Final 2022 Annual Groundwater Monitoring and Corrective Action Report
LOS CCR Landfill

Leland Olds Station
Stanton, North Dakota

Basin Electric Power Cooperative

January 31, 2023
Project #60634996

Basin Electric Power Cooperative
Bismarck, North Dakota

Quality information

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List of Acronyms

AECOM	AECOM Technical Services, Inc.
Basin	Basin Electric Power Cooperative
CCR	Coal Combustion Residuals
EPA	United States Environmental Protection Agency
FGD	flue gas desulfurization
ft amsl	feet above mean sea level
GWPSs	groundwater protection standards
LCL	lower control limits
LOS	Leland Olds Station
LPL	lower prediction limit
mg/L	milligrams per liter
RCRA	Resource Conservation and Recovery Act
SSI	statistically significant increase
UCL	upper control limit
UPL	upper prediction limit

Executive Summary

This report summarizes groundwater monitoring and corrective action activities completed between January 1 and December 31, 2022, at the Coal Combustion Residuals (CCR) Landfill at Leland Olds Station (LOS), as required by 40 Code of Federal Regulations Section 257.90(e) of the United States Environmental Protection Agency (USEPA) CCR Rule.

The location of the CCR units and program monitoring network for the CCR units, including supporting monitoring wells are illustrated on **Figures 1** and **2**, respectively. In October, two (2) additional monitoring wells were added to the CCR monitoring network and four (4) existing monitoring wells were decommissioned on site (differentiated in **Figure 2**).

Detection-mode groundwater monitoring of the CCR Landfill was initiated in 2018. Detection monitoring through October 2022 identified no statistically significant increases (SSIs) of Appendix III constituents of boron, calcium, chloride, fluoride, pH, sulfate, and total dissolved solids in the downgradient monitoring wells MW-2016-2, MW-2016-9, MW-2016-10, and MW-2016-11. Accordingly, the unit remains in detection monitoring into the next year.

Other activities and conditions for the 2022 annual reporting period include:

- Semiannual Detection-mode groundwater monitoring events were conducted in June and October. Monitoring involved sampling of five background monitoring wells and four downgradient monitoring wells in June and sampling of three background and four downgradient monitoring wells in October.
- Two (2) monitoring wells (MW-2016-12 and MW-2016-13) were installed in October downgradient to the proposed Landfill Expansion Area
- Four (4) monitoring wells (MW-2016-1, MW-2016-4, MW-2016-5, and MW-2016-7) were decommissioned and abandoned from the program monitoring network.
- No program transitions (Detection to Assessment or vice versa) were triggered.
- No programmatic problems were encountered, so no remedies were required.

Anticipated activities for the next annual reporting period include:

- Completion of two semiannual Detection-mode groundwater monitoring events.
- Initiation of baseline monitoring of new landfill expansion wells in Spring 2023 (weather permitting) prior to anticipated CCR placement into the landfill expansion area in Fall 2023.
- Statistical evaluation of groundwater data for Appendix III constituents.

1. Introduction

On behalf of Basin Electric Power Cooperative, (Basin), AECOM Technical Services, Inc. (AECOM) has prepared the 2022 annual report documenting groundwater monitoring and corrective action for the Glenharold Coal Combustion Residuals (CCR) Landfill at Basin's Leland Olds Station (LOS).

Section 1 provides background information on the power generating facility, the CCR unit(s) present at the facility, and the physical setting of the CCR unit(s), specifically regarding groundwater conditions. Section 2 summarizes CCR groundwater monitoring activities conducted prior to the current reporting year. Section 3 summarizes the groundwater monitoring and corrective action activities completed in the current reporting year, and references attachments to this report that contain detailed documentation of those activities. Section 4 reports on general information including program transitions, problems encountered, and anticipated activities for the coming year. Section 5 summarizes the report content. Section 6 lists references cited in this report.

Regulatory Background

The CCR Rule, effective on October 19, 2015, established standards for the disposal of CCR in landfills and surface impoundments (CCR units). In particular, the rule set forth groundwater monitoring and corrective action requirements for CCR units. The Rule includes the requirement for an "annual groundwater monitoring and corrective action report" (annual report), submitted to the operating record annually on or before January 31 of the year following the monitoring period. The annual report is intended to document the status of the groundwater monitoring and corrective action program for each CCR unit, summarize key actions completed in the previous year, and project key activities for the upcoming year. This report is the sixth annual report, and includes activities performed in calendar year 2022.

Facility Location and Operational History

LOS is a coal-based generating station located southeast of Stanton, North Dakota (**Figure 1**). The plant, which began operating in 1966, consists of two power generating units with a total power output capacity of 669 megawatts.

CCR produced at LOS includes fly ash, bottom ash, and flue gas desulfurization (FGD) waste.

CCR Unit Description

CCR is disposed at LOS in the following CCR unit:

- CCR Landfill

The CCR Landfill is located approximately 3 miles southwest of the generating units and office complex, in an area of mine spoils (**Figure 1**). Basin reported that in 2022 the LOS CCR Landfill received approximately 240,000 cubic yards of solid waste, including fly ash, FGD waste, and a minor contribution of solid debris.

Physical Setting

The geology underlying the site includes mine spoils underlain by the Sentinel Butte Formation. This formation is comprised of continental deposits in excess of 1,000-feet thickness, consisting of dense clay, weakly cemented sandstone, mudstone, and lignite beds.

The topography of the surrounding areas consists of alluvial terraces and historic mine spoils. Much of the surrounding mined areas have historically been developed such that precipitation outside of the landfill footprint is generally redirected as surface water runoff toward drainage ditches and culverts that drain to Alderin Creek and ultimately to the Missouri River. Groundwater is recharged primarily through regional infiltration of melt water in the spring.

The base of the LOS CCR Landfill is underlain by approximately 50 feet of clay-rich mine spoil that overlies the Lower Sentinel Butte Formation. At the site, the Sentinel Butte is comprised primarily of dense clay with a trace very fine sand and sparse beds of lignite typically ranging from 6- to 9-feet thick. The 2016 AECOM drilling investigation did not penetrate to depths great enough to expose the lower portions of the Sentinel Butte.

The uppermost aquifer is found within the 6- to 9-foot unmined lignite bed located at depths ranging roughly from 86 to 125 feet below ground surface. The elevation of the lignite bed varies across the site by approximately 32 feet from 1,811 feet above mean sea level (ft amsl) at MW-2016-4 to 1,843 ft amsl at MW-2016-1. The potentiometric surface of the uppermost groundwater present within the lignite is approximately 1,880 ft amsl in the southern portion of the Landfill facility sloping generally north-northeast to 1,843 ft amsl on the northern side of the landfill. Aquifer testing completed at monitoring wells MW-2016-4, MW-2016-8, and MW-2016-10 indicates an average hydraulic conductivity of 1.21×10^{-5} centimeters per second for the saturated materials.

2. CCR Groundwater Monitoring Activity Prior to 2022

The regulatory process for CCR groundwater monitoring and corrective action is established by 40 Code of Federal Regulations (CFR) Sections 257.90 through 257.98. The process includes a phased approach to groundwater monitoring, leading (if applicable) to the establishment of groundwater protection standards (GWPSs) for each CCR unit. Exceedances of the GWPSs that are determined to be statistically significant can trigger requirements for additional groundwater characterization and Assessment of Corrective Measures followed by selection of remedy and remedy implementation.

The following paragraphs provide a brief summary of CCR groundwater monitoring activities performed prior to 2022. CCR groundwater monitoring activities performed between January and December 2022 are discussed in Section 3.

Groundwater monitoring at the CCR Landfill is performed using a network of monitoring wells that includes wells to monitor background water quality that is not potentially influenced by the presence of the CCR unit and wells placed at the downgradient boundary of the unit (**Figure 2**). The hydro-stratigraphic positions of the CCR monitoring wells selected for sampling background and downgradient groundwater quality for the LOS CCR Landfill are summarized below:

CCR unit	Background wells	Downgradient wells
Active Landfill	MW-2016-3, MW-2016-4, MW-2016-5, MW-2016-6, MW-2016-8	MW-2016-2, MW-2016-9, MW-2016-10, MW-2016-11

Two monitoring wells have historically been excluded from the groundwater monitoring network due to deficiencies. Monitoring well MW-2016-1 was excluded due to insufficient water production to obtain a representative sample. Monitoring well MW-2016-7 was excluded due to screen interval placement that is not representative of the uppermost aquifer monitoring at the site.

Baseline monitoring, initiated in August 2016, involved sampling groundwater for Appendix III and Appendix IV constituents over eight Baseline Detection monitoring events.

Baseline detection monitoring events were performed in general accordance with procedures established in the site-specific Sampling and Analysis Plan (AECOM 2018a), which is included in the facility's Operating Record. The Sampling and Analysis Plan describes the procedures for equipment calibration, monitoring well water level measurement, monitoring well purging and sampling, sample custody, sample shipping, laboratory analysis, and documentation requirements for each groundwater sample submitted. The results of the baseline monitoring and 2018 detection monitoring at the LOS CCR Landfill were presented and discussed in the First and Second Annual Groundwater Monitoring and Corrective Action Reports (AECOM 2018b, 2019). The LOS CCR Landfill was placed in detection monitoring in the winter of 2018 with the first detection monitoring groundwater sampling event completed in April 2018, then twice annually thereafter. The results of detection monitoring at the LOS CCR Landfill in 2018, 2019, 2020, and 2021 were presented and discussed in the Second, Third, Fourth, and Fifth Annual Groundwater Monitoring and Corrective Action Reports issued on January 31, 2019 (AECOM 2019); January 31, 2020 (AECOM 2020); January 31, 2021 (AECOM 2021); and January 31, 2022 (AECOM 2022a) respectively.

3. CCR Groundwater Monitoring and Corrective Action Activities in 2022

This section summarizes the groundwater monitoring and corrective action conducted at the LOS CCR Landfill in 2022 to comply with the groundwater requirements of the CCR rule:

- Groundwater Detection monitoring activities:
  - monitoring system evaluation completed in June and October 2022
  - groundwater sampling completed in June and October 2022
  - laboratory analysis of groundwater samples in June and October 2022
  - statistical analysis of the monitoring results of the groundwater samples in June and October 2022
- Groundwater Corrective Action – Not applicable
- Expansion of monitoring well network included installation of two monitoring wells (MW-2016-12 and MW-2016-13)
- Abandonment of existing network monitoring wells including MW-2016-1, MW-2016-4, MW-2016-5, and MW-2016-7 in October.

Further details concerning each of these activities, including a brief discussion of work completed during the reporting period, are provided below.

Detection Monitoring Activities

Monitoring System Evaluation

As described in the CCR Groundwater Monitoring System Report (AECOM 2017), monitoring wells were installed around the CCR unit at LOS with appropriate total depth and placement of the well screen to: (1) facilitate collection of representative groundwater samples from the uppermost aquifer; and (2) accurately measure water table elevations to support evaluation of groundwater gradient and flow direction. All monitoring wells comprising the LOS CCR Landfill monitoring system were found to be in good condition during the detection monitoring events conducted in 2022.

Potentiometric surface maps constructed using the depth-to-groundwater measurements obtained at the beginning of each detection monitoring event are presented in **Attachment A**. The direction of groundwater flow observed in June and October 2022 was generally north-northeast, which is consistent with the direction observed in previous years. The flow direction supports the designation of the wells noted in Section 2 above to represent background groundwater quality and the quality of groundwater downgradient of the unit.

Groundwater Sampling and Analysis

The detection monitoring events completed in 2022 included analysis of collected groundwater samples for the constituents listed in Part 257 Appendix III. The tabulated laboratory analytical results are presented in **Attachment A** along with potentiometric surface maps for the uppermost aquifer, inferred groundwater flow direction and estimated velocities, and a tabulated summary of field measurements.

Sampling and analysis in 2022 was performed in general accordance with procedures established in the Sampling and Analysis Plan, Revision 1 (AECOM 2022b).

Two monitoring wells were installed between October 2 and 6, 2022 to evaluate the uppermost aquifer northwest of the existing landfill in preparation for a planned expansion into this area. A copy of the boring log and well diagram for both monitoring wells is provided as **Attachment B**. Baseline groundwater monitoring events are expected to begin in spring of 2023 with analysis for the constituents listed in Part 257 Appendix III and Appendix IV.

Four existing monitoring wells were abandoned in September and early October 2022 in preparation for the anticipated landfill expansion. The abandoned wells included MW-2016-1 and MW-2016-7, both of which have historically been excluded from Detection monitoring as discussed in Section 2, along with monitoring wells MW-2016-4 and MW-2016-5. Monitoring wells MW-2016-4 and MW-2016-5 were removed as they were located in the footprint of the landfill expansion.

Statistical Procedures and Analysis

The cumulative groundwater data collected for Appendix III indicator parameters at the LOS CCR Landfill were evaluated in accordance with the statistical procedures certified on October 17, 2017 (AECOM 2017).The Appendix III groundwater quality data were evaluated to determine whether any constituents showed a statistically significant increase (SSI) over background using an interwell approach that statistically compared constituent concentrations at downgradient monitoring wells to those present at the background monitoring wells. ProUCL Version 5.1 was selected for the development of site-specific background upper prediction limits (UPLs) with a 95-percent confidence for each Appendix III constituent utilizing monitoring well data from background monitoring wells collected between September 2016 and October 2020. The input file used for development of the UPLs is provided as **Attachment C**. A lower prediction limit (LPL) was also developed for pH which is a two-sided parameter. The concentrations of detected Appendix III constituents were entered as reported by the laboratory [non-detections set to Reporting Limit (RL)] and evaluated using ProUCL to determine if the population exhibited a normal, lognormal, or nonparametric distribution.

Data from the downgradient monitoring wells during the 2022 reporting period were compared to the UPL or LPL to identify statistically significant increases (SSIs) over background. Statistical analysis for the current reporting period compares compliance well data to UPLs, where non-detect values are represented as one-half the method detection limit. The results of the analyses, including the UPLs and LPL for pH, are provided in **Table 1**. The statistical analysis results indicate that calcium, chloride, fluoride, pH, sulfate and total dissolved solids (TDS) do not currently exhibit SSIs over background. pH also does not exhibit an SSI below background as presented in **Table 2**.

Boron was evaluated using a control chart and upper and lower control limits were developed using the mean ± 4.5 standard deviations. Starks (1988); USEPA (2009), and ASTM (2017) suggest using 4.5 standard deviations to develop control limits for groundwater detection monitoring. **Figure 1** presents the control chart that shows the background mean (0.256 milligrams per liter [mg/L]), upper and lower control limits (UCL and LCL), 0.341 and 0.171 mg/L, respectively, and the baseline and detection monitoring results for downgradient compliance wells through October 2022. The results indicate that boron does not exceed the UCL at monitoring wells for any sampling event and does not currently exhibit a SSI over background at any of the downgradient compliance wells.

Based on these results, no SSIs were identified at the LOS Landfill and Assessment monitoring is not required. and Detection monitoring should continue at the LOS Landfill in 2023.

4. General Information

The following subsections summarize any problems encountered in the LOS CCR Landfill program through 2022, any resolutions to those problems, if needed, and upcoming actions planned for 2023.

Program Transitions 2022

There were no groundwater monitoring program transitions for the LOS CCR Landfill monitoring system during the January–December 2022 reporting period.

Problems Encountered

No problems were encountered during the December–January 2022 monitoring period.

Actions Planned for 2023

Basin plans on continuing the Detection monitoring program for the LOS Landfill in 2023. The Detection monitoring program will include semi-annual groundwater sampling events and the required statistical evaluations.

Basin plans to begin baseline sampling of the two newly installed wells downgradient of the proposed expansion area for groundwater analysis of the CCR Rule Part 257 Appendix III and Appendix IV constituents. This will include statistical evaluations of each sampling event to obtain information about background water quality prior to acceptance of CCR material into the landfill expansion area.

5. Summary and Conclusions

Basin conducted two rounds of CCR groundwater detection monitoring at the LOS CCR Landfill between January and December 2022. The results were used to establish background groundwater quality for Appendix III constituents in the uppermost aquifer, identify appropriate UPLs and LPLs, and determine whether any Appendix III constituents experienced SSIs downgradient of the CCR unit.

The statistical analysis results indicate that none of the Appendix III constituents had SSIs over background or statistically significant increasing trends in constituent concentrations. Based on these results, assessment monitoring is not required at the LOS CCR Landfill and Detection monitoring will continue at the site in 2023.

6. References

AECOM Technical Services, Inc. (AECOM). 2017. CCR Groundwater Monitoring System Report, Leland Olds Station, Stanton, North Dakota. Basin Electric Power Cooperative. October 2017.

AECOM. 2018a. Sampling and Analysis Plan, CCR Monitoring Program, Leland Olds Station, Stanton, North Dakota. Basin Electric Power Cooperative. January 2018.

AECOM. 2018b. First Annual Groundwater Monitoring and Corrective Action Report, 2016-2017, Leland Olds Station, Stanton, North Dakota. Basin Electric Power Cooperative. January 2018.

AECOM. 2019. Second Annual Groundwater Monitoring and Corrective Action Report, 2018, Leland Olds Station, Stanton, North Dakota. Basin Electric Power Cooperative. January 2019.

AECOM. 2020. Third Annual Groundwater Monitoring and Corrective Action Report, 2019, Leland Olds Station, Stanton, North Dakota. Basin Electric Power Cooperative. January 2020.

AECOM. 2021. Fourth Annual Groundwater Monitoring and Corrective Action Report, 2019, Leland Olds Station, Stanton, North Dakota. Basin Electric Power Cooperative. January 2021.

AECOM. 2022a. Fifth Annual Groundwater Monitoring and Corrective Action Report, 2019, Leland Olds Station, Stanton, North Dakota. Basin Electric Power Cooperative. January 2021.

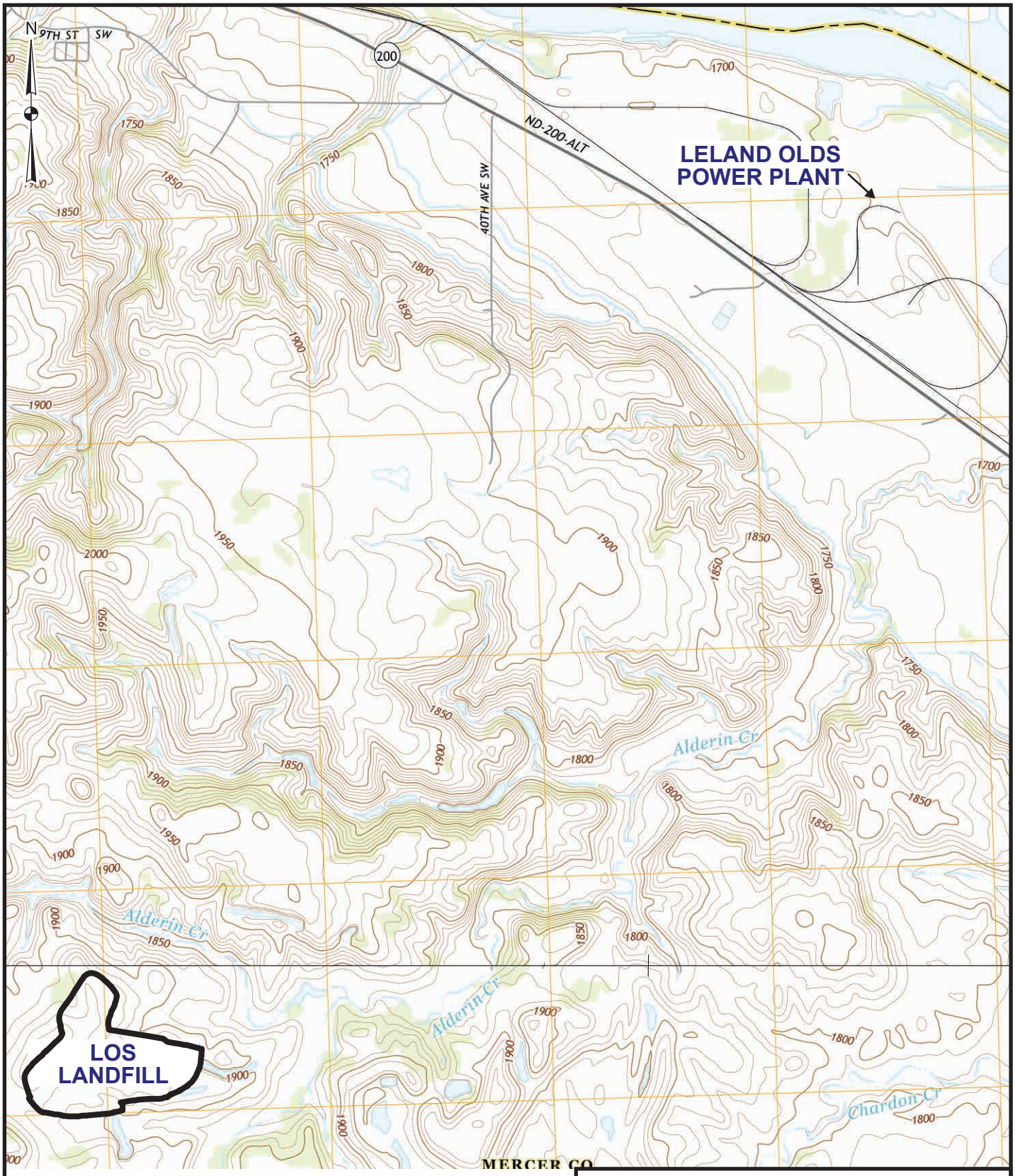
AECOM. 2022b. Sampling and Analysis Plan, Revision 1, CCR Monitoring Program, Leland Olds Station, Stanton, North Dakota. Basin Electric Power Cooperative. June 2022.

American Society of Testing and Materials. 2017. Designation D6312-17 Standard Guide for Developing Appropriate Statistical Approaches for Groundwater Detection Monitoring Programs at Waste Disposal Facilities, 15 pp.

Starks, T. H. 1988, Evaluation of Control Chart Methodologies for RCRA Waste Sites, U.S. Environmental Protection Agency EPA/600/4-88/040, December, 40 pp.

U.S. Environmental Protection Agency. 2009. Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities. Unified Guidance. EPA 530-R-09-007. March 2009. 884 pp.

Figures



J:\Project\B\Basin Electric Coop\60514340 LOS Landfill CCR Well\Data-Tech\TI

0 2,000 4,000

APPROXIMATE SCALE IN FEET

ND

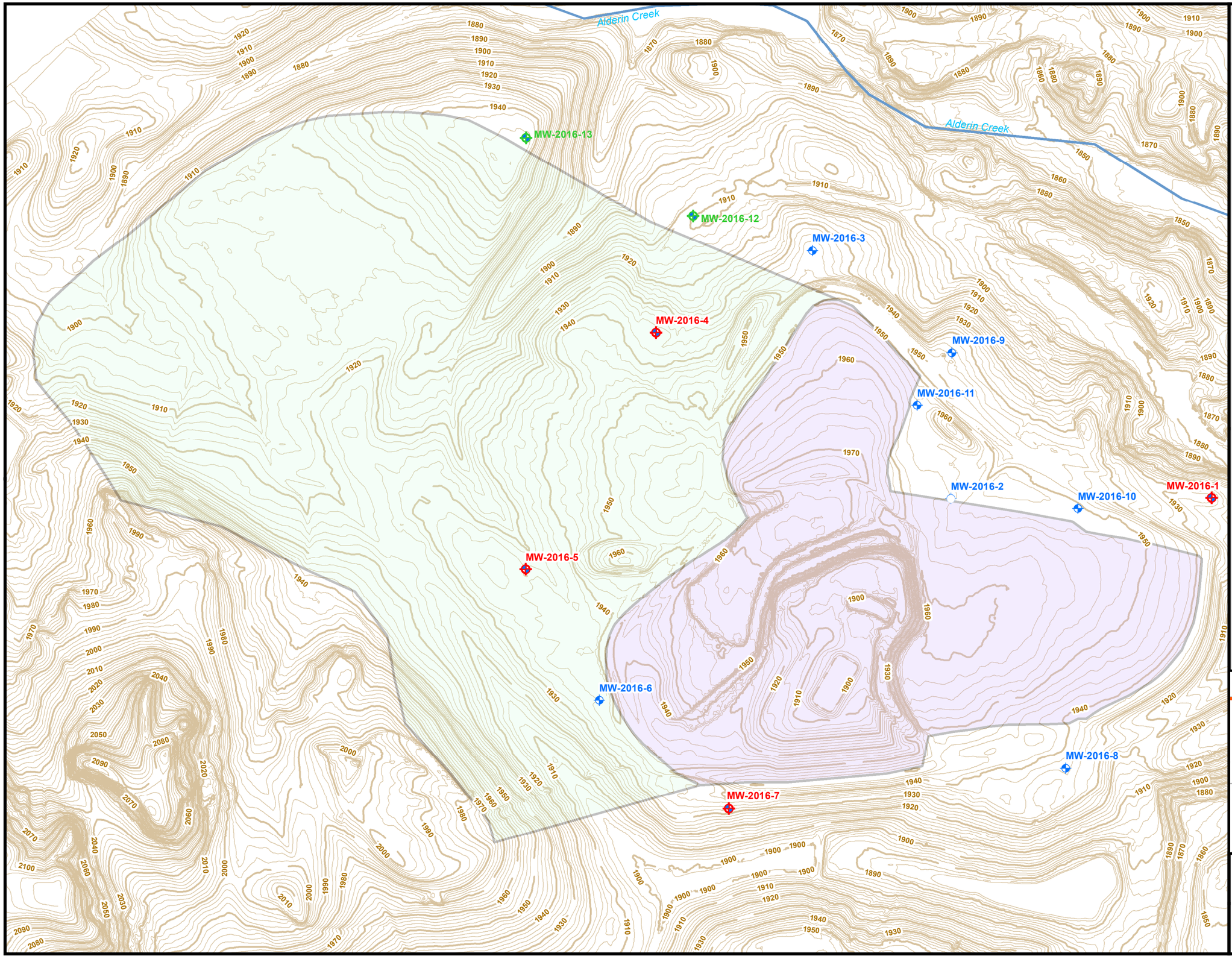
Quadrangle Location

BASE MAP SOURCE: USGS 7½ minute topographic quadrangle maps: Hannover NE, North Dakota 2014; Stanton SE, North Dakota 2014.

BASIN ELECTRIC POWER COOPERATIVE

FIGURE 1
SITE VICINITY MAP
LOS LANDFILL

JOB NO. 60634996



Legend

- Monitoring Well
- Abandoned Well (October 2022)
- New Expansion Monitoring Well
- Existing Limits of Waste
- Expansion Limits of Waste
- Surface Contours (2-foot interval)

N
W E
S

1 inch = 400 feet

0 0.05 0.1 Miles

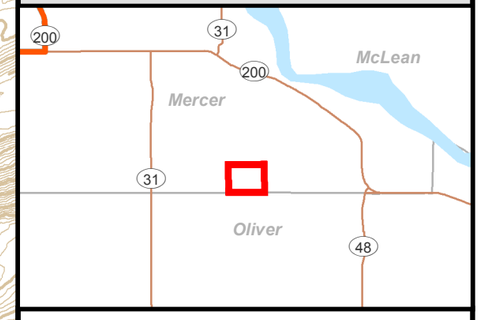


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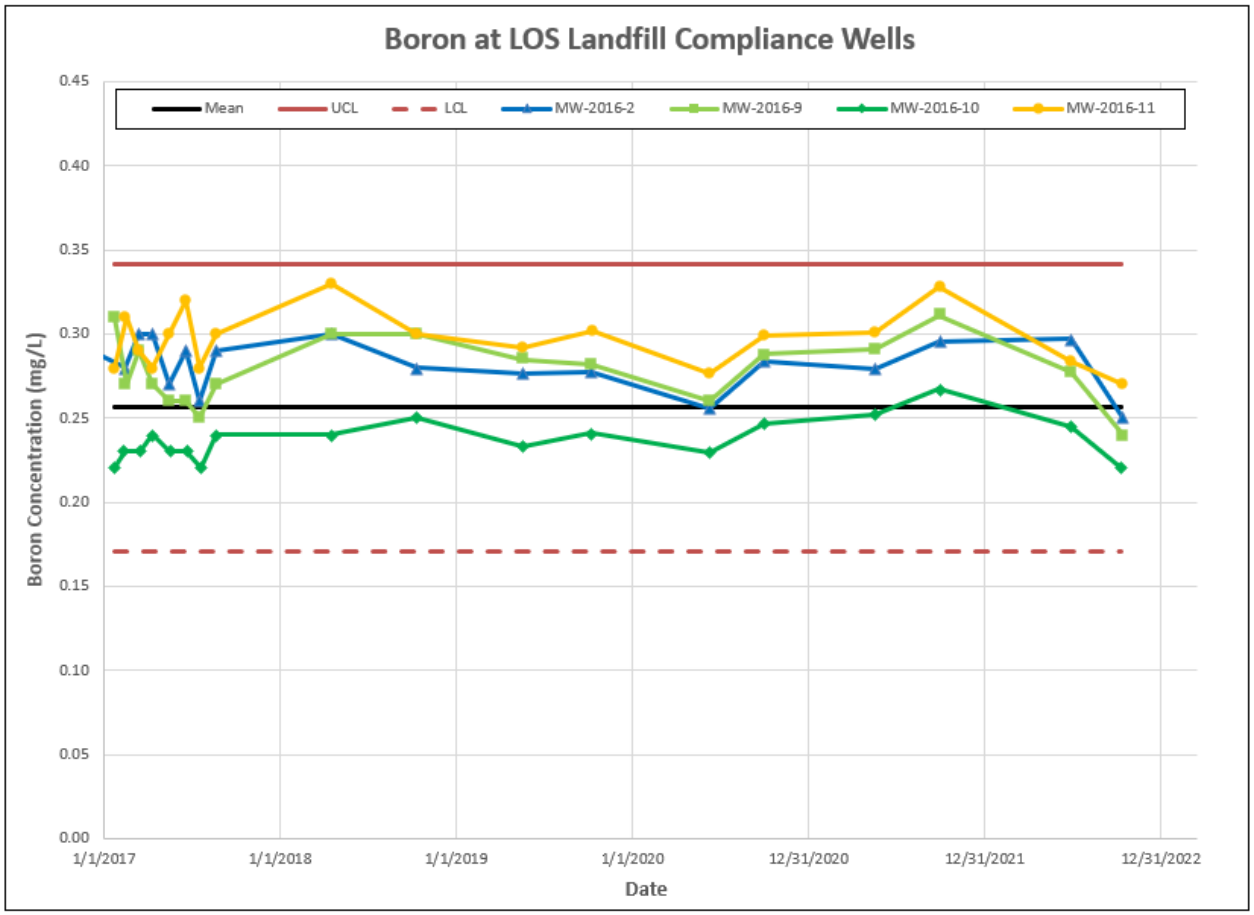
FIGURE 2
LOS CCR MONITORING WELL NETWORK

AECOM

Figure 3. Boron Control Chart for October 2022
2022 Annual Groundwater Monitoring and Corrective Action Report
Leland Olds Station CCR Landfill, North Dakota



Tables

Table 1. Background Upper Prediction Limits (UPLs) or Control Limits
2022 Annual Groundwater Monitoring and Corrective Action Report
Leland Olds Station CCR Landfill, North Dakota

Parameter (Units)	Number of Samples	Percent Nondetects	Normal or Lognormal Distribution?	Statistical Method	Background Prediction or Control Limit
Boron (mg/L)	71	0	Yes/Yes	Control Chart 99.9% UCL	0.331
Calcium (mg/L)	70	0	No/Yes	Parametric 95% UPL	20.79
Chloride (mg/L)	71	8no.5	No/No	Nonparametric 95% UPL	38.16
Fluoride (mg/L)	70	41	No/No	Nonparametric 95% UPL	2.5
pH (std units)	83	0	No/No	Nonparametric 95% LPL/UPL	7.25/8.24
Sulfate (mg/L)	71	0	No/No	Nonparametric 95% UPL	741
TDS (mg/L)	71	0	No/No	Nonparametric 95% UPL	2,200

Notes:
Background Prediction limits calculated using data from May 2016 through October 2020
pH has both an LPL and UPL; all other constituents only have an UPL or UCL.
mg/L= milligrams per liter
TDS = total dissolved solids
UCL = Upper Control Limit
LPL = Lower Control Limit

Table 2. Statistical Method Analysis Results
2022 Annual Groundwater Monitoring and Corrective Action Report
Leland Olds Station CCR Landfill, North Dakota

Well	Location	B	Ca	Cl	F	pH (LPL/UPL)		SO_4	TDS
MW-2016-2	Downgradient								
MW-2016-9	Downgradient								
MW-2016-10	Downgradient								
MW-2016-11	Downgradient								

Notes:

SSIs determined using interwell upper prediction limits (UPLs) at background monitoring wells MW-2016-3, MW-2016-6, and MW-2016-8. Background monitoring wells MW-2016-4 and MW-2016-5 were abandoned in October 2022.

Less than or equal to background upper prediction limit (UPL) or greater than lower prediction limit (LPL) for pH

Unverified statistically significant increase (SSI) over background UPL or below background LPL for pH

Verified SSI over background UPL or below background LPL for pH

Attachment A
Sampling and Analysis Report, 2022

2022 Groundwater Sampling and Analysis Report
LOS CCR Landfill
Monitoring Program

Leland Olds Station
Stanton, North Dakota

Basin Electric Power Cooperative

January 31, 2023

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Figure 2 LOS CCR Monitoring Well Network October 11, 2022

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Table 1B October 2022 Groundwater Monitoring Water Levels and Elevations
Table 2 Estimated Groundwater Gradient and Seepage Velocity, CCR Program Monitoring Wells
Table 3 2022 Analytical Results Summary

Appendix

Appendix I Laboratory Reports

List of Acronyms

AECOM	AECOM Technical Services, Inc.
Basin	Basin Electric Power Cooperative
CCR	Coal Combustion Residuals
CFR	Code of Federal Regulations
EPA	United States Environmental Protection Agency
LOS	Leland Olds Station

1. Introduction

On behalf of Basin Electric Power Cooperative (Basin), AECOM Technical Services, Inc. (AECOM) prepared this Coal Combustion Residuals (CCR) Groundwater Sampling and Analysis Report for the Basin Leland Olds Station (LOS) CCR Landfill.

This Report was prepared to present the results of sampling and analysis of groundwater conducted for the monitoring requirements of the United States Environmental Protection Agency (EPA) CCR rule (Chapter 40 of the Code of Federal Regulations (CFR), Sections 257.90 to 257.98). Specifically, the report presents the data collected for the two groundwater Detection monitoring events conducted in 2022.

2. Groundwater Flow

As required by 40 CFR Section 257.93(c), groundwater elevations were measured in each well prior to purging, each time groundwater was sampled. The measurements, presented in **Tables 1A and 1B**, were used to create potentiometric surface maps for the uppermost aquifer for the Detection monitoring events. The resulting potentiometric surface maps were used to evaluate the direction and rate of groundwater flow across the subject CCR unit. **Figure 1** and **Figure 2** represent potentiometric surface maps constructed using measurements taken on June 28, 2022 and October 11, 2022 , respectively. The maps and show the inferred groundwater flow directions for the CCR unit, which are generally consistent with the patterns observed during previous monitoring events. Calculated groundwater flow velocities are summarized in **Table 2**.

Based on the groundwater flow conditions documented in this chapter, the relative functions of the monitoring wells employed in the LOS CCR Landfill groundwater monitoring system are as follows:

CCR unit	Background wells	Downgradient wells
Active Landfill	MW-2016-3, MW-2016-4*, MW-2016-5*, MW-2016-6, MW-2016-8	MW-2016-2, MW-2016-9, MW-2016-10, MW-2016-11
Landfill Expansion Area	See Above	MW-2016-12, MW-2016-13

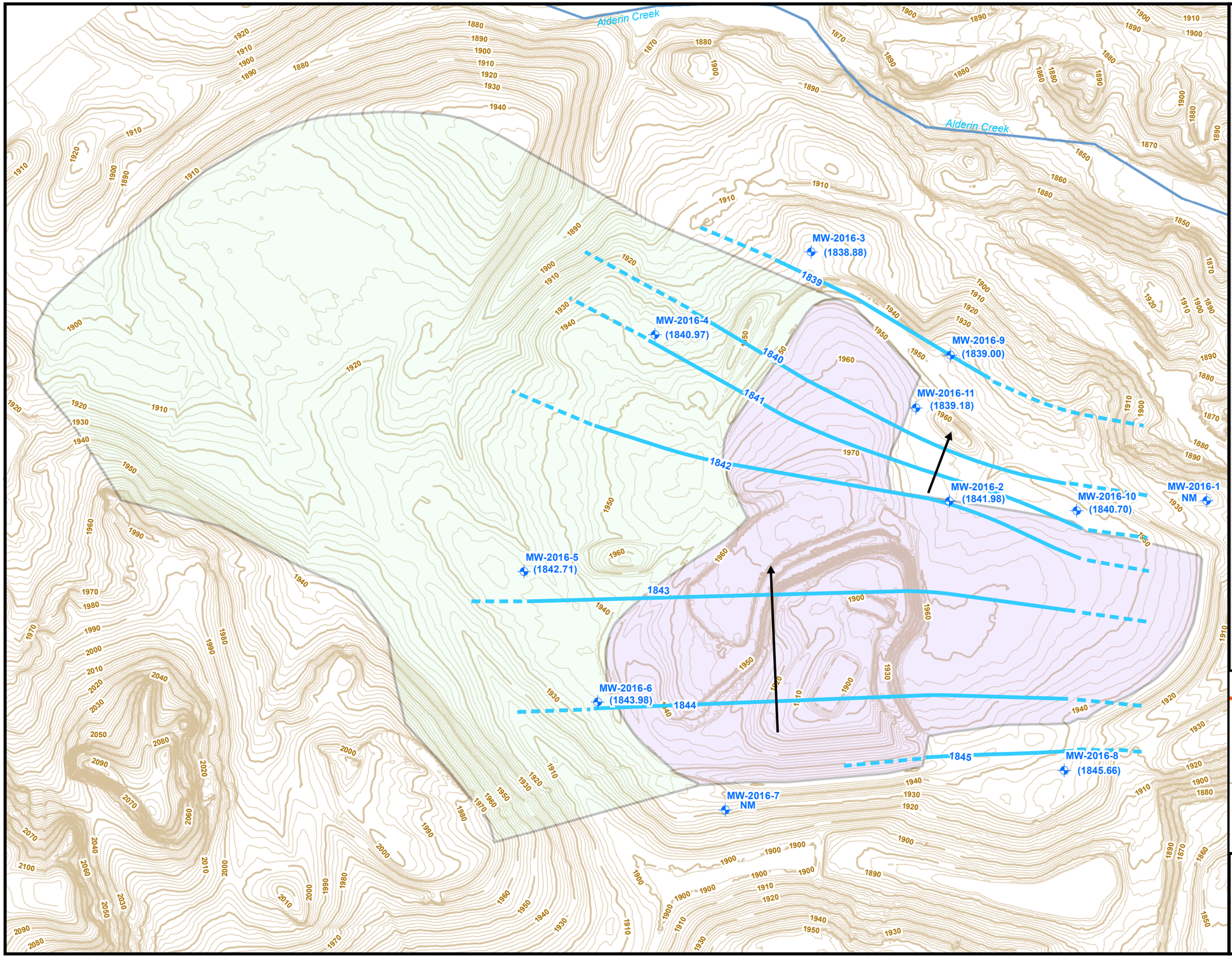
*= abandoned Fall 2022 in preparation of landfill expansion

Monitoring wells MW-2016-1 and MW-2016-7 were omitted from the LOS CCR Landfill program monitoring network following conclusion of the baseline monitoring period in 2017 and had only been used occasionally for water level gauging. These two wells along with monitoring wells MW-2016-4, and MW-2016-5 were decommissioned in late September to early October 2022 in preparation for landfill expansion. MW-2016-1 and MW-2016-7 were not gauged during either monitoring event in 2022. MW-2016-4 and MW-2016-5 were included in the LOS CCR Landfill program monitoring and were gauged and sampled during the June 2022 event but were abandoned prior to the sampling event in October 2022.

3. Groundwater Quality

The analytical testing laboratory reports for the 2022 monitoring events as presented in **Appendix I** were reviewed for completeness against the project-required methods and the chain-of-custody forms. Laboratory reports were also reviewed for holding times, and that the data was appropriately flagged based on the quality assurance/quality control testing results provided by the laboratory. The results were compiled into a summary form as presented in **Table 3**.

Figures



Legend

- Monitoring Well
- Existing Limits of Waste
- Expansion Limits of Waste
- Surface Contours (2-foot interval)
- Piezometric Surface Contour Dashed where inferred (1-foot interval)
- Groundwater Flow Direction

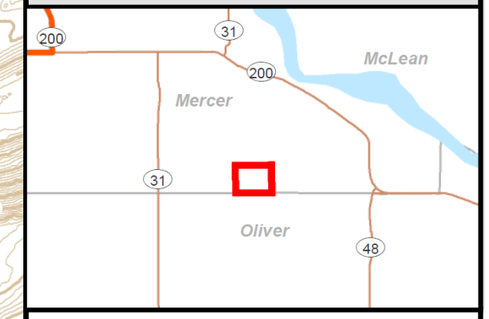
Note:
Groundwater elevations were obtained on June 28, 2022.

NM Not Measured

N
W E
S

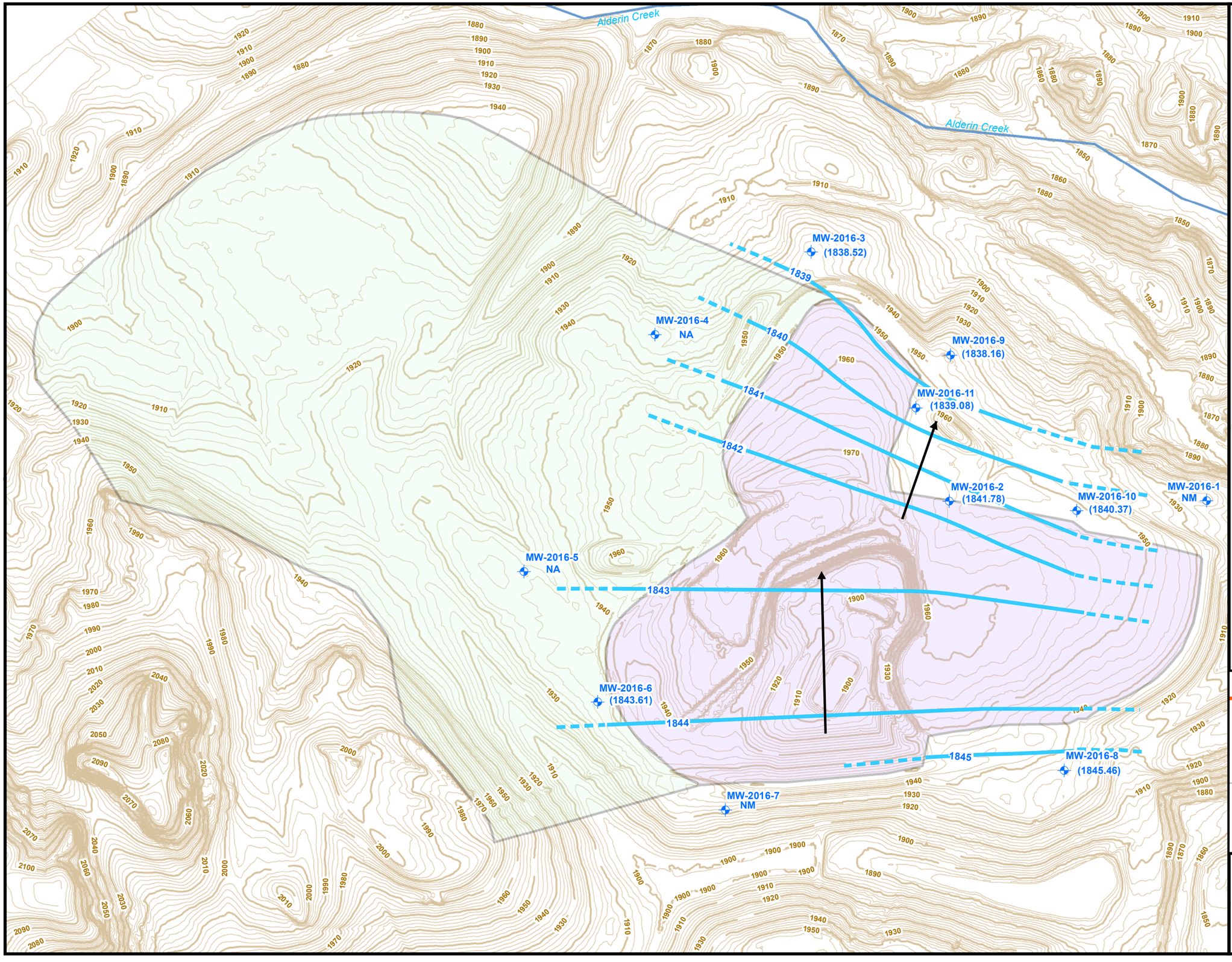
1 inch = 400 feet

0 400 800
Feet



BASIN ELECTRIC POWER COOPERATIVE
LOS LANDFILL
FIGURE 1
POTENTIOMETRIC SURFACE MAP
JUNE 28, 2022

JOB NO. 60634996 AECOM



Legend

- Monitoring Well
- Existing Limits of Waste
- Expansion Limits of Waste
- Surface Contours (2-foot interval)
- Piezometric Surface Contour Dashed where inferred (1-foot interval)
- Groundwater Flow Direction

Note:
Groundwater elevations were obtained on October 11, 2022

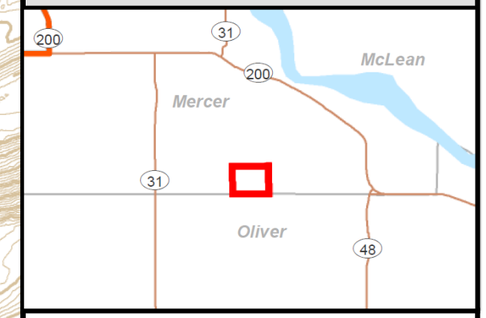
NM Not Measured

NA Not Applicable

N
W E
S

1 inch = 400 feet

0 0.05 0.1 Miles



BASIN ELECTRIC POWER COOPERATIVE
LOS LANDFILL
FIGURE 1
POTENTIOMETRIC SURFACE MAP
OCTOBER 11, 2022
JOB NO. 60634996 AECOM

Tables

Table 1A
June 2022 Groundwater Monitoring Water Levels and Elevations
CCR Program Monitoring Wells
Leland Olds Station CCR Landfill- Stanton, North Dakota

	Reference Elevation	June 28, 2022	Groundwater
	Top of Casing	Depth to Water	Elevation
Well ID	(feet, NAVD 88)	(feet)	(feet, NAVD 88)
MW-2016-1	1931.73	Not Measured	Not Measured
MW-2016-2	1957.98	116	1841.98
MW-2016-3	1939.88	101	1838.88
MW-2016-4	1939.97	99	1840.97
MW-2016-5	1937.54	94.83	1842.71
MW-2016-6	1939.31	95.33	1843.98
MW-2016-7	1936.11	Not Measured	Not Measured
MW-2016-8	1939.361	93.70	1845.66
MW-2016-9	1947.392	108.39	1839.00
MW-2016-10	1953.315	112.62	1840.70
MW-2016-11	1956.73	117.55	1839.18

Notes:
NAVD 88 = North American Vertical Datum 1988

Table 1B
October 2022 Groundwater Monitoring Water Levels and Elevations
CCR Program Monitoring Wells
Leland Olds Station CCR Landfill- Stanton, North Dakota

	Reference Elevation	October 11, 2022	Groundwater
	Top of Casing	Depth to Water	Elevation
Well ID	(feet, NAVD 88)	(feet)	(feet, NAVD 88)
MW-2016-1	1931.73	Abandoned	Not Measured
MW-2016-2	1957.98	116.2	1841.78
MW-2016-3	1939.88	101.36	1838.52
MW-2016-4	1939.97	Abandoned	Not Measured
MW-2016-5	1937.54	Abandoned	Not Measured
MW-2016-6	1939.31	95.7	1843.61
MW-2016-7	1936.11	Abandoned	Not Measured
MW-2016-8	1939.361	93.90	1845.46
MW-2016-9	1947.392	109.23	1838.16
MW-2016-10	1953.315	112.95	1840.37
MW-2016-11	1956.73	117.65	1839.08

Notes:
NAVD 88 = North American Vertical Datum 1988

TABLE 2

ESTIMATED GROUNDWATER GRADIENT AND SEEPAGE VELOCITY
CCR PROGRAM MONITORING WELLS

LELAND OLDS STATION CCR LANDFILL – STANTON, NORTH DAKOTA

Date of event	d_l (ft)	d_h (ft)	i (ft/ft)	n_e	K (ft/day)	v_s (ft/day)
9/27/2016	680	4	5.88E-03	0.185	0.0344	1.09E-03
2/13/2017	680	3	4.41E-03	0.185	0.0344	8.20E-04
3/16/2017	600	4	6.67E-03	0.185	0.0344	1.24E-03
4/11/2017	600	3	5.00E-03	0.185	0.0344	9.30E-04
5/17/2017	920	4	4.35E-03	0.185	0.0344	8.08E-04
6/20/2017	880	4	4.55E-03	0.185	0.0344	8.45E-04
7/18/2017	960	6	6.25E-03	0.185	0.0344	1.16E-03
8/21/2017	960	5	5.21E-03	0.185	0.0344	9.68E-04
4/18/2018	800	4	5.00E-03	0.185	0.0344	9.30E-04
10/11/2018	960	3	3.13E-03	0.185	0.0344	5.81E-04
5/20/2019	800	2	2.50E-03	0.185	0.0344	4.65E-04
10/8/2019	1080	4	3.70E-03	0.185	0.0344	6.89E-04
6/9/2020	800	2	2.50E-03	0.185	0.0344	4.65E-04
9/30/2020	640	2	3.13E-03	0.185	0.0344	5.81E-04
5/17/2021	740	2	2.70E-03	0.185	0.0344	5.03E-04
9/27/2021	1290	2	1.55E-03	0.185	0.0344	2.88E-04
6/28/2022	1700	5	2.92E-03	0.185	0.0344	5.43E-04
10/11/2022	1700	5	2.99E-03	0.185	0.0344	5.57E-04

d_l = Horizontal separation between upgradient and downgradient locations perpendicular to potentiometric contours

d_h = Change in hydraulic head between upgradient and downgradient locations

i = Hydraulic gradient (change in elevation over distance)

n_e = Site average porosity of 18.5%

K = Site average hydraulic conductivity of 3.44 E-02 ft/day from slug and pumping tests at site

v_s = Seepage Velocity (ft/day)

Hydraulic Gradient Governing Equation[1] – $i = -dh/dl$

Seepage Velocity Governing Equation[2] – $v_s = -K * i / n_e$

1. In textbook form, d_h is a negative number as hydraulic head is reported as the higher value subtracted from the lower value.
2. Negative operation performed as in textbook form, hydraulic gradient is negative.

Table 3

2022 Analytical Results Summary
LOS Landfill CCR Monitoring Well Network
Leland Olds Station - Stanton North Dakota

			Appendix III Constituents															
			Boron		Calcium		Chloride		Fluoride		pH		Sulfate		Total Dissolved Solids			
			mg/L		mg/L		mg/L		mg/L		SU		mg/L		mg/L			
Well ID	Event	Date																
MW-2016-2	June 2022	6/29/2022	0.297		6.88		21.8		< 0.500	U	7.65		246		1630	H		
MW-2016-3	June 2022	6/29/2022	0.259		4.71		36.1	F1	0.576	F1	7.78		39.1	F1	1480	H		
MW-2016-4	June 2022	6/28/2022	0.25		5.17		15.6		0.565		8.05		394		1660	H		
MW-2016-5	June 2022	6/29/2022	0.257		7.14		7.18		0.535		7.71		613		1900	H		
MW-2016-6	June 2022	6/29/2022	0.281		8.56		5.99		< 0.500	U	7.77		705		2070	H		
MW-2016-8	June 2022	6/28/2022	0.27		12.9		8.22		< 0.500	U	7.85		735		2220	H		
MW-2016-9	June 2022	6/29/2022	0.277		6.43		18.9		< 0.500	U	7.61		211		1680	H		
MW-2016-10	June 2022	6/29/2022	0.245		5.48		13.7		< 0.500	U	7.81		356		1690	H		
MW-2016-10 (Dup)	June 2022	6/29/2022	0.252		5.68		13.6		< 0.500	U	7.81		355		1680	H		
MW-2016-11	June 2022	6/29/2022	0.284		8.57		12.5		< 0.500	U	7.66		291		1740	H		
MW-2016-2	October 2022	10/12/22	0.25		9.40		15.9		0.53		7.59		334		1730			
MW-2016-3	October 2022	10/11/22	0.22		5.09		36.5		0.69		8.04		45.2		1470			
MW-2016-6	October 2022	10/11/22	0.24		8.55		9.3		0.48		7.85		637		2070			
MW-2016-8	October 2022	10/11/22	0.22		12.8		11.6		0.37		7.89		697		2270			
MW-2016-8 (Dup)	October 2022	10/11/22	0.24		13.5		11.5		0.36		7.89		741		2300			
MW-2016-9	October 2022	10/12/22	0.24		6.67		20.8		0.54		7.9		176		1670			
MW-2016-10	October 2022	10/11/22	0.22		5.89		16.2		0.61		8.06		340		1680			
MW-2016-11	October 2022	10/12/22	0.27		6.99		21.6		0.56		7.92		241		1600			

Notes:
mg/L = milligrams per liter
S.U. = Standard units
< = less than
H = Sample was prepped or analyzed beyond the specified holding time
U = Non detect
F1 = MS and/or MSD recovery exceeds control limits

Appendix I

Laboratory Reports

eurofins | Environment Testing America

ANALYTICAL REPORT

Eurofins Denver
4955 Yarrow Street
Arvada, CO 80002
Tel: (303)736-0100

Laboratory Job ID: 280-164042-1
Laboratory Sample Delivery Group: LOS Landfill
Client Project/Site: CCR Groundwater - ND Sites - LOS Landfill

For:
Basin Electric Power Cooperative
1717 E Interstate Ave
Bismarck, North Dakota 58504

Attn: Aaron Knutson

Shelby Turner

Authorized for release by:
7/20/2022 12:11:48 PM

Shelby Turner, Project Manager I
(303)736-0100
Shelby.Turner@et.eurofinsus.com

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Definitions/Glossary

Client: Basin Electric Power Cooperative
Project/Site: CCR Groundwater - ND Sites - LOS Landfill

Job ID: 280-164042-1
SDG: LOS Landfill

Qualifiers

General Chemistry

Qualifier	Qualifier Description
F1	MS and/or MSD recovery exceeds control limits.
H	Sample was prepped or analyzed beyond the specified holding time

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 280-164042-1

Laboratory: Eurofins Denver

Narrative

CASE NARRATIVE

Client: Basin Electric Power Cooperative

Project: CCR Groundwater - ND Sites - LOS Landfill

Report Number: 280-164042-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

RECEIPT

The samples were received on 7/5/2022 9:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 19.4º C.

The following samples were received at the laboratory outside the required temperature criteria at 19.4C: MW-2016-6 (280-164042-1), MW-2016-8 (280-164042-2), MW-2016-3 (280-164042-3), MW-2016-5 (280-164042-4), MW-2016-4 (280-164042-5), MW-2016-10 (280-164042-6), MW-2016-9 (280-164042-7), MW-2016-11 (280-164042-8), MW-2016-2 (280-164042-9) and DUP (280-164042-10). This does not meet regulatory requirements. The client was notified on 7/5/22 and instructed the laboratory to proceed with analysis.

The following samples were received with limited hold time remaining for 2540C TDS analysis: MW-2016-6 (280-164042-1), MW-2016-8 (280-164042-2), MW-2016-3 (280-164042-3), MW-2016-5 (280-164042-4), MW-2016-4 (280-164042-5), MW-2016-10 (280-164042-6), MW-2016-9 (280-164042-7), MW-2016-11 (280-164042-8), MW-2016-2 (280-164042-9) and DUP (280-164042-10). The samples were collected on 6/28/22 and 6/29/22 and received at the laboratory on 7/5/22. Hold time expires on 7/5/22 at 23:59 for the samples collected on 6/28/22. Hold time expires on 7/6/22 at 23:59 for the samples collected on 6/29/22. The laboratory will proceed with analysis.

TOTAL RECOVERABLE METALS

Samples MW-2016-6 (280-164042-1), MW-2016-8 (280-164042-2), MW-2016-3 (280-164042-3), MW-2016-5 (280-164042-4), MW-2016-4 (280-164042-5), MW-2016-10 (280-164042-6), MW-2016-9 (280-164042-7), MW-2016-11 (280-164042-8), MW-2016-2 (280-164042-9) and DUP (280-164042-10) were analyzed for Total Recoverable Metals in accordance with EPA SW-846 Method 6010C. The samples were prepared on 07/18/2022 and analyzed on 07/18/2022 and 07/19/2022.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

TOTAL DISSOLVED SOLIDS

Samples MW-2016-6 (280-164042-1), MW-2016-8 (280-164042-2), MW-2016-3 (280-164042-3), MW-2016-5 (280-164042-4), MW-2016-4 (280-164042-5), MW-2016-10 (280-164042-6), MW-2016-9 (280-164042-7), MW-2016-11 (280-164042-8), MW-2016-2 (280-164042-9) and DUP (280-164042-10) were analyzed for total dissolved solids in accordance with SM20 2540C. The samples were analyzed on 07/07/2022.

The following samples were received with less than 2 days remaining on the holding time or less than one shift (8 hours) remaining on a test with a holding time of 48 hours or less: MW-2016-6 (280-164042-1), MW-2016-8 (280-164042-2), MW-2016-3 (280-164042-3), MW-2016-5 (280-164042-4), MW-2016-4 (280-164042-5), MW-2016-10 (280-164042-6), MW-2016-9 (280-164042-7), MW-2016-11

Job ID: 280-164042-1 (Continued)

Laboratory: Eurofins Denver (Continued)

(280-164042-8), MW-2016-2 (280-164042-9), and DUP (280-164042-10). As such, the laboratory had insufficient time remaining to perform the analysis within holding time.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

ANIONS (28 DAYS)

Samples MW-2016-6 (280-164042-1), MW-2016-8 (280-164042-2), MW-2016-3 (280-164042-3), MW-2016-5 (280-164042-4), MW-2016-4 (280-164042-5), MW-2016-10 (280-164042-6), MW-2016-9 (280-164042-7), MW-2016-11 (280-164042-8), MW-2016-2 (280-164042-9) and DUP (280-164042-10) were analyzed for anions (28 days) in accordance with EPA SW-846 Method 9056A (28 Days). The samples were analyzed on 07/06/2022 and 07/07/2022.

Chloride and Sulfate failed the recovery criteria high for the MS of sample MW-2016-3 (280-164042-3) in batch 280-580064. Chloride, Fluoride and Sulfate failed the recovery criteria high for the MSD of sample MW-2016-3 (280-164042-3) in batch 280-580064. Refer to the QC report for details.

Due to the high concentration of chloride, the matrix spike / matrix spike duplicate (MS/MSD) for analytical batch 280-580064 could not be evaluated for accuracy and precision. The associated laboratory control sample (LCS) met acceptance criteria.

Samples MW-2016-6 (280-164042-1)[10X], MW-2016-8 (280-164042-2)[10X], MW-2016-5 (280-164042-4)[5X], MW-2016-4 (280-164042-5)[5X], MW-2016-10 (280-164042-6)[5X], MW-2016-9 (280-164042-7)[5X], MW-2016-11 (280-164042-8)[5X], MW-2016-2 (280-164042-9)[5X] and DUP (280-164042-10)[5X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Detection Summary

Client: Basin Electric Power Cooperative
Project/Site: CCR Groundwater - ND Sites - LOS Landfill

Job ID: 280-164042-1
SDG: LOS Landfill

Client Sample ID: MW-2016-6 — Lab Sample ID: 280-164042-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	281		100		ug/L	1		6010C	Total Recoverable
Calcium	8560		200		ug/L	1		6010C	Total Recoverable
Chloride	5.99		3.00		mg/L	1		9056A	Total/NA
Sulfate	705		50.0		mg/L	10		9056A	Total/NA
Total Dissolved Solids (TDS)	2070	H	20.0		mg/L	1		SM 2540C	Total/NA

Client Sample ID: MW-2016-8 — Lab Sample ID: 280-164042-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	270		100		ug/L	1		6010C	Total Recoverable
Calcium	12900		200		ug/L	1		6010C	Total Recoverable
Chloride	8.22		3.00		mg/L	1		9056A	Total/NA
Sulfate	735		50.0		mg/L	10		9056A	Total/NA
Total Dissolved Solids (TDS)	2220	H	40.0		mg/L	1		SM 2540C	Total/NA

Client Sample ID: MW-2016-3 — Lab Sample ID: 280-164042-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	259		100		ug/L	1		6010C	Total Recoverable
Calcium	4710		200		ug/L	1		6010C	Total Recoverable
Chloride	36.1	F1	3.00		mg/L	1		9056A	Total/NA
Fluoride	0.576	F1	0.500		mg/L	1		9056A	Total/NA
Sulfate	39.1	F1	5.00		mg/L	1		9056A	Total/NA
Total Dissolved Solids (TDS)	1480	H	20.0		mg/L	1		SM 2540C	Total/NA

Client Sample ID: MW-2016-5 — Lab Sample ID: 280-164042-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	257		100		ug/L	1		6010C	Total Recoverable
Calcium	7140		200		ug/L	1		6010C	Total Recoverable
Chloride	7.18		3.00		mg/L	1		9056A	Total/NA
Fluoride	0.535		0.500		mg/L	1		9056A	Total/NA
Sulfate	613		25.0		mg/L	5		9056A	Total/NA
Total Dissolved Solids (TDS)	1900	H	20.0		mg/L	1		SM 2540C	Total/NA

Client Sample ID: MW-2016-4 — Lab Sample ID: 280-164042-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	250		100		ug/L	1		6010C	Total Recoverable
Calcium	5170		200		ug/L	1		6010C	Total Recoverable
Chloride	15.6		3.00		mg/L	1		9056A	Total/NA
Fluoride	0.565		0.500		mg/L	1		9056A	Total/NA
Sulfate	394		25.0		mg/L	5		9056A	Total/NA
Total Dissolved Solids (TDS)	1660	H	20.0		mg/L	1		SM 2540C	Total/NA

This Detection Summary does not include radiochemical test results.

Detection Summary

Client: Basin Electric Power Cooperative
Project/Site: CCR Groundwater - ND Sites - LOS Landfill

Job ID: 280-164042-1
SDG: LOS Landfill

Client Sample ID: MW-2016-10 — Lab Sample ID: 280-164042-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	245		100		ug/L	1		6010C	Total Recoverable
Calcium	5480		200		ug/L	1		6010C	Total Recoverable
Chloride	13.7		3.00		mg/L	1		9056A	Total/NA
Sulfate	356		25.0		mg/L	5		9056A	Total/NA
Total Dissolved Solids (TDS)	1690	H	20.0		mg/L	1		SM 2540C	Total/NA

Client Sample ID: MW-2016-9 — Lab Sample ID: 280-164042-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	277		100		ug/L	1		6010C	Total Recoverable
Calcium	6430		200		ug/L	1		6010C	Total Recoverable
Chloride	18.9		3.00		mg/L	1		9056A	Total/NA
Sulfate	211		25.0		mg/L	5		9056A	Total/NA
Total Dissolved Solids (TDS)	1680	H	20.0		mg/L	1		SM 2540C	Total/NA

Client Sample ID: MW-2016-11 — Lab Sample ID: 280-164042-8

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	284		100		ug/L	1		6010C	Total Recoverable
Calcium	8570		200		ug/L	1		6010C	Total Recoverable
Chloride	12.5		3.00		mg/L	1		9056A	Total/NA
Sulfate	291		25.0		mg/L	5		9056A	Total/NA
Total Dissolved Solids (TDS)	1740	H	20.0		mg/L	1		SM 2540C	Total/NA

Client Sample ID: MW-2016-2 — Lab Sample ID: 280-164042-9

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	297		100		ug/L	1		6010C	Total Recoverable
Calcium	6880		200		ug/L	1		6010C	Total Recoverable
Chloride	21.8		3.00		mg/L	1		9056A	Total/NA
Sulfate	246		25.0		mg/L	5		9056A	Total/NA
Total Dissolved Solids (TDS)	1630	H	20.0		mg/L	1		SM 2540C	Total/NA

Client Sample ID: DUP — Lab Sample ID: 280-164042-10

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	252		100		ug/L	1		6010C	Total Recoverable
Calcium	5680		200		ug/L	1		6010C	Total Recoverable
Chloride	13.6		3.00		mg/L	1		9056A	Total/NA
Sulfate	355		25.0		mg/L	5		9056A	Total/NA
Total Dissolved Solids (TDS)	1680	H	20.0		mg/L	1		SM 2540C	Total/NA

This Detection Summary does not include radiochemical test results.

Method Summary

Client: Basin Electric Power Cooperative
Project/Site: CCR Groundwater - ND Sites - LOS Landfill

Job ID: 280-164042-1
SDG: LOS Landfill

Method	Method Description	Protocol	Laboratory
6010C	Metals (ICP)	SW846	TAL DEN
9056A	Anions, Ion Chromatography	SW846	TAL DEN
SM 2540C	Solids, Total Dissolved (TDS)	SM	TAL DEN
3005A	Preparation, Total Recoverable or Dissolved Metals	SW846	TAL DEN

Protocol References:

SM = "Standard Methods For The Examination Of Water And Wastewater"

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL DEN = Eurofins Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

Sample Summary

Client: Basin Electric Power Cooperative
Project/Site: CCR Groundwater - ND Sites - LOS Landfill

Job ID: 280-164042-1
SDG: LOS Landfill

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
280-164042-1	MW-2016-6	Water	06/29/22 08:35	07/05/22 09:00
280-164042-2	MW-2016-8	Water	06/28/22 10:50	07/05/22 09:00
280-164042-3	MW-2016-3	Water	06/29/22 08:50	07/05/22 09:00
280-164042-4	MW-2016-5	Water	06/29/22 10:30	07/05/22 09:00
280-164042-5	MW-2016-4	Water	06/28/22 14:30	07/05/22 09:00
280-164042-6	MW-2016-10	Water	06/29/22 08:20	07/05/22 09:00
280-164042-7	MW-2016-9	Water	06/29/22 10:45	07/05/22 09:00
280-164042-8	MW-2016-11	Water	06/29/22 11:00	07/05/22 09:00
280-164042-9	MW-2016-2	Water	06/29/22 11:10	07/05/22 09:00
280-164042-10	DUP	Water	06/29/22 08:20	07/05/22 09:00

Method: 6010C - Metals (ICP) - Total Recoverable

Client Sample ID: MW-2016-6
Date Collected: 06/29/22 08:35
Date Received: 07/05/22 09:00

Lab Sample ID: 280-164042-1
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	281		100		ug/L		07/18/22 08:40	07/18/22 23:48	1
Calcium	8560		200		ug/L		07/18/22 08:40	07/18/22 23:48	1

Client Sample ID: MW-2016-8
Date Collected: 06/28/22 10:50
Date Received: 07/05/22 09:00

Lab Sample ID: 280-164042-2
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	270		100		ug/L		07/18/22 08:40	07/18/22 23:52	1
Calcium	12900		200		ug/L		07/18/22 08:40	07/18/22 23:52	1

Client Sample ID: MW-2016-3
Date Collected: 06/29/22 08:50
Date Received: 07/05/22 09:00

Lab Sample ID: 280-164042-3
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	259		100		ug/L		07/18/22 08:40	07/19/22 00:12	1
Calcium	4710		200		ug/L		07/18/22 08:40	07/19/22 00:12	1

Client Sample ID: MW-2016-5
Date Collected: 06/29/22 10:30
Date Received: 07/05/22 09:00

Lab Sample ID: 280-164042-4
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	257		100		ug/L		07/18/22 08:40	07/19/22 00:16	1
Calcium	7140		200		ug/L		07/18/22 08:40	07/19/22 00:16	1

Client Sample ID: MW-2016-4
Date Collected: 06/28/22 14:30
Date Received: 07/05/22 09:00

Lab Sample ID: 280-164042-5
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	250		100		ug/L		07/18/22 08:40	07/19/22 00:20	1
Calcium	5170		200		ug/L		07/18/22 08:40	07/19/22 00:20	1

Client Sample ID: MW-2016-10
Date Collected: 06/29/22 08:20
Date Received: 07/05/22 09:00

Lab Sample ID: 280-164042-6
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	245		100		ug/L		07/18/22 08:40	07/19/22 00:24	1
Calcium	5480		200		ug/L		07/18/22 08:40	07/19/22 00:24	1

Client Sample ID: MW-2016-9
Date Collected: 06/29/22 10:45
Date Received: 07/05/22 09:00

Lab Sample ID: 280-164042-7
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	277		100		ug/L		07/18/22 08:40	07/19/22 00:28	1
Calcium	6430		200		ug/L		07/18/22 08:40	07/19/22 00:28	1

Client Sample ID: MW-2016-11
Date Collected: 06/29/22 11:00
Date Received: 07/05/22 09:00

Lab Sample ID: 280-164042-8
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	284		100		ug/L		07/18/22 08:40	07/19/22 00:32	1
Calcium	8570		200		ug/L		07/18/22 08:40	07/19/22 00:32	1

Method: 6010C - Metals (ICP) - Total Recoverable

Client Sample ID: MW-2016-2
Date Collected: 06/29/22 11:10
Date Received: 07/05/22 09:00

Lab Sample ID: 280-164042-9
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	297		100		ug/L		07/18/22 08:40	07/19/22 01:17	1
Calcium	6880		200		ug/L		07/18/22 08:40	07/19/22 01:17	1

Client Sample ID: DUP
Date Collected: 06/29/22 08:20
Date Received: 07/05/22 09:00

Lab Sample ID: 280-164042-10
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	252		100		ug/L		07/18/22 08:40	07/19/22 01:37	1
Calcium	5680		200		ug/L		07/18/22 08:40	07/19/22 01:37	1

General Chemistry

Client Sample ID: MW-2016-6
Date Collected: 06/29/22 08:35
Date Received: 07/05/22 09:00

Lab Sample ID: 280-164042-1
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	5.99		3.00		mg/L			07/06/22 14:50	1
Fluoride	ND		0.500		mg/L			07/06/22 14:50	1
Sulfate	705		50.0		mg/L			07/06/22 15:06	10
Total Dissolved Solids (TDS)	2070	H	20.0		mg/L			07/07/22 09:54	1

Client Sample ID: MW-2016-8
Date Collected: 06/28/22 10:50
Date Received: 07/05/22 09:00

Lab Sample ID: 280-164042-2
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	8.22		3.00		mg/L			07/06/22 15:22	1
Fluoride	ND		0.500		mg/L			07/06/22 15:22	1
Sulfate	735		50.0		mg/L			07/06/22 15:38	10
Total Dissolved Solids (TDS)	2220	H	40.0		mg/L			07/07/22 09:54	1

Client Sample ID: MW-2016-3
Date Collected: 06/29/22 08:50
Date Received: 07/05/22 09:00

Lab Sample ID: 280-164042-3
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	36.1	F1	3.00		mg/L			07/06/22 15:54	1
Fluoride	0.576	F1	0.500		mg/L			07/06/22 15:54	1
Sulfate	39.1	F1	5.00		mg/L			07/06/22 15:54	1
Total Dissolved Solids (TDS)	1480	H	20.0		mg/L			07/07/22 09:54	1

Client Sample ID: MW-2016-5
Date Collected: 06/29/22 10:30
Date Received: 07/05/22 09:00

Lab Sample ID: 280-164042-4
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	7.18		3.00		mg/L			07/06/22 17:30	1
Fluoride	0.535		0.500		mg/L			07/06/22 17:30	1
Sulfate	613		25.0		mg/L			07/06/22 17:46	5
Total Dissolved Solids (TDS)	1900	H	20.0		mg/L			07/07/22 09:54	1

General Chemistry

Client Sample ID: MW-2016-4
Date Collected: 06/28/22 14:30
Date Received: 07/05/22 09:00

Lab Sample ID: 280-164042-5
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	15.6		3.00		mg/L			07/06/22 18:02	1
Fluoride	0.565		0.500		mg/L			07/06/22 18:02	1
Sulfate	394		25.0		mg/L			07/07/22 17:33	5
Total Dissolved Solids (TDS)	1660	H	20.0		mg/L			07/07/22 09:54	1

Client Sample ID: MW-2016-10
Date Collected: 06/29/22 08:20
Date Received: 07/05/22 09:00

Lab Sample ID: 280-164042-6
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	13.7		3.00		mg/L			07/06/22 18:18	1
Fluoride	ND		0.500		mg/L			07/06/22 18:18	1
Sulfate	356		25.0		mg/L			07/06/22 18:35	5
Total Dissolved Solids (TDS)	1690	H	20.0		mg/L			07/07/22 09:54	1

Client Sample ID: MW-2016-9
Date Collected: 06/29/22 10:45
Date Received: 07/05/22 09:00

Lab Sample ID: 280-164042-7
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	18.9		3.00		mg/L			07/06/22 18:51	1
Fluoride	ND		0.500		mg/L			07/06/22 18:51	1
Sulfate	211		25.0		mg/L			07/07/22 16:45	5
Total Dissolved Solids (TDS)	1680	H	20.0		mg/L			07/07/22 09:54	1

Client Sample ID: MW-2016-11
Date Collected: 06/29/22 11:00
Date Received: 07/05/22 09:00

Lab Sample ID: 280-164042-8
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	12.5		3.00		mg/L			07/06/22 19:07	1
Fluoride	ND		0.500		mg/L			07/06/22 19:07	1
Sulfate	291		25.0		mg/L			07/07/22 17:01	5
Total Dissolved Solids (TDS)	1740	H	20.0		mg/L			07/07/22 09:54	1

Client Sample ID: MW-2016-2
Date Collected: 06/29/22 11:10
Date Received: 07/05/22 09:00

Lab Sample ID: 280-164042-9
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	21.8		3.00		mg/L			07/06/22 19:23	1
Fluoride	ND		0.500		mg/L			07/06/22 19:23	1
Sulfate	246		25.0		mg/L			07/07/22 17:17	5
Total Dissolved Solids (TDS)	1630	H	20.0		mg/L			07/07/22 09:54	1

Client Sample ID: DUP
Date Collected: 06/29/22 08:20
Date Received: 07/05/22 09:00

Lab Sample ID: 280-164042-10
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	13.6		3.00		mg/L			07/06/22 19:39	1
Fluoride	ND		0.500		mg/L			07/06/22 19:39	1
Sulfate	355		25.0		mg/L			07/06/22 19:55	5
Total Dissolved Solids (TDS)	1680	H	20.0		mg/L			07/07/22 09:54	1

Method: 6010C - Metals (ICP)

Lab Sample ID: MB 280-580851/1-A
Matrix: Water
Analysis Batch: 581188

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 580851

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND		100		ug/L		07/18/22 08:40	07/18/22 22:35	1
Calcium	ND		200		ug/L		07/18/22 08:40	07/18/22 22:35	1

Lab Sample ID: LCS 280-580851/2-A
Matrix: Water
Analysis Batch: 581188

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 580851

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Boron	2000	2025		ug/L		101	86 - 110
Calcium	50000	51710		ug/L		103	90 - 111

Lab Sample ID: 280-164042-8 MS
Matrix: Water
Analysis Batch: 581188

Client Sample ID: MW-2016-11
Prep Type: Total Recoverable
Prep Batch: 580851

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Boron	284		2000	2266		ug/L		99	87 - 113
Calcium	8570		50000	58710		ug/L		100	48 - 153

Lab Sample ID: 280-164042-8 MSD
Matrix: Water
Analysis Batch: 581188

Client Sample ID: MW-2016-11
Prep Type: Total Recoverable
Prep Batch: 580851

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Boron	284		2000	2271		ug/L		99	87 - 113	0	20
Calcium	8570		50000	58680		ug/L		100	48 - 153	0	20

Lab Sample ID: MB 280-580894/1-A
Matrix: Water
Analysis Batch: 581188

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 580894

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND		100		ug/L		07/18/22 08:40	07/19/22 01:09	1
Calcium	ND		200		ug/L		07/18/22 08:40	07/19/22 01:09	1

Lab Sample ID: LCS 280-580894/2-A
Matrix: Water
Analysis Batch: 581188

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 580894

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Boron	2000	2005		ug/L		100	86 - 110
Calcium	50000	51480		ug/L		103	90 - 111

Lab Sample ID: 280-164042-9 MS
Matrix: Water
Analysis Batch: 581188

Client Sample ID: MW-2016-2
Prep Type: Total Recoverable
Prep Batch: 580894

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Boron	297		2000	2315		ug/L		101	87 - 113
Calcium	6880		50000	58030		ug/L		102	48 - 153

Method: 6010C - Metals (ICP)

Lab Sample ID: 280-164042-9 MSD
Matrix: Water
Analysis Batch: 581188

Client Sample ID: MW-2016-2
Prep Type: Total Recoverable
Prep Batch: 580894

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Boron	297		2000	2327		ug/L		101	87 - 113	1	20
Calcium	6880		50000	58240		ug/L		103	48 - 153	0	20

Method: 9056A - Anions, Ion Chromatography

Lab Sample ID: MB 280-580064/6
Matrix: Water
Analysis Batch: 580064

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		3.00		mg/L			07/06/22 12:36	1
Fluoride	ND		0.500		mg/L			07/06/22 12:36	1
Sulfate	ND		5.00		mg/L			07/06/22 12:36	1

Lab Sample ID: LCS 280-580064/4
Matrix: Water
Analysis Batch: 580064

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Chloride	100	98.69		mg/L		99	90 - 110
Fluoride	5.00	4.859		mg/L		97	90 - 110
Sulfate	100	99.78		mg/L		100	90 - 110

Lab Sample ID: LCSD 280-580064/5
Matrix: Water
Analysis Batch: 580064

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Chloride	100	98.56		mg/L		99	90 - 110	0	10
Fluoride	5.00	4.803		mg/L		96	90 - 110	1	10
Sulfate	100	99.66		mg/L		100	90 - 110	0	10

Lab Sample ID: MRL 280-580064/3
Matrix: Water
Analysis Batch: 580064

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	MRL Result	MRL Qualifier	Unit	D	%Rec	%Rec Limits
Chloride	5.00	3.692		mg/L		74	50 - 150
Fluoride	0.500	ND		mg/L		94	50 - 150
Sulfate	5.00	ND		mg/L		72	50 - 150

Lab Sample ID: 280-164042-3 MS
Matrix: Water
Analysis Batch: 580064

Client Sample ID: MW-2016-3
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Chloride	36.1	F1	50.0	101.4	F1	mg/L		131	80 - 120
Fluoride	0.576	F1	5.00	6.256		mg/L		114	80 - 120
Sulfate	39.1	F1	50.0	106.0	F1	mg/L		134	80 - 120

Method: 9056A - Anions, Ion Chromatography (Continued)

Lab Sample ID: 280-164042-3 MSD
Matrix: Water
Analysis Batch: 580064

Client Sample ID: MW-2016-3
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Chloride	36.1	F1	50.0	107.1	F1	mg/L		142	80 - 120	5	20
Fluoride	0.576	F1	5.00	6.788	F1	mg/L		124	80 - 120	8	20
Sulfate	39.1	F1	50.0	114.0	F1	mg/L		150	80 - 120	7	20

Lab Sample ID: 280-164042-3 DU
Matrix: Water
Analysis Batch: 580064

Client Sample ID: MW-2016-3
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Chloride	36.1	F1	36.06		mg/L		0.06	15
Fluoride	0.576	F1	0.5761		mg/L		0.1	15
Sulfate	39.1	F1	39.05		mg/L		0.09	15

Lab Sample ID: MB 280-580183/6
Matrix: Water
Analysis Batch: 580183

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	ND		5.00		mg/L			07/07/22 11:02	1

Lab Sample ID: LCS 280-580183/4
Matrix: Water
Analysis Batch: 580183

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Sulfate	100	99.48		mg/L		99	90 - 110

Lab Sample ID: LCSD 280-580183/5
Matrix: Water
Analysis Batch: 580183

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Sulfate	100	99.32		mg/L		99	90 - 110	0	10

Lab Sample ID: MRL 280-580183/3
Matrix: Water
Analysis Batch: 580183

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	MRL Result	MRL Qualifier	Unit	D	%Rec	%Rec Limits
Sulfate	5.00	ND		mg/L		70	50 - 150

Method: SM 2540C - Solids, Total Dissolved (TDS)

Lab Sample ID: MB 280-580191/1
Matrix: Water
Analysis Batch: 580191

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (TDS)	ND		10.0		mg/L			07/07/22 09:54	1

Method: SM 2540C - Solids, Total Dissolved (TDS) (Continued)

Lab Sample ID: LCS 280-580191/2
Matrix: Water
Analysis Batch: 580191

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Total Dissolved Solids (TDS)			501	483.0		mg/L		96	88 - 114		

Metals

Prep Batch: 580851

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-164042-1	MW-2016-6	Total Recoverable	Water	3005A	
280-164042-2	MW-2016-8	Total Recoverable	Water	3005A	
280-164042-3	MW-2016-3	Total Recoverable	Water	3005A	
280-164042-4	MW-2016-5	Total Recoverable	Water	3005A	
280-164042-5	MW-2016-4	Total Recoverable	Water	3005A	
280-164042-6	MW-2016-10	Total Recoverable	Water	3005A	
280-164042-7	MW-2016-9	Total Recoverable	Water	3005A	
280-164042-8	MW-2016-11	Total Recoverable	Water	3005A	
MB 280-580851/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 280-580851/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
280-164042-8 MS	MW-2016-11	Total Recoverable	Water	3005A	
280-164042-8 MSD	MW-2016-11	Total Recoverable	Water	3005A	

Prep Batch: 580894

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-164042-9	MW-2016-2	Total Recoverable	Water	3005A	
280-164042-10	DUP	Total Recoverable	Water	3005A	
MB 280-580894/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 280-580894/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
280-164042-9 MS	MW-2016-2	Total Recoverable	Water	3005A	
280-164042-9 MSD	MW-2016-2	Total Recoverable	Water	3005A	

Analysis Batch: 581188

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-164042-1	MW-2016-6	Total Recoverable	Water	6010C	580851
280-164042-2	MW-2016-8	Total Recoverable	Water	6010C	580851
280-164042-3	MW-2016-3	Total Recoverable	Water	6010C	580851
280-164042-4	MW-2016-5	Total Recoverable	Water	6010C	580851
280-164042-5	MW-2016-4	Total Recoverable	Water	6010C	580851
280-164042-6	MW-2016-10	Total Recoverable	Water	6010C	580851
280-164042-7	MW-2016-9	Total Recoverable	Water	6010C	580851
280-164042-8	MW-2016-11	Total Recoverable	Water	6010C	580851
280-164042-9	MW-2016-2	Total Recoverable	Water	6010C	580894
280-164042-10	DUP	Total Recoverable	Water	6010C	580894
MB 280-580851/1-A	Method Blank	Total Recoverable	Water	6010C	580851
MB 280-580894/1-A	Method Blank	Total Recoverable	Water	6010C	580894
LCS 280-580851/2-A	Lab Control Sample	Total Recoverable	Water	6010C	580851
LCS 280-580894/2-A	Lab Control Sample	Total Recoverable	Water	6010C	580894
280-164042-8 MS	MW-2016-11	Total Recoverable	Water	6010C	580851
280-164042-8 MSD	MW-2016-11	Total Recoverable	Water	6010C	580851
280-164042-9 MS	MW-2016-2	Total Recoverable	Water	6010C	580894
280-164042-9 MSD	MW-2016-2	Total Recoverable	Water	6010C	580894

General Chemistry

Analysis Batch: 580064

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-164042-1	MW-2016-6	Total/NA	Water	9056A	
280-164042-1	MW-2016-6	Total/NA	Water	9056A	
280-164042-2	MW-2016-8	Total/NA	Water	9056A	
280-164042-2	MW-2016-8	Total/NA	Water	9056A	

General Chemistry (Continued)

Analysis Batch: 580064 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-164042-3	MW-2016-3	Total/NA	Water	9056A	
280-164042-4	MW-2016-5	Total/NA	Water	9056A	
280-164042-4	MW-2016-5	Total/NA	Water	9056A	
280-164042-5	MW-2016-4	Total/NA	Water	9056A	
280-164042-6	MW-2016-10	Total/NA	Water	9056A	
280-164042-6	MW-2016-10	Total/NA	Water	9056A	
280-164042-7	MW-2016-9	Total/NA	Water	9056A	
280-164042-8	MW-2016-11	Total/NA	Water	9056A	
280-164042-9	MW-2016-2	Total/NA	Water	9056A	
280-164042-10	DUP	Total/NA	Water	9056A	
280-164042-10	DUP	Total/NA	Water	9056A	
MB 280-580064/6	Method Blank	Total/NA	Water	9056A	
LCS 280-580064/4	Lab Control Sample	Total/NA	Water	9056A	
LCSD 280-580064/5	Lab Control Sample Dup	Total/NA	Water	9056A	
MRL 280-580064/3	Lab Control Sample	Total/NA	Water	9056A	
280-164042-3 MS	MW-2016-3	Total/NA	Water	9056A	
280-164042-3 MSD	MW-2016-3	Total/NA	Water	9056A	
280-164042-3 DU	MW-2016-3	Total/NA	Water	9056A	

Analysis Batch: 580183

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-164042-5	MW-2016-4	Total/NA	Water	9056A	
280-164042-7	MW-2016-9	Total/NA	Water	9056A	
280-164042-8	MW-2016-11	Total/NA	Water	9056A	
280-164042-9	MW-2016-2	Total/NA	Water	9056A	
MB 280-580183/6	Method Blank	Total/NA	Water	9056A	
LCS 280-580183/4	Lab Control Sample	Total/NA	Water	9056A	
LCSD 280-580183/5	Lab Control Sample Dup	Total/NA	Water	9056A	
MRL 280-580183/3	Lab Control Sample	Total/NA	Water	9056A	

Analysis Batch: 580191

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-164042-1	MW-2016-6	Total/NA	Water	SM 2540C	
280-164042-2	MW-2016-8	Total/NA	Water	SM 2540C	
280-164042-3	MW-2016-3	Total/NA	Water	SM 2540C	
280-164042-4	MW-2016-5	Total/NA	Water	SM 2540C	
280-164042-5	MW-2016-4	Total/NA	Water	SM 2540C	
280-164042-6	MW-2016-10	Total/NA	Water	SM 2540C	
280-164042-7	MW-2016-9	Total/NA	Water	SM 2540C	
280-164042-8	MW-2016-11	Total/NA	Water	SM 2540C	
280-164042-9	MW-2016-2	Total/NA	Water	SM 2540C	
280-164042-10	DUP	Total/NA	Water	SM 2540C	
MB 280-580191/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 280-580191/2	Lab Control Sample	Total/NA	Water	SM 2540C	

Lab Chronicle

Client: Basin Electric Power Cooperative
Project/Site: CCR Groundwater - ND Sites - LOS Landfill

Job ID: 280-164042-1
SDG: LOS Landfill

Client Sample ID: MW-2016-6
Date Collected: 06/29/22 08:35
Date Received: 07/05/22 09:00

Lab Sample ID: 280-164042-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	580851	07/18/22 08:40	KMS	TAL DEN
Total Recoverable	Analysis	6010C		1			581188	07/18/22 23:48	MAB	TAL DEN
Total/NA	Analysis	9056A		1	10 mL	10 mL	580064	07/06/22 14:50	MEC	TAL DEN
Total/NA	Analysis	9056A		10	10 mL	10 mL	580064	07/06/22 15:06	MEC	TAL DEN
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	580191	07/07/22 09:54	ASP	TAL DEN

Client Sample ID: MW-2016-8
Date Collected: 06/28/22 10:50
Date Received: 07/05/22 09:00

Lab Sample ID: 280-164042-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	580851	07/18/22 08:40	KMS	TAL DEN
Total Recoverable	Analysis	6010C		1			581188	07/18/22 23:52	MAB	TAL DEN
Total/NA	Analysis	9056A		1	10 mL	10 mL	580064	07/06/22 15:22	MEC	TAL DEN
Total/NA	Analysis	9056A		10	10 mL	10 mL	580064	07/06/22 15:38	MEC	TAL DEN
Total/NA	Analysis	SM 2540C		1	25 mL	100 mL	580191	07/07/22 09:54	ASP	TAL DEN

Client Sample ID: MW-2016-3
Date Collected: 06/29/22 08:50
Date Received: 07/05/22 09:00

Lab Sample ID: 280-164042-3
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	580851	07/18/22 08:40	KMS	TAL DEN
Total Recoverable	Analysis	6010C		1			581188	07/19/22 00:12	MAB	TAL DEN
Total/NA	Analysis	9056A		1	10 mL	10 mL	580064	07/06/22 15:54	MEC	TAL DEN
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	580191	07/07/22 09:54	ASP	TAL DEN

Client Sample ID: MW-2016-5
Date Collected: 06/29/22 10:30
Date Received: 07/05/22 09:00

Lab Sample ID: 280-164042-4
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	580851	07/18/22 08:40	KMS	TAL DEN
Total Recoverable	Analysis	6010C		1			581188	07/19/22 00:16	MAB	TAL DEN
Total/NA	Analysis	9056A		1	10 mL	10 mL	580064	07/06/22 17:30	MEC	TAL DEN
Total/NA	Analysis	9056A		5	10 mL	10 mL	580064	07/06/22 17:46	MEC	TAL DEN
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	580191	07/07/22 09:54	ASP	TAL DEN

Client Sample ID: MW-2016-4
Date Collected: 06/28/22 14:30
Date Received: 07/05/22 09:00

Lab Sample ID: 280-164042-5
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	580851	07/18/22 08:40	KMS	TAL DEN
Total Recoverable	Analysis	6010C		1			581188	07/19/22 00:20	MAB	TAL DEN

Lab Chronicle

Client: Basin Electric Power Cooperative
Project/Site: CCR Groundwater - ND Sites - LOS Landfill

Job ID: 280-164042-1
SDG: LOS Landfill

Client Sample ID: MW-2016-4
Date Collected: 06/28/22 14:30
Date Received: 07/05/22 09:00

Lab Sample ID: 280-164042-5
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		1	10 mL	10 mL	580064	07/06/22 18:02	MEC	TAL DEN
Total/NA	Analysis	9056A		5	10 mL	10 mL	580183	07/07/22 17:33	RAF	TAL DEN
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	580191	07/07/22 09:54	ASP	TAL DEN

Client Sample ID: MW-2016-10
Date Collected: 06/29/22 08:20
Date Received: 07/05/22 09:00

Lab Sample ID: 280-164042-6
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	580851	07/18/22 08:40	KMS	TAL DEN
Total Recoverable	Analysis	6010C		1			581188	07/19/22 00:24	MAB	TAL DEN
Total/NA	Analysis	9056A		1	10 mL	10 mL	580064	07/06/22 18:18	MEC	TAL DEN
Total/NA	Analysis	9056A		5	10 mL	10 mL	580064	07/06/22 18:35	MEC	TAL DEN
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	580191	07/07/22 09:54	ASP	TAL DEN

Client Sample ID: MW-2016-9
Date Collected: 06/29/22 10:45
Date Received: 07/05/22 09:00

Lab Sample ID: 280-164042-7
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	580851	07/18/22 08:40	KMS	TAL DEN
Total Recoverable	Analysis	6010C		1			581188	07/19/22 00:28	MAB	TAL DEN
Total/NA	Analysis	9056A		1	10 mL	10 mL	580064	07/06/22 18:51	MEC	TAL DEN
Total/NA	Analysis	9056A		5	10 mL	10 mL	580183	07/07/22 16:45	RAF	TAL DEN
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	580191	07/07/22 09:54	ASP	TAL DEN

Client Sample ID: MW-2016-11
Date Collected: 06/29/22 11:00
Date Received: 07/05/22 09:00

Lab Sample ID: 280-164042-8
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	580851	07/18/22 08:40	KMS	TAL DEN
Total Recoverable	Analysis	6010C		1			581188	07/19/22 00:32	MAB	TAL DEN
Total/NA	Analysis	9056A		1	10 mL	10 mL	580064	07/06/22 19:07	MEC	TAL DEN
Total/NA	Analysis	9056A		5	10 mL	10 mL	580183	07/07/22 17:01	RAF	TAL DEN
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	580191	07/07/22 09:54	ASP	TAL DEN

Client Sample ID: MW-2016-2
Date Collected: 06/29/22 11:10
Date Received: 07/05/22 09:00

Lab Sample ID: 280-164042-9
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	580894	07/18/22 08:40	KMS	TAL DEN
Total Recoverable	Analysis	6010C		1			581188	07/19/22 01:17	MAB	TAL DEN

Lab Chronicle

Client: Basin Electric Power Cooperative
Project/Site: CCR Groundwater - ND Sites - LOS Landfill

Job ID: 280-164042-1
SDG: LOS Landfill

Client Sample ID: MW-2016-2

Date Collected: 06/29/22 11:10
Date Received: 07/05/22 09:00

Lab Sample ID: 280-164042-9

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		1	10 mL	10 mL	580064	07/06/22 19:23	MEC	TAL DEN
Total/NA	Analysis	9056A		5	10 mL	10 mL	580183	07/07/22 17:17	RAF	TAL DEN
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	580191	07/07/22 09:54	ASP	TAL DEN

Client Sample ID: DUP

Date Collected: 06/29/22 08:20
Date Received: 07/05/22 09:00

Lab Sample ID: 280-164042-10

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	580894	07/18/22 08:40	KMS	TAL DEN
Total Recoverable	Analysis	6010C		1			581188	07/19/22 01:37	MAB	TAL DEN
Total/NA	Analysis	9056A		1	10 mL	10 mL	580064	07/06/22 19:39	MEC	TAL DEN
Total/NA	Analysis	9056A		5	10 mL	10 mL	580064	07/06/22 19:55	MEC	TAL DEN
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	580191	07/07/22 09:54	ASP	TAL DEN

Laboratory References:

TAL DEN = Eurofins Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

Accreditation/Certification Summary

Client: Basin Electric Power Cooperative
Project/Site: CCR Groundwater - ND Sites - LOS Landfill

Job ID: 280-164042-1
SDG: LOS Landfill

Laboratory: Eurofins Denver

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
North Dakota	State	R-034	01-08-23

Eurofins TestAmerica, Denver
4955 Yarrow Street
Arvada, CO 80002
Phone (303) 736-0100 Fax (303) 431-7171

Chain of Custody Record

eurofins | Environment Testing America

Client Information	Sampler: A. Knutson / Myles Shettler	Lab PM: Turner, Shelby R	Carrier Tracking No(s):	COC No:
Client Contact: Mr. Aaron Knutson	Phone: 701-745-7238	E-Mail: Shelby.Turner@Eurofinset.com		Page: 1 of 1
Company: Basin Electric Power Cooperative				Job #:

Address: 3901 Highway 200A	Due Date Requested:	Analysis Requested	Preservation Codes:
City: Stanton	TAT Requested (days): Standard		A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA; M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Z - other (specify)
State, Zip: ND, 58571	PO #: Purchase Order Requested		
Phone: 701-745-7238(Tel)	WO #:		Other:
Email: aknutson@bepc.com			
Project Name: CCR Groundwater - North Dakota Sites	Project #: 28021258		
Site: LOS LANDFILL	SSOW#:		

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	6010C - Total Calcium and Boron (App III)	9056A_28D - Chloride, Fluoride, Sulfate	2540C_Calcd - TDS	6010C - Total Lithium (1 of 3), 6020A - Total 11 Metals (2 of 3), 7470A - Total Mercury (3 of 3) (Appendix IV)	9315_Ra226, 9320_Ra228, Combined Radium-226 and Radium-228	Total Number of containers	Special Instructions/Note:
			Preservation Code:				D	N	N	N	D		
MW-2016-6	6-29-22	0835	G	W	N		X	X	X				pH - 7.77
MW-2016-8	6-28-22	1050	G	W			X	X	X				pH - 7.85
MW-2016-3	6-29-22	0850	G	W			X	X	X				pH - 7.78
MW-2016-5	6-29-22	1030	G	W			X	X	X				pH - 7.71
MW-2016-4	6-28-22	1430	G	W			X	X	X				pH - 8.05
MW-2016-10	6-29-22	0820	G	W			X	X	X				pH - 7.81
MW-2016-9	6-29-22	1045	G	W			X	X	X				pH - 7.61
MW-2016-11	6-29-22	1100	G	W			X	X	X				pH - 7.66
MW-2016-2	6-29-22	1110	G	W			X	X	X				pH - 7.65
DUP	6-29-22	0820	G	W			X	X	X				pH - 7.81

280-164042 Chain of Custody

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☒ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
	6-30-22			7/1/22 0900	ETAPEN
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks: 14.3 (-0.1 IR#2

Ver: 01/16/2019

FedEx Ship Manager - Print Your Label(s)

STANTON, ND 58571
UNITED STATES US

BILL SENDER

TO SHELBY TURNER
EUROFINS TESTAMERICA, DENVER
4955 YARROW ST

ARVADA CO 80002
(303) 736-0100
INV:
PO:

REF: CCR GROUNDWATER - ND SITE
DEPT:

TestAmerica

1891589

19.3

FedEx Express

TRK# 0201 7772 7043 4799

TUE - 05 JUL AA
PRIORITY OVERNIGHT

80002
CO-US
DEN

XA LAAA

4476297 01Jul2022 BISA 56DG2/274F/C0B8

280-164042 Waybill

Login Sample Receipt Checklist

Client: Basin Electric Power Cooperative

Job Number: 280-164042-1
SDG Number: LOS Landfill

Login Number: 164042
List Number: 1
Creator: Roehsner, Karen P

List Source: Eurofins Denver

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	False	Water present in cooler; indicates evidence of melted ice.
Cooler Temperature is acceptable.	False	Cooler temperature outside required temperature criteria.
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	Limited HT remaining.
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

MINNESOTA VALLEY TESTING LABORATORIES, INC.
1126 North Front St. ~ New Ulm, MN 56073 ~ 800-782-3557 ~ Fax 507-359-2890
2616 East Broadway Ave. ~ Bismarck, ND 58501 ~ 800-279-6885 ~ Fax 701-258-9724
1201 Lincoln Hwy. ~ Nevada, IA 50201 ~ 800-362-0855 ~ Fax 515-382-3885
www.MVTL.com

Account #: 2040 **Client:** Basin Electric Power Cooperative
Workorder: LOS Landfill CCR (4280) **PO:** 790708-04 LOS

Kevin Solie
Basin Electric Power Cooperative
1717 E Interstate Ave
Bismarck, ND 58503

Certificate of Analysis

Approval

All data reported has been reviewed and approved by:

C. Carroll

Claudette Carroll, Lab Manager Bismarck, ND

Analyses performed under Minnesota Department of Health Accreditation conforms to the current TNI standards.

NEW ULM LAB CERTIFICATIONS:
MN LAB # 027-015-125 ND WW/DW # R-040

BISMARCK LAB CERTIFICATIONS:
MN LAB # 038-999-267 ND W/DW # ND-016

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1201 Lincoln Hwy. ~ Nevada, IA 50201 ~ 800-362-0855 ~ Fax 515-382-3885
www.MVTL.com

Account #: 2040 **Client:** Basin Electric Power Cooperative

Workorder Summary

Workorder Comments

All analytes with dilution factors greater than 1 (displayed in DF column) required dilution due to matrix or high concentration of target analyte unless otherwise noted and reporting limits (RDL column) have been adjusted accordingly.

Sample Comments

4280008 (Dup 1) - Sample

Time sampled was not supplied by the client.

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www.MVTL.com

Account #: 2040 **Client:** Basin Electric Power Cooperative

Analytical Results

Lab ID: 4280001 **Date Collected:** 10/12/2022 08:20 **Matrix:** Groundwater
Sample ID: MW-2016-2 **Date Received:** 10/13/2022 15:20 **Collector:** Client

Temp @ Receipt (C): 2.8

Method: ASTM D516-16

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	By	Cert	Qual
Sulfate	**334**	mg/L	25	5	10/19/2022 11:25	10/19/2022 11:25	EJV	MA,NDA	

Method: EPA 6010D

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	By	Cert	Qual
Boron	**0.25**	mg/L	0.1	1	10/13/2022 17:14	10/17/2022 12:06	SLZ	MA,NDA	
Calcium	**9.40**	mg/L	1	1	10/13/2022 17:14	10/25/2022 12:30	SLZ	MA,NDA	

Method: SM4500-Cl-E 2011

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	By	Cert	Qual
Chloride	**15.9**	mg/L	2.0	1	10/25/2022 14:50	10/25/2022 14:50	EJV	MA,NDA	

Method: SM4500-F-C-2011

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	By	Cert	Qual
Fluoride	**0.53**	mg/L	0.1	1	10/14/2022 13:46	10/14/2022 13:46	RAA		

Method: USGS I-1750-85

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	By	Cert	Qual
Total Dissolved Solids	**1730**	mg/L	10	1	10/14/2022 09:00	10/14/2022 09:00	RAA	MA,NDA	

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1201 Lincoln Hwy. ~ Nevada, IA 50201 ~ 800-362-0855 ~ Fax 515-382-3885
www.MVTL.com

Account #: 2040 **Client:** Basin Electric Power Cooperative

Analytical Results

Lab ID: 4280002 **Date Collected:** 10/11/2022 12:55 **Matrix:** Groundwater
Sample ID: MW-2016-3 **Date Received:** 10/13/2022 15:20 **Collector:** Client

Temp @ Receipt (C): 2.8

Method: ASTM D516-16

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	By	Cert	Qual
Sulfate	**45.2**	mg/L	5	1	10/19/2022 11:26	10/19/2022 11:26	EJV	MA,NDA	

Method: EPA 6010D

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	By	Cert	Qual
Boron	**0.22**	mg/L	0.1	1	10/13/2022 17:14	10/17/2022 12:06	SLZ	MA,NDA	
Calcium	**5.09**	mg/L	1	1	10/13/2022 17:14	10/25/2022 12:31	SLZ	MA,NDA	

Method: SM4500-Cl-E 2011

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	By	Cert	Qual
Chloride	**36.5**	mg/L	2.0	1	10/25/2022 14:52	10/25/2022 14:52	EJV	MA,NDA	

Method: SM4500-F-C-2011

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	By	Cert	Qual
Fluoride	**0.69**	mg/L	0.1	1	10/14/2022 14:33	10/14/2022 14:33	RAA		

Method: USGS I-1750-85

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	By	Cert	Qual
Total Dissolved Solids	**1470**	mg/L	10	1	10/14/2022 09:00	10/14/2022 09:00	RAA	MA,NDA	

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Account #: 2040 **Client:** Basin Electric Power Cooperative

Analytical Results

Lab ID: 4280003 **Date Collected:** 10/11/2022 08:25 **Matrix:** Groundwater
Sample ID: MW-2016-6 **Date Received:** 10/13/2022 15:20 **Collector:** Client

Temp @ Receipt (C): 2.8

Method: ASTM D516-16

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	By	Cert	Qual
Sulfate	**637**	mg/L	25	5	10/19/2022 11:17	10/19/2022 11:17	EJV	MA,NDA	

Method: EPA 6010D

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	By	Cert	Qual
Boron	**0.24**	mg/L	0.1	1	10/13/2022 17:14	10/17/2022 12:07	SLZ	MA,NDA	
Calcium	**8.55**	mg/L	1	1	10/13/2022 17:14	10/25/2022 12:34	SLZ	MA,NDA	

Method: SM4500-Cl-E 2011

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	By	Cert	Qual
Chloride	**9.3**	mg/L	2.0	1	10/25/2022 14:53	10/25/2022 14:53	EJV	MA,NDA	

Method: SM4500-F-C-2011

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	By	Cert	Qual
Fluoride	**0.48**	mg/L	0.1	1	10/14/2022 14:27	10/14/2022 14:27	RAA		

Method: USGS I-1750-85

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	By	Cert	Qual
Total Dissolved Solids	**2070**	mg/L	10	1	10/14/2022 09:00	10/14/2022 09:00	RAA	MA,NDA	

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Account #: 2040 **Client:** Basin Electric Power Cooperative

Analytical Results

Lab ID: 4280004 **Date Collected:** 10/11/2022 09:32 **Matrix:** Groundwater
Sample ID: MW-2016-8 **Date Received:** 10/13/2022 15:20 **Collector:** Client

Temp @ Receipt (C): 2.8

Method: ASTM D516-16

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	By	Cert	Qual
Sulfate	**697**	mg/L	25	5	10/19/2022 11:18	10/19/2022 11:18	EJV	MA,NDA	

Method: EPA 6010D

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	By	Cert	Qual
Boron	**0.22**	mg/L	0.1	1	10/13/2022 17:14	10/17/2022 12:08	SLZ	MA,NDA	
Calcium	**12.8**	mg/L	1	1	10/13/2022 17:14	10/25/2022 12:35	SLZ	MA,NDA	

Method: SM4500-Cl-E 2011

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	By	Cert	Qual
Chloride	**11.6**	mg/L	2.0	1	10/25/2022 14:54	10/25/2022 14:54	EJV	MA,NDA	

Method: SM4500-F-C-2011

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	By	Cert	Qual
Fluoride	**0.37**	mg/L	0.1	1	10/14/2022 14:21	10/14/2022 14:21	RAA		

Method: USGS I-1750-85

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	By	Cert	Qual
Total Dissolved Solids	**2270**	mg/L	10	1	10/14/2022 09:00	10/14/2022 09:00	RAA	MA,NDA	

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Account #: 2040 **Client:** Basin Electric Power Cooperative

Analytical Results

Lab ID: 4280005 **Date Collected:** 10/12/2022 08:55 **Matrix:** Groundwater
Sample ID: MW-2016-9 **Date Received:** 10/13/2022 15:20 **Collector:** Client

Temp @ Receipt (C): 2.8

Method: ASTM D516-16

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	By	Cert	Qual
Sulfate	**176**	mg/L	25	5	10/19/2022 11:19	10/19/2022 11:19	EJV	MA,NDA	

Method: EPA 6010D

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	By	Cert	Qual
Boron	**0.24**	mg/L	0.1	1	10/13/2022 17:14	10/17/2022 12:10	SLZ	MA,NDA	
Calcium	**6.67**	mg/L	1	1	10/13/2022 17:14	10/25/2022 12:36	SLZ	MA,NDA	

Method: SM4500-Cl-E 2011

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	By	Cert	Qual
Chloride	**20.8**	mg/L	2.0	1	10/25/2022 14:55	10/25/2022 14:55	EJV	MA,NDA	

Method: SM4500-F-C-2011

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	By	Cert	Qual
Fluoride	**0.54**	mg/L	0.1	1	10/14/2022 13:18	10/14/2022 13:18	RAA		

Method: USGS I-1750-85

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	By	Cert	Qual
Total Dissolved Solids	**1670**	mg/L	10	1	10/14/2022 09:00	10/14/2022 09:00	RAA	MA,NDA	

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Account #: 2040 **Client:** Basin Electric Power Cooperative

Analytical Results

Lab ID: 4280006 **Date Collected:** 10/11/2022 10:30 **Matrix:** Groundwater
Sample ID: MW-2016-10 **Date Received:** 10/13/2022 15:20 **Collector:** Client

Temp @ Receipt (C): 2.8

Method: ASTM D516-16

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	By	Cert	Qual
Sulfate	**340**	mg/L	25	5	10/19/2022 11:20	10/19/2022 11:20	EJV	MA,NDA	

Method: EPA 6010D

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	By	Cert	Qual
Boron	**0.22**	mg/L	0.1	1	10/13/2022 17:14	10/17/2022 12:10	SLZ	MA,NDA	
Calcium	**5.89**	mg/L	1	1	10/13/2022 17:14	10/25/2022 12:37	SLZ	MA,NDA	

Method: SM4500-Cl-E 2011

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	By	Cert	Qual
Chloride	**16.2**	mg/L	2.0	1	10/25/2022 14:56	10/25/2022 14:56	EJV	MA,NDA	

Method: SM4500-F-C-2011

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	By	Cert	Qual
Fluoride	**0.61**	mg/L	0.1	1	10/14/2022 14:10	10/14/2022 14:10	RAA		

Method: USGS I-1750-85

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	By	Cert	Qual
Total Dissolved Solids	**1680**	mg/L	10	1	10/14/2022 09:00	10/14/2022 09:00	RAA	MA,NDA	

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Account #: 2040 **Client:** Basin Electric Power Cooperative

Analytical Results

Lab ID: 4280007 **Date Collected:** 10/12/2022 08:40 **Matrix:** Groundwater
Sample ID: MW-2016-11 **Date Received:** 10/13/2022 15:20 **Collector:** Client

Temp @ Receipt (C): 2.8

Method: ASTM D516-16

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	By	Cert	Qual
Sulfate	**241**	mg/L	25	5	10/19/2022 11:35	10/19/2022 11:35	EJV	MA,NDA	

Method: EPA 6010D

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	By	Cert	Qual
Boron	**0.27**	mg/L	0.1	1	10/13/2022 17:14	10/17/2022 12:11	SLZ	MA,NDA	
Calcium	**6.99**	mg/L	1	1	10/13/2022 17:14	10/25/2022 12:39	SLZ	MA,NDA	

Method: SM4500-Cl-E 2011

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	By	Cert	Qual
Chloride	**21.6**	mg/L	2.0	1	10/25/2022 14:58	10/25/2022 14:58	EJV	MA,NDA	

Method: SM4500-F-C-2011

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	By	Cert	Qual
Fluoride	**0.56**	mg/L	0.1	1	10/14/2022 14:04	10/14/2022 14:04	RAA		

Method: USGS I-1750-85

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	By	Cert	Qual
Total Dissolved Solids	**1600**	mg/L	10	1	10/14/2022 09:00	10/14/2022 09:00	RAA	MA,NDA	

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Account #: 2040 **Client:** Basin Electric Power Cooperative

Analytical Results

Lab ID: 4280008 **Date Collected:** 10/25/2022 **Matrix:** Groundwater
Sample ID: Dup 1 **Date Received:** 10/13/2022 15:20 **Collector:** Client

Temp @ Receipt (C): 2.8

Method: ASTM D516-16

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	By	Cert	Qual
Sulfate	**741**	mg/L	25	5	10/19/2022 11:36	10/19/2022 11:36	EJV	MA,NDA	

Method: EPA 6010D

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	By	Cert	Qual
Boron	**0.24**	mg/L	0.1	1	10/13/2022 17:14	10/17/2022 12:13	SLZ	MA,NDA	
Calcium	**13.5**	mg/L	1	1	10/13/2022 17:14	10/25/2022 12:41	SLZ	MA,NDA	

Method: SM4500-Cl-E 2011

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	By	Cert	Qual
Chloride	**11.5**	mg/L	2.0	1	10/25/2022 14:59	10/25/2022 14:59	EJV	MA,NDA	

Method: SM4500-F-C-2011

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	By	Cert	Qual
Fluoride	**0.36**	mg/L	0.1	1	10/14/2022 14:15	10/14/2022 14:15	RAA		

Method: USGS I-1750-85

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	By	Cert	Qual
Total Dissolved Solids	**2300**	mg/L	10	1	10/14/2022 09:00	10/14/2022 09:00	RAA	MA,NDA	

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Account #: 2040 **Client:** Basin Electric Power Cooperative

Minnesota Valley Testing Laboratories, In
2616 East Broadway Avenue
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Phone: (701) 258-9720
Toll Free: (800) 279-6885 Fax: (701) 258-9724

Basin Electric Power Cooperative
WO: 4280

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BASIN ELECTRIC POWER COOP.
Leland Olds Station
3901 HIGHWAY 200A
STANTON, ND 58571

Account #:
Phone #: 202-5096
Contact: Kevin Solie
Email: Ksolie@bepc.com
Name of Sampler: mk
For e-mail report check box XX

Billing Address (indicate if different from above):
Att: Liabilities
3901 Hwy 200A
Stanton, ND 58523-9475

Quote Number
Date Submitted: 10-13-22
Project Name/Number: ~~605143~~ LOS LANDFILL CCR
Purchase Order #: 675266-04

Sample Information					Filtered Y or (N)	Bottle Type											Analysis
Lab Use Only Lab Number	Sample ID	Sample Matrix PW- Potable Water GW - Groundwater WW - Wastewater SW - Surface Water S - Soil/Sludge O- Other	Date Sampled	Time Sampled		Untreated	Sterile	500 ml HNO3	1000 ml H2SO4	250 ml H2SO4	1000 ml NaOH	Amber HCl	Amber Unpres.	VOC Vials HCl	Amber H2SO4	40 ml Vials H2SO4	Other:	Analysis Required
001	MW-2016-2	GW	10-12-22	0820		X		X										TDS, Cl, F,
002	MW-2016-3		10-11-22	1255		X		X										Sulfate, Ca, B
003	MW-2016-6		10-11-22	0825		X		X										
004	MW-2016-8		10-11-22	0932		X		X										
005	MW-2016-9		10-12-22	0855		X		X										
006	MW-2016-10		10-11-22	1030		X		X										
007	MW-2016-11		10-12-22	0840		X		X										
008	Dup 1		10-11-22			X		X										

Comments:

Transferred by:	Date:	Time:	Sample Condition:	Received by:	Date:	Time:	Temp:
1.					10ct22	1520	2.8 TM 920
2.							
3.							

Please submit the top two copies with your samples. We will return the completed original with your results.

N1157-9 0118

Form # 80-90003-1 See above for page number Effective Date: 15 Jan 2018

Attachment B
Boring Logs and Well Completion Diagrams

WELL NUMBER MW-2016-12

CLIENT Basin Electric Power Cooperative
PROJECT NAME Leland Olds Landfill
PROJECT NUMBER 60634996
PROJECT LOCATION Stanton, North Dakota
DATE STARTED 10/3/2022 **COMPLETED** 10/4/2022
GROUND ELEVATION 1909.224 ft NAVD88 **TOC ELEVATION** 1911.518 ft NAVD88
DRILLING CONTRACTOR Cascade Drilling
GROUND WATER LEVELS: Measured bgs or from top of casing, as noted
DRILLING METHOD SONIC
AT TIME OF DRILLING None Encountered ATD
LOGGED BY David Buhl **CHECKED BY**
AT END OF DRILLING None Encountered EOD
COORDINATES 578895.218 N 1784416.7 E
AFTER DRILLING None Encountered AD

DEPTH (ft)	SAMPLE TYPE NUMBER	% RECOVERY	POCKET PENE-TROMETER, TSF	U.S.C.S.	GRAPHIC LOG	Depth, bgs	MATERIAL DESCRIPTION	Elevation	WELL CONSTRUCTION
0									Protective Casing with Locking Cap
				OL		1.5	Dark grayish brown (10YR 4/2) soils and organic material	1907.7	
	SONIC 1	100	NA	ML		2.8	Light olive brown (10Y 5/3) sandy SILT, stiff, dry, 20-30% sand (very fine to fine), very mottled (FILL material)	1906.5	
5				CL		5.0	Dark grayish brown (2.5Y 4/2) sandy CLAY, stiff, dry, low to medium plasticity, 20% very fine to fine sand, mottled (FILL material)	1904.2	Volclay Bentonite Grout (0' - 83.8' bgs)
						7.0	No recovery	1902.2	PVC Pipe (2' ags - 101' bgs)
				CL		9.0	Dark grayish brown (2.5Y 4/2) sandy CLAY, stiff, dry, low to medium plasticity, 20% very fine to fine sand, mottled (FILL material)	1900.2	
10	SONIC 2	82	NA	CH		11.0	Very dark grayish brown (10YR 3/2) CLAY, medium stiffness, dry to moist, high plasticity, some sand, some orange-y red to red/rust gravel	1898.2	
				ML		13.0	Dark gray (10YR 4/1) sandy SILT, stiff, slightly moist, low plasticity, 30-40% very fine to fine sand	1896.2	
15				SM		15.0	Grayish brown (2.5Y 5/2) silty SAND, dense, slightly moist, fine, high sphericity, angular to subangular	1894.2	
						17.0	No recovery	1892.2	
20	SONIC 3	79	NA	CL		25.0	Very dark grayish brown (2.5Y 3/2) sandy CLAY, slightly moist, medium plasticity, fine sand (20%)	1884.2	
25						29.0	No recovery	1880.2	
30	SONIC			CL			Very dark grayish brown (2.5Y 3/2) sandy CLAY, slightly moist, medium plasticity, fine sand (20%)		

(Continued Next Page)

CLIENT Basin Electric Power Cooperative **PROJECT NAME** Leland Olds Landfill

PROJECT NUMBER 60634996 **PROJECT LOCATION** Stanton, North Dakota

DEPTH (ft)	SAMPLE TYPE NUMBER	% RECOVERY	POCKET PENETROMETER, TSF	U.S.C.S.	GRAPHIC LOG	Depth, bgs	MATERIAL DESCRIPTION	Elevation	WELL CONSTRUCTION
30	4	63	NA	CL		33.0		1876.2	VolclayBentonite Grout (0' - 83.8 bgs)
				SM			Gray (10 YR 5/1) silty SAND, moist, medium dense to dense, fine, subangular, high sphericity, poorly graded		
35						35.0		1874.2	PVC Pipe (2' ags - 101' bgs)
						36.0	No recovery	1873.2	
	SONIC 5	83	NA	CL		38.0	Dark gray (2.5Y 4/1) sandy CLAY, medium stiffness, moist, medium plasticity, 30% fine sand	1871.2	
40				SM			Gray (2.5Y 6/1) silty SAND, moist, medium dense, fine, subangular, high sphericity, poorly graded		
45	SONIC 6	100	NA						
50						52.0		1857.2	
						53.0	No recovery	1856.2	
	SONIC 7	92	NA	SM		55.0	Some sandstone cobbles up to 120 mm composed of same grains as surrounding silty SAND	1854.2	
55						56.0	No recovery	1853.2	
				SM		57.0		1852.2	
				SC		59.0	Dark gray (2.5Y 4/1) clayey SAND, moist, medium dense to dense, fine, high sphericity, subangular	1850.2	
60	SONIC 8	88	NA	CL		62.0	Gray (2.5Y 5/1) CLAY, very stiff, dry, low plasticity	1847.2	
				SC			Light olive brown (2.5Y 5/3) clayey SAND, dense, moist, fine, high sphericity, subangular NOTE: seeing some lignite fragments and debris, but no defined lignite layer		

(Continued Next Page)

CLIENT Basin Electric Power Cooperative **PROJECT NAME** Leland Olds Landfill

PROJECT NUMBER 60634996 **PROJECT LOCATION** Stanton, North Dakota

DEPTH (ft)	SAMPLE TYPE NUMBER	% RECOVERY	POCKET PENE-TROMETER, TSF	U.S.C.S.	GRAPHIC LOG	Depth, bgs	MATERIAL DESCRIPTION	Elevation	WELL CONSTRUCTION
65				SC		65.0		1844.2	
				CH		67.5	Dark gray (2.5Y 4/1) sandy CLAY, soft, high plasticity, moist, 20-30% fine sand	1841.7	
				SC		68.0	Light olive brown (2.5Y 5/3) clayey SAND, soft, moist, fine, high sphericity, subangular	1841.2	VolclayBentonite Grout (0' - 83.8' bgs)
70	SONIC 9	100	NA			70.0	Black lignite, wet	1839.2	PVC Pipe (2' ags - 101' bgs)
				CL		72.0	Dark gray (2.5Y 4/1) CLAY, hard, low plasticity	1837.2	
				CL		73.0	Grey (2.5Y 6/1) sandy CLAY, hard, low plasticity, moist, fine	1836.2	
				CL		74.0	Very dark grayish brown (2.5Y 3/2) CLAY, medium plasticity, soft, moist	1835.2	
75				CL		75.0	Dark gray (2.5Y 4/1) CLAY, dry, low to medium plasticity, stiff	1834.2	
				CL		77.0	Very dark gray (2.5Y 3/1) CLAY, stiff, low to medium plasticity, moist	1832.2	
	SONIC 10	100	NA				Dark gray (2.5Y 4/1) CLAY, dry, very stiff, low to medium plasticity, dry to moist		
80				CL					
85	SONIC 11	100	NA	SC		85.0	Gray (2.5Y 6/1) clayey SAND, dense, slightly moist, fine, high sphericity, angular to subangular, poor grading	1824.2	Bentonite Seal (83.8' - 88' bgs)
90						90.0		1819.2	Filter Sand Pack (88 - 102' bgs)
							Black to very dark reddish gray lignite, dry to wet		
95	SONIC 12	100	NA			96.0		1813.2	0.010" Slotted Pipe (91' - 101' bgs)
				CL			Gray (2.5Y 5/1) CLAY, very stiff, dry to wet, low plasticity		

(Continued Next Page)

WELL NUMBER MW-2016-12

CLIENT Basin Electric Power Cooperative **PROJECT NAME** Leland Olds Landfill

PROJECT NUMBER 60634996 **PROJECT LOCATION** Stanton, North Dakota

DEPTH (ft)	SAMPLE TYPE NUMBER	% RECOVERY	POCKET PENE-TROMETER, TSF	U.S.C.S.	GRAPHIC LOG	Depth, bgs	MATERIAL DESCRIPTION	Elevation	WELL CONSTRUCTION
100				CL		100.0		1809.2	
						100.5	Black lignite (6" at top of run)	1808.7	
				CL		101.5	Dark gray (2.5Y 4/1) CLAY, low plasticity, dry to moist, very stiff	1807.7	
	SONIC 13	100	NA	CL			Gray (2.5Y 6/1) sandy CLAY, low plasticity, slightly moist, very stiff		
						103.5		1805.7	Bentonite fill (102'-105' bgs)
						104.0	Grey argillaceous limestone (mostly pulverized)	1805.2	
105				SC		105.0	Gray (2.5 Y 5/1) clayey SAND, dense, very fine to fine, poorly graded, moist, high sphericity, angular to subangular	1804.2	
						106.0	No recovery	1803.2	
							Gray (2.5 Y 5/1) clayey SAND, dense, very fine to fine, poorly graded, wet, high sphericity, angular to subangular		
110	SONIC 14	93	NA						
115									Clay backfill from drilling samples (105'-125' bgs)
				SC					
120	SONIC 15	100	NA						
125						125.0		1784.2	

Bottom of borehole at 125.0 feet.

WELL NUMBER MW-2016-13

CLIENT Basin Electric Power Cooperative **PROJECT NAME** Leland Olds Landfill

PROJECT NUMBER 60634996 **PROJECT LOCATION** Stanton, North Dakota

DATE STARTED 10/1/2022 **COMPLETED** 10/2/2022 **GROUND ELEVATION** 1945.544 ft NAVD88 **TOC ELEVATION** 1948.147 ft NAVD88

DRILLING CONTRACTOR Cascade Drilling **GROUND WATER LEVELS: Measured bgs or from top of casing, as noted**

DRILLING METHOD SONIC **AT TIME OF DRILLING** None Encountered ATD

LOGGED BY David Buhl **CHECKED BY** **AT END OF DRILLING** None Encountered EOD

COORDINATES 579111.612 N 1783626.1 E **AKGWA#** **AFTER DRILLING** None Encountered AD

DEPTH (ft)	SAMPLE TYPE NUMBER	% RECOVERY	POCKET PENE-TROMETER, TSF	U.S.C.S.	GRAPHIC LOG	Depth, bgs	MATERIAL DESCRIPTION	Elevation	WELL CONSTRUCTION
0									Protective Casing with Locking Cap
							No recovery		
						1.8		1943.8	
	SONIC 1	70	NA	OL		2.5	Grayish brown TOPSOIL (10YR 5/2)	1943.0	
				OL		3.5	TOPSOIL, very dark grayish brown (10YR 3/2)	1942.0	Volclay Bentonite Grout (0' - 129' bgs)
				ML		4.5	Black (5YR 2.5/1) sandy SILT, dry, medium stiffness, low plasticity, 30% very fine sand	1941.0	
5				CL		5.0	Dark reddish brown (5YR 2.5/2) clayey SILT, very stiff, dry, medium plasticity, some very fine, very pale brown (10YR 7/2) sandy lenses, mottled	1940.5	PVC Pipe (2' ags - 144' bgs)
							No recovery		
						7.8		1937.8	
				CL		8.5	[Dark reddish brown (5YR 2.5/2) clayey SILT, very stiff, dry, medium plasticity, some very fine, very pale brown (10YR 7/2) sandy lenses, mottled]	1937.0	
				ML			Black (5YR 2.5/1) silty CLAY, dry soft, low plasticity, some very fine sand		
10	SONIC 2	73	NA			10.0		1935.5	
				CH			Black (5 YR 2.5/1) silty CLAY, dry medium stiffness, high plasticity		
						11.5		1934.0	
				CL			Light brownish gray (10YR 6/2) silty CLAY, dry to moist, medium plasticity, stiff, mottled		
				CL		14.0	some black silt mixed in	1931.5	
15				CL		15.0	Brown (10YR 5/3) CLAY, moist, hard, medium plasticity, mottled	1930.5	
							No recovery		
20	SONIC 3	50	NA			20.0		1925.5	
				CH		21.0	Very dark grayish brown (10YR 3/2) CLAY, moist, high plasticity, somewhat mottled	1924.5	
				CL			Black and light yellowish brown (2.5Y 6/4) silty CLAY, moist, medium plasticity, mottled		
						24.0		1921.5	
25				CH			Very dark grayish brown (10YR 3/2) CLAY, moist, high plasticity, somewhat mottled		
						28.0		1917.5	
				CH		29.0	Dark gray (7.5 YR 4/1) sandy CLAY, wet, very stiff, high plasticity, 30% very fine to fine sand	1916.5	
						29.5		1916.0	
30	SONIC			CH			Black lignite		

(Continued Next Page)

CLIENT Basin Electric Power Cooperative **PROJECT NAME** Leland Olds Landfill

PROJECT NUMBER 60634996 **PROJECT LOCATION** Stanton, North Dakota

DEPTH (ft)	SAMPLE TYPE NUMBER	% RECOVERY	POCKET PENE-TROMETER, TSF	U.S.C.S.	GRAPHIC LOG	Depth, bgs	MATERIAL DESCRIPTION	Elevation	WELL CONSTRUCTION
30	4	92	NA	CH		31.5	Dark gray (7.5YR 4/1) sandy CLAY, wet, very stiff, high plasticity, 30% very fine sand	1914.0	
				CL		35.0	Gray (10YR 5/1) sandy CLAY, hard, wet, medium plasticity, 40% very fine sand	1910.5	Volclay Bentonite Grout (0' - 129' bgs)
35						38.5	No recovery	1907.0	PVC Pipe (2' ags - 144' bgs)
40	SONIC 5	68	NA	CL		43.0	Very dark grayish brown (10YR 3/2) CLAY, medium stiffness, medium plasticity, wet, some red rock fragments (feldspathic arenite)	1902.5	
45				ML		46.0	Gray (2.5YR 6/1) sandy SILT, wet, stiff to very stiff, 40-50% very fine sand, low plasticity	1899.5	
				ML		48.5	Yellowish brown (10YR 5/4) clayey SILT, moist to dry, hard, low plasticity	1897.0	
50	SONIC 6	108	NA	ML		55.0	Light yellowish brown (2.5Y 6/3) clayey SILT, moist to wet, very stiff, low plasticity, several zones of iron staining	1890.5	
55						56.5	No recovery	1889.0	
	SONIC 7	78	NA	ML		59.0	Light olive brown (2.5Y 5/3) SILT, wet, stiff to hard, medium plasticity, slightly mottled	1886.5	
60							Very dark gray to black organic SHALE and lignite coal. some pyrite in laminae, some very dark reddish black sediments		

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CLIENT Basin Electric Power Cooperative **PROJECT NAME** Leland Olds Landfill

PROJECT NUMBER 60634996 **PROJECT LOCATION** Stanton, North Dakota

DEPTH (ft)	SAMPLE TYPE NUMBER	% RECOVERY	POCKET PENE-TROMETER, TSF	U.S.C.S.	GRAPHIC LOG	Depth, bgs	MATERIAL DESCRIPTION	Elevation	WELL CONSTRUCTION
						66.0		1879.5	
				ML			Gray (2.5Y 5/1) sandy SILT, wet, medium stiff to very stiff, medium plasticity, 20% very fine sand		
						67.5		1878.0	
	SONIC 8	100	NA	ML		68.0	Black (10YR 2/1) SILT, moist, hard, low to medium plasticity	1877.5	Volclay Bentonite Grout (0' - 129' bgs)
				ML			Dark gray (2.5Y 4/1) sandy SILT, wet stiff to hard, low plasticity, 40-50% fine sand		PVC Pipe (2' ags - 144' bgs)
70						71.0		1874.5	
							Gray (2.5Y 5/1) silty SAND, wet, medium dense to dense, very fine to fine, 20% silt, high sphericity, subrounded, well-sorted, poorly graded		
75									
				SM					
80	SONIC 9	100	NA						
							becoming dry		
85				SM					
							becoming more silty (30-40% silt), low to medium plasticity (silty SAND)		
	SONIC 10	100	NA	SM					
90						91.0		1854.5	
							Gray (10YR 6/1) and light gray (10YR 7/1) SILT, very stiff, dry to moist, low plasticity, some clay and sand, thinly laminated with alternating colors listed above, some brownish red staining		
	SONIC 11	100	NA	ML		94.0		1851.5	
95				CL		95.0	Dark gray (10YR 4/1) CLAY, hard, dry, low to medium plasticity, massive, some very dark purple-gray-black staining	1850.5	
						95.5	No recovery	1850.0	
							Black to reddish black lignite		
	SONIC								

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CLIENT Basin Electric Power Cooperative **PROJECT NAME** Leland Olds Landfill

PROJECT NUMBER 60634996 **PROJECT LOCATION** Stanton, North Dakota

DEPTH (ft)	SAMPLE TYPE NUMBER	% RECOVERY	POCKET PENE-TROMETER, TSF	U.S.C.S.	GRAPHIC LOG	Depth, bgs	MATERIAL DESCRIPTION	Elevation	WELL CONSTRUCTION
100	12	95	NA			102.0		1843.5	Volclay Bentonite Grout (0' - 129' bgs)
						102.5	No recovery	1843.0	PVC Pipe (2' ags - 144' bgs)
	SONIC 13	83	NA				Black to reddish black lignite		
105						104.0	Gray (2.5Y 5/1) CLAY, dry, very stiff, low to medium plasticity	1841.5	
				CL					
				CL			some silty sections		
110	SONIC 14	100	NA			110.0		1835.5	
				ML			Gray (2.5Y 5/1) SILT, dry, stiff, low plasticity, some very fine sand		
115				ML		116.0	increasing sand content	1829.5	
							Gray (2.5Y 5/1) silty SAND, medium dense to dense, moist, very fine, subangular, very well-sorted, poorly graded, 20-30% silt		
120	SONIC 15	100	NA						
				SM					
125									
130	SONIC 16	100	NA			131.0		1814.5	Bentonite Seal (129' - 131' bgs)
				CL-ML			Gray (2.5Y 5/1) sandy SILTS and CLAYS, stiff to very stiff, dry to moist, low plasticity, 40-50% very fine sand		Filter Sand Pack (131 - 145' bgs)

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WELL NUMBER MW-2016-13

CLIENT Basin Electric Power Cooperative **PROJECT NAME** Leland Olds Landfill

PROJECT NUMBER 60634996 **PROJECT LOCATION** Stanton, North Dakota

DEPTH (ft)	SAMPLE TYPE NUMBER	% RECOVERY	POCKET PENE-TROMETER, TSF	U.S.C.S.	GRAPHIC LOG	Depth, bgs	MATERIAL DESCRIPTION	Elevation	WELL CONSTRUCTION
				CL-ML		134.0		1811.5	
135							Black and reddish black lignite		Filter Sand Pack (131 - 145' bgs)
						137.5		1808.0	
				CL		138.5	Very dark, grayish brown (2.5Y 3/2) sandy CLAY, very stiff, moist, low plasticity, 10% sand (very fine)	1807.0	
						139.5	Very dark gray (10YR 3/1) SHALE, organic rich and lignite	1806.0	0.010" Slotted Pipe (134' - 144' bgs)
140	SONIC 17	100	NA	CL			Very dark gray (2.5Y 3/1) CLAY, moist, stiff to very stiff, low plasticity, some sand 5-10% (very fine), alternating laminated beds (gray/very dark gray)		
						144.0		1801.5	
						144.5	Reddish black lignite	1801.0	
145							Very dark gray (2.5Y 3/1) CLAY, stiff, dry to moist		
	SONIC 18	100	NA	CL					Bentonite fill (145'-147' bgs)
						147.0		1798.5	

Bottom of borehole at 147.0 feet.

Attachment C
Data Input Files for Calculation of Upper and Lower Prediction Limits

Attachment B
Data Input Files for Calculation of Upper and Lower Prediction Limits
Background wells: MW-2016-3, MW-2016-4, MW-2016-5, MW-2016-6, MW-2016-8
CCR Landfill, Leland Olds Station, Stanton, ND

sys_loc_code	sample_date	sample_type_code	Boron	D_Boron	Calcium	D_Calciun	Chloride	D_Chlorid	Fluoride	D_Fluorid	pH	D_pH	Sulfate	D_Sulfate	TDS	D_TDS
MW-2016-3	9/29/2016	N	0.27	1	23	1	35	1	0.5	0	7.42	1	100	1	1400	1
MW-2016-3	2/16/2017	N	0.22	1	22	1	37	1	0.5	1	7.59	1	74	1	1500	1
MW-2016-3	3/17/2017	N	0.26	1	15	1	36	1	0.56	1	7.83	1	59	1	1500	1
MW-2016-3	4/12/2017	N	0.29	1	12	1	39	1	0.57	1	7.58	1	59	1	1500	1
MW-2016-3	5/19/2017	N	0.26	1	13	1	33	1	0.5	0	7.46	1	78	1	1800	1
MW-2016-3	6/22/2017	N	0.25	1	10	1					7.63	1			1500	1
MW-2016-3	7/20/2017	N	0.24	1	9.7	1					7.54	1			1600	1
MW-2016-3	8/23/2017	N	0.25	1	8.4	1	37	1	0.6	1	7.41	1	51	1	1400	1
MW-2016-3	10/9/2017	N					41	1	0.54	1	7.54	1	47	1		
MW-2016-3	10/12/2017	N					40	1	0.58	1	7.54	1	50	1		
MW-2016-3	4/19/2018	N	0.28	1	7.3	1	37	1	0.64	1	7.89	1	34	1	1500	1
MW-2016-3	10/11/2018	N	0.257	1	6.53	1	37.6	1	0.548	1	8.24	1	33.5	1	1490	1
MW-2016-3	5/20/2019	N	0.244	1	5.6	1	37.3	1	0.314	1	7.66	1	47.6	1	1510	1
MW-2016-3	10/8/2019	N	0.263	1	5.38	1	36.7	1	0.622	1	8	1	47.2	1	1520	1
MW-2016-3	6/10/2020	N	0.246	1	5.41	1	29.8	1	0.512	1	7.9	1	31.6	1	1510	1
MW-2016-3	10/1/2020	N	0.254	1	5	1	31.6	1	0.5	0	7.92	1	42.2	1	1590	1
MW-2016-4	9/29/2016	N	0.24	1	11	1	18	1	0.58	1	7.49	1	370	1	1700	1
MW-2016-4	2/15/2017	N	0.23	1	9.9	1	19	1	0.63	1	7.61	1	370	1	1700	1
MW-2016-4	3/16/2017	N	0.22	1	10	1	20	1	0.58	1	7.59	1	360	1	1700	1
MW-2016-4	4/12/2017	N	0.25	1	9.5	1	20	1	0.6	1	7.41	1	370	1	1700	1
MW-2016-4	5/19/2017	N	0.23	1	8.5	1	17	1	0.54	1	7.36	1	350	1	1700	1
MW-2016-4	6/21/2017	N	0.24	1	8.1	1					7.31	1			1700	1
MW-2016-4	7/20/2017	N	0.22	1	10	1					7.27	1			1700	1
MW-2016-4	8/23/2017	N	0.25	1	9.7	1	19	1	0.58	1	7.24	1	360	1	1600	1
MW-2016-4	10/9/2017	N					18	1	0.56	1	7.61	1	360	1		
MW-2016-4	10/12/2017	N					18	1	0.57	1	7.69	1	320	1		
MW-2016-4	4/18/2018	N	0.25	1	7.6	1	20	1	0.62	1	8.14	1	350	1	1700	1
MW-2016-4	10/11/2018	N	0.248	1	6.67	1	20.9	1	0.567	1	8.43	1	358	1	1730	1
MW-2016-4	5/20/2019	N	0.237	1	5.8	1	20.2	1	0.31	1	7.83	1	377	1	1770	1
MW-2016-4	10/8/2019	N	0.232	1	5.36	1	20.5	1	0.641	1	8.22	1	337	1	1760	1
MW-2016-4	6/9/2020	N	0.234	1	5.37	1	13.2	1	0.516	1	8.13	1	366	1	1710	1
MW-2016-4	9/30/2020	N	0.246	1	5.39	1	30	0	0.5	0	8.08	1	363	1	1860	1
MW-2016-4	10/1/2020	N	0.246	1	5.39	1	30	0	0.5	0			368	1	1650	1
MW-2016-5	9/28/2016	N	0.24	1	23	1	7.9	1	0.5	0	7.93	1	600	1	1700	1
MW-2016-5	2/14/2017	N	0.24	1	18	1	8.8	1	0.52	1	7.51	1	600	1	1900	1
MW-2016-5	3/16/2017	N	0.25	1	13	1	8.2	1	0.5	0	7.53	1	590	1	1800	1
MW-2016-5	4/12/2017	N	0.25	1	12	1	7.9	1	0.55	1	7.32	1	610	1	1700	1
MW-2016-5	5/18/2017	N	0.25	1	11	1	6.2	1	0.5	0	7.22	1	590	1	1900	1
MW-2016-5	6/21/2017	N	0.25	1	9.9	1					7.32	1			1900	1
MW-2016-5	7/19/2017	N	0.23	1	9.8	1					7.36	1			1900	1
MW-2016-5	8/23/2017	N	0.24	1	9.9	1	7.3	1	0.56	1	7.45	1	630	1	1700	1
MW-2016-5	10/9/2017	N					7.2	1	0.5	0	7.37	1	620	1		
MW-2016-5	10/12/2017	N					6.5	1	0.54	1	7.44	1	610	1		
MW-2016-5	4/19/2018	N	0.27	1	7.8	1	6.7	1	0.56	1	7.79	1	620	1	1900	1
MW-2016-5	10/11/2018	N	0.265	1	9.58	1	8.4	1	0.518	1	8.18	1	606	1	1950	1
MW-2016-5	5/20/2019	N	0.246	1	9.09	1	8.35	1	2.5	0	7.53	1	607	1	1890	1
MW-2016-5	10/8/2019	N	0.255	1	7.35	1	7.28	1	0.584	1	7.69	1	615	1	1890	1
MW-2016-5	6/9/2020	N									7.01	1				
MW-2016-5	6/10/2020	N	0.237	1	6.5	1	5.31	1	0.451	1	7.91	1	623	1	1890	1
MW-2016-5	10/1/2020	N	0.263	1	6.8	1	30	0	0.5	0	8.13	1	588	1	1860	1
MW-2016-6	9/28/2016	N	0.21	1	43	1	9.1	1	0.5	0	7.69	1	520	1	1500	1
MW-2016-6	2/15/2017	N	0.27	1	16	1	6.3	1	0.5	0	7.55	1	730	1	2100	1
MW-2016-6	3/16/2017	N	0.29	1	13	1	15	0	2.5	0	7.58	1	740	1	2100	1
MW-2016-6	4/12/2017	N	0.29	1	12	1	5.8	1	0.5	0	7.67	1	770	1	2200	1
MW-2016-6	5/19/2017	N	0.27	1	13	1	4.7	1	0.5	0	7.39	1	730	1	2100	1
MW-2016-6	6/22/2017	N	0.27	1	12	1					7.52	1			2100	1
MW-2016-6	7/20/2017	N	0.24	1	11	1					7.53	1			2100	1
MW-2016-6	8/23/2017	N	0.27	1	11	1	5.9	1	0.5	0	7.49	1	750	1	2000	1
MW-2016-6	10/10/2017	N					5.9	1	0.5	0	7.37	1	710	1		
MW-2016-6	10/11/2017	N					5.1	1	0.5	0	7.51	1	720	1		
MW-2016-6	4/19/2018	N	0.27	1	9.6	1	5.6	1	0.48	1	8.39	1	710	1	2100	1
MW-2016-6	10/11/2018	N	0.287	1	9.78	1	6.03	1	0.401	1	7.95	1	716	1	1890	1
MW-2016-6	5/20/2019	N	0.27	1	8.49	1	6.77	1	2.5	0	7.46	1	734	1	2030	1
MW-2016-6	10/8/2019	N	0.266	1	7.93	1	6.38	1	0.428	1	7.87	1	688	1	2040	1
MW-2016-6	6/9/2020	N									8.05	1				
MW-2016-6	6/10/2020	N	0.265	1	8.35	1	4.85	1	0.325	1	7.93	1	667	1	2040	1
MW-2016-6	10/1/2020	N	0.279	1	8.37	1	30	0	0.884	1	7.9	1	659	1	2100	1
MW-2016-8	9/27/2016	N	0.25	1	20	1	9	1	0.5	0	7.82	1	700	1	2200	1
MW-2016-8	2/13/2017	N	0.26	1	22	1	9.2	1	0.5	0	7.52	1	730	1	2200	1
MW-2016-8	3/16/2017	N	0.27	1	15	1	8.7	1	0.5	0	7.52	1	710	1	2200	1
MW-2016-8	4/11/2017	N	0.27	1	14	1	8.7	1	0.5	0	7.25	1	740	1	2200	1
MW-2016-8	5/18/2017	N	0.25	1	13	1	8	1	0.5	0	7.87	1	710	1	2200	1
MW-2016-8	6/22/2017	N	0.25	1	13	1					7.51	1			2200	1
MW-2016-8	7/19/2017	N	0.24	1	13	1					7.36	1			2300	1
MW-2016-8	8/22/2017	N	0.26	1	16	1	8.7	1	0.5	0	7.49	1	720	1	2100	1
MW-2016-8	10/9/2017	N					8.8	1	0.5	0	7.46	1	700	1		
MW-2016-8	10/12/2017	N					7.9	1	0.5	0	7.59	1	700	1		
MW-2016-8	4/18/2018	N	0.26	1	13	1	8.2	1	0.41	1	8.06	1	720	1	2200	1
MW-2016-8	10/11/2018	N	0.267	1	13.4	1	8.22	1	0.372	1	8.43	1	717	1	2320	1
MW-2016-8	5/20/2019	N	0.254	1	12.4	1	9.6	1	2.5	0	7.94	1	742	1	1910	1
MW-2016-8	10/8/2019	N	0.259	1	12.2	1	9.13	1	0.353	1	8.08	1	691	1	2200	1
MW-2016-8	6/9/2020	N									7.93	1				
MW-2016-8	6/10/2020	N	0.23	1			6.67	1	0.221	1	7.9	1	678	1	2180	1
MW-2016-8	9/30/2020	N	0.266	1	12.1	1	30	0			7.92	1	675	1	2090	1