121.1 |
| 12/12/2022 | 20846030 | 1.90 | 4.25 | 58 | 3960 | 5120 | 5170 | 113.8 |
| | 20846025 | 1.90 | 4.00 | 56 | 4110 | 5380 | 5260 | 119.6 |
| 7/15/2022 | 70088155 | 1.70 | 8.75 | 73 | 3450 | 5010 | 5320 | 111.3 |
| | 70088150 | 2.00 | 5.00 | 75 | 4030 | 5390 | 5510 | 119.8 |
| 7/12/2022 | 70088093 | 1.80 | 7.25 | 77 | 4190 | 5550 | 5740 | 123.3 |
| | 70088088 | 2.30 | 7.00 | 77 | 7090 | 5600 | 5740 | 124.4 |
| 7/1/2022 | 70087846 | 3.50 | 7.25 | 69 | 4650 | 6070 | 5830 | 134.9 |
| | 70087841 | 3.00 | 8.00 | 69 | 4540 | 5550 | 5780 | 123.3 |
| | 70078735 | 3.60 | 7.25 | 70 | 4210 | 5870 | 5860 | 130.4 |
| 6/30/2022 | 70087815 | 3.20 | 6.50 | 73 | 4720 | 5910 | 5590 | 131.3 |
| | 70087809 | 3.70 | 5.75 | 75 | 4570 | 5810 | 5310 | 129.1 |
| 7/8/2021 | 52845101 | 4.00 | 4.50 | 72 | 3840 | 5050 | 5020 | 112.2 |
| | 50095888 | 1.80 | 6.50 | 78 | 4180 | 5070 | 5380 | 112.7 |
| 7/2/2021 | 50095628 | 2.40 | 5.50 | 84 | 4120 | 4950 | 5700 | 110.0 |
| 6/8/2021 | 30017761 | 1.70 | 7.00 | 75 | 4620 | 6120 | 6110 | 136.0 |
| 5/25/2021 | 52844417 | 2.60 | 7.00 | 74 | 4580 | 6030 | 5780 | 134.0 |
| 5/20/2021 | 60588531 | 2.20 | 2.50 | 65 | 4670 | 6190 | | 137.6 |
| 4/5/2021 | 70080989 | | 6.50 | 69 | 4010 | 5130 | | 114.0 |

May 8, 2023

RE: MnKota Power Plant Riser Pipe Encasement
Sulfate Exposure

It is our understanding that the request for Type V Portland Cement is due to a concern for about a [potential sulfate exposure within this project. Based on ACI 318 requirements for Concrete Exposure Class Table 4.3.1, Type V cement is required for a "S2" severe sulfate exposure class, or a cement with a "HS" high sulfate resistance classification. For a "S3" Exposure Class, Table 4.3.1 also requires a 4500 psi strength class with a maximum W/C ratio of 0.45, a "HS" high sulfate resistance cement classification, and the addition of pozzolans such as fly ash.

By utilizing ASTM C 1012 *"Standard Test Method of Hydraulic-Cement Mortars Exposed to a Sulfate Solution"*, it can be shown that incorporating a pozzolan, such as fly ash, can be equally effective in mitigating damage to concrete due to sulfate attack. Please find the attached recent ASTM C 1012 test data for the combination of Lafarge-Holcim Exshaw type 1L cement and Coal Creek Fly Ash. The attached test data shows that the combination of these cementitious materials is effective in mitigating sulfate attack. In accordance with ASTM C 1012, mortar bar expansions that are less than 0.05% at six months of age indicate that the concrete is considered resistant to a *"High Sulfate Exposure"* category. The attached historical test data show that a ratio of 20% fly ash or greater provides sulfate resistance equal to or better than that required for *"High Sulfate Exposure"* category.

Strata Corporation (a supplier of concrete) respectfully request that the submitted blended cementitious, which meet the "HS" classification for high sulfate resistance be approved for use.

Thank You for your consideration in this matter.

Henry Hauge
Technical Services
Strata Corporation

# CODE

## TABLE 4.3.1 — REQUIREMENTS FOR CONCRETE BY EXPOSURE CLASS

| Exposure Class | Max. w/cm* | Min. $f'_c$, psi | Additional minimum requirements | | | |
|---|---|---|---|---|---|---|
| | | | Air content | | | Limits on cementitious materials |
| F0 | N/A | 2500 | N/A | | | N/A |
| F1 | 0.45 | 4500 | Table 4.4.1 | | | N/A |
| F2 | 0.45 | 4500 | Table 4.4.1 | | | N/A |
| F3 | 0.45 | 4500 | Table 4.4.1 | | | Table 4.4.2 |
| | | | Cementitious materials† —types | | | Calcium chloride admixture |
| | | | ASTM C150 | ASTM C595 | ASTM C1157 | |
| S0 | N/A | 2500 | No Type restriction | No Type restriction | No Type restriction | No restriction |
| S1 | 0.50 | 4000 | II‡ | IP(MS), IS (<70) (MS) | MS | No restriction |
| S2 | 0.45 | 4500 | V§ | IP (HS) IS (<70) (HS) | HS | Not permitted |
| S3 | 0.45 | 4500 | V + pozzolan or slag¶ | IP (HS) + pozzolan or slag¶ or IS (<70) (HS) + pozzolan or slag¶ | HS + pozzolan or slag¶ | Not permitted |
| P0 | N/A | 2500 | None | | | |
| P1 | 0.50 | 4000 | None | | | |
| | | | Maximum water-soluble chloride ion ($Cl^-$) content in concrete, percent by weight of cement# | | | |
| | | | Reinforced concrete | Prestressed concrete | Related provisions | |
| C0 | N/A | 2500 | 1.00 | 0.06 | None | |
| C1 | N/A | 2500 | 0.30 | 0.06 | | |
| C2 | 0.40 | 5000 | 0.15 | 0.06 | 7.7.6, 18.16** | |

*For lightweight concrete, see 4.1.2.
†Alternative combinations of cementitious materials of those listed in Table 4.3.1 shall be permitted when tested for sulfate resistance and meeting the criteria in 4.5.1.
‡For seawater exposure, other types of portland cements with tricalcium aluminate ($C_3A$) contents up to 10 percent are permitted if the *w/cm* does not exceed 0.40.
§Other available types of cement such as Type III or Type I are permitted in Exposure Classes S1 or S2 if the $C_3A$ contents are less than 8 or 5 percent, respectively.
¶The amount of the specific source of the pozzolan or slag to be used shall not be less than the amount that has been determined by service record to improve sulfate resistance when used in concrete containing Type V cement. Alternatively, the amount of the specific source of the pozzolan or slag to be used shall not be less than the amount tested in accordance with ASTM C1012 and meeting the criteria in 4.5.1.
#Water-soluble chloride ion content that is contributed from the ingredients including water, aggregates, cementitious materials, and admixtures shall be determined on the concrete mixture by ASTM C1218 at age between 28 and 42 days.
**Requirements of 7.7.6 shall be satisfied. See 18.16 for unbonded tendons.

# COMMENTARY

content. For Exposure Class S1 (moderate exposure), Type II cement is limited to a maximum $C_3A$ content of 8.0 percent under ASTM C150. The blended cements under ASTM C595 with the MS designation are appropriate for use in Exposure Class S1. The appropriate types under ASTM C595 are IP(MS) and IS(<70)(MS) and under C1157 is Type MS. For Exposure Class S2 (severe exposure), Type V cement with a maximum $C_3A$ content of 5 percent is specified. Blended cements Types IP (HS) and IS (<70) (HS) under ASTM C595 and Type HS under ASTM C1157 can also be used. In certain areas, the $C_3A$ content of other available types such as Type III or Type I may be less than 8 or 5 percent and are usable in moderate or severe sulfate exposures. Note that sulfate-resisting cement will not increase resistance to some chemically aggressive solutions, for example, sulfuric acid. The project specifications should cover all special cases.

The use of fly ash (ASTM C618, Class F), natural pozzolans (ASTM C618, Class N), silica fume (ASTM C1240), or ground-granulated blast-furnace slag (ASTM C989) also has been shown to improve the sulfate resistance of concrete.[4.1-4.3] ASTM C1012 can be used to evaluate the sulfate resistance of mixtures using combinations of cementitious materials as determined in 4.5.1. For Exposure Class S3, the alternative in ACI 318-05 allowing use of Type V plus pozzolan, based on records of successful service, instead of meeting the testing requirements of 4.5.1, still exists and has been expanded to consider the use of slag and the blended cements.

Table 4.2.1 lists seawater under Exposure Class S1 (moderate exposure), even though it generally contains more than 1500 ppm $SO_4$. Portland cement with higher $C_3A$ content improves binding of chlorides present in seawater and the Code permits other types of portland cement with $C_3A$ up to 10 percent if the maximum *w/cm* is reduced to 0.40.

In addition to the proper selection of cementitious materials, other requirements for durable concrete exposed to water-soluble sulfate are essential, such as low *w/cm*, strength, adequate air entrainment, adequate consolidation, uniformity, adequate cover of reinforcement, and sufficient moist curing to develop the potential properties of the concrete.

**Exposure Class P1:** The Code includes an Exposure Class P1 for concrete that needs to have a low permeability when in direct contact with water and where the other exposure conditions defined in Table 4.2.1 do not apply. The primary means to obtain low permeability is to use a low *w/cm*. Low permeability can be also achieved by optimizing the cementitious materials used in the concrete mixture. One standard method that provides a performance-based indicator of low permeability of concrete is ASTM C1202, which is more reliable in laboratory evaluations than for field-based acceptance.

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LAFARGE
NORTH AMERICA

March 27, 2023

To Whom it May Concern:

The Lafarge North America Western Region Laboratory, a AASHTO Accredited Laboratory located in Seattle, WA has tested a combination of portland cement and fly ash in accordance with ASTM C1012. The results below reflect the tested conducted. The cement mixture was prepared in the laboratory and proportioned to 80% Lafarge Exshaw Type IL and 20% Coal Creek Type F Fly Ash.

The average expansion of six mortar bars cast using each blend of cementitious materials at 26 weeks was 0.0497% which falls within the expansion limits for High Sulfate Resistance.

One must keep in mind that the results presented below are indicative of the stated materials only. The concrete producer using these materials is also obligated to follow all guidelines in ACI for the production of sulfate resistant concrete.

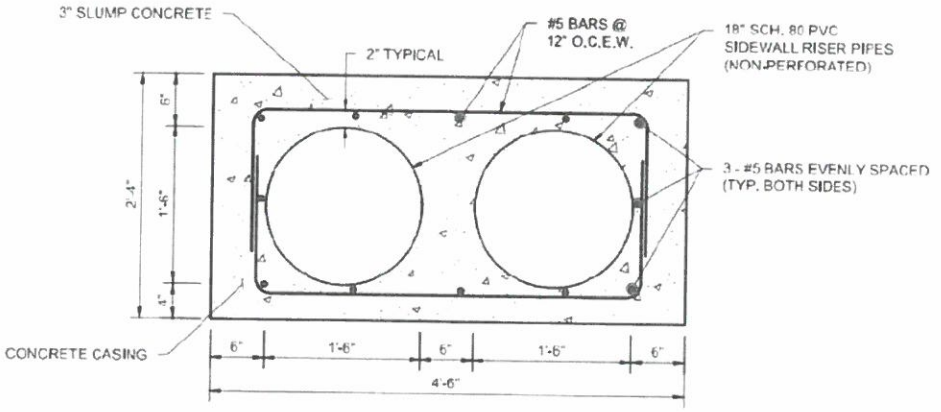
| Age | Percent Length Change |
|---|---|
| 1 Week | 0.008 |
| 2 Weeks | 0.015 |
| 3 Weeks | 0.016 |
| 4 Weeks | 0.020 |
| 8 Weeks | 0.029 |
| 13 Weeks | 0.038 |
| 15 Weeks | 0.041 |
| 4 Months | 0.042 |
| 6 Months | 0.049 |

For High Sulfate Resistance expansion must be <0.05% in 6 months (26 weeks).

Sincerely,

Robert S. Shogren

Rob Shogren, PE, Ph.D
Regional Technical Director
Lafarge North America




NOTES:

1. FORM CONCRETE BY MEANS AND METHODS THAT WILL NOT DAMAGE THE COMPOSITE LINER SYSTEM. CONCRETE FORMING SHALL BE APPROVED BY ENGINEER PRIOR TO CONSTRUCTION.
2. PROVIDE MIN. 3" CLEAR COVER FOR ALL REINFORCING STEEL.
3. ALL REINFORCING SHALL BE EPOXY COATED.
4. ALL CONCRETE SHALL BE SULFATE RESISTANT TYPE V.
5. DEWATERING SYSTEM SIDEWALL RISER PIPES CAN LIE DIRECTLY ON BOTTOM MAT OF REINFORCEMENT.
6. CONTRACTOR TO SUBMIT CONCRETE MIX DESIGN (4,000 PSI MIN.) FOR REVIEW AND APPROVAL.

4 SECTION: DEWATERING SUMP SIDEWALL RISER PIPES CONCRETE ENCASEMENT

0 1 2

SCALE IN FEET

LAFARGE CEMENT

# Cement Mill Test Report

## Date of Issue: March 13, 2023

| | |
|---|---|
| **Plant:** | **Exshaw, AB** |
| **Product:** | **OneCem** |
| **Mill Test Report Number:** | **MTR-IL-2023-02** |
| **Manufactured:** | **February 1-28, 2023** |

### ASTM C 595-21 and AASHTO M240-20 Standard Requirements

#### CHEMICAL ANALYSIS

| Item | Spec limit | Test Result |
|---|---|---|
| Rapid Method, X-Ray (C114) | | |
| $SiO_2$ (%) | | 17.4 |
| $Al_2O_3$ (%) | | 3.6 |
| $Fe_2O_3$ (%) | | 3.1 |
| CaO (%) | | 60.4 |
| MgO (%) | | 4.5 |
| $SO_3$ (%) | 3.0 max* | 3.3 |
| Loss on Ignition @ 950 (%) | 10.0 max | 6.5 |
| Loss on Ignition @ 550 (%) | | 0.9 |
| $CaCO_3$ in Limestone (%) | 70 min | 90 |
| Inorganic Process Addition | 5.0 max | - |
| Adjusted Potential Phase Composition *(C 150 - For information only)* | | |
| $C_3S$ (%) | --- | 52 |
| $C_2S$ (%) | --- | 10 |
| $C_3A$ (%) | --- | 4 |
| $C_4AF$ (%) | --- | 9 |

#### PHYSICAL ANALYSIS

| Item | Spec limit | Test Result |
|---|---|---|
| Blaine Fineness ($m^2$/kg) (C204) | | 532 |
| Passing 45 µm (%) (C430) | | 99.5 |
| Autoclave Expansion (%) (C151)* | -0.20 to 0.80 | 0.11 |
| Air Content (%) (C186) | 12 max | 6 |
| Compressive Strength (MPa[psi]) (C109) | | |
| 1 day | | 19.3 [2830] |
| 3 days | 13.0 [1890] min | 31.3 [4530] |
| 7 days | 20.0 [2900] min | 35.3 [5440] |
| 28 days (Reflects previous month's data) | 25.0 [3620] min | 44.3 [6610] |
| Time of setting (minutes) (C191) | | |
| Vicat Initial | 45 min. | 105 |
| ASTM C1012 Expansion %, (6 months)*** | | 0.048 |
| Mortar Bar Expansion (%) (C1038)* | 0.020 max | 0.012 |

| | |
|---|---|
| **NaEq (%)** | **0.52** |

* May exceed the $SO_3$ maximum based on C1038 results of <0.020% expansion at 14 days.

** Most recent result provided

*** Performed by Lafarge Edmonton and/or Seattle Labs

**We certify that the above described cement, at the time of shipment, meets the chemical and physical requirements of ASTM C 595-21 & AASHTO M 240-20 STANDARD SPECIFICATIONS FOR TYPE IL (13) and (HS) CEMENT.**

NSF Certified to NSF/ANSI/CAN 61

Our laboratory is AASHTO accredited. Grey highlighted tests are not within current Scope of Accreditation.

AASHTO ACCREDITED

**Western BU - Exshaw Plant**
P.O. Box 160, Highway 1A, Exshaw AB T0L 2C0
Phone: 403-673-3815

**Prepared By:**

*Lorraine Johnson*

**Lorraine Johnson**
**Quality Manager**

LAFARGE
CEMENT

# Cement Mill Test Report

## Date of Issue: March 13, 2023

| | |
|---|---|
| **Plant:** | **Exshaw, AB** |
| **Product:** | **OneCem** |
| **Mill Test Report Number:** | **MTR-IL-2023-02** |
| **Manufactured:** | **February 1-28, 2023** |

**Additional Data - For information only.**

| Item | Test Result | Test Result |
|---|---|---|
| | Limestone | Inorganic Process Addition<br>Lafarge Cement Kiln Dust |
| Amount (%) | 13.1 | - |
| $SiO_2$ (%) | 1.6 | n/a |
| $Al_2O_3$ (%) | 0.7 | n/a |
| $Fe_2O_3$ (%) | 0.3 | n/a |
| CaO (%) | 50.1 | n/a |
| $SO_3$ (%) | 0.3 | n/a |
| $CO_2$ (%) | 42.7 | n/a |

**Base Cement Phase Composition - C150 - For information only.**

| Item | Test Result |
|---|---|
| $C_3S$ (%) | 59 |
| $C_2S$ (%) | 12 |
| $C_3A$ (%) | 5 |
| $C_4AF$ (%) | 11 |

**Specific Gravity:** 3.11**

**Western Canada BU - Exshaw Plant**
P.O. Box 160, Highway 1A, Exshaw AB, T0L 2C0
Phone: 403-673-3815

**Prepared By:**

*Lorraine Johnson*

Lorraine Johnson
Quality Manager

ECOMATERIAL TECHNOLOGIES

**Materials Testing & Research Facility**
2650 Old State Hwy 113
Taylorsville, GA 30178
770-684-0102

# ASTM C618 / AASHTO M295 Testing of Coal Creek Station Fly Ash

**Sample Date:** 1/1 - 1/31/23
**Sample Type:** Monthly
**Sample ID:** MnDOT Split

**Report Date:** 3/29/2023
**MTRF ID:** 272CC

| Chemical Analysis | Results | ASTM Limit Class F / C | AASHTO Limit Class F / C |
|---|---|---|---|
| Silicon Dioxide (SiO2) | 52.04 % | | |
| Aluminum Oxide (Al2O3) | 15.71 % | | |
| Iron Oxide (Fe2O3) | 5.59 % | | |
| Sum (SiO2+Al2O3+Fe2O3) | 73.34 % | 50.0 min | 50.0 min |
| Sulfur Trioxide (SO3) | 0.61 % | 5.0 max | 5.0 max |
| Calcium Oxide (CaO) | 13.05 % | 18.0 max / >18.0 | 18.0 max / >18.0 |
| Magnesium Oxide (MgO) | 4.19 % | | |
| Sodium Oxide (Na2O) | 3.28 % | | |
| Potassium Oxide (K2O) | 2.29 % | | |
| Total Alkali (Sodium Oxide Equivalent) | 4.8 % | | |
| Moisture | 0.04 % | 3.0 max | 3.0 max |
| Loss on Ignition | 0.06 % | 6.0 max | 5.0 max |
| Available Alkalies, as Na2Oe | 1.68 % | Not Required | 1.5 max* *when required by purchaser |
| **Physical Analysis** | | | |
| Fineness, % retained on 45-µm sieve | 22.65 % | 34 max | 34 max |
| Fineness Uniformity | 1.8 % | ±5 max | ±5 max |
| Strength Activity Index - 7 or 28 day requirement | | | |
| 7 day, % of control | 85 % | 75 min | 75 min |
| 28 day, % of control | 88 % | 75 min | 75 min |
| Water Requirement, % control | 93 % | 105 max | 105 max |
| Density, ASTM C604 | 2.52 g/cm3 | | |
| Density Uniformity | 1.2 % | ±5 max | ±5 max |

**The test data listed herein was generated by applicable ASTM methods. The reported results pertain only to the sample(s) or lot(s) tested. This report cannot be reproduced without permission from EM Resources LLC.**

Tyler Lambert
QA Manager

AASHTO ACCREDITED

# TESTS OF FINE AGGREGATE

**Report Number:** M1231002.0003
**Service Date:** 01/10/23
**Report Date:** 04/10/23
**Task:** Pit 260 - Anderson

Terracon
860 9th St. NE, Unit K
West Fargo, ND 58078
701-282-9633

## Client

Strata Corporation
Attn: Hank Hauge
PO Box 39
West Fargo, ND 58078-0039

## Project

Plant Tests 2023 - Strata Corporation
210 12th Ave. NW
West Fargo, ND 58078

Project Number: M1231002

**Report Number:** Report .0003.6

**Aggregate Type:** Fine Aggregate

**Location Sampled:** Production Belt Sample

**Source:** Pit 260 – Anderson/Rockridge Resources
MnDOT Source Number: 03090

**Sieve Analysis:**
(ASTM C117 & C136)
(AASHTO T 11 & T 27)

| % Passing | | Submitted Test Sample | Strata Production Average | ASTM C33 | MnDOT 3126 | NDDOT 802 |
|---|---|---|---|---|---|---|
| | 3/8" (9.5 mm) | | | 100% | 100% | 100% |
| | #4 (4.75 mm) | 100% | 100 | 95-100 | 95-100 | 95-100 |
| | #8 (2.36 mm) | 93 | 93 | 80-100 | 80-100 | --- |
| | #16 (1.18 mm) | 73 | 71 | 50-85 | 55-85 | 45-80 |
| | #30 (600 μm) | 45 | 43 | 25-60 | 30-60 | --- |
| | #50 (300 μm) | 18 | 16 | 5-30 | 5-30 | 10-30 |
| | #100 (150 μm) | 3.0 | 2.1 | 0-10 | 0-10 | 0-10 |
| | #200 (75 μm) | 1.0 | 0.2 | 0-3.0 | 0-2.5 | 0-3.0 |
| | Fineness Modulus | 2.68 | 2.75 | 2.3 – 3.1 (Max. Var. ±0.20) | Max. Var. ±0.20 | Max. Var. ±0.20 |

**Remarks:** ASTM C33: The sample meets gradation specifications for ASTM C33 Fine Aggregate.
MnDOT: The sample meets gradation specifications for MnDOT 3126 Fine Aggregate.
NDDOT: The sample meets gradation specifications for NDDOT 802 Fine Aggregate.

**Services:**

**Terracon Rep.:** Gabriel Olivas
**Reported To:**
**Contractor:**
**Report Distribution:**
(1) Strata Corporation, Hank Hauge
(1) Strata Corporation, Dale Johnson
(1) Strata Corporation, Jordan Bremer

**Reviewed By:** Scott Mathson

The tests were performed in general accordance with applicable ASTM, AASHTO, or DOT test methods. This report is exclusively for the use of the client indicated above and shall not be reproduced except in full without the written consent of our company. Test results transmitted herein are only applicable to the actual samples tested at the location(s) referenced and are not necessarily indicative of the properties of other apparently similar or identical materials.

# TEST OF FINE AGGREGATE QUALITY

**Report Number:** M1231002.0003
**Service Date:** 01/10/23
**Report Date:** 04/10/23
**Task:** Pit 260 - Anderson

Terracon
860 9th St. NE, Unit K
West Fargo, ND 58078
701-282-9633

## Client

Strata Corporation
Attn: Hank Hauge
PO Box 39
West Fargo, ND 58078-0039

## Project

Plant Tests 2023 - Strata Corporation
210 12th Ave. NW
West Fargo, ND 58078

Project Number: M1231002

| | | |
|---|---|---|
| **Report Number:** | Report .0003.7 | |
| **Aggregate Type:** | Fine Aggregate | |
| **Location Sampled:** | Production Belt Sample | |
| **Source:** | Pit 260 – Anderson/Rockridge | ASTM C33 Specifications |
| **Deleterious Materials** (% by mass): | | Maximum Allowable (%) |
| Clay Lumps & Friable Particles (ASTM C142): | <0.1 | 3.0 |
| Material Finer than #200 (75 $\mu$m) (ASTM C117): | 1.0 | 5.0/3.0 for concrete subject to abrasion |
| Lightweight Particles (Specific Gravity under 2.0) (ASTM C123): | | |
| Coal and Lignite: | 0.0 | 1.0/0.5 where appearance of concrete is important |
| Shale & Other Lightweight Particles: | 0.2 | |
| Total: | 0.2 | |
| Organic Matter (ASTM C40): | Plate 1 – Clear | Plate 3 or Lighter |
| Soundness (5 cycles $NaSO_4$) (ASTM C88): | 2.5 | 10.0 |
| Soundness (5 cycles $MgSO_4$) (ASTM C88): | 7.9 | 15.0 |
| **Relative Density** (Specific Gravity) (ASTM C128): | | |
| Bulk Oven-Dry (B.O.D.): | 2.632 | |
| Saturated-Surface-Dry (S.S.D.): | 2.658 | |
| Apparent: | 2.703 | |
| Absorption (%): | 1.00 | |

**Remarks:** The sample meets quality specifications for ASTM C33 Fine Aggregate.

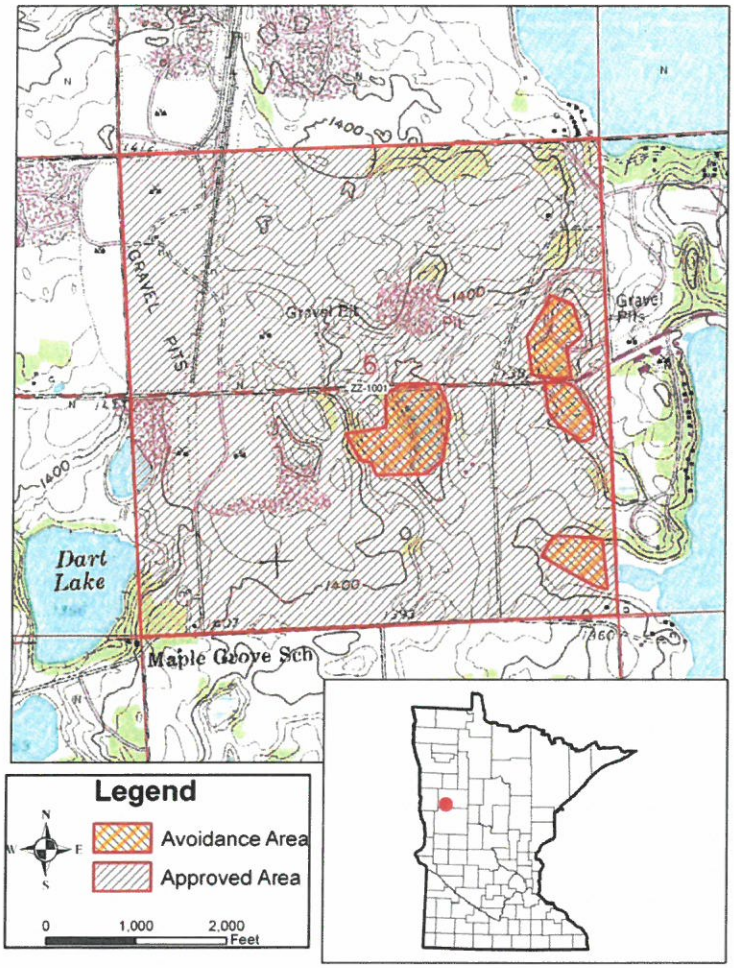
**Services:**

**Terracon Rep.:** Gabriel Olivas
**Reported To:**
**Contractor:**
**Report Distribution:**
(1) Strata Corporation, Hank Hauge
(1) Strata Corporation, Dale Johnson
(1) Strata Corporation, Jordan Bremer

**Reviewed By:** Scott Mathson

The tests were performed in general accordance with applicable ASTM, AASHTO, or DOT test methods. This report is exclusively for the use of the client indicated above and shall not be reproduced except in full without the written consent of our company. Test results transmitted herein are only applicable to the actual samples tested at the location(s) referenced and are not necessarily indicative of the properties of other apparently similar or identical materials.

# NDDOT Material Source Certificate of Approval




## ZZ-1001

Pit Name:
#260 Anderson

S. 6, 138/41, Becker Co., MN

Conditions: The contractor must coordinate with the applicable township, municipality, or county authority that regulates extractive uses. In many counties, a Conditional Land Used Permit (CLUP) needs to be acquired from the county planning and zoning office. Additional state and federal permits may also be required for material extraction.

This location is approved for use, provided all avoidance areas shown on the map are avoided and all Conditions listed above and below are complied with.

NDDOT advises that all applicants (contractors or their representatives) may be subject to meeting certain legal responsibilities pursuant to one or more of the following authorities administered by the USFWS: Migratory Bird Treaty Act (MBTA) (16 U.S.C. 703 et seq.); Endangered Species Act (ESA) (16 U.S.C. 1531 et seq.); and Bald and Golden Eagle Protection Act (BGEPA) (16 U.S.C. 668-668d, 54 Stat. 250). It is the responsibility of the applicants and/or any individual conducting activities at any approved site to fulfill the requirements of these Acts. The contractor will be responsible obtaining all applicable permits outlined in Section 107 of the Standard Specifications for Road and Bridge Construction (SSRBC). Additionally, contractor will be responsible for any impacts to wetlands, including permitting those impacts and mitigating the loss of the wetlands. As with all projects, if cultural artifacts and/or features (e.g., stone tools, fire hearths, stone circles, burials) are encountered, provisions outlined in Section 107.06 of SSRBC shall be followed.

This approval does not imply landowner permission to acquire material at this location. An agreement with the landowner is still necessary. If you have any questions regarding material sources please email materialsource@nd.gov

# TESTS OF COARSE AGGREGATE

**Report Number:** M1231002.0009
**Service Date:** 01/10/23
**Report Date:** 04/10/23
**Task:** Pit 800 - Fisher

Terracon
860 9th St. NE, Unit K
West Fargo, ND 58078
701-282-9633

## Client

Strata Corporation
Attn: Hank Hauge
PO Box 39
West Fargo, ND 58078-0039

## Project

Plant Tests 2023 - Strata Corporation
210 12th Ave. NW
West Fargo, ND 58078

Project Number: M1231002

**Report Number:** Report .009.1

**Aggregate Type:** Coarse Aggregate 1"-#4 and ¾"-#4

**Location Sampled:** Production Belt Sample

**Source:** Pit 800 - Fisher

| | Submitted Test Sample | Fisher Sand & Gravel Production Average | ASTM C33 | | NDDOT | |
|---|---|---|---|---|---|---|
| **Sieve Analysis:** (ASTM C117 & C136) (AASHTO T 11 & T 27) | | | Size 57 1"-#4 | Size 67 ¾"-#4 | Sec. 802-03 Size 3 | Size 4 |
| % Passing 1 ½" (37.5 mm) | | | 100% | --- | 100% | --- |
| 1" (25.0 mm) | 100% | 100% | 95 – 100 | 100% | 95 – 100 | 100% |
| 3/4" (19.0 mm) | 97 | 95 | --- | 90 – 100 | --- | 90 – 100 |
| 1/2" (12.5 mm) | 50 | 49 | 25 – 60 | --- | 25 – 65 | --- |
| 3/8" (9.5 mm) | 26 | 25 | --- | 20 – 55 | 15 – 55 | 20 – 55 |
| #4 (4.75 mm) | 1.4 | 1.2 | 0 – 10 | 0 – 10 | 0 – 10 | 0 – 10 |
| #8 (2.36 mm) | 0.1 | 0.3 | 0 – 5.0 | 0 – 5.0 | 0 – 5.0 | 0 – 5.0 |

Remarks: ASTM C33: The sample meets gradation specifications for ASTM C33, Size 57 and 67 Coarse Aggregate.
NDDOT: The sample meets gradation specifications for NDDOT 802, Size 3 and 4 Coarse Aggregate.

**Services:**

**Terracon Rep.:** Gabriel Olivas
**Reported To:**
**Contractor:**
**Report Distribution:**
(1) Strata Corporation, Hank Hauge
(1) Strata Corporation, Dale Johnson
(1) Strata Corporation, Jordan Bremer

**Reviewed By:** Scott Mathson

The tests were performed in general accordance with applicable ASTM, AASHTO, or DOT test methods. This report is exclusively for the use of the client indicated above and shall not be reproduced except in full without the written consent of our company. Test results transmitted herein are only applicable to the actual samples tested at the location(s) referenced and are not necessarily indicative of the properties of other apparently similar or identical materials.

# TESTS OF COARSE AGGREGATE QUALITY

**Report Number:** M1231002.0009
**Service Date:** 01/10/23
**Report Date:** 04/10/23
**Task:** Pit 800 - Fisher

Terracon
860 9th St. NE, Unit K
West Fargo, ND 58078
701-282-9633

## Client

Strata Corporation
Attn: Hank Hauge
PO Box 39
West Fargo, ND 58078-0039

## Project

Plant Tests 2023 - Strata Corporation
210 12th Ave. NW
West Fargo, ND 58078

Project Number: M1231002

**Report Number**: Report .009.2
**Aggregate Size:** Size 57 & 67
**Location Sampled**: Production Belt Sample
**Source**: Pit 800 - Fisher

| | | ASTM C33 Specifications Maximum Allowable (%) Class Designation | | |
|---|---|---|---|---|
| **Deleterious Materials** (% by mass): | | 1S | 3S | 4S |
| a. Clay Lumps & Friable Particles (ASTM C142): | 0.2 | 10.0 | 5.0 | 3.0 |
| b. Unsound Chert (less than 2.40 sp.gr. SSD) (ASTM C123): | 0.0 | --- | 5.0 | 5.0 |
| c. Sum of a & b: | 0.2 | --- | 7.0 | 5.0 |
| d. Material Passing #200 (75 $\mu$m) Sieve (ASTM C117): | 0.2 | 1.0 | 1.0 | 1.0 |
| e. Coal & Lignite (ASTM C123): | 0.0 | 1.0 | 0.5 | 0.5 |
| f. Flat or Elongated Particles (3:1) (ASTM D4791): | 1.5 | | | |
| Flat: | 1.5 | | | |
| Elongated: | 0.0 | | | |
| g. Lightweight Particles (ASTM C123): | 0.2 | | | |
| h. Iron Oxide: | 0.0 | | | |
| **Carbonates** (MnDOT Lab Manual Section 1209): | 0.6 | | | |
| **Relative Density** (Specific Gravity) (ASTM C127): | | | | |
| Bulk Oven Dry (B.O.D): | 2.587 | | | |
| Saturated Surface Dry (S.S.D.): | 2.616 | | | |
| Apparent: | 2.662 | | | |
| Absorption (24-Hrs. Immersed) (%): | 1.09 | | | |

| | | ASTM C33 Specifications |
|---|---|---|
| **Soundness** (%) (5 cycles $MgSO_4$) (ASTM C88): | 2.3 | 18 maximum |
| **Abrasion Loss** (%) (ASTM C131) (Grading B): | 18 | 50 maximum |
| **Fractured Faces** (%) (1 Face + #4) (ASTM D5821): | 41 | |

**Remarks**: The sample meets quality specifications for ASTM C33 Coarse Aggregate.

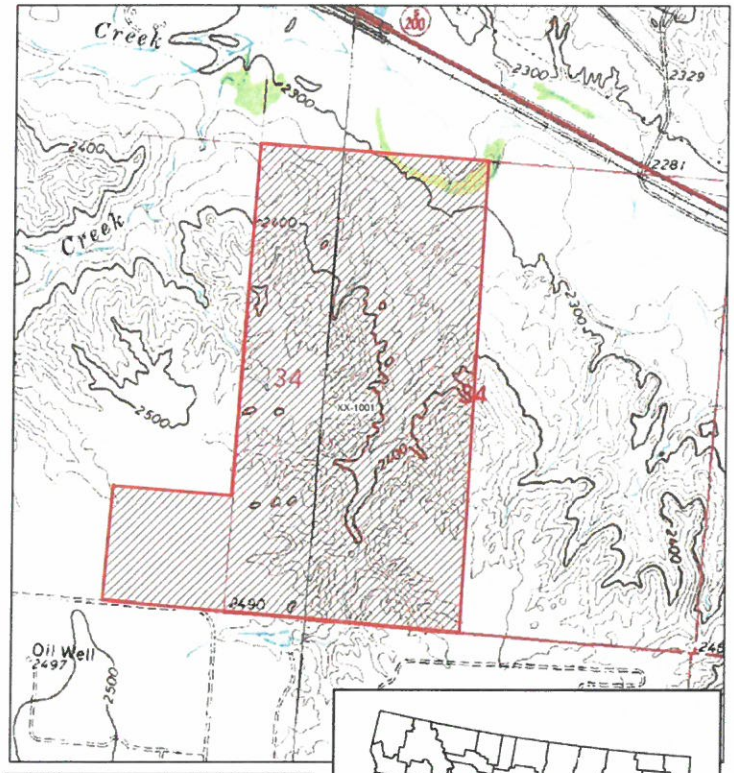
**Services:**

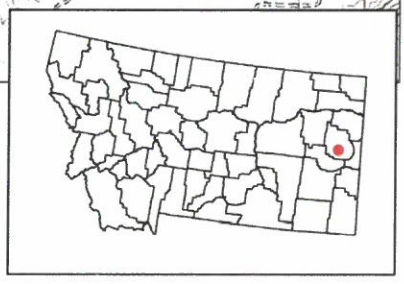
**Terracon Rep.:** Gabriel Olivas
**Reported To:**
**Contractor:**
**Report Distribution:**
(1) Strata Corporation, Hank Hauge
(1) Strata Corporation, Dale Johnson
(1) Strata Corporation, Jordan Bremer

**Reviewed By:** Scott Mathson

The tests were performed in general accordance with applicable ASTM, AASHTO, or DOT test methods. This report is exclusively for the use of the client indicated above and shall not be reproduced except in full without the written consent of our company. Test results transmitted herein are only applicable to the actual samples tested at the location(s) referenced and are not necessarily indicative of the properties of other apparently similar or identical materials.

# NDDOT Material Source Certificate of Approval



## XX-1001

Pit Name:
Fisher S&G Glendive Pit

SE,S.33;W,S.34,T16N,R54W,Dawson,MT

Conditions: Prior to the use of this location the contractor must acquire an Open Cut Mining Permit from the Montana Department of Environmental Quality (406-444-4970). Additionally, the source may be located on property encumbered by USFWS (United States Fish and Wildlife Service) property interest. The contractor must coordinate with Montana United States Fish and Wildlife Service Ecological Services (406-449-5225) in Helena, Montana and the landowner regarding any terms and conditions before using material from this source.

**This location is approved for use, provided all avoidance areas shown on the map are avoided, and any Conditions listed above are complied with. NDDOT advises that all applicants (contractors or their representatives) may be subject to meeting certain legal responsibilities pursuant to one or more of the following authorities administered by the USFWS: Migratory Bird Treaty Act (MBTA) (16 U.S.C. 703 et seq.); Endangered Species Act (ESA) (16 U.S.C. 1531 et seq.); and Bald and Golden Eagle Protection Act (BGEPA) (16 U.S.C. 668-668d, 54 Stat. 250). It is unclear at this time what effects, if any, material source activities may have on plants, fish, and/or wildlife species protected by the above-mentioned Acts. It is the responsibility of the applicants and/or any individual conducting activities at any approved site to fulfill the requirements of these Acts.**

**This approval does not imply landowner permission to acquire material at this location. An agreement with the landowner is still necessary. The contractor will be responsible for any impacts to wetlands, including permitting those impacts and mitigating the loss of the wetlands. As with all projects, if cultural artifacts and/or features (e.g., stone tools, fire hearths, stone circles, burials) are encountered, provisions outlined in Section 107.04 of the Standard Specifications for Road and Bridge Construction shall be followed.**

**Master Builders Solutions Admixtures US, LLC**

MASTER® BUILDERS SOLUTIONS

**March 28, 2023**

**Strata Corporation**
**Mandan, ND**

**Attention:** Winn Construction
**Project:** MnKota Power Plant Riser Pipes Concrete Encasement
**Project location:** Mandan, ND

Certificate of Conformance
MasterPolyheed® 1020 Admixture (formerly Polyheed 1020)
Admixture for Concrete

I, Richard Hubbard, Sr. Technical Specialist for Master Builders Solutions US LLC, Cleveland, Ohio, certify:
That MasterPolyheed 1020 admixture is a Master Builders Solutions Mid-Range Water-Reducing Admixture for concrete; and
That MasterPolyheed 1020 admixture and PolyHeed 1020 admixture are the same product having the same compostion, differing only in designation; and
That no calcium chloride or chloride based ingredient is used in the manufacture of MasterPolyheed 1020 admixture; and
That MasterPolyheed 1020 admixture, based on the chlorides originating from all the ingredients used in its manufacture, contributes less than 0.00014 percent (1.4 ppm) chloride ions by weight of the cement when used at the rate of 65 mL per 100 kg (1 fluid ounce per 100 pounds) of cement; and
That MasterPolyheed 1020 admixture meets the requirements for a Type A, Water-Reducing and Type F, Water-Reducing, High Range Admixture specified in ASTM C494/C494M, the Standard Specification for Chemical Admixtures for Concrete, as well as the requirements for Type A and Type F admixtures as specified in Corps of Engineers' CRD-C 87 and AASHTO M194.

Richard Hubbard III

Richard Hubbard
Sr. Technical Specialist

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**Master Builders Solutions Admixtures US, LLC**

MASTER® BUILDERS SOLUTIONS

**March 28, 2023**

**Strata Corporation**
**Mandan, ND**

**Attention:** Winn Construction
**Project:** MnKota Power Plant Riser Pipes Concrete Encasement
**Project location:** Mandan, ND

Certificate of Conformance
MasterGlenium® 7500
Master Builders Solutions Admixture for Concrete

I, Richard Hubbard, Sr. Technical Marketing Specialist for Master Builders Solutions, Cleveland, Ohio, certify:
That MasterGlenium 7500 admixture is a full-range water-reducing admixture manufactured by Master Builders Solutions; and
That MasterGlenium 7500 admixture and Glenium 7500 admixture are the same product having identical composition, differing only in designation; and
That no calcium chloride or chloride based ingredient is used in the manufacture of MasterGlenium 7500 admixture; and
That MasterGlenium 7500 admixture, based on the chlorides originating from all the ingredients used in its manufacture, contributes less than 0.00017 percent (1.7 ppm) chloride ions by weight of the cement when used at the rate of 65 mL per 100 kg (1 fluid ounce per 100 pounds) of cement; and
That MasterGlenium 7500 admixture meets the requirements for a Type A, Water-Reducing and Type F, Water-Reducing, High Range Admixture specified in ASTM C494/C494M, the Standard Specification for Chemical Admixtures for Concrete, as well as the requirements for Type A and Type F admixtures as specified in Corps of Engineers' CRD-C 87 and AASHTO M194.

Richard Hubbard III

Richard Hubbard
Sr. Technical Specialist

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MASTER® BUILDERS SOLUTIONS

**March 28, 2023**

**Strata Corporation**
**Mandan, ND**

**Attention:** Winn Construction
**Project:** MnKota Power Plant Riser Pipes Concrete Encasement
**Project location:** Mandan, ND

Certificate of Conformance
MasterSet® DELVO
Master Builders Solutions Admixture for Concrete

I, Richard Hubbard, Sr. Technical Marketing Specialist for Master Builders Solutions, Cleveland, Ohio, certify:
That MasterSet DELVO admixture is a Master Builders Solutions Hydration Controlling Admixture for concrete; and
That MasterSet DELVO admixture and DELVO Stabilizer admixture are the same product having identical composition, differing only in designation; and
That no calcium chloride or chloride based ingredient is used in the manufacture of MasterSet DELVO admixture and
That MasterSet DELVO admixture, based on the chlorides originating from all the ingredients used in its manufacture, contributes less than 0.00014 percent (1.4 ppm) chloride ions by weight of the cement when used at the rate of 65 mL per 100 kg (1 fluid ounce per 100 pounds) of cement; and
That MasterSet DELVO admixture meets the requirements for a Type B, Retarding and Type D, Water-Reducing and Retarding Admixture specified in ASTM C494/C494M, the Standard Specification for Chemical Admixtures for Concrete, as well as the requirements for Tyep B and Type D admixtures as specified in Corps of Engineers' CRD-C 87 and AASHTO M194.

Richard Hubbard III

Richard Hubbard
Sr. Technical Specialist

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MASTER® BUILDERS SOLUTIONS

**March 28, 2023**

**Strata Corporation**
**Mandan, ND**

**Attention:** Winn Construction
**Project:** MnKota Power Plant Riser Pipes Concrete Encasement
**Project location:** Mandan, ND

Certificate of Conformance
MasterGlenium® 7500
Master Builders Solutions Admixture for Concrete

I, Richard Hubbard, Sr. Technical Marketing Specialist for Master Builders Solutions, Cleveland, Ohio, certify:
That MasterGlenium 7500 admixture is a full-range water-reducing admixture manufactured by Master Builders Solutions; and
That MasterGlenium 7500 admixture and Glenium 7500 admixture are the same product having identical composition, differing only in designation; and
That no calcium chloride or chloride based ingredient is used in the manufacture of MasterGlenium 7500 admixture; and
That MasterGlenium 7500 admixture, based on the chlorides originating from all the ingredients used in its manufacture, contributes less than 0.00017 percent (1.7 ppm) chloride ions by weight of the cement when used at the rate of 65 mL per 100 kg (1 fluid ounce per 100 pounds) of cement; and
That MasterGlenium 7500 admixture meets the requirements for a Type A, Water-Reducing and Type F, Water-Reducing, High Range Admixture specified in ASTM C494/C494M, the Standard Specification for Chemical Admixtures for Concrete, as well as the requirements for Type A and Type F admixtures as specified in Corps of Engineers' CRD-C 87 and AASHTO M194.

Richard Hubbard III

Richard Hubbard
Sr. Technical Specialist

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| | | |
|---|---|---|
| 3 | 03 30 00 | Cast-in-Place Concrete |
| | 03 40 00 | Precast Concrete |
| | 03 70 00 | Mass Concrete |

MASTER® BUILDERS SOLUTIONS

# MasterPolyheed® 1020

## Mid-Range Water-Reducing Admixture

### Description

MasterPolyheed 1020 admixture is a patent-pending ready-to-use mid-range water-reducing admixture. MasterPolyheed 1020 admixture, is very effective in producing concrete with different levels of workability and with enhanced finishing characteristics. MasterPolyheed 1020 admixture meets ASTM C 494/C 494M requirements for Type A, water-reducing, and Type F, high-range water-reducing, admixtures.

### Applications

Recommended for use in:

- All concrete applications where superior workability, pumpability and finishability qualities are desired, in particular, flatwork, pumped concrete and pervious concrete
- Concrete containing manufactured sand and harsh concrete mixtures

### Features

- Based on MasterGlenium® technology
- Dosage flexibility - provides up to 20% water reduction
- Reduced water content for a given level of workability
- Provides better slump retention
- Provides excellent workability
- Enhanced later-age strength
- Excellent finishability, even with manufactured sands and in lean mixtures

### Benefits

- Can be used in a wide variety of concrete mixtures as a multi-purpose admixture meeting the performance requirements for ASTM Type A or Type F admixtures
- Faster setting at higher dosages compared to other mid-range water-reducing admixtures
- Enhanced flowability, strength and durability
- Reduces effort required to finish
- Lowers in-place cost
- Increases service life of structures

### Performance Characteristics

**Setting Time:** Concrete produced with MasterPolyheed 1020 admixture sets faster than a mixture containing a typical mid-range water-reducing admixture.

Mixture Data: 517 lb/yd$^3$ (307 kg/m$^3$) of Type I/II cement; slump 5 in. (125 mm); non-air-entrained concrete; Admixture dosage adjusted for 8% water reduction.

**Setting Time**

| Mixture | Initial Set (h:min) | Difference over Reference (h:min) |
|---|---|---|
| Reference | 4:48 | – |
| Ref. Mid-Range Water-Reducer | 6:12 | +1:24 |
| MasterPolyheed 1020 admixture | 5:18 | +0.30 |

**Compressive Strength:** Concrete produced with MasterPolyheed 1020 admixture achieves higher compressive strength at later ages compared to plain concrete and concrete mixtures produced with a typical mid-range water-reducing admixture.

**Mixture Data:** 517 lb/yd$^3$ (307 kg/m$^3$) of Type I/II cement; slump 5 in. (125mm); non-air-entrained concrete; Admixture dosage adjusted for 12% water reduction.

**Compressive Strength, psi (MPa)**

| Mixture | 1-Day | 7-Day | 28-Day |
|---|---|---|---|
| Plain | 1330 (9.2) | 3670 (25.3) | 5080 (35.0) |
| Reference MRWR* | 1760 (12.1) | 5160 (35.6) | 6720 (46.3) |
| MasterPolyheed 1020 admixture | 1940 (13.4) | 5370 (37.0) | 7150 (49.3) |

**Mid-Range Water-Reducer*

*Note: The data shown are based upon controlled laboratory tests. Reasonable variations from the results shown here may be experienced as a result of differences in concrete making materials and jobsite conditions.*

## Guidelines for Use

**Dosage:** MasterPolyheed 1020 admixture has a recommended dosage range of 3 to 12 fl oz/cwt (195 to 780 mL/100 kg) of cementitious materials for most concrete mixtures. A dosage range of 3 to 5 fl oz/cwt (195 to 325 mL/100 kg) is typical for Type A applications and up to 12 fl oz/cwt (780 mL/100 kg) for mid-range and high-range applications. Because of variations in concrete materials, job site conditions, and/or applications, dosages outside of the recommended range may be required. In such cases, contact your local sales representative.

**Mixing:** MasterPolyheed 1020 admixture can be added with the initial batch water or at the end of the batching sequence.

## Product Notes

**Corrosivity – Non-Chloride, Non-Corrosive:** MasterPolyheed 1020 admixture will neither initiate nor promote corrosion of reinforcing or prestressing steel embedded in concrete, or of galvanized steel floor and roof systems. Neither calcium chloride nor other chloride-based ingredients are used in the manufacture of MasterPolyheed 1020 admixture.

**Compatibility:** MasterPolyheed 1020 admixture is compatible with most admixtures and can be used in combination with other Master Builders Solutions admixtures, unless stated otherwise. When used in conjunction with other admixtures, each admixture must be dispensed separately into the concrete mixture.

MasterPolyheed 1020 admixture is designed to be used with MasterAir® VR 10 and MasterAir AE 90 air-entraining admixtures when the production of air-entrained concrete is desired. **Do not use MasterPolyheed 1020 admixture in combination with naphthalene-based admixtures. Erratic performance in slump may be experienced.**

## Storage and Handling

**Storage Temperature:** MasterPolyheed 1020 admixture should be stored between 35 and 105 °F (2 and 41 °C). If MasterPolyheed 1020 admixture freezes, thaw at 40 °F (5 °C) or above and completely reconstitute using mild mechanical agitation. **Do not use pressurized air for agitation.**

**Shelf Life:** MasterPolyheed 1020 admixture has a minimum shelf life of 12 months. Depending on storage conditions, the shelf life may be greater than stated. Please contact your local sales representative regarding suitability for use and dosage recommendations if the shelf life of PolyHeed 1020 admixture has been exceeded.

**Dispensing:** Consult your local sales representative for the proper dispensing equipment for MasterPolyheed 1020 admixture.

## Packaging

MasterPolyheed 1020 admixture is supplied in 55 gal (208 L) drums, 275 gal (1040 L) totes, and by bulk delivery.

## Related Documents

Safety Data Sheets: MasterPolyheed 1020 admixture

## Additional Information

For additional information on MasterPolyheed 1020 admixture or its use in developing concrete mixtures with special performance characteristics, contact your local sales representative.

*Master Builders Solutions, a brand of MBCC Group, is a global leader of innovative chemistry systems and formulations for construction, maintenance, repair and restoration of structures. The Admixture Systems business provides advanced products, solutions and expertise that improve durability, water resistance, energy efficiency, safety, sustainability and aesthetics of concrete structures, above and below ground, helping customers to achieve reduced operating costs, improved efficiency and enhanced finished products.*

*Utilizing worldwide resources, the Master Builders Solutions community of experts are passionate about providing solutions to challenges within all stages of construction, as well as the life cycle of a structure. At Master Builders Solutions we create sustainable solutions for construction around the globe.*

## Limited Warranty Notice

Master Builders Solutions Admixtures US, LLC ("Master Builders Solutions") warrants this product to be free from manufacturing defects and to meet the technical properties on the current Technical Data Guide, if used as directed within shelf life. Satisfactory results depend not only on quality products but also upon many factors beyond our control. MASTER BUILDERS SOLUTIONS MAKES NO OTHER WARRANTY OR GUARANTEE, EXPRESS OR IMPLIED, INCLUDING WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE WITH RESPECT TO ITS PRODUCTS. The sole and exclusive remedy of Purchaser for any claim concerning this product, including but not limited to, claims alleging breach of warranty, negligence, strict liability or otherwise, is shipment to purchaser of product equal to the amount of product that fails to meet this warranty or refund of the original purchase price of product that fails to meet this warranty, at the sole option of Master Builders Solutions. Any claims concerning this product must be received in writing within one (1) year from the date of shipment and any claims not presented within that period are waived by Purchaser. MASTER BUILDERS SOLUTIONS WILL NOT BE RESPONSIBLE FOR ANY SPECIAL, INCIDENTAL, CONSEQUENTIAL (INCLUDING LOST PROFITS) OR PUNITIVE DAMAGES OF ANY KIND.

Purchaser must determine the suitability of the products for the intended use and assumes all risks and liabilities in connection therewith. This information and all further technical advice are based on Master Builders Solutions' present knowledge and experience. However, Master Builders Solutions assumes no liability for providing such information and advice including the extent to which such information and advice may relate to existing third party intellectual property rights, especially patent rights, nor shall any legal relationship be created by or arise from the provision of such information and advice. Master Builders Solutions reserves the right to make any changes according to technological progress or further developments. The Purchaser of the Product(s) must test the product(s) for suitability for the intended application and purpose before proceeding with a full application of the product(s). Performance of the product described herein should be verified by testing and carried out by qualified experts.

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CANADA ■ 289-360-1300

| | | |
|---|---|---|
| 3 | 03 30 00 | Cast-in-Place Concrete |
| | 03 40 00 | Precast Concrete |
| | 03 70 00 | Mass Concrete |
| 4 | 04 05 16 | Masonry Grouting |

MASTER® BUILDERS SOLUTIONS

# MasterGlenium® 7500

## Full-Range Water-Reducing Admixture

### Description

MasterGlenium 7500 full-range water-reducing admixture is very effective in producing concrete mixtures with different levels of workability including applications that require self-consolidating concrete (SCC). MasterGlenium 7500 admixture meets ASTM C 494/C 494M compliance requirements for Type A, water-reducing, and Type F, high-range water-reducing, admixtures.

### Applications

Recommended for use in:

- Concrete with varying water reduction requirements (5-40%)
- Concrete where control of workability and setting time is critical
- Concrete where high flowability, increased stability, high-early and ultimate strengths, and improved durability are needed
- Producing self-consolidating concrete (SCC)
- Strength-on-demand concrete, such as 4x4™ Concrete
- Pervious concrete

### Features

MasterGlenium 7500 full-range water-reducing admixture is based on the next generation of polycarboxylate technology found in all of the MasterGlenium 7000 series products. This technology combines state-of-the-art molecular engineering with a precise understanding of regional cements to provide specific and exceptional value to all phases of the concrete construction process.

- Dosage flexibility for normal, mid-range and high-range applications
- Excellent early strength development
- Controls setting characteristics
- Optimizes slump retention/setting relationship
- Consistent air entrainment

### Benefits

- Faster turnover of forms due to accelerated early strength development
- Reduces finishing labor costs due to optimized set times
- Use in fast track construction
- Minimizes the need for slump adjustments at the jobsite
- Less jobsite QC support required
- Fewer rejected loads
- Optimizes concrete mixture costs

### Performance Characteristics

Concrete produced with MasterGlenium 7500 admixture achieves significantly higher early age strength than first generation polycarboxylate high-range water-reducing admixtures. MasterGlenium 7500 admixture also strikes the perfect balance between workability retention and setting characteristics in order to provide efficiency in placing and finishing concrete. The dosage flexibility of MasterGlenium 7500 allows it to be used as a normal, mid-range, and high-range water reducer.

## Guidelines for Use

**Dosage:** MasterGlenium 7500 admixture has a recommended dosage range of 2-15 fl oz/cwt (130-975 mL/100 kg) of cementitious materials. For most mid- to high-range applications, dosages in the range of 5-8 fl oz/cwt (325-520 mL/100 kg) will provide excellent performance. For high performance and producing self-consolidating concrete mixtures, dosages of up to 12 fl oz/cwt (780 mL/100 kg) of cementitious materials can be utilized. Because of variations in concrete materials, jobsite conditions and/or applications, dosages outside of the recommended range may be required. In such cases, contact your local sales representative.

**Mixing:** MasterGlenium 7500 admixture can be added with the initial batch water or as a delayed addition. However, optimum water reduction is generally obtained with a delayed addition.

## Product Notes

**Corrosivity – Non-Chloride, Non-Corrosive:** MasterGlenium 7500 admixture will neither initiate nor promote corrosion of reinforcing steel embedded in concrete, prestressing steel or of galvanized steel floor and roof systems. Neither calcium chloride nor other chloride-based ingredients are used in the manufacture of MasterGlenium 7500 admixture.

**Compatibility:** MasterGlenium 7500 admixture is compatible with most admixtures used in the production of quality concrete, including normal, mid-range and high-range water-reducing admixtures, air-entrainers, accelerators, retarders, extended set control admixtures, corrosion inhibitors, and shrinkage reducers.

**Do not use MasterGlenium 7500 admixture with admixtures containing beta-naphthalene sulfonate. Erratic behaviors in slump, workability retention and pumpability may be experienced.**

## Storage and Handling

**Storage Temperature:** MasterGlenium 7500 admixture must be stored at temperatures above 40 °F (5 °C). If MasterGlenium 7500 admixture freezes, thaw and reconstitute by mechanical agitation.

**Shelf Life:** MasterGlenium 7500 admixture has a minimum shelf life of 9 months. Depending on storage conditions, the shelf life may be greater than stated. Please contact your local sales representative regarding suitability for use and dosage recommendations if the shelf life of MasterGlenium 7500 admixture has been exceeded.

## Packaging

MasterGlenium 7500 admixture is supplied in 55 gal (208 L) drums, 275 gal (1040 L) totes and by bulk delivery.

## Related Documents

Safety Data Sheets: MasterGlenium 7500 admixture

## Additional Information

For additional information on MasterGlenium 7500 admixture or on its use in developing concrete mixtures with special performance characteristics, contact your local sales representative.

*Master Builders Solutions, a brand of MBCC Group, is a global leader of innovative chemistry systems and formulations for construction, maintenance, repair and restoration of structures. The Admixture Systems business provides advanced products, solutions and expertise that improve durability, water resistance, energy efficiency, safety, sustainability and aesthetics of concrete structures, above and below ground, helping customers to achieve reduced operating costs, improved efficiency and enhanced finished products.*

*Utilizing worldwide resources, the Master Builders Solutions community of experts are passionate about providing solutions to challenges within all stages of construction, as well as the life cycle of a structure. At Master Builders Solutions we create sustainable solutions for construction around the globe.*

## Limited Warranty Notice

Master Builders Solutions Admixtures US, LLC ("Master Builders Solutions") warrants this product to be free from manufacturing defects and to meet the technical properties on the current Technical Data Guide, if used as directed within shelf life. Satisfactory results depend not only on quality products but also upon many factors beyond our control. MASTER BUILDERS SOLUTIONS MAKES NO OTHER WARRANTY OR GUARANTEE, EXPRESS OR IMPLIED, INCLUDING WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE WITH RESPECT TO ITS PRODUCTS. The sole and exclusive remedy of Purchaser for any claim concerning this product, including but not limited to, claims alleging breach of warranty, negligence, strict liability or otherwise, is shipment to purchaser of product equal to the amount of product that fails to meet this warranty or refund of the original purchase price of product that fails to meet this warranty, at the sole option of Master Builders Solutions. Any claims concerning this product must be received in writing within one (1) year from the date of shipment and any claims not presented within that period are waived by Purchaser. MASTER BUILDERS SOLUTIONS WILL NOT BE RESPONSIBLE FOR ANY SPECIAL, INCIDENTAL, CONSEQUENTIAL (INCLUDING LOST PROFITS) OR PUNITIVE DAMAGES OF ANY KIND.

Purchaser must determine the suitability of the products for the intended use and assumes all risks and liabilities in connection therewith. This information and all further technical advice are based on Master Builders Solutions' present knowledge and experience. However, Master Builders Solutions assumes no liability for providing such information and advice including the extent to which such information and advice may relate to existing third party intellectual property rights, especially patent rights, nor shall any legal relationship be created by or arise from the provision of such information and advice. Master Builders Solutions reserves the right to make any changes according to technological progress or further developments. The Purchaser of the Product(s) must test the product(s) for suitability for the intended application and purpose before proceeding with a full application of the product(s). Performance of the product described herein should be verified by testing and carried out by qualified experts.

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CANADA ■ 289-360-1300

MasterSet Delvo

# *Delvo Stabilizer Dosage Guidelines*

**Delvo Hydration Control Admixtures**

| Concrete Temp. (Degree F) | Hours of Additional Working Time (*Retardation*) | | | | | | |
|---|---|---|---|---|---|---|---|
| | .5 - 1 hrs | 1 - 1.5 hrs | 1.5 - 2 hrs | 2 - 2.5 hrs | 2.5 - 3 hrs | 3 - 3.5 hrs | 3.5 - 4 hrs |
| **100-109 degrees** | 5 oz/cwt | 6 oz/cwt | 7 oz/cwt | 8 oz/cwt | 9 oz/cwt | 10 oz/cwt | 11 oz/cwt |
| **90-99 degrees** | 4 oz/cwt | 5 oz/cwt | 6 oz/cwt | 7 oz/cwt | 8 oz/cwt | 9 oz/cwt | 10 oz/cwt |
| **80-89 degrees** | 3 oz/cwt | 4 oz/cwt | 5 oz/cwt | 6 oz/cwt | 7 oz/cwt | 8 oz/cwt | 9 oz/cwt |
| **70-79 degrees** | 2 oz/cwt | 3 oz/cwt | 4 oz/cwt | 5 oz/cwt | 6 oz/cwt | 7 oz/cwt | 8 oz/cwt |
| **60-69 degrees** | 1 oz/cwt | 2 oz/cwt | 3 oz/cwt | 4 oz/cwt | 5 oz/cwt | 6 oz/cwt | 7 oz/cwt |

Note: 1 Delvo ESC Puck is equal to 16 oz of Delvo Stabilizer

**Sample Dosage Rate of ESC Pucks per Cubic Yard of a 564 lb. Portland Mix**

| Concrete Temp. (Degree F) | Hours of Additional Working Time (*Retardation*) | | | | | | |
|---|---|---|---|---|---|---|---|
| | .5 - 1 hrs | 1 - 1.5 hrs | 1.5 - 2 hrs | 2 - 2.5 hrs | 2.5 - 3 hrs | 3 - 3.5 hrs | 3.5 - 4 hrs |
| **100-109 degrees** | 1.75 Pucks | 2 Pucks | 2.5 Pucks | 2.75 Pucks | 3.25 Pucks | 3.5 Pucks | 4 Pucks |
| **90-99 degrees** | 1.5 Pucks | 1.75 Pucks | 2 Pucks | 2.5 Pucks | 2.75 Pucks | 3.25 Pucks | 3.5 Pucks |
| **80-89 degrees** | 1 Puck | 1.5 Pucks | 1.75 Pucks | 2 Pucks | 2.5 Pucks | 2.75 Pucks | 3.25 Pucks |
| **70-79 degrees** | .75 Puck | 1 Puck | 1.5 Pucks | 1.75 Pucks | 2 Pucks | 2.5 Pucks | 2.75 Pucks |
| **60-69 degrees** | .25 Puck | .75 Puck | 1 Puck | 1.5 Pucks | 1.75 Pucks | 2 Pucks | 2.5 Pucks |

Note: To ensure initial dispersion, ESC Pucks should be crushed and diluted in water prior to addition to the concrete mix.

| | | |
|---|---|---|
| 3 | 03 30 00 | Cast-in-Place Concrete |
| | 03 40 00 | Precast Concrete |
| | 03 70 00 | Mass Concrete |

MASTER® BUILDERS SOLUTIONS

# MasterSet® DELVO

## Hydration Controlling Admixture

### Description

MasterSet DELVO ready-to-use, liquid admixture is used for making more uniform and predictable high-performance concrete. MasterSet DELVO admixture retards setting time by controlling the hydration of portland cement and other cementitious materials while facilitating placing and finishing operations. MasterSet DELVO admixture meets ASTM C 494/C 494M requirements for Type B, retarding, and Type D, water-reducing and retarding, admixtures.

### Applications

Recommended for use in:

- Stabilization of concrete washwater
- Stabilization of returned plastic concrete
- Stabilization of freshly batched concrete for long hauls
- 4x4™ Concrete
- Pumped concrete, shotcrete (wet mix) and conventionally-placed concrete
- Plain, reinforced, precast, prestressed, lightweight and normal weight concrete
- Pervious concrete

### Features

- Reduced water content required for a given workability
- Retarded setting time characteristics
- Improved workability

### Benefits

- Provides flexibility in the scheduling of placing and finishing operations
- Offsets the effects of slump loss during extended delays between mixing and placing
- Reduces waste associated with concrete washwater and returned concrete
- Increased strength – compressive and flexural

### Performance Characteristics

**Rate of Hardening:** The temperature of a concrete mixture and the ambient temperature (forms, earth, air, etc.) affect the hardening rate of concrete. At higher temperatures, concrete hardens more rapidly which may cause problems with placing and finishing.

One of the functions of MasterSet DELVO admixture is to retard the set of concrete. Within the normal dosage range, it will generally extend the working and setting times of concrete containing normal portland cement, fly ash, slag cement and silica fume approximately 1 hour to 5 hours compared to a plain concrete mixture. This depends on job materials and temperatures. Trial mixtures should be made under approximate job conditions to determine the dosage required.

**Compressive Strength:** Concrete produced with MasterSet DELVO admixture will develop higher early (within 24 hours) and higher ultimate strengths than plain concrete when used within the recommended dosage range and under normal, comparable curing conditions. When MasterSet DELVO admixture is used in heat-cured concrete, the length of the preheating period should be increased until the initial set of the concrete is achieved. The actual heat-curing period is then reduced accordingly to maintain existing production cycles without sacrificing early or ultimate strengths.

## Guidelines for Use

**Dosage:** MasterSet DELVO admixture is recommended for use at a dosage of 4 ± 1 fl oz/cwt (260 ± 65 mL/100 kg) of cementitious materials for most concrete mixtures using average concrete ingredients. For long time-to-discharge applications, such as long hauls, dosages higher than the recommended range may be required. Specifically, for shotcrete applications, MasterSet DELVO admixture is recommended for use at a dosage of 1.5 fl oz/cwt to 25 fl oz/cwt (100 mL/100 kg to 1,500 mL/100 kg) of cementitious materials. Because of variations in job conditions and concrete materials, dosages other than the recommended amounts may be required. In such cases, contact your local sales representative. For concrete washwater and returned concrete stabilization, utilize MasterSet DELVO charts to determine the appropriate dosage rates.

## Product Notes

**Corrosivity – Non-Chloride, Non-Corrosive:** MasterSet DELVO admixture will neither initiate nor promote corrosion of reinforcing steel in concrete. This admixture does not contain intentionally-added calcium chloride or other chloride-based ingredients.

**Compatibility:** MasterSet DELVO admixture may be used in combination with any Master Builders Solutions admixture. When used in conjunction with another admixture, each admixture must be dispensed separately into the mixture.

**CAUTION:** While MasterSet DELVO and MasterLife CI 30 admixtures are compatible in the same concrete mixture when added separately, these two admixtures are NOT compatible in the same STORAGE TANK OR CONTAINER, in any ratio, as potentially harmful gas may result from blending the two. Contact a Master Builders Solutions representative if there are any questions regarding admixture storage or admixture compatibility.

## Storage and Handling

**Storage Temperature:** MasterSet DELVO admixture should be stored above freezing temperatures. If MasterSet DELVO admixture freezes, thaw at 35 °F (2 °C) or above and completely reconstitute by mild mechanical agitation. Do not use pressurized air for agitation.

**Shelf Life:** MasterSet DELVO admixture has a minimum shelf life of 12 months. Depending on storage conditions, the shelf life may be greater than stated. Please contact your local sales representative regarding suitability for use and dosage recommendations if the shelf life of MasterSet DELVO admixture has been exceeded.

## Packaging

MasterSet DELVO admixture is supplied in specially designed 55 gal (208 L) drums, 275 gal (1040 L) totes and by bulk delivery.

## Related Documents

Safety Data Sheets: MasterSet DELVO admixture

## Additional Information

For more information on MasterSet DELVO admixture, contact your local sales representative.

*Master Builders Solutions, a brand of MBCC Group, is a global leader of innovative chemistry systems and formulations for construction, maintenance, repair and restoration of structures. The Admixture Systems business provides advanced products, solutions and expertise that improve durability, water resistance, energy efficiency, safety, sustainability and aesthetics of concrete structures, above and below ground, helping customers to achieve reduced operating costs, improved efficiency and enhanced finished products.*

*Utilizing worldwide resources, the Master Builders Solutions community of experts are passionate about providing solutions to challenges within all stages of construction, as well as the life cycle of a structure. At Master Builders Solutions we create sustainable solutions for construction around the globe.*

## Limited Warranty Notice

Master Builders Solutions Admixtures US, LLC ("Master Builders Solutions") warrants this product to be free from manufacturing defects and to meet the technical properties on the current Technical Data Guide, if used as directed within shelf life. Satisfactory results depend not only on quality products but also upon many factors beyond our control. MASTER BUILDERS SOLUTIONS MAKES NO OTHER WARRANTY OR GUARANTEE, EXPRESS OR IMPLIED, INCLUDING WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE WITH RESPECT TO ITS PRODUCTS. The sole and exclusive remedy of Purchaser for any claim concerning this product, including but not limited to, claims alleging breach of warranty, negligence, strict liability or otherwise, is shipment to purchaser of product equal to the amount of product that fails to meet this warranty or refund of the original purchase price of product that fails to meet this warranty, at the sole option of Master Builders Solutions. Any claims concerning this product must be received in writing within one (1) year from the date of shipment and any claims not presented within that period are waived by Purchaser. MASTER BUILDERS SOLUTIONS WILL NOT BE RESPONSIBLE FOR ANY SPECIAL, INCIDENTAL, CONSEQUENTIAL (INCLUDING LOST PROFITS) OR PUNITIVE DAMAGES OF ANY KIND.

Purchaser must determine the suitability of the products for the intended use and assumes all risks and liabilities in connection therewith. This information and all further technical advice are based on Master Builders Solutions' present knowledge and experience. However, Master Builders Solutions assumes no liability for providing such information and advice including the extent to which such information and advice may relate to existing third party intellectual property rights, especially patent rights, nor shall any legal relationship be created by or arise from the provision of such information and advice. Master Builders Solutions reserves the right to make any changes according to technological progress or further developments. The Purchaser of the Product(s) must test the product(s) for suitability for the intended application and purpose before proceeding with a full application of the product(s). Performance of the product described herein should be verified by testing and carried out by qualified experts.

NSF Certified to NSF/ANSI 61

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# National Ready Mixed Concrete Association

NRMCA

## Certificate of Conformance For Concrete Production Facilities

THIS IS TO CERTIFY THAT

## *Mandan Plant 604, Mandan, ND*

## *Strata Corporation*

*"Facility does not meet all requirements for furnishing concrete in subfreezing weather"*

has been inspected by the undersigned licensed professional engineer for conformance with the requirements of the *Check List for Ready Mixed Concrete Production Facilities.* As of the inspection date, the facilities met the requirements for production by

***Truck Mixing with Automatic Batching and Recordings of Cementitious Materials, Aggregate, Water, and Chemical Admixtures***

REGISTERED PROFESSIONAL ENGINEER
CHAD GLEN ERICKSON
PE-7867
DATE 6/23/21
NORTH DAKOTA
(Seal)

Signature of Licensed Professional Engineer

| *June 17, 2021* | *June 17, 2023* |
|---|---|
| Inspection Date | Certification Expiration Date |

This company will maintain these facilities in compliance with the *Check List* requirements and will correct promptly any deficiencies which develop.

Signature of Company Official

Region 5 QC Manager
Title of Company Official

**NOTICE:** The Check List indicates only that plant facilities are satisfactory for the production of concrete when properly operated. Conformance of the concrete itself with specification requirements must be verified by usual inspection methods in accordance with sales agreements.

This certificate is issued by the National Ready Mixed Concrete Association on verification that the production facility conforms to the requirements of the NRMCA Certification of Ready Mixed Concrete Production Facilities, QC3. Unauthorized reproduction or misuse of this certificate may result in legal action.

Plant ID #: 856362

Certification ID #: 27717

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# National Ready Mixed Concrete Association

NRMCA

## Certificate of Conformance For Concrete Production Facilities

THIS IS TO CERTIFY THAT

***Mandan Plant 605-1, Mandan, ND***

***Strata Corporation***

has been inspected by the undersigned licensed professional engineer for conformance with the requirements of the *Check List for Ready Mixed Concrete Production Facilities.* As of the inspection date, the facilities met the requirements for production by

***Truck Mixing with Automatic Batching and Recordings of Cementitious Materials, Aggregate, Water, and Chemical Admixtures***

REGISTERED PROFESSIONAL ENGINEER
CHAD GLEN ERICKSON
PE-7867
DATE 30 April 2021
NORTH DAKOTA
(Seal)

Signature of Licensed Professional Engineer

| *April 22, 2021* | *May 15, 2023* |
|---|---|
| Inspection Date | Certification Expiration Date |

This company will maintain these facilities in compliance with the *Check List* requirements and will correct promptly any deficiencies which develop.

Signature of Company Official

Region 5 QC Manager
Title of Company Official

**NOTICE:** The Check List indicates only that plant facilities are satisfactory for the production of concrete when properly operated. Conformance of the concrete itself with specification requirements must be verified by usual inspection methods in accordance with sales agreements.

This certificate is issued by the National Ready Mixed Concrete Association on verification that the production facility conforms to the requirements of the NRMCA Certification of Ready Mixed Concrete Production Facilities, QC3. Unauthorized reproduction or

Plant ID #: 842222

Certification ID #: 27415

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