



2020 Annual Groundwater Monitoring and Corrective Action Report

Scrubber Pond and Temporary Storage Area

Lewis & Clark Station

Sidney, Montana

Prepared for
Montana Dakota Utilities

January 2021

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Acronyms

Acronym	Description
ACM	Assessment of Corrective Measure
ASD	Alternative Source Demonstration
CCR	Coal Combustion Residuals
CFR	Code of Federal Regulations
EPA	Environmental Protection Agency
FGD	Flue-Gas Desulfurization
GWPS	Groundwater Protection Standard
MCL	Maximum Contaminant Level
MDU	Montana Dakota Utilities Company
RL	Reporting Limit
RSL	Regional Screening Level
SSI	Statistically Significant Increase
TSP	Temporary Storage Pad

Executive Summary

This summary provides an overview of the Groundwater Monitoring & Corrective Action Program status as required by 40 CFR 257.94(e)(6). The Site operated under the assessment monitoring program described in § 257.95 at the start and at the end of the 2020 annual reporting period. Lithium was detected at statistically significant levels above the groundwater protection standards (GWPS) for both semiannual monitoring events at all downgradient monitoring wells. Selenium was detected at statistically significant levels above the GWPS for the spring monitoring event at monitoring well MW-111. An assessment of corrective measures was initiated on April 2, 2019, and completed on August 29, 2019. A selection of remedy was underway in 2020, but an alternative source demonstration (ASD) showing that lithium and selenium levels above GWPS were not the result of releases from the regulated CCR units was completed, ending the selection of remedy phase. No remedial activities have been initiated. An ASD was prepared in 2020 that showed that a source other than the Temporary Storage Pad (TSP) CCR unit caused lithium to be present at statistically significant levels above the GWPS; therefore, the TSP has been closed in accordance with the requirements of § 257.102(c).

1.0 Introduction

Montana-Dakota Utilities Co. (MDU) owns and operates Lewis & Clark Station, a coal-fired electricity generation unit near Sidney, Montana (Figure 1). Lewis & Clark Station is a coal-fired electrical generating plant, operation of which results in coal combustion residuals (CCR) as a by-product. Two storage ponds and a CCR pile are situated at the property to manage CCR. The storage ponds—which comprise a single, multi-unit CCR surface impoundment under the CCR Rule—are named the East and West Scrubber Ponds, or collectively the Scrubber Ponds.

The Scrubber Ponds store sluiced flue-gas desulfurization (FGD) solids. The CCR pile is located on a Temporary Storage Pad (TSP) where FGD solids (excavated from the Scrubber Ponds) are stored and allowed to drain prior to loading and hauling for disposal. The Scrubber Ponds are required to comply with the provisions of the US Environmental Protection Agency (EPA) CCR Rule (40 CFR Parts 257 and 261, Disposal of Coal Combustion Residuals from Electric Utilities). Monitoring and reporting requirements in the CCR Rule do not apply to the current TSP because it qualifies for the CCR pile exemptions in the CCR Rule. The former TSP, which was located in the same location as the current TSP, is closed.

Closure by removal of CCR began at the TSP in 2018 with the removal of CCR and CCR-contaminated sediments. A demonstration that a source other than the TSP (Alternative Source Demonstration, ASD) caused lithium to be present at statistically significant levels above the groundwater protection standards (GWPS) was completed on November 13, 2020. The ASD is provided in Appendix B. Closure by removal under § 257.102(c) has been completed.

The locations of the Scrubber Ponds and TSP are shown on Figure 1. The groundwater monitoring system is a multi-unit groundwater monitoring system, as allowed in § 257.91(d), meaning that both the Scrubber Ponds and the TSP are monitored by the groundwater monitoring system. This 2020 Annual Groundwater Monitoring and Corrective Action Report (Annual Report) describes the monitoring program and results for the Scrubber Ponds and TSP at MDU's Lewis & Clark Station.

1.1 Purpose

As stated in Section § 257.90(e), the purpose of the Annual Report is to:

- Document the status of monitoring and corrective action program for the CCR unit
- Summarize key actions completed
- Describe any problems encountered
- Discuss actions to resolve the problems
- Project key activities for the upcoming year

1.2 Status of the Groundwater Monitoring and Corrective Action Program

The Scrubber Ponds and TSP are currently in assessment monitoring. Baseline groundwater monitoring was completed in 2017, as documented in the 2017 Annual Groundwater Monitoring and Corrective

Action Report, Scrubber Pond and Temporary Storage Area (Barr, 2018a). A detection monitoring program began on October 17, 2017, and continued until April 14, 2018 (Barr, 2019a). A statistically significant increase (SSI) over background levels was determined for constituents listed in appendix III to the CCR Rule in 2018, so the site transitioned to an assessment monitoring program (§ 257.95(a)) on April 15, 2018. Assessment monitoring continued through 2020.

It was determined on January 2, 2019, that the initial assessment monitoring event resulted in detections of lithium and selenium at statistically significant levels above applicable GWPS. An assessment of corrective measures (ACM) was initiated on April 2, 2019, and completed on August 29, 2019 (Barr, 2019b). The site was undergoing a selection of remedy, as described in § 257.97, subject to the ongoing evaluation of a potential alternative source. An ASD (Appendix C) showing that lithium and selenium levels above GWPS are not the result of releases from the regulated CCR units was completed on January 28, 2021, and the selection of remedy was suspended.

1.3 CCR Rule Requirements

This Annual Report has been prepared in accordance with the requirements of § 257.90(e) of the CCR Rule, as outlined in Table 1.

2.0 Groundwater Monitoring and Corrective Action Program

This section documents the status of the groundwater monitoring and corrective action program for the CCR units for 2020. The groundwater monitoring system is described in Section 2.1, monitoring and analytical results are described in Section 2.2, the corrective action program status is described in Section 2.3, key actions completed and problems encountered are described in Section 2.4, and key activities planned for 2021 are described in Section 2.5.

2.1 Groundwater Monitoring System

2.1.1 Documentation

Figure 1 shows an aerial image of the CCR units and all upgradient (or background) and downgradient monitoring wells in the groundwater monitoring system, including well identification numbers, that are part of the groundwater monitoring program, as required by § 257.90(e)(1). Further details on the groundwater monitoring system are included in Groundwater Monitoring System Certification, Lewis & Clark Station (Barr, 2018b).

2.1.2 Changes to Monitoring System

There were no changes to the groundwater monitoring system in 2020.

2.2 Monitoring and Analytical Results

The following actions and results occurred during assessment monitoring in 2020:

- A total of fourteen samples (seven monitoring wells during two sampling events) were collected from the CCR groundwater monitoring system. Samples were analyzed for the constituents listed in appendices III and IV (Part 257). The assessment monitoring sampling events (March 4-5 and August 26-28, 2019) were consistent with the requirements of § 257.95(b) and § 257.95(d)(1).
- Following the March sampling event, two wells (MW-111 and MW-118) were resampled (April 20) to confirm selenium results.
- A total of fourteen additional samples (seven monitoring wells during two sampling events, May 19 and September 21) were collected from the CCR groundwater monitoring system and were analyzed for lithium to complete baseline sampling requirements.
- Lithium was detected at statistically significant levels above the GWPS for both spring and fall monitoring events at all downgradient monitoring wells.
- Selenium was detected at statistically significant levels above the GWPS for the spring monitoring event at one well (MW-111). Selenium was below the GWPS in all wells for the fall monitoring event.

Sampling dates are reported on the field data sheets and analytical laboratory reports in Appendix A. A summary of the results is also provided in the attached Table 4.

Background concentration levels were established under § 257.94(b) and are provided in Table 2 in compliance with § 257.95(d)(3). Recorded concentrations for these parameters are provided in Table 4.

2.2.1 Establishment of Lithium Groundwater Protection Standards

In compliance with CCR Rule § 257.95(d)(2), GWPS were established for all appendix IV constituents detected in groundwater. GWPS are defined as the highest of the following values: the applicable MCL; in the case of cobalt, lead, lithium and molybdenum, the default GWPS values established under the CCR Rule; or, for any constituent, a site-specific background concentration established from background sampling. Background levels of lithium and selenium at the site were demonstrated to be higher than the default GWPS and MCL, respectively. Thus, site-specific GWPS have been adopted for lithium and selenium in accordance with § 257.95(h)(3).

Background concentration levels were determined in accordance with the statistical methods established in § 257.93(f-g) and the Statistical Method Selection Certification (Barr, 2017) using the monitoring results from samples collected from upgradient monitoring wells. Samples collected during the baseline sample collection period (Barr, 2018a) were used to establish the site-specific GWPS for selenium (Barr, 2018a).

The lithium groundwater monitoring results for upgradient samples (from monitoring wells MW-103, MW-110, and MW-119) collected during the baseline period defined by the CCR Rule were reported as non-detect with a reporting limit (RL) of 100 µg/L; therefore, the initial background lithium concentration level was set as the RL of 100 µg/L for lithium. On July 30, 2018, EPA promulgated for the first time a default lithium GWPS (40 µg/L) in the agency's Phase I revision to CCR Rule § 257.95(h)(2).

After the Phase I CCR Rule revision was issued and before completion of the ACM in 2019, all wells in the groundwater monitoring system had been sampled and analyzed three times for lithium concentrations with the lower RL. A lithium GWPS was determined for the ACM using the upgradient lithium monitoring results from the three events that used the lower RL (a total of nine samples; Barr, 2020). A fourth monitoring event was conducted in August 2019. An additional four samples were collected in 2020 to complete the required eight baseline sampling events for each well for lithium at the lower RL. The additional four sampling events include the standard spring and fall sampling events, plus two sampling events where samples were only analyzed for lithium. With eight baseline events (the minimum specified in § 257.94(b)) at the lower RL, a GWPS was recalculated.

Table 3 provides a summary of the GWPS and background concentration levels determined in August 2019 and the revised lithium GWPS calculated in 2020.

2.3 Corrective Action Program Status

An ACM (§ 257.95(g)(4)) was completed on August 29, 2019 (Barr, 2019b). Since then, MDU has commenced work to further understand the source of the GWPS exceedances and site conditions to better evaluate potential remedies.

During the selection of remedy evaluation, an alternative source demonstration (ASD) was completed for both lithium and selenium. The results of the ASD demonstrate that lithium and selenium levels above

GWPS are not the result of releases from the regulated CCR units (Appendix C). Therefore, the selection of remedy phase has been terminated for lithium and selenium exceedances.

2.4 Key Actions Completed/Problems Encountered

The following key actions were completed for the groundwater monitoring program through 2020:

- Completed semiannual assessment monitoring sampling for each background and downgradient well.
- Determined that lithium was detected at statistically significant levels above background at all downgradient wells.
- Determined that selenium was detected at statistically significant levels above background during the spring sampling at MW-111.
- Updated the GWPS for lithium (Table 3).
- Continued selection of remedy.
- Completed an ASD for both lithium and selenium (Appendix C), ending the selection of remedy phase.

No problems were encountered.

2.5 Key Activities for Upcoming Year

The following key groundwater monitoring program activities are planned for 2021:

- Continue the assessment monitoring program in accordance with the CCR Rule.
- Evaluate analytical results from monitoring events according to the Statistical Method Selection Certification (Barr, 2017).

3.0 References

- Barr, 2020. 2019 Annual Groundwater Monitoring and Corrective Action Report, Scrubber Pond and Temporary Storage Area. Prepared for Montana Dakota Utilities Company. January 2020.
- Barr, 2019a. 2018 Annual Groundwater Monitoring and Corrective Action Report, Scrubber Pond and Temporary Storage Area. Prepared for Montana Dakota Utilities Company. January 2019.
- Barr, 2019b. Assessment of Corrective Measures, Lewis & Clark Station. Prepared for Montana Dakota Utilities Company. August 2019.
- Barr, 2018a. 2017 Annual Groundwater Monitoring and Corrective Action Report, Scrubber Pond and Temporary Storage Area. Prepared for Montana Dakota Utilities Company. January 2018.
- Barr, 2018b. Groundwater Monitoring System Certification. Prepared for Montana Dakota Utilities Company. November 2018.
- Barr, 2017. Statistical Method Selection Certification. Prepared for Montana Dakota Utilities Company. October 2017.

Tables

Table 1
CCR Rule Requirements
Lewis & Clark Station
Sidney, Montana

CCR Rule Reference	Content Required in Report	Location
§ 257.90(e)(1)	Map showing the CCR unit and all monitoring wells that are part of the groundwater monitoring system	Section 2.1.1 Documentation; see Figure 1
§ 257.90(e)(2)	Discuss any new or decommissioned monitoring wells	Section 2.1.2 Changes to Monitoring System
§ 257.90(e)(3)	Provide the number and date groundwater samples were collected, and the monitoring data (i.e., detection or assessment)	Section 2.2 Monitoring and Analytical Results
§ 257.90(e)(4)	Discuss any transition between monitoring programs	Not applicable in 2020
§ 257.90(e)(5)	Other information specified in § 257.90 through § 257.98	See § 257.95(d)(3) and § 257.95(a) in this Table
§ 257.90(e)(6)	Overview of the current status of groundwater monitoring and corrective action programs	Executive Summary
§ 257.95(d)(3)	Assessment monitoring concentrations, background concentrations, and groundwater protection standards	Error! Reference source not found. , Section 2.2.1 Establishment of Lithium Groundwater Protection Standards, Error! Reference source not found. , Error! Not a valid bookmark self-reference. , and Error! Reference source not found.
§ 257.95(g)(3)(ii)	Demonstrate that a source other than the CCR unit caused the contamination, or that the statistically significant increase resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality.	Error! Reference source not found.

Table 2
Background Concentration Levels
Lewis & Clark Station
Sidney, Montana

Parameter	Units	Background Concentration Level
Boron	mg/L	2.4
Calcium	mg/L	97.6
Chloride	mg/L	25.7
Fluoride	mg/L	0.87
pH	pH units	7.3 – 7.9
Sulfate	mg/L	516
Total Dissolved Solids	mg/L	1,060

Background concentration level based on statistical methods established in 40 CFR 257.93 (f-g).

Table 3
Groundwater Protection Standards
Lewis & Clark Station
Sidney, Montana

Parameter	Units	Groundwater Protection Standard	MCL or RSL	Background Concentration Level
Antimony	µg/L	6	6	5.7
Arsenic	µg/L	10	10	10
Barium	µg/L	2000	2000	40.2
Beryllium	µg/L	4	4	1
Cadmium	µg/L	5	5	2
Chromium	µg/L	100	100	2.3
Cobalt	µg/L	6	6	2
Fluoride	mg/L	4	4	0.87
Lead	µg/L	15	15	1
Lithium	µg/L	62.7	40	62.7
Mercury	µg/L	2	2	0.2
Molybdenum	µg/L	100	100	29.2
Selenium	µg/L	70.5	50	70.5
Thallium	µg/L	2	2	1
Radium, combined (226+228)	pCi/l	5	5	2.5

MCL: Maximum Contaminant Level, as established in 40 CFR 141.62 and 141.66.

RSL: Regional Screening Level (default GWPS), as included in the Phase I revision to 40 CFR 259.95(h) issued on July 30, 2018.

Background concentration level based on statistical methods established in 40 CFR 257.93 (f-g).

Table 4
Groundwater Analytical Data Summary
Lewis & Clark
Montana-Dakota Utilities Company

Location			MW103		MW103	MW103	MW103	MW110	MW110	MW110	MW110
Date			3/18/2020		5/19/2020	7/21/2020	9/22/2020	3/16/2020	5/18/2020	7/20/2020	9/21/2020
Sample Type			N	FD	N	N	N	N	N	N	N
Parameter	Analysis Location	Units									
Appendix III											
Boron	Lab	mg/l	1.10	1.08	--	--	1.21	0.28	--	--	0.33
Calcium	Lab	mg/l	95.8	96.1	--	--	106	108	--	--	97.0
Chloride	Lab	mg/l	17.7	17.5	--	--	23.2	22.4	--	--	32.1
Fluoride	Lab	mg/l	0.73	0.72	--	--	0.73	0.46	--	--	0.54
pH	Field	pH units	7.45	--	7.45	7.44	7.30	7.39	7.44	7.40	7.36
Solids, total dissolved	Lab	mg/l	1080	1090	--	--	997	915	--	--	759
Sulfate, as SO4	Lab	mg/l	448	481	--	--	348	219	--	--	204
Appendix IV											
Antimony	Lab	mg/l	0.0038	0.0036	--	--	0.0042	< 0.001 U	--	--	< 0.001 U
Arsenic	Lab	mg/l	0.0025	0.0027	--	--	0.0022	< 0.002 U	--	--	< 0.002 U
Barium	Lab	mg/l	0.0267	0.0248	--	--	0.0286	0.0393	--	--	0.0352
Beryllium	Lab	mg/l	< 0.0005 U	< 0.0005 U	--	--	< 0.0005 U	< 0.0005 U	--	--	< 0.0005 U
Cadmium	Lab	mg/l	< 0.0005 U	< 0.0005 U	--	--	< 0.0005 U	< 0.0005 U	--	--	< 0.0005 U
Chromium	Lab	mg/l	< 0.002 U	< 0.002 U	--	--	< 0.002 U	< 0.002 U	--	--	< 0.002 U
Cobalt	Lab	mg/l	< 0.002 U	< 0.002 U	--	--	0.0023	< 0.002 U	--	--	< 0.002 U
Lead	Lab	mg/l	< 0.0005 U	< 0.0005 U	--	--	< 0.0005 U	< 0.0005 U	--	--	< 0.0005 U
Lithium	Lab	mg/l	0.053	0.053	0.043	0.054	0.060	0.042	0.033	0.044	0.045
Mercury	Lab	mg/l	< 0.0002 U	< 0.0002 U	--	--	< 0.0002 U	< 0.0002 U	--	--	< 0.0002 U
Molybdenum	Lab	mg/l	0.0196	0.0201	--	--	0.0202	0.0035	--	--	0.0037
Selenium	Lab	mg/l	0.0558	0.0554	--	--	0.0444	0.0056	--	--	< 0.005 U
Thallium	Lab	mg/l	< 0.0005 U	< 0.0005 U	--	--	< 0.0005 U	< 0.0005 U	--	--	< 0.0005 U
Radium 226	Lab	pCi/l	0.5 +/- 0.2	0.6 +/- 0.2	--	--	0.3 +/- 0.2 UB	0.08 +/- 0.1 ND	--	--	0.3 +/- 0.2 UB
Radium 228	Lab	pCi/l	0.5 +/- 1.1 ND	0.4 +/- 1.0 ND	--	--	-0.01 +/- 0.7 ND	-0.4 +/- 1.0 ND	--	--	-0.1 +/- 0.6 ND
Radium, combined (226+228)	Calc	pCi/l	1 +/- 1.12 q	1 +/- 1.02 q	--	--	0.3 +/- 0.2 ND	0.08 +/- 0.1 ND	--	--	0.3 +/- 0.2 ND

Table 4
Groundwater Analytical Data Summary
Lewis & Clark
Montana-Dakota Utilities Company

Location			MW111	MW111	MW111		MW111	MW111		MW117	MW117	MW117	MW117
Date			3/17/2020	4/20/2020	5/19/2020		7/21/2020	9/22/2020		3/17/2020	5/19/2020	7/21/2020	9/22/2020
Sample Type			N	N	N	FD	N	N	FD	N	N	N	N
Parameter	Analysis Location	Units											
Appendix III													
Boron	Lab	mg/l	6.40	--	--	--	--	8.04	8.32	9.46	--	--	10.8
Calcium	Lab	mg/l	186	--	--	--	--	193	194	353	--	--	352
Chloride	Lab	mg/l	36.1	--	--	--	--	35.8	37.7	51.5	--	--	49.9
Fluoride	Lab	mg/l	1.95	--	--	--	--	2.06	2.04	0.22	--	--	0.29
pH	Field	pH units	7.36	--	7.34	--	7.24	7.12	--	7.36	7.26	7.23	6.99
Solids, total dissolved	Lab	mg/l	3880	--	--	--	--	3840	3930	8790	--	--	8090
Sulfate, as SO4	Lab	mg/l	2230	--	--	--	--	1970	2130	5780	--	--	4960
Appendix IV													
Antimony	Lab	mg/l	< 0.001 U	--	--	--	--	< 0.001 U	< 0.001 U	< 0.001 U	--	--	< 0.001 U
Arsenic	Lab	mg/l	< 0.002 U	--	--	--	--	< 0.002 U	< 0.002 U	< 0.002 U	--	--	< 0.002 U
Barium	Lab	mg/l	0.0198	--	--	--	--	0.0240	0.0296	0.0307	--	--	0.0172
Beryllium	Lab	mg/l	< 0.0005 U	--	--	--	--	< 0.0005 U	< 0.0005 U	< 0.0005 U	--	--	< 0.0005 U
Cadmium	Lab	mg/l	< 0.0005 U	--	--	--	--	< 0.0005 U	< 0.0005 U	< 0.0005 U	--	--	< 0.0005 U
Chromium	Lab	mg/l	< 0.002 U	--	--	--	--	0.0061	0.0080	0.0051	--	--	0.0031
Cobalt	Lab	mg/l	< 0.002 U	--	--	--	--	< 0.002 U	< 0.002 U	< 0.002 U	--	--	< 0.002 U
Lead	Lab	mg/l	< 0.0005 U	--	--	--	--	< 0.0005 U	< 0.0005 U	0.0010	--	--	< 0.0005 U
Lithium	Lab	mg/l	0.190	--	0.154	0.159	0.204	0.227	0.224	0.130	0.115	0.140	0.135
Mercury	Lab	mg/l	< 0.0002 U	--	--	--	--	< 0.0002 U	< 0.0002 U	< 0.0002 U	--	--	< 0.0002 U
Molybdenum	Lab	mg/l	0.0509	--	--	--	--	0.0534	0.0666	0.0031	--	--	0.0048
Selenium	Lab	mg/l	0.0801	0.0783	--	--	--	0.0634	0.0761	0.0383	--	--	0.0322
Thallium	Lab	mg/l	< 0.0005 U	--	--	--	--	< 0.0005 U	< 0.0005 U	< 0.0005 U	--	--	< 0.0005 U
Radium 226	Lab	pCi/l	0.2 +/- 0.1	--	--	--	--	0.3 +/- 0.2 UB	0.3 +/- 0.2 UB	0.6 +/- 0.2	--	--	0.8 +/- 0.2 UB
Radium 228	Lab	pCi/l	-0.3 +/- 1.0 ND	--	--	--	--	0.9 +/- 0.8 ND	1.1 +/- 0.7	-0.2 +/- 1.1 ND	--	--	1.9 +/- 0.9
Radium, combined (226+228)	Calc	pCi/l	0.2 +/- 0.1 q	--	--	--	--	1.2 +/- 0.82 ND	1.4 +/- 0.73 q	0.6 +/- 0.2 q	--	--	2.7 +/- 0.92 q

Table 4
Groundwater Analytical Data Summary
Lewis & Clark
Montana-Dakota Utilities Company

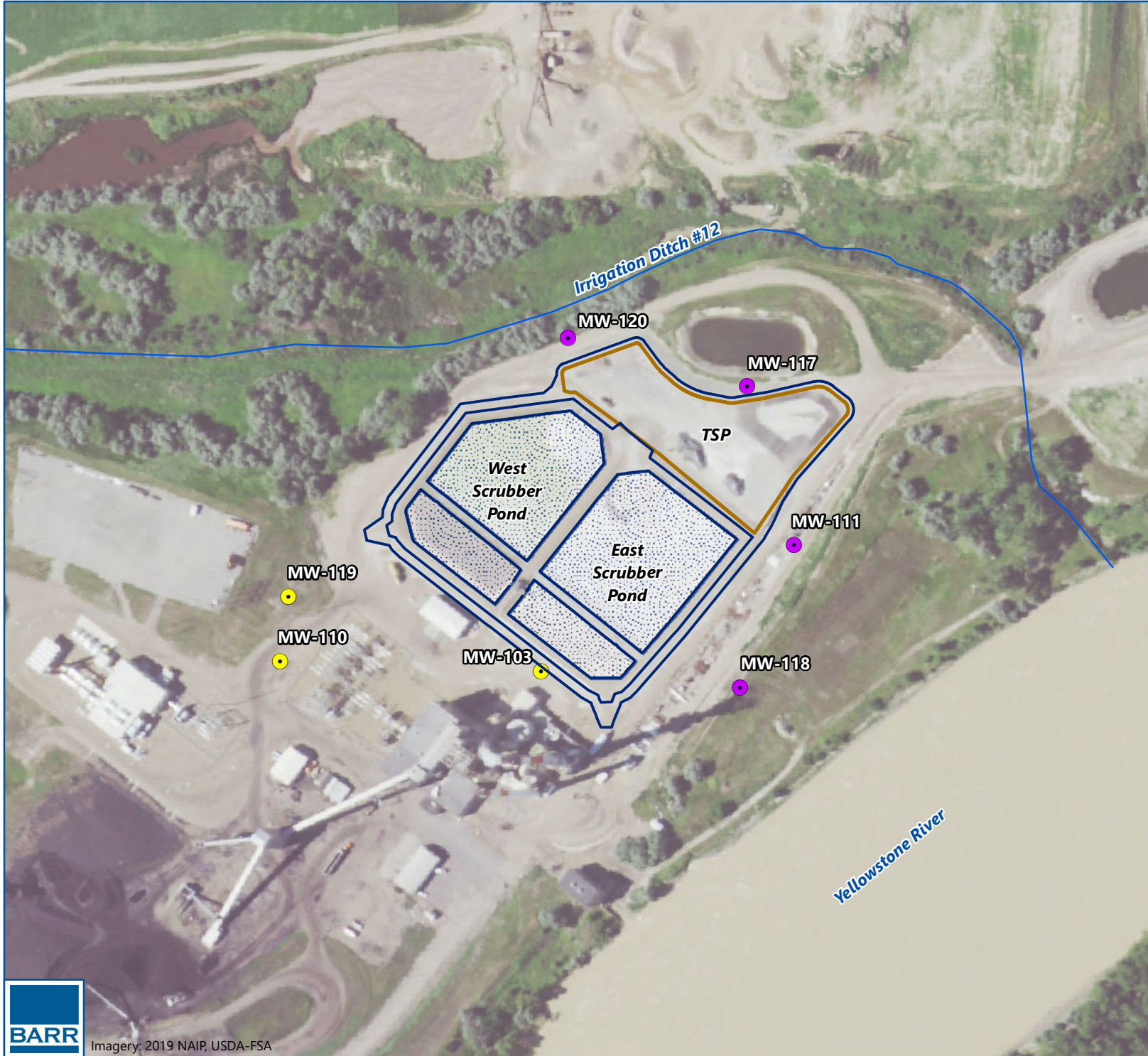
Location			MW118	MW118	MW118	MW118	MW118	MW119	MW119	MW119	MW119	MW120	MW120	MW120		MW120
Date			3/17/2020	4/20/2020	5/19/2020	7/21/2020	9/22/2020	3/16/2020	5/18/2020	7/20/2020	9/21/2020	3/17/2020	5/19/2020	7/20/2020		9/22/2020
Sample Type			N	N	N	N	N	N	N	N	N	N	N	N	N	N
Parameter	Analysis Location	Units	N		FD											
			N	FD												
Appendix III																
Boron	Lab	mg/l	1.43	--	--	--	1.74	0.26	--	--	0.30	8.60	--	--	--	10.1
Calcium	Lab	mg/l	108	--	--	--	96.9	114	--	--	104	410	--	--	--	456
Chloride	Lab	mg/l	25.9	--	--	--	22.2	24.9	--	--	36.8	56.4	--	--	--	60.4
Fluoride	Lab	mg/l	0.92	--	--	--	1.14	0.44	--	--	0.49	0.41	--	--	--	0.41
pH	Field	pH units	7.51	--	7.40	7.31	7.11	7.40	7.41	7.39	7.29	6.92	6.80	6.80	--	6.70
Solids, total dissolved	Lab	mg/l	1680	--	--	--	1310	883	--	--	805	6880	--	--	--	6880
Sulfate, as SO4	Lab	mg/l	779	--	--	--	571	202	--	--	210	4220	--	--	--	4180
Appendix IV																
Antimony	Lab	mg/l	< 0.002 U	--	--	--	< 0.001 U	< 0.001 U	--	--	< 0.001 U	< 0.001 U	--	--	--	< 0.001 U
Arsenic	Lab	mg/l	< 0.005 U	--	--	--	< 0.002 U	< 0.002 U	--	--	< 0.002 U	< 0.002 U	--	--	--	< 0.002 U
Barium	Lab	mg/l	0.0254	--	--	--	0.0232	0.0344	--	--	0.0356	0.0224	--	--	--	0.0226
Beryllium	Lab	mg/l	< 0.0005 U	--	--	--	< 0.0005 U	< 0.0005 U	--	--	< 0.0005 U	< 0.0005 U	--	--	--	< 0.0005 U
Cadmium	Lab	mg/l	< 0.0005 U	--	--	--	< 0.0005 U	< 0.0005 U	--	--	< 0.0005 U	< 0.0005 U	--	--	--	< 0.0005 U
Chromium	Lab	mg/l	< 0.002 U	--	--	--	< 0.002 U	< 0.002 U	--	--	< 0.002 U	0.0020	--	--	--	0.0032
Cobalt	Lab	mg/l	< 0.002 U	--	--	--	< 0.002 U	< 0.002 U	--	--	< 0.002 U	< 0.002 U	--	--	--	< 0.002 U
Lead	Lab	mg/l	< 0.0005 U	--	--	--	0.0024	< 0.0005 U	--	--	< 0.0005 U	< 0.0005 U	--	--	--	0.0013
Lithium	Lab	mg/l	0.085	--	0.076	0.106	0.095	0.041	0.035	0.047	0.048	0.145	0.110	0.130	0.146	0.135
Mercury	Lab	mg/l	< 0.0002 U	--	--	--	< 0.0002 U	< 0.0002 U	--	--	< 0.0002 U	< 0.0002 U	--	--	--	< 0.0002 U
Molybdenum	Lab	mg/l	0.0236	--	--	--	0.0393	0.0034	--	--	0.0037	0.0030	--	--	--	0.0039
Selenium	Lab	mg/l	0.0716	0.0698	--	--	0.0689	0.0056	--	--	< 0.005 U	< 0.005 U	--	--	--	< 0.005 U
Thallium	Lab	mg/l	< 0.0005 U	--	--	--	< 0.0005 U	< 0.0005 U	--	--	< 0.0005 U	< 0.0005 U	--	--	--	< 0.0005 U
Radium 226	Lab	pCi/l	0.05 +/- 0.1 ND	--	--	--	0.1 +/- 0.2 ND	0.2 +/- 0.1	--	--	0.2 +/- 0.2	0.2 +/- 0.1	--	--	--	0.2 +/- 0.1 UB
Radium 228	Lab	pCi/l	0.08 +/- 1.1 ND	--	--	--	0.1 +/- 0.8 ND	-0.4 +/- 1.1 ND	--	--	0.5 +/- 0.7 ND	2.0 +/- 0.7	--	--	--	1 +/- 0.7 ND
Radium, combined (226+228)	Calc	pCi/l	0.13 +/- 1.1 ND	--	--	--	0.2 +/- 0.82 ND	0.2 +/- 0.1 q	--	--	0.7 +/- 0.73 q	2.2 +/- 0.71	--	--	--	1.2 +/- 0.71 ND

Data Footnotes and Qualifiers

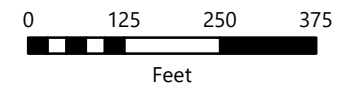
Barr Standard Footnotes and Qualifiers

--	Not analyzed/Not available.
N	Sample Type: Normal
FD	Sample Type: Field Duplicate
ND	Not detected.
q	The combined radium result includes both detected and not detected values.
U	The analyte was analyzed for, but was not detected.
UB	The analyte was detected in one of the associated laboratory, equipment, field or trip blank samples and is considered non-detect at the concentration reported by the laboratory.

Figures



- Upgradient Monitoring Well
- Downgradient Monitoring Well
- ▨ Scrubber Ponds
- ▭ Temporary Storage Pad (TSP)



GROUNDWATER
MONITORING SYSTEM
Lewis & Clark Station
Annual Groundwater Monitoring
and Corrective Action Report
Montana-Dakota Utilities Co.

FIGURE 1



Appendices

Appendix A

Laboratory Reports and Field Sheets



MINNESOTA VALLEY TESTING LABORATORIES, INC.

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REVISION #1

Page: 1 of 1

CERTIFICATE of ANALYSIS - STATE

Todd Peterson
Montana-Dakota Utilities Co.
400 N 4th St
Bismarck ND 58501

Report Date: 1 Apr 20
Lab Number: 20-W478
Work Order #: 82-0623
Account #: 002800
Date Sampled: 18 Mar 20
Date Received: 18 Mar 20 16:38
Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark

PO #: 180534 OP

Sample Description: Dup 1

Temp at Receipt: 0.6C

Event and Year: March 2020

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	19 Mar 20	HT
Total Suspended Solids	3	mg/l	2	I3765-85	19 Mar 20 14:25	HT
Total Alkalinity	288	mg/l CaCO3	20	SM2320-B	19 Mar 20 17:00	HT
Nitrate-Nitrite as N	3.91	mg/l	0.10	EPA 353.2	19 Mar 20 12:05	EV
Mercury - Dissolved	< 0.0002	mg/l	0.0002	EPA 245.1	25 Mar 20 11:27	MDE
Magnesium - Total	114	mg/l	1.0	6010D	24 Mar 20 12:22	MDE
Sodium - Total	81.5	mg/l	1.0	6010D	24 Mar 20 12:22	MDE
Potassium - Total	7.0	mg/l	1.0	6010D	24 Mar 20 12:22	MDE
Calcium - Dissolved	96.9	mg/l	1.0	6010D	24 Mar 20 14:22	MDE
Magnesium - Dissolved	112	mg/l	1.0	6010D	24 Mar 20 14:22	MDE
Sodium - Dissolved	79.2	mg/l	1.0	6010D	24 Mar 20 14:22	MDE
Potassium - Dissolved	7.2	mg/l	1.0	6010D	24 Mar 20 14:22	MDE
Lithium - Dissolved	0.050	mg/l	0.020	6010D	30 Mar 20 11:07	SZ
Boron - Dissolved	0.99	mg/l	0.10	6010D	27 Mar 20 10:48	SZ
Antimony - Dissolved	0.0030	mg/l	0.0010	6020B	20 Mar 20 14:08	MDE
Arsenic - Dissolved	< 0.002	mg/l	0.0020	6020B	20 Mar 20 14:08	MDE
Barium - Dissolved	0.0206	mg/l	0.0020	6020B	20 Mar 20 14:08	MDE
Beryllium - Dissolved	< 0.0005	mg/l	0.0005	6020B	23 Mar 20 12:40	MDE
Cadmium - Dissolved	< 0.0005	mg/l	0.0005	6020B	20 Mar 20 14:08	MDE
Chromium - Dissolved	< 0.002	mg/l	0.0020	6020B	20 Mar 20 14:08	MDE
Cobalt - Dissolved	< 0.002	mg/l	0.0020	6020B	20 Mar 20 14:08	MDE
Lead - Dissolved	< 0.0005	mg/l	0.0005	6020B	20 Mar 20 14:08	MDE
Molybdenum - Dissolved	0.0172	mg/l	0.0020	6020B	20 Mar 20 14:08	MDE
Selenium - Dissolved	0.0531	mg/l	0.0050	6020B	20 Mar 20 14:08	MDE
Thallium - Dissolved	< 0.0005	mg/l	0.0005	6020B	20 Mar 20 14:08	MDE

* Holding time exceeded

Approved by:

Claudette K. Carroll

CC
14 Apr 2020

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

The reporting limit was elevated for any analyte requiring a dilution as coded below:

@ = Due to sample matrix
! = Due to sample quantity

= Due to concentration of other analytes
* = Due to internal standard response

CERTIFICATION: ND # ND-00016



MINNESOTA VALLEY TESTING LABORATORIES, INC.

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www.mvtl.com



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CERTIFICATE of ANALYSIS - STATE

Todd Peterson
Montana-Dakota Utilities Co.
400 N 4th St
Bismarck ND 58501

Report Date: 1 Apr 20
Lab Number: 20-W479
Work Order #: 82-0623
Account #: 002800
Date Sampled: 18 Mar 20
Date Received: 18 Mar 20 16:38
Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark

PO #: 180534 OP

Sample Description: Field Blank (FB)

Temp at Receipt: 0.6C

Event and Year: March 2020

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	19 Mar 20	HT
Total Suspended Solids	< 2	mg/l	2	13765-85	19 Mar 20 14:25	HT
Total Alkalinity	< 20	mg/l CaCO3	20	SM2320-B	19 Mar 20 17:00	HT
Nitrate-Nitrite as N	< 0.1	mg/l	0.10	EPA 353.2	19 Mar 20 12:05	EV
Mercury - Dissolved	< 0.0002	mg/l	0.0002	EPA 245.1	25 Mar 20 11:27	MDE
Magnesium - Total	< 1	mg/l	1.0	6010D	24 Mar 20 12:22	MDE
Sodium - Total	< 1	mg/l	1.0	6010D	24 Mar 20 12:22	MDE
Potassium - Total	< 1	mg/l	1.0	6010D	24 Mar 20 12:22	MDE
Calcium - Dissolved	< 1	mg/l	1.0	6010D	24 Mar 20 14:22	MDE
Magnesium - Dissolved	< 1	mg/l	1.0	6010D	24 Mar 20 14:22	MDE
Sodium - Dissolved	< 1	mg/l	1.0	6010D	24 Mar 20 14:22	MDE
Potassium - Dissolved	< 1	mg/l	1.0	6010D	24 Mar 20 14:22	MDE
Lithium - Dissolved	< 0.02	mg/l	0.020	6010D	30 Mar 20 11:07	SZ
Boron - Dissolved	< 0.1	mg/l	0.10	6010D	27 Mar 20 10:48	SZ
Antimony - Dissolved	< 0.001	mg/l	0.0010	6020B	20 Mar 20 14:08	MDE
Arsenic - Dissolved	< 0.002	mg/l	0.0020	6020B	20 Mar 20 14:08	MDE
Barium - Dissolved	< 0.002	mg/l	0.0020	6020B	20 Mar 20 14:08	MDE
Beryllium - Dissolved	< 0.0005	mg/l	0.0005	6020B	23 Mar 20 12:40	MDE
Cadmium - Dissolved	< 0.0005	mg/l	0.0005	6020B	20 Mar 20 14:08	MDE
Chromium - Dissolved	< 0.002	mg/l	0.0020	6020B	20 Mar 20 14:08	MDE
Cobalt - Dissolved	< 0.002	mg/l	0.0020	6020B	20 Mar 20 14:08	MDE
Lead - Dissolved	< 0.0005	mg/l	0.0005	6020B	20 Mar 20 14:08	MDE
Molybdenum - Dissolved	< 0.002	mg/l	0.0020	6020B	20 Mar 20 14:08	MDE
Selenium - Dissolved	< 0.005	mg/l	0.0050	6020B	20 Mar 20 14:08	MDE
Thallium - Dissolved	< 0.0005	mg/l	0.0005	6020B	20 Mar 20 14:08	MDE

* Holding time exceeded

Approved by:

Claudette K. Carroll

14 Apr 2020

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

The reporting limit was elevated for any analyte requiring a dilution as coded below:

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= Due to concentration of other analytes
+ = Due to internal standard response

CERTIFICATION: ND # ND-00016



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www.mvtl.com



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CERTIFICATE of ANALYSIS - STATE

Todd Peterson
Montana-Dakota Utilities Co.
400 N 4th St
Bismarck ND 58501

Report Date: 1 Apr 20
Lab Number: 20-W480
Work Order #: 82-0623
Account #: 002800
Date Sampled: 18 Mar 20 9:31
Date Received: 18 Mar 20 16:38
Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark

PO #: 180534 OP

Sample Description: MW103

Temp at Receipt: 0.6C

Event and Year: March 2020

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	19 Mar 20	HT
Total Suspended Solids	5	mg/l	2	I3765-85	19 Mar 20 14:25	HT
pH - Field	7.45	units	NA	SM 4500 H+ B	18 Mar 20 9:31	DJN
Temperature - Field	6.08	Degrees C	NA	SM 2550B	18 Mar 20 9:31	DJN
Total Alkalinity	289	mg/l CaCO3	20	SM2320-B	19 Mar 20 17:00	HT
Conductivity - Field	1416	umhos/cm	1	EPA 120.1	18 Mar 20 9:31	DJN
Nitrate-Nitrite as N	3.91	mg/l	0.10	EPA 353.2	19 Mar 20 12:05	EV
Mercury - Dissolved	< 0.0002	mg/l	0.0002	EPA 245.1	25 Mar 20 11:27	MDE
Magnesium - Total	115	mg/l	1.0	6010D	24 Mar 20 12:22	MDE
Sodium - Total	80.0	mg/l	1.0	6010D	24 Mar 20 12:22	MDE
Potassium - Total	7.2	mg/l	1.0	6010D	24 Mar 20 12:22	MDE
Calcium - Dissolved	97.0	mg/l	1.0	6010D	24 Mar 20 14:22	MDE
Magnesium - Dissolved	112	mg/l	1.0	6010D	24 Mar 20 14:22	MDE
Sodium - Dissolved	79.7	mg/l	1.0	6010D	24 Mar 20 14:22	MDE
Potassium - Dissolved	7.0	mg/l	1.0	6010D	24 Mar 20 14:22	MDE
Lithium - Dissolved	0.050	mg/l	0.020	6010D	30 Mar 20 11:07	SZ
Boron - Dissolved	0.98	mg/l	0.10	6010D	27 Mar 20 10:48	SZ
Antimony - Dissolved	0.0031	mg/l	0.0010	6020B	20 Mar 20 14:08	MDE
Arsenic - Dissolved	< 0.002	mg/l	0.0020	6020B	20 Mar 20 14:08	MDE
Barium - Dissolved	0.0206	mg/l	0.0020	6020B	20 Mar 20 14:08	MDE
Beryllium - Dissolved	< 0.0005	mg/l	0.0005	6020B	23 Mar 20 12:40	MDE
Cadmium - Dissolved	< 0.0005	mg/l	0.0005	6020B	20 Mar 20 14:08	MDE
Chromium - Dissolved	< 0.002	mg/l	0.0020	6020B	20 Mar 20 14:08	MDE
Cobalt - Dissolved	< 0.002	mg/l	0.0020	6020B	20 Mar 20 14:08	MDE
Lead - Dissolved	< 0.0005	mg/l	0.0005	6020B	20 Mar 20 14:08	MDE
Molybdenum - Dissolved	0.0170	mg/l	0.0020	6020B	20 Mar 20 14:08	MDE
Selenium - Dissolved	0.0556	mg/l	0.0050	6020B	20 Mar 20 14:08	MDE
Thallium - Dissolved	< 0.0005	mg/l	0.0005	6020B	20 Mar 20 14:08	MDE

* Holding time exceeded

Approved by:

Claudette K. Carroll

14 Apr 2020

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

The reporting limit was elevated for any analyte requiring a dilution as coded below:

@ = Due to sample matrix
! = Due to sample quantity

= Due to concentration of other analytes
+ = Due to internal standard response

CERTIFICATION: ND # ND-00016



MINNESOTA VALLEY TESTING LABORATORIES, INC.

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CERTIFICATE of ANALYSIS - STATE

Todd Peterson
Montana-Dakota Utilities Co.
400 N 4th St
Bismarck ND 58501

Report Date: 1 Apr 20
Lab Number: 20-W481
Work Order #: 82-0623
Account #: 002800
Date Sampled: 16 Mar 20 16:29
Date Received: 18 Mar 20 16:38
Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark

PO #: 180534 OP

Sample Description: MW110

Temp at Receipt: 0.6C

Event and Year: March 2020

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	19 Mar 20	HT
Total Suspended Solids	6	mg/l	2	I3765-85	19 Mar 20 14:25	HT
pH - Field	7.39	units	NA	SM 4500 H+ B	16 Mar 20 16:29	DJN
Temperature - Field	3.60	Degrees C	NA	SM 2550B	16 Mar 20 16:29	DJN
Total Alkalinity	413	mg/l CaCO3	20	SM2320-B	19 Mar 20 17:00	HT
Conductivity - Field	1360	umhos/cm	1	EPA 120.1	16 Mar 20 16:29	DJN
Nitrate-Nitrite as N	20.0	mg/l	0.10	EPA 353.2	19 Mar 20 12:05	EV
Mercury - Dissolved	< 0.0002	mg/l	0.0002	EPA 245.1	25 Mar 20 11:27	MDE
Magnesium - Total	69.4	mg/l	1.0	6010D	24 Mar 20 12:22	MDE
Sodium - Total	102	mg/l	1.0	6010D	24 Mar 20 12:22	MDE
Potassium - Total	6.8	mg/l	1.0	6010D	24 Mar 20 12:22	MDE
Calcium - Dissolved	118	mg/l	1.0	6010D	24 Mar 20 14:22	MDE
Magnesium - Dissolved	69.3	mg/l	1.0	6010D	24 Mar 20 14:22	MDE
Sodium - Dissolved	99.8	mg/l	1.0	6010D	24 Mar 20 14:22	MDE
Potassium - Dissolved	6.7	mg/l	1.0	6010D	24 Mar 20 14:22	MDE
Lithium - Dissolved	0.039	mg/l	0.020	6010D	30 Mar 20 11:07	SZ
Boron - Dissolved	0.27	mg/l	0.10	6010D	27 Mar 20 10:48	SZ
Antimony - Dissolved	< 0.001	mg/l	0.0010	6020B	20 Mar 20 14:08	MDE
Arsenic - Dissolved	< 0.002	mg/l	0.0020	6020B	20 Mar 20 14:08	MDE
Barium - Dissolved	0.0352	mg/l	0.0020	6020B	20 Mar 20 14:08	MDE
Beryllium - Dissolved	< 0.0005	mg/l	0.0005	6020B	23 Mar 20 12:40	MDE
Cadmium - Dissolved	< 0.0005	mg/l	0.0005	6020B	20 Mar 20 14:08	MDE
Chromium - Dissolved	< 0.002	mg/l	0.0020	6020B	20 Mar 20 14:08	MDE
Cobalt - Dissolved	< 0.002	mg/l	0.0020	6020B	20 Mar 20 14:08	MDE
Lead - Dissolved	< 0.0005	mg/l	0.0005	6020B	20 Mar 20 14:08	MDE
Molybdenum - Dissolved	0.0027	mg/l	0.0020	6020B	20 Mar 20 14:08	MDE
Selenium - Dissolved	< 0.005	mg/l	0.0050	6020B	20 Mar 20 14:08	MDE
Thallium - Dissolved	< 0.0005	mg/l	0.0005	6020B	20 Mar 20 14:08	MDE

* Holding time exceeded

Approved by:

Claudette K. Carroll

14 Apr 2020

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

The reporting limit was elevated for any analyte requiring a dilution as coded below:

@ = Due to sample matrix # = Due to concentration of other analytes
! = Due to sample quantity + = Due to internal standard response

CERTIFICATION: ND # ND-00016



MINNESOTA VALLEY TESTING LABORATORIES, INC.

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CERTIFICATE of ANALYSIS - STATE

Todd Peterson
Montana-Dakota Utilities Co.
400 N 4th St
Bismarck ND 58501

Report Date: 1 Apr 20
Lab Number: 20-W482
Work Order #: 82-0623
Account #: 002800
Date Sampled: 16 Mar 20 18:57
Date Received: 18 Mar 20 16:38
Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark

PO #: 180534 OP

Sample Description: MW119

Temp at Receipt: 0.6C

Event and Year: March 2020

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	19 Mar 20	HT
Total Suspended Solids	2	mg/l	2	I3765-85	19 Mar 20 14:25	HT
pH - Field	7.40	units	NA	SM 4500 H+ B	16 Mar 20 18:57	DJN
Temperature - Field	3.96	Degrees C	NA	SM 2550B	16 Mar 20 18:57	DJN
Total Alkalinity	417	mg/l CaCO3	20	SM2320-B	19 Mar 20 17:00	HT
Conductivity - Field	1311	umhos/cm	1	EPA 120.1	16 Mar 20 18:57	DJN
Nitrate-Nitrite as N	15.2	mg/l	0.10	EPA 353.2	19 Mar 20 12:05	EV
Mercury - Dissolved	< 0.0002	mg/l	0.0002	EPA 245.1	25 Mar 20 11:27	MDE
Magnesium - Total	69.0	mg/l	1.0	6010D	24 Mar 20 12:22	MDE
Sodium - Total	100	mg/l	1.0	6010D	24 Mar 20 12:22	MDE
Potassium - Total	7.2	mg/l	1.0	6010D	24 Mar 20 12:22	MDE
Calcium - Dissolved	114	mg/l	1.0	6010D	24 Mar 20 14:22	MDE
Magnesium - Dissolved	68.3	mg/l	1.0	6010D	24 Mar 20 14:22	MDE
Sodium - Dissolved	94.6	mg/l	1.0	6010D	24 Mar 20 14:22	MDE
Potassium - Dissolved	6.9	mg/l	1.0	6010D	24 Mar 20 14:22	MDE
Lithium - Dissolved	0.040	mg/l	0.020	6010D	30 Mar 20 11:07	SZ
Boron - Dissolved	0.26	mg/l	0.10	6010D	27 Mar 20 10:48	SZ
Antimony - Dissolved	< 0.001	mg/l	0.0010	6020B	20 Mar 20 14:08	MDE
Arsenic - Dissolved	< 0.002	mg/l	0.0020	6020B	20 Mar 20 14:08	MDE
Barium - Dissolved	0.0330	mg/l	0.0020	6020B	20 Mar 20 14:08	MDE
Beryllium - Dissolved	< 0.0005	mg/l	0.0005	6020B	23 Mar 20 12:40	MDE
Cadmium - Dissolved	< 0.0005	mg/l	0.0005	6020B	20 Mar 20 14:08	MDE
Chromium - Dissolved	< 0.002	mg/l	0.0020	6020B	20 Mar 20 14:08	MDE
Cobalt - Dissolved	< 0.002	mg/l	0.0020	6020B	20 Mar 20 14:08	MDE
Lead - Dissolved	< 0.0005	mg/l	0.0005	6020B	20 Mar 20 14:08	MDE
Molybdenum - Dissolved	0.0032	mg/l	0.0020	6020B	20 Mar 20 14:08	MDE
Selenium - Dissolved	0.0053	mg/l	0.0050	6020B	20 Mar 20 14:08	MDE
Thallium - Dissolved	< 0.0005	mg/l	0.0005	6020B	20 Mar 20 14:08	MDE

* Holding time exceeded

Approved by:

Claudette K. Carroll

CC
14 Apr 2020

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

The reporting limit was elevated for any analyte requiring a dilution as coded below:

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! = Due to sample quantity

= Due to concentration of other analytes
+ = Due to internal standard response

CERTIFICATION: ND # ND-00016



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www.mvttl.com



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CERTIFICATE of ANALYSIS - STATE

Todd Peterson
Montana-Dakota Utilities Co.
400 N 4th St
Bismarck ND 58501

Report Date: 1 Apr 20
Lab Number: 20-W483
Work Order #: 82-0623
Account #: 002800
Date Sampled: 17 Mar 20 13:09
Date Received: 18 Mar 20 16:38
Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark

PO #: 180534 OP

Sample Description: MW111

Temp at Receipt: 0.6C

Event and Year: March 2020

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	19 Mar 20	HT
Total Suspended Solids	3	mg/l	2	13765-85	19 Mar 20 14:25	HT
pH - Field	7.36	units	NA	SM 4500 H+ B	17 Mar 20 13:09	DJN
Temperature - Field	4.72	Degrees C	NA	SM 2550B	17 Mar 20 13:09	DJN
Total Alkalinity	435	mg/l CaCO3	20	SM2320-B	19 Mar 20 17:00	HT
Conductivity - Field	4077	umhos/cm	1	EPA 120.1	17 Mar 20 13:09	DJN
Nitrate-Nitrite as N	23.3	mg/l	0.10	EPA 353.2	19 Mar 20 12:05	EV
Mercury - Dissolved	< 0.0002	mg/l	0.0002	EPA 245.1	25 Mar 20 11:27	MDE
Magnesium - Total	540	mg/l	1.0	6010D	24 Mar 20 12:22	MDE
Sodium - Total	142	mg/l	1.0	6010D	24 Mar 20 12:22	MDE
Potassium - Total	10.5	mg/l	1.0	6010D	24 Mar 20 12:22	MDE
Calcium - Dissolved	186	mg/l	1.0	6010D	24 Mar 20 14:22	MDE
Magnesium - Dissolved	540	mg/l	1.0	6010D	24 Mar 20 14:22	MDE
Sodium - Dissolved	136	mg/l	1.0	6010D	24 Mar 20 14:22	MDE
Potassium - Dissolved	10.0	mg/l	1.0	6010D	24 Mar 20 14:22	MDE
Lithium - Dissolved	0.180	mg/l	0.020	6010D	30 Mar 20 11:07	SZ
Boron - Dissolved	6.05	mg/l	0.10	6010D	27 Mar 20 10:48	SZ
Antimony - Dissolved	< 0.001	mg/l	0.0010	6020B	20 Mar 20 14:08	MDE
Arsenic - Dissolved	< 0.002	mg/l	0.0020	6020B	20 Mar 20 14:08	MDE
Barium - Dissolved	0.0175	mg/l	0.0020	6020B	20 Mar 20 14:08	MDE
Beryllium - Dissolved	< 0.0005	mg/l	0.0005	6020B	23 Mar 20 12:40	MDE
Cadmium - Dissolved	< 0.0005	mg/l	0.0005	6020B	20 Mar 20 14:08	MDE
Chromium - Dissolved	< 0.002	mg/l	0.0020	6020B	20 Mar 20 14:08	MDE
Cobalt - Dissolved	< 0.002	mg/l	0.0020	6020B	20 Mar 20 14:08	MDE
Lead - Dissolved	< 0.0005	mg/l	0.0005	6020B	20 Mar 20 14:08	MDE
Molybdenum - Dissolved	0.0437	mg/l	0.0020	6020B	20 Mar 20 14:08	MDE
Selenium - Dissolved	0.0758	mg/l	0.0050	6020B	20 Mar 20 14:08	MDE
Thallium - Dissolved	< 0.0005	mg/l	0.0005	6020B	20 Mar 20 14:08	MDE

* Holding time exceeded

Approved by:

Claudette K. Carroll

CC
14 Apr 2020

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

The reporting limit was elevated for any analyte requiring a dilution as coded below:

@ = Due to sample matrix # = Due to concentration of other analytes
! = Due to sample quantity + = Due to internal standard response

CERTIFICATION: ND # ND-00016



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CERTIFICATE of ANALYSIS - STATE

Todd Peterson
Montana-Dakota Utilities Co.
400 N 4th St
Bismarck ND 58501

Report Date: 1 Apr 20
Lab Number: 20-W484
Work Order #: 82-0623
Account #: 002800
Date Sampled: 17 Mar 20 10:30
Date Received: 18 Mar 20 16:38
Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark

PO #: 180534 OP

Sample Description: MW117

Temp at Receipt: 0.6C

Event and Year: March 2020

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	19 Mar 20	HT
Total Suspended Solids	84	mg/l	2	I3765-85	19 Mar 20 14:25	HT
pH - Field	7.36	units	NA	SM 4500 H+ B	17 Mar 20 10:30	DJN
Temperature - Field	0.80	Degrees C	NA	SM 2550B	17 Mar 20 10:30	DJN
Total Alkalinity	379	mg/l CaCO3	20	SM2320-B	19 Mar 20 17:00	HT
Conductivity - Field	8177	umhos/cm	1	EPA 120.1	17 Mar 20 10:30	DJN
Nitrate-Nitrite as N	33.8	mg/l	0.10	EPA 353.2	19 Mar 20 12:05	EV
Mercury - Dissolved	< 0.0002	mg/l	0.0002	EPA 245.1	25 Mar 20 11:27	MDE
Magnesium - Total	1070	mg/l	1.0	6010D	24 Mar 20 12:22	MDE
Sodium - Total	565	mg/l	1.0	6010D	24 Mar 20 12:22	MDE
Potassium - Total	23.1	mg/l	1.0	6010D	24 Mar 20 12:22	MDE
Calcium - Dissolved	368	mg/l	1.0	6010D	24 Mar 20 14:22	MDE
Magnesium - Dissolved	1100	mg/l	1.0	6010D	24 Mar 20 14:22	MDE
Sodium - Dissolved	560	mg/l	1.0	6010D	24 Mar 20 14:22	MDE
Potassium - Dissolved	22.8	mg/l	1.0	6010D	24 Mar 20 14:22	MDE
Lithium - Dissolved	0.125	mg/l	0.020	6010D	30 Mar 20 11:07	SZ
Boron - Dissolved	9.21	mg/l	0.10	6010D	27 Mar 20 10:48	SZ
Antimony - Dissolved	< 0.001	mg/l	0.0010	6020B	20 Mar 20 14:08	MDE
Arsenic - Dissolved	< 0.002	mg/l	0.0020	6020B	20 Mar 20 14:08	MDE
Barium - Dissolved	0.0113	mg/l	0.0020	6020B	20 Mar 20 14:08	MDE
Beryllium - Dissolved	< 0.0005	mg/l	0.0005	6020B	23 Mar 20 12:40	MDE
Cadmium - Dissolved	< 0.0005	mg/l	0.0005	6020B	20 Mar 20 14:08	MDE
Chromium - Dissolved	< 0.002	mg/l	0.0020	6020B	20 Mar 20 14:08	MDE
Cobalt - Dissolved	< 0.002	mg/l	0.0020	6020B	20 Mar 20 14:08	MDE
Lead - Dissolved	< 0.0005	mg/l	0.0005	6020B	20 Mar 20 14:08	MDE
Molybdenum - Dissolved	0.0028	mg/l	0.0020	6020B	20 Mar 20 14:08	MDE
Selenium - Dissolved	0.0367	mg/l	0.0050	6020B	20 Mar 20 14:08	MDE
Thallium - Dissolved	< 0.0005	mg/l	0.0005	6020B	20 Mar 20 14:08	MDE

* Holding time exceeded

Approved by: Claudette K. Carroll *14 Apr 2020*
Claudette K. Carroll, Laboratory Manager, Bismarck, ND

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CERTIFICATION: ND # ND-00016

MVTL guarantees the accuracy of the analysis done on the sample submitted for testing. It is not possible for MVTL to guarantee that a test result obtained on a particular sample will be the same on any other sample unless all conditions affecting the sample are the same, including sampling by MVTL. As a mutual protection to clients, the public and ourselves, all reports are submitted as the confidential property of clients, and authorization for publication of statements, conclusions or extracts from or regarding our reports is reserved pending our written approval.



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CERTIFICATE of ANALYSIS - STATE

Todd Peterson
Montana-Dakota Utilities Co.
400 N 4th St
Bismarck ND 58501

Report Date: 1 Apr 20
Lab Number: 20-W485
Work Order #: 82-0623
Account #: 002800
Date Sampled: 17 Mar 20 19:01
Date Received: 18 Mar 20 16:38
Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark

PO #: 180534 OP

Sample Description: MW118

Temp at Receipt: 0.6C

Event and Year: March 2020

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	19 Mar 20	HT
Total Suspended Solids	2	mg/l	2	I3765-85	19 Mar 20 14:25	HT
pH - Field	7.51	units	NA	SM 4500 H+ B	17 Mar 20 19:01	DJN
Temperature - Field	4.22	Degrees C	NA	SM 2550B	17 Mar 20 19:01	DJN
Total Alkalinity	353	mg/l CaCO3	20	SM2320-B	19 Mar 20 17:00	HT
Conductivity - Field	2138	umhos/cm	1	EPA 120.1	17 Mar 20 19:01	DJN
Nitrate-Nitrite as N	10.9	mg/l	0.10	EPA 353.2	19 Mar 20 12:05	EV
Mercury - Dissolved	< 0.0002	mg/l	0.0002	EPA 245.1	25 Mar 20 11:27	MDE
Magnesium - Total	202	mg/l	1.0	6010D	24 Mar 20 12:22	MDE
Sodium - Total	108	mg/l	1.0	6010D	24 Mar 20 12:22	MDE
Potassium - Total	7.7	mg/l	1.0	6010D	24 Mar 20 12:22	MDE
Calcium - Dissolved	116	mg/l	1.0	6010D	24 Mar 20 14:22	MDE
Magnesium - Dissolved	200	mg/l	1.0	6010D	24 Mar 20 14:22	MDE
Sodium - Dissolved	105	mg/l	1.0	6010D	24 Mar 20 14:22	MDE
Potassium - Dissolved	7.5	mg/l	1.0	6010D	24 Mar 20 14:22	MDE
Lithium - Dissolved	0.082	mg/l	0.020	6010D	30 Mar 20 11:07	SZ
Boron - Dissolved	1.45	mg/l	0.10	6010D	27 Mar 20 10:48	SZ
Antimony - Dissolved	< 0.002 ^	mg/l	0.0010	6020B	27 Mar 20 11:19	MDE
Arsenic - Dissolved	< 0.005 ^	mg/l	0.0020	6020B	27 Mar 20 11:19	MDE
Barium - Dissolved	0.0229	mg/l	0.0020	6020B	27 Mar 20 11:19	MDE
Beryllium - Dissolved	< 0.0005	mg/l	0.0005	6020B	27 Mar 20 13:53	MDE
Cadmium - Dissolved	< 0.0005	mg/l	0.0005	6020B	27 Mar 20 11:19	MDE
Chromium - Dissolved	< 0.002	mg/l	0.0020	6020B	27 Mar 20 11:19	MDE
Cobalt - Dissolved	< 0.002	mg/l	0.0020	6020B	27 Mar 20 11:19	MDE
Lead - Dissolved	< 0.0005	mg/l	0.0005	6020B	27 Mar 20 11:19	MDE
Molybdenum - Dissolved	0.0237	mg/l	0.0020	6020B	27 Mar 20 11:19	MDE
Selenium - Dissolved	0.0670	mg/l	0.0050	6020B	27 Mar 20 11:19	MDE
Thallium - Dissolved	< 0.0005	mg/l	0.0005	6020B	27 Mar 20 11:19	MDE

* Holding time exceeded

^ Elevated result due to instrument performance at the lower limit of quantification (LLOQ).

Approved by:

Claudette K Carroll

14 Apr 2020

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

The reporting limit was elevated for any analyte requiring a dilution as coded below:

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CERTIFICATION: ND # ND-00016



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CERTIFICATE of ANALYSIS - STATE

Todd Peterson
Montana-Dakota Utilities Co.
400 N 4th St
Bismarck ND 58501

Report Date: 1 Apr 20
Lab Number: 20-W486
Work Order #: 82-0623
Account #: 002800
Date Sampled: 17 Mar 20 8:59
Date Received: 18 Mar 20 16:38
Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark

PO #: 180534 OP

Sample Description: MW120

Temp at Receipt: 0.6C

Event and Year: March 2020

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	19 Mar 20	HT
Total Suspended Solids	2	mg/l	2	I3765-85	19 Mar 20 14:25	HT
pH - Field	6.92	units	NA	SM 4500 H+ B	17 Mar 20 8:59	DJN
Temperature - Field	1.23	Degrees C	NA	SM 2550B	17 Mar 20 8:59	DJN
Total Alkalinity	704	mg/l CaCO3	20	SM2320-B	19 Mar 20 17:00	HT
Conductivity - Field	6556	umhos/cm	1	EPA 120.1	17 Mar 20 8:59	DJN
Nitrate-Nitrite as N	5.30	mg/l	0.10	EPA 353.2	19 Mar 20 12:05	EV
Mercury - Dissolved	< 0.0002	mg/l	0.0002	EPA 245.1	25 Mar 20 11:27	MDE
Magnesium - Total	860	mg/l	1.0	6010D	24 Mar 20 12:22	MDE
Sodium - Total	406	mg/l	1.0	6010D	24 Mar 20 12:22	MDE
Potassium - Total	28.3	mg/l	1.0	6010D	24 Mar 20 12:22	MDE
Calcium - Dissolved	448	mg/l	1.0	6010D	24 Mar 20 14:22	MDE
Magnesium - Dissolved	930	mg/l	1.0	6010D	24 Mar 20 14:22	MDE
Sodium - Dissolved	414	mg/l	1.0	6010D	24 Mar 20 14:22	MDE
Potassium - Dissolved	29.0	mg/l	1.0	6010D	24 Mar 20 14:22	MDE
Lithium - Dissolved	0.145	mg/l	0.020	6010D	30 Mar 20 11:07	SZ
Boron - Dissolved	9.75	mg/l	0.10	6010D	27 Mar 20 10:48	SZ
Antimony - Dissolved	< 0.001	mg/l	0.0010	6020B	20 Mar 20 14:08	MDE
Arsenic - Dissolved	< 0.002	mg/l	0.0020	6020B	20 Mar 20 14:08	MDE
Barium - Dissolved	0.0204	mg/l	0.0020	6020B	20 Mar 20 14:08	MDE
Beryllium - Dissolved	< 0.0005	mg/l	0.0005	6020B	23 Mar 20 12:40	MDE
Cadmium - Dissolved	< 0.0005	mg/l	0.0005	6020B	20 Mar 20 14:08	MDE
Chromium - Dissolved	< 0.002	mg/l	0.0020	6020B	20 Mar 20 14:08	MDE
Cobalt - Dissolved	< 0.002	mg/l	0.0020	6020B	20 Mar 20 14:08	MDE
Lead - Dissolved	< 0.0005	mg/l	0.0005	6020B	20 Mar 20 14:08	MDE
Molybdenum - Dissolved	0.0024	mg/l	0.0020	6020B	20 Mar 20 14:08	MDE
Selenium - Dissolved	< 0.005	mg/l	0.0050	6020B	20 Mar 20 14:08	MDE
Thallium - Dissolved	< 0.0005	mg/l	0.0005	6020B	20 Mar 20 14:08	MDE

* Holding time exceeded

Approved by:

Claudette K. Carroll

14 Apr 2020

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

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CERTIFICATION: ND # ND-00016



2616 E. Broadway Ave
Bismarck, ND 58501
(701) 258-9720

Chain of Custody Record

Project Name: MDU Lewis & Clark		Event: March 2020	Work Order Number: 82-0623
Report To: Attn: Address: Phone: Email:	MDU Lewis & Clark Todd Peterson 400 N. 4th St Bismarck, ND 58501 701-425-2427 Todd.Peterson@mdu.com	CC:	Collected By: <i>Darin Nieswaag</i>

Lab Number	Sample ID	Date	Time	Sample Type	Sample Type				Temp (°C)	Spec. Cond.	pH	Analysis Required	
					1 Liter Raw	500 mL Nitric	500 mL Nitric (filtered)	1 Liter Sulfuric					
W478	Dup 1	18 March 2020	NA	GW	X	X	X	X	NA	NA	NA	NA	MDU Lewis & Clark List
W479	Field Blank (FB)	18 March 2020	NA	GW	X	X	X	X	NA	NA	NA	NA	
W480	MW103	18 March 2020	0931	GW	X	X	X	X	6.08	1416	7.45		
W481	MW110	16 March 2020	1629	GW	X	X	X	X	3.60	1360	7.39		
W482	MW119	16 March 2020	1857	GW	X	X	X	X	3.96	1311	7.40		
W483	MW111	17 March 2020	1309	GW	X	X	X	X	4.72	4077	7.36		
W484	MW117	17 March 2020	1030	GW	X	X	X	X	0.80	8177	7.36		
W485	MW118	17 March 2020	1901	GW	X	X	X	X	4.22	2138	7.51		
W486	MW120	17 March 2020	0859	GW	X	X	X	X	1.23	6556	6.92		

Comments:

Relinquished By		Sample Condition		Received By	
Name	Date/Time	Location	Temp (°C)	Name	Date/Time
<i>[Signature]</i>	18 Mar 2020	Log In	ROT 0.6	<i>[Signature]</i>	18 Mar 2020
	1638	Walk In #2	TM562 / TM805		1638
2			17 Mar 2020 (B)		



April 10, 2020

Montana Dakota Utilities
Todd Peterson
5181 Southgate Dr.
Billings, MT 59102

RE: Amended Field Data Report

Dear Mr. Peterson,

Per email dated April 6, 2020 from Terri Olson, Barr Engineering, it was brought to MVTL's attention that some of the summary data in the Field Data Report did not match the Raw Data collected in the field. Attached to this letter is the corrected Field Data Report.

Thank you for your trust and support of our services. If you have any questions, please call me at (701) 391-4900.

Sincerely,

Jeremy Meyer
MVTL Field Services



MVTL Laboratories Inc.

2616 E. Broadway
Bismarck, ND 58501
Phone (701) 258-9720

MDU Lewis and Clark

CCR Sampling

Attn: MDU

400 N. 4th St.
Bismarck, ND 58501

WO#
82-0636
82-0623

FIELD DATA REPORT

SAMPLE ID	PURGE DATE	START PURGE TIME	SAMPLE DATE	TIME OF SAMPLE	WATER LEVEL START (FT)	WATER LEVEL END (FT)	VOLUME REMOVED (mL)	SAMPLE METHOD	FIELD READINGS				SAMPLE APPEARANCE OR COMMENT
									TEMP (°C)	EC	pH	TURB. NTU	
MW103	18-Mar-20	8:06	18-Mar-20	9:31	10.78	10.77	8500.0	Bladder	6.08	1416	7.45	3.81	clear
MW110	16-Mar-20	12:54	16-Mar-20	16:29	9.26	9.35	14700.0	Bladder	3.60	1360	7.39	6.98	clear
MW119	16-Mar-20	18:12	16-Mar-20	18:57	9.12	9.20	4500.0	Bladder	3.96	1311	7.40	3.14	clear
MW111	17-Mar-20	11:54	17-Mar-20	13:09	7.00	7.78	7500.0	Bladder	4.72	4077	7.36	4.07	clear
MW117	16-Mar-20	11:33	17-Mar-20	10:30	6.67	9.64	9000.0	Bladder	0.80	8177	7.36	108.00	slightly turbid
MW118	17-Mar-20	17:56	17-Mar-20	19:01	8.47	8.50	5500.0	Bladder	4.22	2138	7.51	1.80	clear
MW120	17-Mar-20	8:24	17-Mar-20	8:59	15.13	15.60	3500.0	Bladder	1.23	6556	6.92	1.06	clear

na = Not Applicable NR = Not Recorded



Field Datasheet

Groundwater Assessment

2616 E. Broadway Ave, Bismarck, ND
Phone: (701) 258-9720

Company: MDU Lewis & Clark
Event: March 2020
Sample ID: 103
Sampling Personal: Darren Niesman

Weather Conditions: Temp: 20 °F Wind: North @ 14 Precip: Sunny / Partly Cloudy / Cloudy

WELL INFORMATION

Well Locked?	YES	NO	
Well Labeled?	YES	NO	
Casing Strait?	YES	NO	
Grout Seal Intact?	YES	NO	Not Visible
Repairs Necessary?			
Casing Diameter:	2"		
Water Level Before Purge:	10.78	ft	
Total Depth of Well:	21.10	ft	
Well Volume:	0.20	liters	
Depth to Top of Pump:	18.03	ft	
Water Level After Sample:	10.77	ft	
Measurement Method:	Electric Water Level Indicator		

SAMPLING INFORMATION

Purging Method:	Bladder
Sampling Method:	Bladder
Dedicated Equipment?	YES Tubing NO
Duplicate Sample?	YES NO
Duplicate Sample ID:	Dup-1

Control Settings:	
Purge:	3 Sec.
Recover:	57 Sec.
PSI:	

Bottle List:	
1 Liter Raw	4- 1L Nitric
500mL Nitric	
500mL Nitric (filtered)	
250mL Sulfuric	

FIELD READINGS

Stabilization Parameters (3 Consecutive)		Temp. (°C)	Spec. Cond.	pH	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Water Level (ft)	Pumping Rate mL/Min	Liters Removed	Appearance or Comment Clarity, Color, Odor, Ect.
Purge Date	Time	±0.5°	±5%	±0.1	±10%	±10		(ft)			clear, slightly turbid, turbid
18 March 2020	0806	Start of Well Purge									
	0807	5.80	266.7	7.40	4.61	248.6	76.7	10.77	100	500	clear
	0808	5.53	150.8	7.46	5.34	240.2	10.0	10.77	100	300	clear
	0911	5.28	147.2	7.45	2.84	240.1	4.56	10.77	100	300	clear
	0916	6.21	143.2	7.45	2.80	239.4	4.47	10.77	100	500	clear
	0921	6.22	144.3	7.45	2.88	239.8	4.08	10.77	100	500	clear
	0926	6.44	142.5	7.45	2.90	239.9	3.98	10.77	100	500	clear
	0931	6.08	141.6	7.45	2.96	239.2	3.81	10.77	100	500	clear

Well Stabilized? YES NO

Total Volume Purged: 8500 Liters

Sample Date	Time	Temp. (°C)	Spec. Cond.	pH	Turbidity (NTU)	Appearance or Comment Clarity, Color, Odor, Ect.
18 March 2020	0931	6.08	141.6	7.45	3.81	clear

Comments:



Field Datasheet

Groundwater Assessment

2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

Company: MDU Lewis & Clark

Event: March 2020

Sample ID: 110

Sampling Personal: Darren Nitzsma

Weather Conditions: Temp: 24 °F Wind: West @ 15 Precip: Sunny / Partly Cloudy / Cloudy

WELL INFORMATION

Well Locked?	YES NO
Well Labeled?	YES NO
Casing Strait?	YES NO
Grout Seal Intact?	YES NO Not Visible
Repairs Necessary?	
Casing Diameter:	2"
Water Level Before Purge:	9.26 ft
Total Depth of Well:	16.83 ft
Well Volume:	4.7 liters
Depth to Top of Pump:	— ft
Water Level After Sample:	9.35 ft
Measurement Method:	Electric Water Level Indicator

SAMPLING INFORMATION

Purging Method:	Bladder
Sampling Method:	Bladder
Dedicated Equipment?	YES NO Tubbing

Control Settings:	
Purge:	2 Sec.
Recover:	8 Sec.
PSI:	

Duplicate Sample?	YES NO
Duplicate Sample ID:	—

Small bladder pump

Bottle List:	
1 Liter Raw	4- 1L Nitric
500mL Nitric	
500mL Nitric (filtered)	
250mL Sulfuric	

FIELD READINGS

Stabilization Parameters (3 Consecutive)		Temp. (°C)	Spec. Cond.	pH	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Water Level (ft)	Pumping Rate mL/Min	Liters Removed	Appearance or Comment Clarity, Color, Odor, Ect.
Purge Date	Time	±0.5°	±5%	±0.1	±10%	±10					clear, slightly turbid, turbid
16 March 2020											
	1254	Start of Well Purge									
	1259	3.39	1399	7.41	5.69	265.5	80.4	9.34	70	350	clear
	1329	3.48	1370	7.40	5.51	272.9	48.9	9.35	70	2100	clear
	1359	3.48	1365	7.40	7.56	280.0	26.4	9.35	70	2100	clear
	1429	3.67	1369	7.39	7.52	277.6	19.8	9.35	70	2100	clear
	1459	3.67	1362	7.39	7.58	282.2	11.2	9.35	70	2100	clear
	1559	3.71	1363	7.38	7.82	285.5	9.57	9.35	70	4200	clear
	1619	3.62	1361	7.39	7.97	298.6	7.14	9.35	70	6050	clear
	1624	3.59	1361	7.39	7.95	298.7	7.00	9.35	70	750	clear
	1629	3.60	1360	7.39	7.98	298.9	6.98	9.35	70	350	clear

Well Stabilized? **YES** NO

Total Volume Purged: 14,700 mL Liters

Sample Date	Time	Temp. (°C)	Spec. Cond.	pH	Turbidity (NTU)	Appearance or Comment Clarity, Color, Odor, Ect.
16 March 2020	1629	3.60	1360	7.39	6.98	clear

Comments: Took out 3 volumes the (NTU) never went below 5 under the 3 volumes so started sampling



2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

Field Datasheet

Groundwater Assessment

Company: MDU Lewis & Clark

Event: March 2020

Sample ID: 119

Sampling Personal: Darren Nieswangs

Weather Conditions: Temp: 22 °F Wind: West @ 12 Precip: Sunny / Partly Cloudy / Cloudy

WELL INFORMATION

Well Locked?	YES	NO
Well Labeled?	YES	NO
Casing Strait?	YES	NO
Grout Seal Intact?	YES	NO
Repairs Necessary?	NO	Not Visible
Casing Diameter:	2"	
Water Level Before Purge:	9.12	ft
Total Depth of Well:	16.62	ft
Well Volume:	4.62	liters
Depth to Top of Pump:	11.28	ft
Water Level After Sample:	9.20	ft
Measurement Method:	Electric Water Level Indicator	

SAMPLING INFORMATION

Purging Method:	Bladder
Sampling Method:	Bladder
Dedicated Equipment?	YES NO Tubing
Duplicate Sample?	YES NO
Duplicate Sample ID:	
Control Settings:	
Purge:	3 Sec.
Recover:	257 Sec.
PSI:	30
Bottle List:	
1 Liter Raw	4- 1L Nitric
500mL Nitric	
500mL Nitric (filtered)	
250mL Sulfuric	

FIELD READINGS

Stabilization Parameters (3 Consecutive)	Purge Date	Time	Temp. (°C)	Spec. Cond.	pH	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Water Level (ft)	Pumping Rate (mL/Min)	Liters Removed	Appearance or Comment
Start of Well Purge												
	16 March 2020	1812										
		1817	5.21	1314	7.36	7.04	233.8	17.8	9.18	100	500	clear
		1837	4.03	1303	7.40	2.56	246.3	7.47	9.20	100	2000	clear
		1847	3.80	1308	7.40	2.44	252.4	3.78	9.20	100	1000	clear
		1852	3.90	1308	7.40	2.42	254.3	3.41	9.20	100	500	clear
		1857	3.96	1311	7.40	2.38	256.8	3.14	9.20	100	500	clear

Well Stabilized? YES NO Total Volume Purged: 4500 Liters

Sample Date	Time	Temp. (°C)	Spec. Cond.	pH		Turbidity (NTU)		Appearance or Comment
16 March 2020	1857	3.96	1311	7.40		3.14		clear

Comments:



Field Datasheet

Groundwater Assessment

2616 E. Broadway Ave, Bismarck, ND
Phone: (701) 258-9720

Company: MDU Lewis & Clark
Event: March 2020
Sample ID: 111
Sampling Personal: Darren Niesnaag

Weather Conditions: Temp: 30 °F Wind: North @ 17 Precip: Sunny / Partly Cloudy / Cloudy

WELL INFORMATION

Well Locked?	YES	NO	
Well Labeled?	YES	NO	
Casing Strait?	YES	NO	
Grout Seal Intact?	YES	NO	Not Visible
Repairs Necessary?			
Casing Diameter:	2"		
Water Level Before Purge:	7.00		ft
Total Depth of Well:	17.80		ft
Well Volume:	6.7		liters
Depth to Top of Pump:	-		ft
Water Level After Sample:	7.78		ft
Measurement Method:	Electric Water Level Indicator		

SAMPLING INFORMATION

Purging Method:	Bladder
Sampling Method:	Bladder
Dedicated Equipment?	YES NO
Duplicate Sample?	YES NO
Duplicate Sample ID:	

Control Settings:	
Purge:	3 Sec.
Recover:	57 Sec.
PSI:	-

Bottle List:	
1 Liter Raw	4- 1L Nitric
500mL Nitric	
500mL Nitric (filtered)	
250mL Sulfuric	

FIELD READINGS

Stabilization Parameters (3 Consecutive)		Temp. (°C)	Spec. Cond.	pH	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Water Level (ft)	Pumping Rate mL/Min	Liters Removed	Appearance or Comment Clarity, Color, Odor, Ect.
Purge Date	Time	±0.5°	±5%	±0.1	±10%	±10					clear, slightly turbid, turbid
	1154	Start of Well Purge									
17 March 2020	1159	5.05	4317	7.20	4.24	246.0	27.5	7.74	100	500	clear
	1229	3.58	4336	7.33	3.56	259.0	28.0	7.74	100	3000	clear
	1259	4.60	4092	7.34	3.23	251.9	4.44	7.78	100	3000	clear
	1304	4.67	4096	7.35	3.19	254.5	4.24	7.78	100	500	clear
	1309	4.72	4077	7.36	3.00	257.2	4.07	7.78	100	500	clear

Well Stabilized? YES NO

Total Volume Purged: 7500 Liters

Sample Date	Time	Temp. (°C)	Spec. Cond.	pH		Turbidity (NTU)		Appearance or Comment Clarity, Color, Odor, Ect.
17 March 2020	1309	4.72	4077	7.36		4.07		clear

Comments:



Field Datasheet

Groundwater Assessment

2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

Company: MDU Lewis & Clark

Event: March 2020

Sample ID: 117

Sampling Personal: Darren Nieswaag

Weather Conditions: Temp: 16 °F Wind: Light@ Precip: Sunny/ Partly Cloudy/ Cloudy

WELL INFORMATION

Well Locked?	<u>YES</u>	NO	
Well Labeled?	<u>YES</u>	NO	
Casing Strait?	<u>YES</u>	NO	
Grout Seal Intact?	<u>YES</u>	NO	Not Visible
Repairs Necessary?			
Casing Diameter:	<u>2"</u>		
Water Level Before Purge:	<u>6.67</u>	ft	
Total Depth of Well:	<u>11.51</u>	ft	
Well Volume:	<u>3.0</u>	liters	
Depth to Top of Pump:	<u>9.84</u>	ft	
Water Level After Sample:	<u>9.64</u>	ft	
Measurement Method:	Electric Water Level Indicator		

SAMPLING INFORMATION

Purging Method:	Bladder	Control Settings:
Sampling Method:	Bladder	Purge: <u>5</u> Sec.
Dedicated Equipment?	<u>YES</u> NO <u>Tubing</u>	Recover: <u>5.5</u> Sec.
Duplicate Sample?	YES <u>NO</u>	PSI: <u>10</u>
Duplicate Sample ID:		
Bottle List:		
1 Liter Raw	4- 1L Nitric	
500mL Nitric		
500mL Nitric (filtered)		
250mL Sulfuric		

FIELD READINGS

Stabilization Parameters (3 Consecutive)		Temp. (°C)	Spec. Cond.	pH	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Water Level (ft)	Pumping Rate mL/Min	Liters Removed	Appearance or Comment Clarity, Color, Odor, Ect.
Purge Date	Time	±0.5°	±5%	±0.1	±10%	±10					clear, slightly turbid, turbid
16 March 2020											
	1133	Start of Well Purge									
	1138	3.40	7746	7.16	7.72	246.7	45.8	7.48	150	750	clear
	1205	2.91	7741	7.19	8.48	257.2	31.3	9.19	150	4500	clear
	1223	2.68	7623	7.20	9.52	264.8	47.8	9.84	150	2250	clear
	1233	2.18	7752	7.20	13.22	269.1	15.6	7.02	150	1500	clear
17 March 2020											
	09025	Purged well 5 min before sampling									
								5.152			

Well Stabilized? YES NO

Total Volume Purged: 9,000 Liters

Sample Date	Time	Temp. (°C)	Spec. Cond.	pH	DO	ORP	Turbidity (NTU)				Appearance or Comment Clarity, Color, Odor, Ect.
17 March 2020	1030	0.80	8177	7.36	8.93	251.8	108				Slightly turbid

Comments:



Field Datasheet

Groundwater Assessment

2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

Company: MDU Lewis & Clark

Event: March 2020

Sample ID: 118

Sampling Personal: Darren Nieswag

Weather Conditions: Temp: 39 °F Wind: NW @ 4 Precip: Sunny / Partly Cloudy / Cloudy

WELL INFORMATION

Well Locked?	YES	NO	
Well Labeled?	YES	NO	
Casing Strait?	YES	NO	
Grout Seal Intact?	YES	NO	Not Visible
Repairs Necessary?			
Casing Diameter:	2"		
Water Level Before Purge:	8.47	ft	
Total Depth of Well:	11.09	ft	
Well Volume:	127	liters	
Depth to Top of Pump:	9.52	ft	
Water Level After Sample:	8.50	ft	
Measurement Method:	Electric Water Level Indicator		

SAMPLING INFORMATION

Purging Method:	Bladder
Sampling Method:	Bladder
Dedicated Equipment?	YES NO
Duplicate Sample?	YES NO
Duplicate Sample ID:	

Control Settings:	
Purge: 3	Sec.
Recover: 57	Sec.
PSI:	

Bottle List:	
1 Liter Raw	4- 1L Nitric
500mL Nitric	
500mL Nitric (filtered)	
250mL Sulfuric	

FIELD READINGS

Stabilization Parameters (3 Consecutive)	Temp. (°C)	Spec. Cond.	pH	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Water Level (ft)	Pumping Rate mL/Min	Liters Removed	Appearance or Comment Clarity, Color, Odor, Ect.
Purge Date	Time	±0.5°	±5%	±0.1	±10%	±10				clear, slightly turbid, turbid
17 March 2020	17:56	Start of Well Purge								
	18:01	5.41	2168	7.47	6.36	261.6	8.46	100	500	slightly turbid
	18:21	4.29	2142	7.50	10.53	269.3	8.49	100	3000	clear
	18:46	4.28	2140	7.51	9.14	273.5	8.50	100	500	clear
	18:51	4.30	2140	7.51	9.21	274.3	8.50	100	500	clear
	18:56	4.18	2139	7.51	9.03	276.3	8.52	100	500	clear
	19:01	4.22	2138	7.51	9.21	276.6	8.50	100	500	clear

Well Stabilized? YES NO Total Volume Purged: 5500 Liters

Sample Date	Time	Temp. (°C)	Spec. Cond.	pH	Turbidity (NTU)	Appearance or Comment Clarity, Color, Odor, Ect.
17 March 2020	19:01	4.22	2138	7.51	1.80	clear

Comments:



Field Datasheet

Groundwater Assessment

2616 E. Broadway Ave, Bismarck, ND
Phone: (701) 258-9720

Company: MDU Lewis & Clark
Event: March 2020
Sample ID: 120
Sampling Personal: Darren Nieswag

Weather Conditions: Temp: 6 °F Wind: South @ 8 Precip: Sunny / Partly Cloudy / Cloudy

WELL INFORMATION

Well Locked?	YES	NO
Well Labeled?	YES	NO
Casing Strait?	YES	NO
Grout Seal Intact?	YES	NO
Repairs Necessary?	Not Visible	
Casing Diameter:	2"	
Water Level Before Purge:	15.13	ft
Total Depth of Well:	18.88	ft
Well Volume:	2.4	liters
Depth to Top of Pump:	15.56	ft
Water Level After Sample:	15.60	ft
Measurement Method:	Electric Water Level Indicator	

SAMPLING INFORMATION

Purging Method:	Bladder	
Sampling Method:	Bladder	
Dedicated Equipment?	YES	NO

Control Settings:		
Purge:	63	Sec.
Recover:	57	Sec.
PSI:		

Duplicate Sample?	YES	NO
Duplicate Sample ID:		

Bottle List:	
1 Liter Raw	4- 1L Nitric
500mL Nitric	
500mL Nitric (filtered)	
250mL Sulfuric	

FIELD READINGS

Stabilization Parameters (3 Consecutive)		Temp. (°C)	Spec. Cond.	pH	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Water Level (ft)	Pumping Rate mL/Min	Liters Removed	Appearance or Comment Clarity, Color, Odor, Ect.
Purge Date	Time	±0.5°	±5%	±0.1	±10%	±10					
17 March 2020	0824	Start of Well Purge									
	0829	2.24	6466	6.90	3.21	219.8	3.85	15.42	100	500	clear
	0849	1.18	6468	6.93	2.25	221.8	1.19	15.41	100	2000	clear
	0854	1.09	6518	6.93	2.18	223.6	1.02	15.41	100	500	clear
	0859	1.23	6556	6.92	2.20	223.8	1.06	15.41	100	500	clear

Well Stabilized? YES NO Total Volume Purged: 3500 Liters

Sample Date	Time	Temp. (°C)	Spec. Cond.	pH	Turbidity (NTU)	Appearance or Comment Clarity, Color, Odor, Ect.
17 March 2020	0859	1.23	6556	6.92	1.06	clear

Comments:

MVTL Calibration Worksheet

Site: MDU Lewis and Clark

Technician: Darren Nieswaag

Instrument
(Circle One):

#1 650 MDS 08F100203

#2 650 MDS 04H14736

#3 556 MPS 12E102056

Pre Site Calibration

Date: 18 March 2020 Time: 0655

pH	Temp °C	Pre Cal	Post Cal	Post Cal Range	mv	mv Range +/- 50
Buffer 7	<u>18.79</u>	<u>7.09</u>	<u>7.00</u>	6.95-7.05	<u>-20.4</u>	0 +/- 50
Buffer 10	<u>18.93</u>	<u>9.99</u>	<u>10.00</u>	9.95-10.05	<u>-197.9</u>	-180 +/- 50
Buffer 4	<u>18.58</u>	<u>3.94</u>	<u>3.99</u>	4.95-5.05	<u>158.9</u>	180 +/- 50

Conductivity

Buffer 1413	<u>19.03</u>	<u>1441</u>	<u>1413</u>	±10%	Buffer 5000	<u>5015</u>
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ORP

231 mV @ 25C	<u>8.53</u>	<u>216.3</u>	<u>231.1</u>	±10 mV	check <u>5.96</u>
--------------	-------------	--------------	--------------	--------	-------------------

DO

	<u>21.63</u>	<u>8.73</u>	<u>8.20</u>	Barometric Pressure (mm Hg)	<u>710.0</u>
--	--------------	-------------	-------------	-----------------------------	--------------

Date: _____ Time: _____

pH	Temp °C	Pre Cal	Post Cal	Post Cal Range	mv	mv Range +/- 50
Buffer 7				6.95-7.05		0 +/- 50
Buffer 10				9.95-10.05		-180 +/- 50
Buffer 4				4.95-5.05		180 +/- 50

Conductivity

Buffer 1413				±10%	Buffer 5000	
-------------	--	--	--	------	-------------	--

ORP

231 mV @ 25C				±10 mV	
--------------	--	--	--	--------	--

DO

				Barometric Pressure (mm Hg)	
--	--	--	--	-----------------------------	--

Post Site Check

Time: 0936

pH	Temp °C	Reading
Buffer 7	<u>12.75</u>	<u>7.02</u>

Conductivity

Buffer 5000	<u>13.98</u>	<u>5018</u>
-------------	--------------	-------------

Time: _____

pH	Temp °C	Reading
Buffer 7		

Conductivity

Buffer 5000		
-------------	--	--

MVTL Calibration Worksheet

Site: MDU Lewis and Clark

Technician: Darren Nieson

Instrument
(Circle One):

#1 650 MDS 08F100203

#2 650 MDS 04H14736

#3 556 MPS 12E102056

Pre Site Calibration

Date: 16 March 2020 Time: 0650

pH	Temp °C	Pre Cal	Post Cal	Post Cal Range	mv	mv Range +/- 50
Buffer 7	<u>17.01</u>	<u>6.99</u>	<u>7.00</u>	6.95-7.05	<u>-19.4</u>	0 +/- 50
Buffer 10	<u>19.18</u>	<u>10.00</u>	<u>10.00</u>	9.95-10.05	<u>-197.4</u>	-180 +/- 50
Buffer 4	<u>19.22</u>	<u>3.99</u>	<u>4.00</u>	4.95-5.05	<u>159.1</u>	180 +/- 50

Conductivity

Buffer 1413	Check
<u>19.07</u>	Buffer 5000 <u>4991</u>

ORP

231 mV @ 25C	Check
<u>7.33</u>	check pH 6 <u>5.97</u>

DO

at site	Barometric Pressure (mm Hg)
<u>16.79</u>	<u>718.4</u>

Pre Site Calibration

Date: 17 March 2020 Time: 0650

pH	Temp °C	Pre Cal	Post Cal	Post Cal Range	mv	mv Range +/- 50
Buffer 7	<u>17.93</u>	<u>7.00</u>	<u>7.00</u>	6.95-7.05	<u>-19.5</u>	0 +/- 50
Buffer 10	<u>17.95</u>	<u>9.98</u>	<u>10.00</u>	9.95-10.05	<u>-195.5</u>	-180 +/- 50
Buffer 4	<u>17.96</u>	<u>4.00</u>	<u>4.00</u>	4.95-5.05	<u>143.7</u>	180 +/- 50

Conductivity

Buffer 1413	Check
<u>18.68</u>	Buffer 5000 <u>5010</u>

ORP

231 mV @ 25C	Check
<u>5.66</u>	check pH 6 <u>5.97</u>

DO

Barometric Pressure (mm Hg)
<u>711.1</u>

Post Site Check

Time: 1905

pH	Temp °C	Reading
Buffer 7	<u>10.27</u>	<u>7.03</u>

Conductivity

Buffer 5000	Reading
<u>13.56</u>	<u>5039</u>

Post Site Check

Time: 1907

pH	Temp °C	Reading
Buffer 7	<u>12.91</u>	<u>7.02</u>

Conductivity

Buffer 5000	Reading
<u>13.02</u>	<u>5072</u>

Claudette Carroll

From: Jeremy Meyer
Sent: Friday, April 10, 2020 9:35 AM
To: Bismarck Customer Service; Claudette Carroll
Subject: FW: Privileged & Confidential: L&C lab data from MVTL

See Todd's email below for reporting for L&C.

Thanks,

Jeremy Meyer

Bismarck Field Services Manager
Cell (701) 391-4900



Minnesota Valley Testing Labs
2616 E. Broadway Ave.
Bismarck, ND 58501

I hope you are pleased with the timeliness and accuracy of our services.
If you have any comments to recognize excellence or feedback that will help improve our services,
please contact Jane Knaak via email at jknaak@mvtl.com.

From: Peterson, Todd <Todd.Peterson@mdu.com>
Sent: Thursday, April 9, 2020 2:55 PM
To: Jeremy Meyer <jmeyer@mvtl.com>
Subject: FW: Privileged & Confidential: L&C lab data from MVTL

Hi Jeremy,

I appreciate the quick turn around with the Lewis & Clark groundwater samples from March 23. Barr Engineering would like the report for 202082-0623 (CCR wells) to exclude the extra analyses for

- o (Major Ions
- o Total Suspended Solids (TSS)
- o Nitrate-Nitrite as N
- o Dissolved Metals

This is good data to have, but not necessary for the CCR requirements. I apologize if this wasn't clear in the sampling plan overview I provided and I will make a reminder note for the next sampling event. Please go ahead and amend the 0623 report and resend to me and copy Barr Engineering.

Thank you,

Todd Peterson, CHMM
Environmental Specialist III
Montana-Dakota Utilities
400 North 4th St
Bismarck, ND 58501
701-222-7835 office
701-425-2427 cell
701-222-7845 fax

Tell me and I forget, teach me and I may remember, involve me and I learn.

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From: Jeremy J. Gacnik <JGacnik@barr.com>
Sent: Wednesday, April 8, 2020 5:43 PM
To: Peterson, Todd <Todd.Peterson@mdu.com>
Cc: Paul T. Swenson <PSwenson@barr.com>; Denise M. Levitan <DLevitan@barr.com>; Terri A. Olson <TOlson@barr.com>; Krebsbach, Abbie <Abbie.Krebsbach@mdu.com>
Subject: Privileged & Confidential: L&C lab data from MVTL

**** WARNING: EXTERNAL SENDER. NEVER click links or open attachments without positive sender verification of purpose. DO NOT provide your user ID or password on sites or forms linked from this email. ****

Hi Todd,

We have received three analytical reports from MVTL for Lewis & Clark, as detailed below:

- 202082-0623 (CCR wells)
- 202082-0624 (MW121)
- 202082-0626 (SP and YR samples for lithium and selenium)

The data received in the CCR Well and MW-121 reports contain analysis that was not requested, including:

- Major Ions
- Total Suspended Solids (TSS)
- Nitrate-Nitrite as N
- Dissolved Metals

While having this additional data in the MW-121 should not be an issue, we would want it removed from the CCR Well Report. The CCR report will be publicly accessible and we want to limit the data presented to only what is needed. Can you direct MVTL to re-issue the CCR Well Report (202082-0623) with only the CCR parameters, removing the extra analysis?

Let us know if you have any questions.

Thanks,

Jeremy J. Gacnik, PE

Senior Civil Engineer

Denver, CO office: 952.842.3676

JGacnik@barr.com

www.barr.com

resourceful. naturally.



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MINNESOTA VALLEY TESTING LABORATORIES, INC.

MVTL

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 2616 E. Broadway Ave. ~ Bismarck, ND 58502 ~ 800-279-6885 ~ Fax 701-258-9724
 1201 Lincoln Highway ~ Nevada, IA 50201 ~ 800-362-0855 ~ Fax 515-382-3885
 www.mvttl.com

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Page: 1 of 2

Quality Control Report

Lab IDs: 20-W478 to 20-W486

Project: MDU Lewis & Clark

Work Order: 202082-0623

Analyte	LCS Spike Amt	LCS Rec %	LCS % Rec Limits	Matrix Spike Amt	Matrix Spike ID	Matrix Spike Orig Result	Matrix Spike Result	Matrix Spike Rec %	Matrix Spike % Rec Limits	MSD/ Dup Orig Result	MSD/ Dup Result	MSD Rec %	MSD/ Dup RPD	MSD/ Dup RPD Limit (<)	Known Rec (%)	Known % Rec Limits	Method Blank
Antimony - Dissolved mg/l	0.1000	106	80-120	0.100	20-W478	0.0030	0.1074	104	75-125	0.1074	0.1059	103	1.4	20	-	-	< 0.001
	0.1000	106	80-120	0.100	20-W485	< 0.002	0.1035	104	75-125	0.1035	0.1068	107	3.1	20	-	-	< 0.001
Arsenic - Dissolved mg/l	0.1000	102	80-120	0.100	20-W478	< 0.002	0.1026	103	75-125	0.1026	0.1028	103	0.2	20	-	-	< 0.002
	0.1000	104	80-120	0.100	20-W485	< 0.005	0.1015	102	75-125	0.1015	0.1072	107	5.5	20	-	-	< 0.005
Barium - Dissolved mg/l	0.1000	108	80-120	0.100	20-W478	0.0206	0.1219	101	75-125	0.1219	0.1164	96	4.6	20	-	-	< 0.002
	0.1000	104	80-120	0.100	20-W485	0.0229	0.1160	93	75-125	0.1160	0.1205	98	3.8	20	-	-	< 0.002
Beryllium - Dissolved mg/l	0.1000	111	80-120	0.100	20-W478	< 0.0005	0.1088	109	75-125	0.1088	0.1044	104	4.1	20	-	-	< 0.0005
	0.1000	99	80-120	0.100	20-W485	< 0.0005	0.0959	96	75-125	0.0959	0.0960	96	0.1	20	-	-	0.0023
											0.0973	0.1002	-	2.9	20	-	-
Boron - Dissolved mg/l	0.40	102	80-120	0.400	20-W482	0.26	0.63	92	75-125	0.63	0.63	92	0.0	20	-	-	< 0.1 < 0.1
Cadmium - Dissolved mg/l	0.1000	104	80-120	0.100	20-W478	< 0.0005	0.0971	97	75-125	0.0971	0.0994	99	2.3	20	-	-	< 0.0005
	0.1000	106	80-120	0.100	20-W485	< 0.0005	0.0986	99	75-125	0.0986	0.0999	100	1.3	20	-	-	< 0.0005
Calcium - Dissolved mg/l	20.0	108	80-120	500	20W483q	186	685	100	75-125	685	690	101	0.7	20	-	-	< 1
Chromium - Dissolved mg/l	0.1000	106	80-120	0.100	20-W478	< 0.002	0.0992	99	75-125	0.0992	0.0980	98	1.2	20	-	-	< 0.002
	0.1000	105	80-120	0.100	20-W485	< 0.002	0.0981	98	75-125	0.0981	0.1020	102	3.9	20	-	-	< 0.002
Cobalt - Dissolved mg/l	0.1000	107	80-120	0.100	20-W478	< 0.002	0.0971	97	75-125	0.0971	0.0956	96	1.6	20	-	-	< 0.002
	0.1000	105	80-120	0.100	20-W485	< 0.002	0.0960	96	75-125	0.0960	0.0990	99	3.1	20	-	-	< 0.002
Lead - Dissolved mg/l	0.1000	109	80-120	0.100	20-W478	< 0.0005	0.1004	100	75-125	0.1004	0.0959	96	4.6	20	-	-	< 0.0005
	0.1000	105	80-120	0.100	20-W485	< 0.0005	0.0961	96	75-125	0.0961	0.0987	99	2.7	20	-	-	< 0.0005
Lithium - Dissolved mg/l	0.400	107	80-120	0.400	20-W482	0.040	0.441	100	75-125	0.441	0.432	98	2.1	20	-	-	< 0.02
Magnesium - Dissolved mg/l	20.0	108	80-120	500	20W483q	540	980	88	75-125	980	980	88	0.0	20	-	-	< 1
Magnesium - Total mg/l	20.0	109	80-120	500	20W483q	540	1000	92	75-125	1000	1020	96	2.0	20	-	-	< 1
	20.0	106	80-120												-	-	< 1
															-	-	< 1
Mercury - Dissolved mg/l	0.0020	105	85-115	0.002	20-W478	< 0.0002	0.0017	85	70-130	0.0017	0.0018	90	5.7	20	-	-	< 0.0002
Molybdenum - Dissolved mg/l	0.1000	108	80-120	0.100	20-W478	0.0172	0.1160	99	75-125	0.1160	0.1145	97	1.3	20	-	-	< 0.002
	0.1000	109	80-120	0.100	20-W485	0.0237	0.1225	99	75-125	0.1225	0.1282	104	4.5	20	-	-	< 0.002



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MEMBER
ACIL

Quality Control Report

Lab IDs: 20-W478 to 20-W486

Project: MDU Lewis & Clark

Work Order: 202082-0623

Analyte	LCS Spike Amt	LCS Rec %	LCS % Rec Limits	Matrix Spike Amt	Matrix Spike ID	Matrix Spike Orig Result	Matrix Spike Result	Matrix Spike Rec %	Matrix Spike % Rec Limits	MSD/ Dup Orig Result	MSD/ Dup Result	MSD Rec %	MSD/ Dup RPD	MSD/ Dup RPD Limit (<)	Known Rec (%)	Known % Rec Limits	Method Blank
Nitrate-Nitrite as N mg/l	0.50	104	90-110	1.00	20-W479	< 0.1	1.06	106	90-110	1.06	1.05	105	0.9	20	-	-	< 0.1
Potassium - Dissolved mg/l	10.0	101	80-120	100	20W483q	10.0	104	94	75-125	104	104	94	0.0	20	-	-	< 1
Potassium - Total mg/l	10.0 10.0	103 98	80-120 80-120	100	20W483q	10.5	107	96	75-125	107	109	98	1.9	20	- - -	- - -	< 1 < 1 < 1
Selenium - Dissolved mg/l	0.1000 0.1000	109 103	80-120 80-120	0.100 0.100	20-W478 20-W485	0.0531 0.0670	0.1705 0.1694	117 102	75-125 75-125	0.1705 0.1694	0.1619 0.1766	109 110	5.2 4.2	20 20	- -	- -	< 0.005 < 0.005
Sodium - Dissolved mg/l	20.0	106	80-120	500	20W483q	136	600	93	75-125	600	615	96	2.5	20	-	-	< 1
Sodium - Total mg/l	20.0 20.0	108 106	80-120 80-120	500	20W483q	142	635	99	75-125	635	635	99	0.0	20	- - -	- - -	< 1 < 1 < 1
Thallium - Dissolved mg/l	0.1000 0.1000	109 105	80-120 80-120	0.100 0.100	20-W478 20-W485	< 0.0005 < 0.0005	0.1005 0.0942	100 94	75-125 75-125	0.1005 0.0942	0.0948 0.0978	95 98	5.8 3.8	20 20	- -	- -	< 0.0005 < 0.0005
Total Alkalinity mg/l CaCO3	410	94	90-110	410 410	20-D792 20-W487	444 494	803 869	88 91	80-120 80-120	803 869	802 871	87 92	0.1 0.2	20 20	94	80-120	< 20 < 20
Total Suspended Solids mg/l	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	14 36 7	13 36 7	- - -	7.4 0.0 0.0	20 20 0	- - -	- - -	< 2 < 2 < 2

Samples were received in good condition on 18 Mar 2020 at 1638.
 Temperature upon receipt at the Bismarck laboratory was 0.6°C.
 All samples were properly preserved unless noted here and/or flagged on the individual analytical laboratory report.
 All holding times were met.
 Approved methodology was followed for all sample analyses.
 All acceptance criteria were met for calibration, method blanks, laboratory control samples, laboratory fortified matrix/duplicates unless noted here.

- For some analytes, the reported results were elevated due to instrument performance at the lower limit of quantitation (LLOQ).

C. Cantelero

Approved by: _____
14 Apr 2020



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Todd Peterson
Montana-Dakota Utilities Co.
400 N 4th St
Bismarck ND 58501

Report Date: 13 Apr 20
Lab Number: 20-W504
Work Order #: 82-0636
Account #: 002800
Date Sampled: 18 Mar 20
Date Received: 18 Mar 20 16:38
Sampled By: MVT L Field Services

Project Name: MDU Lewis & Clark

PO #: 180534 OP

Sample Description: Dup 1

Temp at Receipt: 0.6C

Event and Year: March 2020

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
Radium 226	See Attached Report			7 Apr 20	OL
Radium 228	See Attached Report			2 Apr 20	OL

OL = Analysis performed by an Outside Laboratory.

Approved by: Claudette K. Carroll ^{CC} 14 Apr 2020

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

The reporting limit was elevated for any analyte requiring a dilution as coded below:
@ = Due to sample matrix # = Due to concentration of other analytes
! = Due to sample quantity + = Due to internal standard response

CERTIFICATION: ND # ND-00016



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Todd Peterson
Montana-Dakota Utilities Co.
400 N 4th St
Bismarck ND 58501

Report Date: 13 Apr 20
Lab Number: 20-W505
Work Order #: 82-0636
Account #: 002800
Date Sampled: 18 Mar 20
Date Received: 18 Mar 20 16:38
Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark
Sample Description: Field Blank (FB)
Event and Year: March 2020

PO #: 180534 OP
Temp at Receipt: 0.6C

Table with 6 columns: As Received Result, Method RL, Method Reference, Date Analyzed, Analyst. Rows include Radium 226 and Radium 228, both with 'See Attached Report' results and 'OL' analysts.

OL = Analysis performed by an Outside Laboratory.

Approved by: Claudette K. Carroll (signature) 14 Apr 2020 (handwritten)
Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit
The reporting limit was elevated for any analyte requiring a dilution as coded below:
@ = Due to sample matrix # = Due to concentration of other analytes
! = Due to sample quantity + = Due to internal standard response
CERTIFICATION: ND # ND-00016

MVTL guarantees the accuracy of the analysis done on the sample submitted for testing. It is not possible for MVTL to guarantee that a test result obtained on a particular sample will be the same on any other sample unless all conditions affecting the sample are the same, including sampling by MVTL. As a mutual protection to clients, the public and ourselves, all reports are submitted as the confidential property of clients, and authorization for publication of statements, conclusions or extracts from or regarding our reports is reserved pending our written approval.



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Todd Peterson
Montana-Dakota Utilities Co.
400 N 4th St
Bismarck ND 58501

Report Date: 13 Apr 20
Lab Number: 20-W506
Work Order #: 82-0636
Account #: 002800
Date Sampled: 18 Mar 20 9:31
Date Received: 18 Mar 20 16:38
Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark

PO #: 180534 OP

Sample Description: MW103

Temp at Receipt: 0.6C

Event and Year: March 2020

	As Received Result		Method RL	Method Reference	Date Analyzed		Analyst
pH - Field	7.45	units	NA	SM 4500 H+ B	18 Mar 20	9:31	DJN
Temperature - Field	6.08	Degrees C	NA	SM 2550B	18 Mar 20	9:31	DJN
Conductivity - Field	1416	umhos/cm	1	EPA 120.1	18 Mar 20	9:31	DJN
Radium 226	See Attached Report				7 Apr 20		OL
Radium 228	See Attached Report				2 Apr 20		OL

OL = Analysis performed by an Outside Laboratory.

Approved by: Claudette K. Carroll ^{KC} 14 Apr 2020

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

The reporting limit was elevated for any analyte requiring a dilution as coded below:
@ = Due to sample matrix # = Due to concentration of other analytes
! = Due to sample quantity + = Due to internal standard response

CERTIFICATION: ND # ND-00016



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Todd Peterson
Montana-Dakota Utilities Co.
400 N 4th St
Bismarck ND 58501

Report Date: 13 Apr 20
Lab Number: 20-W507
Work Order #: 82-0636
Account #: 002800
Date Sampled: 16 Mar 20 16:29
Date Received: 18 Mar 20 16:38
Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark

PO #: 180534 OP

Sample Description: MW110

Temp at Receipt: 0.6C

Event and Year: March 2020

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	7.39	units	NA	SM 4500 H+ B	16 Mar 20 16:29	DJN
Temperature - Field	3.60	Degrees C	NA	SM 2550B	16 Mar 20 16:29	DJN
Conductivity - Field	1360	umhos/cm	1	EPA 120.1	16 Mar 20 16:29	DJN
Radium 226	See Attached Report				7 Apr 20	OL
Radium 228	See Attached Report				2 Apr 20	OL

OL = Analysis performed by an Outside Laboratory.

Approved by:

Claudette K. Carroll ^{CC} 14 Apr 2020

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

The reporting limit was elevated for any analyte requiring a dilution as coded below:
@ = Due to sample matrix # = Due to concentration of other analytes
! = Due to sample quantity + = Due to internal standard response

CERTIFICATION: ND # ND-00015



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Todd Peterson
Montana-Dakota Utilities Co.
400 N 4th St
Bismarck ND 58501

Report Date: 13 Apr 20
Lab Number: 20-W508
Work Order #: 82-0636
Account #: 002800
Date Sampled: 16 Mar 20 18:57
Date Received: 18 Mar 20 16:38
Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark

Sample Description: MW119

PO #: 180534 OP

Event and Year: March 2020

Temp at Receipt: 0.6C

Table with 6 columns: As Received Result, Method RL, Method Reference, Date Analyzed, Analyst. Rows include pH - Field, Temperature - Field, Conductivity - Field, Radium 226, and Radium 228.

OL = Analysis performed by an Outside Laboratory.

Approved by: Claudette K. Carroll 14 Apr 2020

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

The reporting limit was elevated for any analyte requiring a dilution as coded below:
@ = Due to sample matrix # = Due to concentration of other analytes
! = Due to sample quantity + = Due to internal standard response

CERTIFICATION: ND # ND-00016



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Todd Peterson
Montana-Dakota Utilities Co.
400 N 4th St
Bismarck ND 58501

Report Date: 13 Apr 20
Lab Number: 20-W509
Work Order #: 82-0636
Account #: 002800
Date Sampled: 17 Mar 20 13:09
Date Received: 18 Mar 20 16:38
Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark

PO #: 180534 OP

Sample Description: MW111

Temp at Receipt: 0.6C

Event and Year: March 2020

	As Received Result	Units	Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	7.36	units	NA	SM 4500 H+ B	17 Mar 20 13:09	DJN
Temperature - Field	4.72	Degrees C	NA	SM 2550B	17 Mar 20 13:09	DJN
Conductivity - Field	4077	umhos/cm	1	EPA 120.1	17 Mar 20 13:09	DJN
Radium 226	See Attached Report				7 Apr 20	OL
Radium 228	See Attached Report				2 Apr 20	OL

OL = Analysis performed by an Outside Laboratory.

Approved by: Claudette K. Carroll ^{cc} 14 Apr 2020

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

The reporting limit was elevated for any analyte requiring a dilution as coded below:

- ⊗ = Due to sample matrix
- ! = Due to sample quantity
- # = Due to concentration of other analytes
- + = Due to internal standard response

CERTIFICATION: ND # ND-00016



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Todd Peterson
Montana-Dakota Utilities Co.
400 N 4th St
Bismarck ND 58501

Report Date: 13 Apr 20
Lab Number: 20-W510
Work Order #: 82-0636
Account #: 002800
Date Sampled: 17 Mar 20 10:30
Date Received: 18 Mar 20 16:38
Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark

PO #: 180534 OP

Sample Description: MW117

Temp at Receipt: 0.6C

Event and Year: March 2020

	As Received Result	units	Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	7.36	units	NA	SM 4500 H+ B	17 Mar 20 10:30	DJN
Temperature - Field	0.80	Degrees C	NA	SM 2550B	17 Mar 20 10:30	DJN
Conductivity - Field	8177	umhos/cm	1	EPA 120.1	17 Mar 20 10:30	DJN
Radium 226	See Attached Report				7 Apr 20	OL
Radium 228	See Attached Report				2 Apr 20	OL

OL = Analysis performed by an Outside Laboratory.

Approved by:

Claudette K. Carroll

14 Apr 2020

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

The reporting limit was elevated for any analyte requiring a dilution as coded below:

@ = Due to sample matrix # = Due to concentration of other analytes
! = Due to sample quantity + = Due to internal standard response

CERTIFICATION: ND # ND-00016



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Todd Peterson
Montana-Dakota Utilities Co.
400 N 4th St
Bismarck ND 58501

Report Date: 13 Apr 20
Lab Number: 20-W511
Work Order #: 82-0636
Account #: 002800
Date Sampled: 17 Mar 20 19:01
Date Received: 18 Mar 20 16:38
Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark

PO #: 180534 OP

Sample Description: MW118

Temp at Receipt: 0.6C

Event and Year: March 2020

	As Received Result	units	Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	7.51	units	NA	SM 4500 H+ B	17 Mar 20 19:01	DJN
Temperature - Field	4.22	Degrees C	NA	SM 2550B	17 Mar 20 19:01	DJN
Conductivity - Field	2138	umhos/cm	1	EPA 120.1	17 Mar 20 19:01	DJN
Radium 226	See Attached Report				7 Apr 20	OL
Radium 228	See Attached Report				2 Apr 20	OL

OL = Analysis performed by an Outside Laboratory.

Approved by:

Claudette K. Carroll *14 Apr 2020*

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

The reporting limit was elevated for any analyte requiring a dilution as coded below:

@ = Due to sample matrix # = Due to concentration of other analytes
! = Due to sample quantity + = Due to internal standard response

CERTIFICATION: ND # ND-00016



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Todd Peterson
Montana-Dakota Utilities Co.
400 N 4th St
Bismarck ND 58501

Report Date: 13 Apr 20
Lab Number: 20-W512
Work Order #: 82-0636
Account #: 002800
Date Sampled: 17 Mar 20 8:59
Date Received: 18 Mar 20 16:38
Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark

PO #: 180534 OP

Sample Description: MW120

Temp at Receipt: 0.6C

Event and Year: March 2020

	As Received Result	units	Method RL	Method Reference	Date Analyzed	Time	Analyst
pH - Field	6.92	units	NA	SM 4500 H+ B	17 Mar 20	8:59	DJN
Temperature - Field	1.23	Degrees C	NA	SM 2550B	17 Mar 20	8:59	DJN
Conductivity - Field	6556	umhos/cm	1	EPA 120.1	17 Mar 20	8:59	DJN
Radium 226	See Attached Report				8 Apr 20		OL
Radium 228	See Attached Report				3 Apr 20		OL

OL = Analysis performed by an Outside Laboratory.

Approved by:

Claudette K. Carroll

CC
14 Apr 2020

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

The reporting limit was elevated for any analyte requiring a dilution as coded below:

@ = Due to sample matrix # = Due to concentration of other analytes
! = Due to sample quantity + = Due to internal standard response

CERTIFICATION: ND # ND-00016



ANALYTICAL SUMMARY REPORT

April 13, 2020

Minnesota Valley Testing Laboratories
1126 N Front St
New Ulm, MN 56073-1176

Work Order: C20030769 Quote ID: C5783

Project Name: 202082-0636

Energy Laboratories, Inc. Casper WY received the following 9 samples for Minnesota Valley Testing Laboratories on 3/25/2020 for analysis.

Lab ID	Client Sample ID	Collect Date	Receive Date	Matrix	Test
C20030769-001	20-W504; Dup 1	03/18/20 0:00	03/25/20	Groundwater	pH Check for Nitric Radiochem FIRST Radium 226, Total Radium 228, Total
C20030769-002	20-W505; Field Blank (FB)	03/18/20 0:00	03/25/20	Groundwater	Same As Above
C20030769-003	20-W506; MW103	03/18/20 9:31	03/25/20	Groundwater	Same As Above
C20030769-004	20-W507; MW110	03/16/20 16:29	03/25/20	Groundwater	Same As Above
C20030769-005	20-W508; MW119	03/16/20 18:57	03/25/20	Groundwater	Same As Above
C20030769-006	20-W509; MW111	03/17/20 13:09	03/25/20	Groundwater	Same As Above
C20030769-007	20-W510; MW117	03/17/20 10:30	03/25/20	Groundwater	Same As Above
C20030769-008	20-W511; MW118	03/17/20 19:01	03/25/20	Groundwater	Same As Above
C20030769-009	20-W512; MW120	03/17/20 8:59	03/25/20	Groundwater	Same As Above

The analyses presented in this report were performed by Energy Laboratories, Inc., 2393 Salt Creek Hwy., Casper, WY 82601, unless otherwise noted. Any exceptions or problems with the analyses are noted in the Laboratory Analytical Report, the QA/QC Summary Report, or the Case Narrative. Any issues encountered during sample receipt are documented in the Work Order Receipt Checklist.

The results as reported relate only to the item(s) submitted for testing. This report shall be used or copied only in its entirety. Energy Laboratories, Inc. is not responsible for the consequences arising from the use of a partial report.

If you have any questions regarding these test results, please contact your Project Manager .

Report Approved By:

Kasey Vidick
Project Manager

Digitally signed by
Kasey Vidick
Date: 2020.04.13 12:47:45 -06:00



LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Minnesota Valley Testing Laboratories
Project: 202082-0636
Lab ID: C20030769-001
Client Sample ID: 20-W504; Dup 1

Report Date: 04/13/20
Collection Date: 03/18/20
Date Received: 03/25/20
Matrix: Groundwater

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
RADIONUCLIDES, TOTAL							
Radium 226	0.6	pCi/L				E903.0	04/07/20 13:30 / trs
Radium 226 precision (±)	0.2	pCi/L				E903.0	04/07/20 13:30 / trs
Radium 226 MDC	0.2	pCi/L				E903.0	04/07/20 13:30 / trs
Radium 228	0.4	pCi/L	U			RA-05	04/02/20 11:52 / plj
Radium 228 precision (±)	1.0	pCi/L				RA-05	04/02/20 11:52 / plj
Radium 228 MDC	1.7	pCi/L				RA-05	04/02/20 11:52 / plj

Report Definitions:

RL - Analyte Reporting Limit	MCL - Maximum Contaminant Level
QCL - Quality Control Limit	ND - Not detected at the Reporting Limit (RL)
U - Not detected at Minimum Detectable Concentration (MDC)	



LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Minnesota Valley Testing Laboratories
Project: 202082-0636
Lab ID: C20030769-002
Client Sample ID: 20-W505; Field Blank (FB)

Report Date: 04/13/20
Collection Date: 03/18/20
Date Received: 03/25/20
Matrix: Groundwater

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
RADIONUCLIDES, TOTAL							
Radium 226	0.2	pCi/L	U		E903.0		04/07/20 13:30 / trs
Radium 226 precision (±)	0.2	pCi/L			E903.0		04/07/20 13:30 / trs
Radium 226 MDC	0.2	pCi/L			E903.0		04/07/20 13:30 / trs
Radium 228	1.3	pCi/L	U		RA-05		04/02/20 11:52 / plj
Radium 228 precision (±)	1	pCi/L			RA-05		04/02/20 11:52 / plj
Radium 228 MDC	1.8	pCi/L			RA-05		04/02/20 11:52 / plj

Report Definitions:

RL - Analyte Reporting Limit	MCL - Maximum Contaminant Level
QCL - Quality Control Limit	ND - Not detected at the Reporting Limit (RL)
U - Not detected at Minimum Detectable Concentration (MDC)	



LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Minnesota Valley Testing Laboratories
Project: 202082-0636
Lab ID: C20030769-003
Client Sample ID: 20-W506; MW103

Report Date: 04/13/20
Collection Date: 03/18/20 09:31
Date Received: 03/25/20
Matrix: Groundwater

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
RADIONUCLIDES, TOTAL							
Radium 226	0.5	pCi/L				E903.0	04/07/20 15:50 / trs
Radium 226 precision (±)	0.2	pCi/L				E903.0	04/07/20 15:50 / trs
Radium 226 MDC	0.2	pCi/L				E903.0	04/07/20 15:50 / trs
Radium 228	0.5	pCi/L	U			RA-05	04/02/20 13:25 / plj
Radium 228 precision (±)	1.1	pCi/L				RA-05	04/02/20 13:25 / plj
Radium 228 MDC	1.9	pCi/L				RA-05	04/02/20 13:25 / plj

Report Definitions:
RL - Analyte Reporting Limit
QCL - Quality Control Limit
U - Not detected at Minimum Detectable Concentration (MDC)

MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)



LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Minnesota Valley Testing Laboratories
Project: 202082-0636
Lab ID: C20030769-004
Client Sample ID: 20-W507; MW110

Report Date: 04/13/20
Collection Date: 03/16/20 16:29
Date Received: 03/25/20
Matrix: Groundwater

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
RADIONUCLIDES, TOTAL							
Radium 226	0.08	pCi/L				E903.0	04/07/20 15:50 / trs
Radium 226 precision (±)	0.1	pCi/L				E903.0	04/07/20 15:50 / trs
Radium 226 MDC	0.2	pCi/L				E903.0	04/07/20 15:50 / trs
Radium 228	-0.4	pCi/L				RA-05	04/02/20 13:25 / plj
Radium 228 precision (±)	1.0	pCi/L				RA-05	04/02/20 13:25 / plj
Radium 228 MDC	1.7	pCi/L				RA-05	04/02/20 13:25 / plj

Report Definitions:
RL - Analyte Reporting Limit
QCL - Quality Control Limit
U - Not detected at Minimum Detectable Concentration (MDC)

MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)



LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Minnesota Valley Testing Laboratories
Project: 202082-0636
Lab ID: C20030769-005
Client Sample ID: 20-W508; MW119

Report Date: 04/13/20
Collection Date: 03/16/20 18:57
Date Received: 03/25/20
Matrix: Groundwater

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
RADIONUCLIDES, TOTAL							
Radium 226	0.2	pCi/L				E903.0	04/07/20 15:50 / trs
Radium 226 precision (±)	0.1	pCi/L				E903.0	04/07/20 15:50 / trs
Radium 226 MDC	0.2	pCi/L				E903.0	04/07/20 15:50 / trs
Radium 228	-0.4	pCi/L	U			RA-05	04/02/20 13:25 / plj
Radium 228 precision (±)	1.1	pCi/L				RA-05	04/02/20 13:25 / plj
Radium 228 MDC	1.9	pCi/L				RA-05	04/02/20 13:25 / plj

Report Definitions:

RL - Analyte Reporting Limit	MCL - Maximum Contaminant Level
QCL - Quality Control Limit	ND - Not detected at the Reporting Limit (RL)
U - Not detected at Minimum Detectable Concentration (MDC)	



LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Minnesota Valley Testing Laboratories
Project: 202082-0636
Lab ID: C20030769-006
Client Sample ID: 20-W509; MW111

Report Date: 04/13/20
Collection Date: 03/17/20 13:09
Date Received: 03/25/20
Matrix: Groundwater

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
RADIONUCLIDES, TOTAL							
Radium 226	0.2	pCi/L				E903.0	04/07/20 15:50 / trs
Radium 226 precision (±)	0.1	pCi/L				E903.0	04/07/20 15:50 / trs
Radium 226 MDC	0.2	pCi/L				E903.0	04/07/20 15:50 / trs
Radium 228	-0.3	pCi/L	U			RA-05	04/02/20 13:25 / plj
Radium 228 precision (±)	1.0	pCi/L				RA-05	04/02/20 13:25 / plj
Radium 228 MDC	1.7	pCi/L				RA-05	04/02/20 13:25 / plj

Report Definitions:
RL - Analyte Reporting Limit
QCL - Quality Control Limit
U - Not detected at Minimum Detectable Concentration (MDC)

MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)



LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Minnesota Valley Testing Laboratories
Project: 202082-0636
Lab ID: C20030769-007
Client Sample ID: 20-W510; MW117

Report Date: 04/13/20
Collection Date: 03/17/20 10:30
Date Received: 03/25/20
Matrix: Groundwater

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
RADIONUCLIDES, TOTAL							
Radium 226	0.6	pCi/L				E903.0	04/07/20 15:50 / trs
Radium 226 precision (±)	0.2	pCi/L				E903.0	04/07/20 15:50 / trs
Radium 226 MDC	0.2	pCi/L				E903.0	04/07/20 15:50 / trs
Radium 228	-0.2	pCi/L	U			RA-05	04/02/20 13:25 / plj
Radium 228 precision (±)	1.1	pCi/L				RA-05	04/02/20 13:25 / plj
Radium 228 MDC	1.8	pCi/L				RA-05	04/02/20 13:25 / plj

Report Definitions:

RL - Analyte Reporting Limit	MCL - Maximum Contaminant Level
QCL - Quality Control Limit	ND - Not detected at the Reporting Limit (RL)
U - Not detected at Minimum Detectable Concentration (MDC)	



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LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Minnesota Valley Testing Laboratories
Project: 202082-0636
Lab ID: C20030769-008
Client Sample ID: 20-W511; MW118

Report Date: 04/13/20
Collection Date: 03/17/20 19:01
Date Received: 03/25/20
Matrix: Groundwater

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
RADIONUCLIDES, TOTAL							
Radium 226	0.05	pCi/L		U		E903.0	04/07/20 15:50 / trs
Radium 226 precision (±)	0.1	pCi/L				E903.0	04/07/20 15:50 / trs
Radium 226 MDC	0.2	pCi/L				E903.0	04/07/20 15:50 / trs
Radium 228	0.08	pCi/L		U		RA-05	04/02/20 13:25 / plj
Radium 228 precision (±)	1.1	pCi/L				RA-05	04/02/20 13:25 / plj
Radium 228 MDC	1.8	pCi/L				RA-05	04/02/20 13:25 / plj

Report Definitions:
 RL - Analyte Reporting Limit
 QCL - Quality Control Limit
 U - Not detected at Minimum Detectable Concentration (MDC)
 MCL - Maximum Contaminant Level
 ND - Not detected at the Reporting Limit (RL)



LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Minnesota Valley Testing Laboratories
Project: 202082-0636
Lab ID: C20030769-009
Client Sample ID: 20-W512; MW120

Report Date: 04/13/20
Collection Date: 03/17/20 08:59
Date Received: 03/25/20
Matrix: Groundwater

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
RADIONUCLIDES, TOTAL							
Radium 226	0.2	pCi/L				E903.0	04/08/20 15:13 / plj
Radium 226 precision (±)	0.1	pCi/L				E903.0	04/08/20 15:13 / plj
Radium 226 MDC	0.2	pCi/L				E903.0	04/08/20 15:13 / plj
Radium 228	2.0	pCi/L				RA-05	04/03/20 13:24 / plj
Radium 228 precision (±)	0.7	pCi/L				RA-05	04/03/20 13:24 / plj
Radium 228 MDC	0.9	pCi/L				RA-05	04/03/20 13:24 / plj

Report Definitions: RL - Analyte Reporting Limit
QCL - Quality Control Limit

MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)



QA/QC Summary Report

Prepared by Casper, WY Branch

Client: Minnesota Valley Testing Laboratories

Work Order: C20030769

Report Date: 04/10/20

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E903.0 Batch: RA226-9599										
Lab ID: LCS-RA226-9599	3	Laboratory Control Sample					Run: G542M_200330B			04/07/20 13:29
Radium 226		11	pCi/L	106		80	120			
Radium 226 precision (±)		2.1	pCi/L							
Radium 226 MDC		0.20	pCi/L							
Lab ID: MB-RA226-9599	3	Method Blank					Run: G542M_200330B			04/07/20 13:29
Radium 226		0.2	pCi/L							U
Radium 226 precision (±)		0.1	pCi/L							
Radium 226 MDC		0.2	pCi/L							
Lab ID: C20030754-001HDUP	3	Sample Duplicate					Run: G542M_200330B			04/07/20 13:30
Radium 226		19	pCi/L					11	20	
Radium 226 precision (±)		3.7	pCi/L							
Radium 226 MDC		0.20	pCi/L							

Method: E903.0 Batch: RA226-9602										
Lab ID: LCS-RA226-9602	3	Laboratory Control Sample					Run: G542M_200331A			04/08/20 15:13
Radium 226		11	pCi/L	105		80	120			
Radium 226 precision (±)		2.1	pCi/L							
Radium 226 MDC		0.20	pCi/L							
Lab ID: MB-RA226-9602	3	Method Blank					Run: G542M_200331A			04/08/20 15:13
Radium 226		0.1	pCi/L							U
Radium 226 precision (±)		0.1	pCi/L							
Radium 226 MDC		0.2	pCi/L							
Lab ID: C20030769-009ADUP	3	Sample Duplicate					Run: G542M_200331A			04/08/20 15:13
Radium 226		0.093	pCi/L					91	20	UR
Radium 226 precision (±)		0.12	pCi/L							
Radium 226 MDC		0.18	pCi/L							

- Duplicate RPD is outside of the acceptance range for this analysis. However, the RER is less than the limit of 2.0. RER is 0.85.

Qualifiers:

RL - Analyte Reporting Limit

R - Relative Percent Difference (RPD) exceeds advisory limit

ND - Not detected at the Reporting Limit (RL)

U - Not detected at Minimum Detectable Concentration (MDC)



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QA/QC Summary Report

Prepared by Casper, WY Branch

Client: Minnesota Valley Testing Laboratories

Work Order: C20030769

Report Date: 04/10/20

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: RA-05										
Batch: RA228-6225										
Lab ID: LCS-228-RA226-9599	3	Laboratory Control Sample								
										Run: TENNELEC-3_200330A 04/02/20 11:52
Radium 228		7.9	pCi/L	85		80	120			
Radium 228 precision (±)		1.8	pCi/L							
Radium 228 MDC		1.7	pCi/L							
Lab ID: MB-RA226-9599	3	Method Blank								
										Run: TENNELEC-3_200330A 04/02/20 11:52
Radium 228		0.4	pCi/L							U
Radium 228 precision (±)		1	pCi/L							
Radium 228 MDC		2	pCi/L							
Lab ID: C20030754-001HDUP	3	Sample Duplicate								
										Run: TENNELEC-3_200330A 04/02/20 11:52
Radium 228		0.21	pCi/L					470	20	UR
Radium 228 precision (±)		0.98	pCi/L							
Radium 228 MDC		1.6	pCi/L							
- Duplicate RPD is outside of the acceptance range for this analysis. However, the RER is less than the limit of 2.0. RER is 0.23.										

Method: RA-05										
Batch: RA228-6227										
Lab ID: LCS-228-RA226-9602	3	Laboratory Control Sample								
										Run: TENNELEC-3_200331A 04/03/20 13:24
Radium 228		7.9	pCi/L	85		80	120			
Radium 228 precision (±)		1.6	pCi/L							
Radium 228 MDC		1.0	pCi/L							
Lab ID: MB-RA226-9602	3	Method Blank								
										Run: TENNELEC-3_200331A 04/03/20 13:24
Radium 228		0.5	pCi/L							U
Radium 228 precision (±)		0.6	pCi/L							
Radium 228 MDC		1	pCi/L							
Lab ID: C20030769-009ADUP	3	Sample Duplicate								
										Run: TENNELEC-3_200331A 04/03/20 13:24
Radium 228		1.8	pCi/L					10	20	
Radium 228 precision (±)		0.79	pCi/L							
Radium 228 MDC		0.91	pCi/L							

Qualifiers:

RL - Analyte Reporting Limit

R - Relative Percent Difference (RPD) exceeds advisory limit

ND - Not detected at the Reporting Limit (RL)

U - Not detected at Minimum Detectable Concentration (MDC)



Work Order Receipt Checklist

Minnesota Valley Testing Laboratories

C20030769

Login completed by: Dorian Quis

Date Received: 3/25/2020

Reviewed by: Misty Stephens

Received by: adw

Reviewed Date: 3/26/2020

Carrier name: Ground

- Shipping container/cooler in good condition? Yes No Not Present
- Custody seals intact on all shipping container(s)/cooler(s)? Yes No Not Present
- Custody seals intact on all sample bottles? Yes No Not Present
- Chain of custody present? Yes No
- Chain of custody signed when relinquished and received? Yes No
- Chain of custody agrees with sample labels? Yes No
- Samples in proper container/bottle? Yes No
- Sample containers intact? Yes No
- Sufficient sample volume for indicated test? Yes No
- All samples received within holding time?
(Exclude analyses that are considered field parameters such as pH, DO, Res Cl, Sulfite, Ferrous Iron, etc.) Yes No
- Temp Blank received in all shipping container(s)/cooler(s)? Yes No Not Applicable
- Container/Temp Blank temperature: 14.0°C No Ice
- Water - VOA vials have zero headspace? Yes No No VOA vials submitted
- Water - pH acceptable upon receipt? Yes No Not Applicable

Standard Reporting Procedures:

Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH, Dissolved Oxygen and Residual Chlorine, are qualified as being analyzed outside of recommended holding time.

Solid/soil samples are reported on a wet weight basis (as received) unless specifically indicated. If moisture corrected, data units are typically noted as –dry. For agricultural and mining soil parameters/characteristics, all samples are dried and ground prior to sample analysis.

Radiochemical precision results represent a 2-sigma Total Measurement Uncertainty.

Contact and Corrective Action Comments:

None



LABORATORIES, Inc.
 2616 E Broadway Ave
 Bismarck, ND 58501

Chain of Custody Record

Phone: (701) 258-9720
 Toll Free: (800) 279-6885 Fax: (701) 258-9724

202082-0636

Company Name and Address: MVTl 2616 E Broadway Bismarck, ND 58501	Account #:	Phone #: 701-258-9720
	Contact: Claudette	Fax #: For faxed report check box <input type="checkbox"/>
Billing Address (indicate if different from above): PO Box 249 New Ulm, MN 56073	Name of Sampler:	E-mail: ccarroll@mvtl.com For e-mail report check box <input type="checkbox"/>
	Quote Number	Date Submitted: 20-Mar-20
	Project Name/Number:	Purchase Order #: BL6219

Sample Information						Bottle Type					Analysis
IML Lab Number	MVTl Lab Number	Client Sample ID	Sample Type	Date Sampled	Time Sampled	Untreated	1000 ml HNO3	VOC Vials Impreserved	Glass Jar	Other	Analysis Required
	20-W504	Dup 1	GW	18-Mar-20	NA		4				Ra226 & Ra228
	20-W505	Field Blank (FB)	GW	18-Mar-20	NA		4				Ra226 & Ra228
	20-W506	MW103	GW	18-Mar-20	931		4				Ra226 & Ra228
	20-W507	MW110	GW	16-Mar-20	1629		4				Ra226 & Ra228
	20-W508	MW119	GW	16-Mar-20	1857		4				Ra226 & Ra228
	20-W509	MW111	GW	17-Mar-20	1309		4				Ra226 & Ra228
	20-W510	MW117	GW	17-Mar-20	1030		4				Ra226 & Ra228
	20-W511	MW118	GW	17-Mar-20	1901		4				Ra226 & Ra228
	20-W512	MW120	GW	17-Mar-20	859		4				Ra226 & Ra228

All results must be reported as a numerical value

C 20030769

Transferred by:	Date:	Time:	Sample Condition:	Received by:	Date:	Temp:
T. Olson	20-Mar-20	1700		<i>[Signature]</i>		
2.				<i>[Signature]</i>	3-25-20 10:18	



Field Datasheet

Groundwater Assessment

Company: MDU Lewis & Clark

Event: March 2020

Sample ID: 103

Sampling Personal: Darren Nieswazy

2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

Weather Conditions: Temp: 20 °F Wind: North @ 14 Precip: Sunny / Partly Cloudy / Cloudy

WELL INFORMATION

Well Locked?	YES	NO
Well Labeled?	YES	NO
Casing Strait?	YES	NO
Grout Seal Intact?	YES	NO
Repairs Necessary?		Not Visible
Casing Diameter:	2"	
Water Level Before Purge:	10.78	ft
Total Depth of Well:	21.0	ft
Well Volume:	22.8	liters
Depth to Top of Pump:	18.3	ft
Water Level After Sample:	10.77	ft
Measurement Method:	Electric Water Level Indicator	

SAMPLING INFORMATION

Purging Method:	Bladder
Sampling Method:	Bladder
Dedicated Equipment?	YES - Tubing NO
Duplicate Sample?	YES NO
Duplicate Sample ID:	Dup-1

Control Settings:	
Purge: 3	Sec.
Recover: 57	Sec.
PSI:	

Bottle List:	
1 Liter Raw	4- 1L Nitric
500mL Nitric	
500mL Nitric (filtered)	
250mL Sulfuric	

FIELD READINGS

Stabilization Parameters (3 Consecutive)		Temp. (°C)	Spec. Cond.	pH	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Water Level (ft)	Pumping Rate mL/Min	Liters Removed	Appearance or Comment Clarity, Color, Odor, Ect.
Purge Date	Time	±0.5°	±5%	±0.1	±10%	±10					clear, slightly turbid, turbid
18 March 2020											
	0806	Start of Well Purge									
	0811	5.80	266.7	7.40	4.11	248.6	76.7	10.77	100	500	clear
	0841	5.53	150.8	7.46	5.34	240.2	10.0	10.77	100	3000	clear
	0911	5.78	147.2	7.45	2.84	240.1	4.56	10.77	100	3000	clear
	0916	6.61	143.2	7.45	2.80	239.4	4.47	10.77	100	500	clear
	0921	6.22	144.3	7.45	2.88	239.8	4.08	10.77	100	500	clear
	0926	6.47	142.5	7.45	2.90	239.9	3.98	10.77	100	500	clear
	0931	6.08	141.6	7.45	2.96	239.2	3.81	10.77	100	500	clear

Well Stabilized? YES NO

Total Volume Purged: 8500 Liters

Sample Date	Time	Temp. (°C)	Spec. Cond.	pH		Turbidity (NTU)		Appearance or Comment Clarity, Color, Odor, Ect.
18 March 2020	0931	6.08	141.6	7.45		3.81		clear

Comments:



Field Datasheet

Groundwater Assessment

Company: MDU Lewis & Clark

Event: March 2020

Sample ID: 110

Sampling Personal: Darren Nicway

2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

Weather Conditions: Temp: 24 °F Wind: West @ 15 Precip: Sunny / Partly Cloudy / Cloudy

WELL INFORMATION

Well Locked?	YES	<u>NO</u>
Well Labeled?	YES	<u>NO</u>
Casing Strait?	YES	<u>NO</u>
Grout Seal Intact?	YES	<u>NO</u>
Repairs Necessary?		Not Visible
Casing Diameter:	2"	
Water Level Before Purge:	9.26	ft
Total Depth of Well:	16.83	ft
Well Volume:	4.7	liters
Depth to Top of Pump:		ft
Water Level After Sample:	9.35	ft
Measurement Method:	Electric Water Level Indicator	

SAMPLING INFORMATION

Purging Method:	Bladder	
Sampling Method:	Bladder	
Dedicated Equipment?	<u>YES</u>	NO Tubbing
Duplicate Sample?	<u>YES</u>	NO
Duplicate Sample ID:	---	

Control Settings:	
Purge:	2 Sec.
Recover:	8 Sec.
PSI:	

small bladder pump

Bottle List:	
1 Liter Raw	4- 1L Nitric
500mL Nitric	
500mL Nitric (filtered)	
250mL Sulfuric	

FIELD READINGS

Stabilization Parameters (3 Consecutive)		Temp. (°C)	Spec. Cond.	pH	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Water Level (ft)	Pumping Rate (mL/Min)	Liters Removed	Appearance or Comment
Purge Date	Time	±0.5°	±5%	±0.1	±10%	±10		(ft)			Clarity, Color, Odor, Ect.
Start of Well Purge											
16 March 2020	1259	3.39	1399	7.41	5.69	265.5	80.4	9.34	70	350	clear
	1329	3.45	1370	7.40	5.51	272.9	48.9	9.35	70	2100	clear
	1359	3.48	1365	7.40	7.56	280.0	26.4	9.35	70	2100	clear
	1429	3.67	1364	7.39	7.52	277.6	19.8	9.35	70	2100	clear
	1459	3.67	1362	7.39	7.58	282.2	11.2	9.35	70	2100	clear
	1559	3.71	1363	7.38	7.82	295.5	9.57	9.35	70	4200	clear
	1619	3.62	1361	7.39	7.97	298.6	7.14	9.35	70	1050	clear
	1624	3.59	1361	7.39	7.95	298.7	7.00	9.35	70	350	clear
	1629	3.60	1360	7.39	7.98	298.9	6.98	9.35	70	350	clear

Well Stabilized? YES NO

Total Volume Purged: 14,700 mL Liters

Sample Date	Time	Temp. (°C)	Spec. Cond.	pH	Turbidity (NTU)	Appearance or Comment
Clarity, Color, Odor, Ect.						
16 March 2020	1629	3.60	1360	7.39	6.98	clear

Comments: Took out 3 volumes the (NTU) never went below 5 under the 3 volumes so started sampling



Field Datasheet

Groundwater Assessment

2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

Company: MDU Lewis & Clark

Event: March 2020

Sample ID: 119

Sampling Personal: Darren Nilsen

Weather Conditions: Temp: 22 °F Wind: West @ 12 Precip: Sunny / Partly Cloudy / Cloudy

WELL INFORMATION

Well Locked?	YES	NO	
Well Labeled?	YES	NO	
Casing Strait?	YES	NO	
Grout Seal Intact?	YES	NO	Not Visible
Repairs Necessary?			
Casing Diameter:	2"		
Water Level Before Purge:	9.12	ft	
Total Depth of Well:	16.62	ft	
Well Volume:	4.62	liters	
Depth to Top of Pump:	11.28	ft	
Water Level After Sample:	9.20	ft	
Measurement Method:	Electric Water Level Indicator		

SAMPLING INFORMATION

Purging Method:	Bladder	Control Settings:	
Sampling Method:	Bladder	Purge:	3 Sec.
Dedicated Equipment?	YES NO Tubbing	Recover:	257 Sec.
Duplicate Sample?	YES NO	PSI:	30
Duplicate Sample ID:			
Bottle List:			
1 Liter Raw	4- 1L Nitric		
500mL Nitric			
500mL Nitric (filtered)			
250mL Sulfuric			

FIELD READINGS

Stabilization Parameters (3 Consecutive)		Temp. (°C)	Spec. Cond.	pH	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Water Level (ft)	Pumping Rate (mL/Min)	Liters Removed	Appearance or Comment
Purge Date	Time	±0.5°	±5%	±0.1	±10%	±10					Clarity, Color, Odor, Ect.
16 March 2020		Start of Well Purge									
	1812										
	1817	5.21	1314	7.36	7.04	233.8	17.8	9.18	100	500	clear
	1837	4.03	1303	7.40	2.56	246.3	7.47	9.20	100	2000	clear
	1847	3.80	1308	7.40	2.44	252.4	3.78	9.20	100	1000	clear
	1852	3.90	1308	7.40	2.42	254.3	3.41	9.20	100	500	clear
	1857	3.96	1311	7.40	2.38	256.8	3.14	9.20	100	500	clear

Well Stabilized? YES NO Total Volume Purged: 4500 Liters

Sample Date	Time	Temp. (°C)	Spec. Cond.	pH	Turbidity (NTU)	Appearance or Comment
Clarity, Color, Odor, Ect.						
16 March 2020	1857	3.96	1311	7.40	3.14	clear

Comments:



Field Datasheet

Groundwater Assessment

Company: MDU Lewis & Clark

Event: March 2020

Sample ID: 111

Sampling Personal: Darren Nieswaag

2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

Weather Conditions: Temp: 30 °F Wind: North @ 7 Precip: Sunny / Partly Cloudy / Cloudy

WELL INFORMATION

Well Locked?	YES	NO
Well Labeled?	YES	NO
Casing Strait?	YES	NO
Grout Seal Intact?	YES	NO
Repairs Necessary?		Not Visible
Casing Diameter:	2"	
Water Level Before Purge:	7.00	ft
Total Depth of Well:	17.80	ft
Well Volume:	6.7	liters
Depth to Top of Pump:	-	ft
Water Level After Sample:	7.78	ft
Measurement Method:	Electric Water Level Indicator	

SAMPLING INFORMATION

Purging Method:	Bladder
Sampling Method:	Bladder
Dedicated Equipment?	YES NO

Control Settings:	
Purge:	53 Sec.
Recover:	57 Sec.
PSI:	-

Duplicate Sample?	YES NO
Duplicate Sample ID:	

Bottle List:	
1 Liter Raw	4- 1L Nitric
500mL Nitric	
500mL Nitric (filtered)	
250mL Sulfuric	

FIELD READINGS

Stabilization Parameters (3 Consecutive)		Temp. (°C)	Spec. Cond.	pH	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Water Level (ft)	Pumping Rate mL/Min	Liters Removed	Appearance or Comment Clarity, Color, Odor, Ect.
Purge Date	Time	±0.5°	±5%	±0.1	±10%	±10					clear, slightly turbid, turbid
Start of Well Purge											
17 March 2020	1154										
	1159	5.05	4317	7.20	4.24	246.0	27.5	7.74	100	500	clear
	1229	3.58	4336	7.33	3.56	257.0	28.0	7.74	100	3000	clear
	1259	4.60	4092	7.34	3.23	251.9	4.44	7.78	100	3000	clear
	1304	4.67	4096	7.35	3.19	254.5	4.24	7.78	100	500	clear
	1309	4.72	4077	7.36	3.00	257.2	4.07	7.78	100	500	clear

Well Stabilized? YES NO

Total Volume Purged: 7500 Liters

Sample Date	Time	Temp. (°C)	Spec. Cond.	pH	Turbidity (NTU)	Appearance or Comment Clarity, Color, Odor, Ect.
17 March 2020	1309	4.72	4077	7.36	4.07	clear

Comments:



Field Datasheet

Groundwater Assessment

2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

Company: MDU Lewis & Clark

Event: March 2020

Sample ID: 117

Sampling Personal: *Darren Nieswaag*

Weather Conditions: Temp: 16 °F Wind: Light @ Precip: Sunny / Partly Cloudy / Cloudy

WELL INFORMATION

Well Locked?	YES	NO
Well Labeled?	YES	NO
Casing Strait?	YES	NO
Grout Seal Intact?	YES	NO
Repairs Necessary?		Not Visible
Casing Diameter:	2"	
Water Level Before Purge:	6.67	ft
Total Depth of Well:	11.51	ft
Well Volume:	3.0	liters
Depth to Top of Pump:	9.84	ft
Water Level After Sample:	9.64	ft
Measurement Method:	Electric Water Level Indicator	

SAMPLING INFORMATION

Purging Method:	Bladder
Sampling Method:	Bladder
Dedicated Equipment?	YES NO <i>Tubing</i>
Duplicate Sample?	YES NO
Duplicate Sample ID:	

Control Settings:	
Purge:	5 Sec.
Recover:	55 Sec.
PSI:	10

Bottle List:	
1 Liter Raw	4- 1L Nitric
500mL Nitric	
500mL Nitric (filtered)	
250mL Sulfuric	

FIELD READINGS

Stabilization Parameters (3 Consecutive)		Temp. (°C)	Spec. Cond.	pH	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Water Level (ft)	Pumping Rate mL/Min	Liters Removed	Appearance or Comment Clarity, Color, Odor, Ect.
Purge Date	Time	±0.5°	±5%	±0.1	±10%	±10					clear, slightly turbid, turbid
16 March 2020	1133	Start of Well Purge									
	1135	3.40	7746	7.16	7.73	246.7	45.8	7.48	150	750	clear
	1205	2.91	7741	7.19	8.48	257.7	31.3	9.19	150	4500	clear
	1223	2.18	7633	7.20	9.37	264.8	47.8	9.84	150	2250	clear
	1233	2.18	7752	7.20	13.22	269.1	15.6	below pump	150	1500	clear
17 March 2020	1025	Purged well 5 min. before sampling									
								5.52			

Well Stabilized? YES NO Total Volume Purged: 9,000 Liters

Sample Date	Time	Temp. (°C)	Spec. Cond.	pH	DO	ORP	Turbidity (NTU)	Appearance or Comment Clarity, Color, Odor, Ect.
17 March 2020	1030	0.80	8177	7.36	8.93	251.8	108	Slightly turbid

Comments:



Field Datasheet

Groundwater Assessment

Company: MDU Lewis & Clark
 Event: March 2020
 Sample ID: 118
 Sampling Personal: Darren Nieswag

2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

Weather Conditions: Temp: 39 °F Wind: NW @ 4 Precip: Sunny / Partly Cloudy / cloudy

WELL INFORMATION

Well Locked?	YES	NO
Well Labeled?	YES	NO
Casing Strait?	YES	NO
Grout Seal Intact?	YES	NO
Repairs Necessary?	Not Visible	
Casing Diameter:	2"	
Water Level Before Purge:	8.47	ft
Total Depth of Well:	11.09	ft
Well Volume:	127	liters
Depth to Top of Pump:	9.52	ft
Water Level After Sample:	8.50	ft
Measurement Method:	Electric Water Level Indicator	

SAMPLING INFORMATION

Purging Method:	Bladder
Sampling Method:	Bladder
Dedicated Equipment?	YES NO
Duplicate Sample?	YES NO
Duplicate Sample ID:	—

Control Settings:	
Purge:	3 Sec.
Recover:	57 Sec.
PSI:	

Bottle List:	
1 Liter Raw	4- 1L Nitric
500mL Nitric	
500mL Nitric (filtered)	
250mL Sulfuric	

FIELD READINGS

Stabilization Parameters (3 Consecutive)		Temp. (°C)	Spec. Cond.	pH	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Water Level (ft)	Pumping Rate mL/Min	Liters Removed	Appearance or Comment Clarity, Color, Odor, Ect.
Purge Date	Time	±0.5°	±5%	±0.1	±10%	±10					clear, slightly turbid, turbid
17 March 2020	17:56	Start of Well Purge									
	18:01	5.41	2168	7.47	6.36	261.6	252	8.46	100	500	slightly turbid
	18:31	4.29	2142	7.50	10.53	269.3	657	8.49	100	3000	clear
	18:46	4.28	2140	7.51	9.14	277.5	2.81	8.50	100	500	clear
	18:51	4.30	2140	7.51	9.21	274.3	1.91	8.50	100	500	clear
	18:56	4.18	2139	7.51	9.03	276.3	1.84	8.52	100	500	clear
	19:01	4.22	2138	7.51	9.21	276.6	1.80	8.50	100	500	clear

Well Stabilized? YES NO Total Volume Purged: 5500 Liters

Sample Date	Time	Temp. (°C)	Spec. Cond.	pH	Turbidity (NTU)	Appearance or Comment Clarity, Color, Odor, Ect.
17 March 2020	19:01	4.22	2138	7.51	1.80	clear

Comments:



Field Datasheet

Groundwater Assessment

2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

Company: MDU Lewis & Clark

Event: March 2020

Sample ID: 120

Sampling Personal: Darren Nieswaag

Weather Conditions: Temp: 6 °F Wind: South @ 8 Precip: Sunny / Partly Cloudy / Cloudy

WELL INFORMATION

Well Locked?	YES	NO
Well Labeled?	YES	NO
Casing Strait?	YES	NO
Grout Seal Intact?	YES	NO
Repairs Necessary?		<u>Not Visible</u>
Casing Diameter:	<u>2"</u>	
Water Level Before Purge:	<u>15.13</u>	ft
Total Depth of Well:	<u>18.88</u>	ft
Well Volume:	<u>2.4</u>	liters
Depth to Top of Pump:	<u>15.56</u>	ft
Water Level After Sample:	<u>15.60</u>	ft
Measurement Method:	Electric Water Level Indicator	

SAMPLING INFORMATION

Purging Method:	Bladder	
Sampling Method:	Bladder	
Dedicated Equipment?	YES	NO
Duplicate Sample?	YES	NO
Duplicate Sample ID:	<u> </u>	

Control Settings:	
Purge:	<u>53</u> Sec.
Recover:	<u>57</u> Sec.
PSI:	

Bottle List:	
1 Liter Raw	4- 1L Nitric
500mL Nitric	
500mL Nitric (filtered)	
250mL Sulfuric	

FIELD READINGS

Stabilization Parameters (3 Consecutive)		Temp. (°C)	Spec. Cond.	pH	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Water Level (ft)	Pumping Rate mL/Min	Liters Removed	Appearance or Comment Clarity, Color, Odor, Ect.
Purge Date	Time	±0.5°	±5%	±0.1	±10%	±10					clear, slightly turbid, turbid
<u>17 March 2020</u>	<u>0824</u>	Start of Well Purge									
	<u>0829</u>	<u>2.24</u>	<u>6466</u>	<u>6.90</u>	<u>3.21</u>	<u>219.8</u>	<u>3.85</u>	<u>15.42</u>	<u>100</u>	<u>500</u>	<u>clear</u>
	<u>0849</u>	<u>1.18</u>	<u>6468</u>	<u>6.93</u>	<u>2.25</u>	<u>221.8</u>	<u>1.19</u>	<u>15.41</u>	<u>100</u>	<u>2000</u>	<u>clear</u>
	<u>0854</u>	<u>1.09</u>	<u>6518</u>	<u>6.93</u>	<u>2.18</u>	<u>223.6</u>	<u>1.02</u>	<u>15.41</u>	<u>100</u>	<u>500</u>	<u>clear</u>
	<u>0859</u>	<u>1.23</u>	<u>6556</u>	<u>6.92</u>	<u>2.20</u>	<u>223.8</u>	<u>1.06</u>	<u>15.41</u>	<u>100</u>	<u>500</u>	<u>clear</u>

Well Stabilized? YES NO Total Volume Purged: 3500 Liters

Sample Date	Time	Temp. (°C)	Spec. Cond.	pH	Turbidity (NTU)	Appearance or Comment Clarity, Color, Odor, Ect.
<u>17 March 2020</u>	<u>0859</u>	<u>1.23</u>	<u>6556</u>	<u>6.92</u>	<u>1.06</u>	<u>clear</u>

Comments:

MVTL Calibration Worksheet

Site: MDU Lewis and Clark

Technician: Darren Nieswaag

Instrument
(Circle One):

#1 650 MDS 08F100203

#2 650 MDS 04H14736

#3 556 MPS 12E102056

Pre Site Calibration

Date: 18 March 2020 Time: 0655

pH	Temp °C	Pre Cal	Post Cal	Post Cal Range	mv	mv Range +/- 50
Buffer 7	<u>18.79</u>	<u>7.09</u>	<u>7.00</u>	6.95-7.05	<u>-20.4</u>	0 +/- 50
Buffer 10	<u>18.93</u>	<u>9.99</u>	<u>10.00</u>	9.95-10.05	<u>-197.9</u>	-180 +/- 50
Buffer 4	<u>18.58</u>	<u>3.94</u>	<u>3.99</u>	4.95-5.05	<u>158.9</u>	180 +/- 50

Conductivity

Buffer 1413	Check	Buffer 5000
<u>19.03</u>	<u>1441</u>	<u>1413</u>
	±10%	Buffer 5000 <u>5015</u>

ORP

231 mV @ 25C	Check
<u>8.53</u>	<u>216.3</u>
	±10 mV <u>check 5.96</u>

DO

Barometric Pressure (mm Hg)	mg/L
<u>21.63</u>	<u>8.73</u>
<u>8.20</u>	<u>710.0</u>

Date: _____ Time: _____

pH	Temp °C	Pre Cal	Post Cal	Post Cal Range	mv	mv Range +/- 50
Buffer 7				6.95-7.05		0 +/- 50
Buffer 10				9.95-10.05		-180 +/- 50
Buffer 4				4.95-5.05		180 +/- 50

Conductivity

Buffer 1413	Check	Buffer 5000
	±10%	Buffer 5000

ORP

231 mV @ 25C	Check
	±10 mV

DO

Barometric Pressure (mm Hg)	mg/L

Post Site Check

Time: 0936

pH	Temp °C	Reading
Buffer 7	<u>12.75</u>	<u>7.02</u>

Conductivity

Buffer 5000	Reading
<u>13.98</u>	<u>5018</u>

Time: _____

pH	Temp °C	Reading
Buffer 7		

Conductivity

Buffer 5000	Reading

MVTL Calibration Worksheet

Site: MDU Lewis and Clark

Technician: Darren Nieswaag

Instrument
(Circle One):

#1 650 MDS 08F100203

#2 650 MDS 04H14736

#3 556 MPS 12E102056

Pre Site Calibration

Date: 16 March 2020 Time: 0650

pH	Temp °C	Pre Cal	Post Cal	Post Cal Range	mv	mv Range +/- 50
Buffer 7	<u>19.01</u>	<u>6.99</u>	<u>7.00</u>	6.95-7.05	<u>-19.4</u>	0 +/- 50
Buffer 10	<u>19.18</u>	<u>10.00</u>	<u>10.00</u>	9.95-10.05	<u>-197.4</u>	-180 +/- 50
Buffer 4	<u>19.22</u>	<u>3.99</u>	<u>4.00</u>	4.95-5.05	<u>159.1</u>	180 +/- 50

Conductivity

Buffer	Pre Cal	Post Cal	Check
Buffer 1413	<u>19.07</u>	<u>1416</u>	<u>1413</u>

±10% Buffer 5000 4991

ORP

231 mV @ 25C	Pre Cal	Post Cal
	<u>7.33</u>	<u>225.5</u>
	<u>231.0</u>	<u>231.0</u>

±10 mV check pH 6 5.97

DO

mg/L	Pre Cal	Post Cal
<u>on site</u>	<u>16.79</u>	<u>10.87</u>
	<u>9.25</u>	<u>9.25</u>

Barometric Pressure (mm Hg) 718.4

Pre Site Calibration

Date: 17 March 2020 Time: 0650

pH	Temp °C	Pre Cal	Post Cal	Post Cal Range	mv	mv Range +/- 50
Buffer 7	<u>17.93</u>	<u>7.00</u>	<u>7.00</u>	6.95-7.05	<u>-195.5</u>	0 +/- 50
Buffer 10	<u>17.95</u>	<u>9.98</u>	<u>10.00</u>	9.95-10.05	<u>-195.5</u>	-180 +/- 50
Buffer 4	<u>17.96</u>	<u>4.00</u>	<u>4.00</u>	4.95-5.05	<u>143.7</u>	180 +/- 50

Conductivity

Buffer	Pre Cal	Post Cal	Check
Buffer 1413	<u>18.68</u>	<u>1387</u>	<u>1414</u>

±10% Buffer 5000 5010

ORP

231 mV @ 25C	Pre Cal	Post Cal
	<u>5.66</u>	<u>237.3</u>
	<u>237.3</u>	<u>231.3</u>

±10 mV check pH 6 5.97

DO

mg/L	Pre Cal	Post Cal
	<u>18.82</u>	<u>7.90</u>
	<u>8.72</u>	<u>8.72</u>

Barometric Pressure (mm Hg) 711.1

Post Site Check

Time: 1905

pH	Temp °C	Reading
Buffer 7	<u>10.27</u>	<u>7.03</u>

Conductivity

Buffer	Reading
Buffer 5000	<u>13.56</u>

5039

Post Site Check

Time: 1907

pH	Temp °C	Reading
Buffer 7	<u>12.91</u>	<u>7.02</u>

Conductivity

Buffer	Reading
Buffer 5000	<u>13.02</u>

5072



2616 E. Broadway Ave
Bismarck, ND 58501
(701) 258-9720

Chain of Custody Record

Project Name: MDU Lewis & Clark	Event: March 2020	Work Order Number: <i>82-0636</i>
Report To: MDU Lewis & Clark Attn: Todd Peterson Address: 400 N. 4th St Bismarck, ND 58501 Phone: 701-425-2427 Email: Todd.Peterson@mdu.com	CC:	Collected By: <i>Darren Nieswag</i>

Lab Number	Sample ID	Date	Time	Sample Type	Sample Type					Temp (°C)	Spec. Cond.	pH	Analysis Required
					1 Liter Raw	500 mL Nitric	500 mL Nitric (filtered)	1 Liter Sulfuric	1 Liter Nitric				
<i>WS04</i>	Dup 1	<i>18 March 2020</i>	NA	GW					4	NA	NA	NA	Rad 226 & 228
<i>WS05</i>	Field Blank (FB)	<i>18 March 2020</i>	NA	GW					4	NA	NA	NA	
<i>WS06</i>	MW103	<i>18 March 2020</i>	<i>0931</i>	GW					4	<i>6.08</i>	<i>1416</i>	<i>7.45</i>	
<i>WS07</i>	MW110	<i>16 March 2020</i>	<i>1629</i>	GW					4	<i>3.60</i>	<i>1360</i>	<i>7.39</i>	
<i>WS08</i>	MW119	<i>16 March 2020</i>	<i>1857</i>	GW					4	<i>3.96</i>	<i>1311</i>	<i>7.40</i>	
<i>WS09</i>	MW111	<i>17 March 2020</i>	<i>1309</i>	GW					4	<i>4.72</i>	<i>4077</i>	<i>7.36</i>	
<i>WS10</i>	MW117	<i>17 March 2020</i>	<i>1030</i>	GW					4	<i>0.80</i>	<i>8177</i>	<i>7.36</i>	
<i>WS11</i>	MW118	<i>17 March 2020</i>	<i>1901</i>	GW					4	<i>4.22</i>	<i>2138</i>	<i>7.51</i>	
<i>WS12</i>	MW120	<i>17 March 2020</i>	<i>0959</i>	GW					4	<i>1.23</i>	<i>6556</i>	<i>6.92</i>	

Comments:

Relinquished By		Sample Condition		Received By	
Name	Date/Time	Location	Temp (°C)	Name	Date/Time
<i>[Signature]</i>	<i>18 Mar 2020</i>	Log In	<i>8.10, 6</i>	<i>Eily Deane</i>	<i>18 Mar 2020</i>
	<i>1638</i>	Walk In #2	TM562 / TM1805		<i>11038</i>
1			<i>4.5 18 Mar 2020</i>		
2					



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



Page: 1 of 1

Terri Olson
Barr Engineering Company
4300 MarketPointe Drive, Suite 200
Minneapolis MN 55435

Report Date: 29 Apr 20
Lab Number: 20-W733
Work Order #: 82-0910
Account #: 013200
Date Sampled: 20 Apr 20 11:10
Date Received: 21 Apr 20 10:25
Sampled By: Client

Project Name: 26411007.00
Sample Description: MW-111
Sample Site: MDU- Lewis & Clark

Temp at Receipt: 4.5C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	21 Apr 20	SD
Selenium - Total	0.0783 mg/l		0.0050	6020B	28 Apr 20 17:31	CC

Approved by:

Claudette K. Carroll

CC
30 Apr 2020

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

The reporting limit was elevated for any analyte requiring a dilution as coded below:

- @ = Due to sample matrix
- ! = Due to sample quantity
- # = Due to concentration of other analytes
- * = Due to internal standard response

CERTIFICATION: ND # ND-00016



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Page: 1 of 1

Terri Olson
Barr Engineering Company
4300 MarketPointe Drive, Suite 200
Minneapolis MN 55435

Report Date: 29 Apr 20
Lab Number: 20-W734
Work Order #: 82-0910
Account #: 013200
Date Sampled: 20 Apr 20 11:50
Date Received: 21 Apr 20 10:25
Sampled By: Client

Project Name: 26411007.00
Sample Description: MW-118
Sample Site: MDU- Lewis & Clark

Temp at Receipt: 4.5C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	21 Apr 20	SD
Selenium - Total	0.0698 mg/l		0.0050	6020B	28 Apr 20 17:31	CC

Approved by: Claudette K. Carroll 30 Apr 2020

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

The reporting limit was elevated for any analyte requiring a dilution as coded below:

- ⊗ = Due to sample matrix
- ! = Due to sample quantity
- # = Due to concentration of other analytes
- + = Due to internal standard response

CERTIFICATION: ND # ND-00016

82-0510 W733-734

Barr Engineering Co. Chain of Custody



- Ann Arbor Duluth Jefferson City
 Bismarck Hibbing Minneapolis

Sample Origination State:

- KS MO WI
 MI ND Other:
 MN SD MT

		Analysis Requested	
		Water	Soil
Perform MS/MSD Y / N	Total Number of Containers		
	1		
	2		
	3		
	4		
	5		
	6		
	7		
	8		
	9		

COC Number: **NO 47433**

COC 1 of 1

Matrix Code: Preservative Code:
 GW = Groundwater A = None
 SW = Surface Water B = HCl
 WW = Waste Water C = HNO₃
 DW = Drinking Water D = H₂SO₄
 S = Soil/Solid E = NaOH
 SD = Sediment F = MeOH
 O = Other G = NaHSO₄
 H = Na₂S₂O₃
 I = Ascorbic Acid
 J = NH₄Cl
 K = Zn Acetate
 O = Other

REPORT TO	INVOICE TO
Company: <u>Barr Engineering</u>	Company: <u>Same</u>
Address: <u>234 W. Century Ave</u>	Address:
Name: <u>TERRI OLSON</u>	Name:
email: <u>Tolson@barr.com</u>	email:
Copy to: <u>datamgt@barr.com</u>	P.O.:
Project Name: <u>MDU - Lewis & Clark</u>	Barr Project No: <u>26411007.00</u>

Location	Sample Depth			Collection Date (mm/dd/yyyy)	Collection Time (hh:mm)	Matrix Code	Perform	Total	Number	Of	Containers	Y / N	MS/MSD	Y / N	Selenium	% Solids
	Start	Stop	Unit (m./ft. or in.)													
1. <u>MW-111</u>	<u>---</u>	<u>---</u>		<u>04/20/2020</u>	<u>11:10</u>	<u>GW</u>	<u>Y</u>	<u>1</u>	<u>1</u>							
2. <u>MW-118</u>	<u>---</u>	<u>---</u>		<u>I</u>	<u>11:50</u>	<u>GW</u>	<u>Y</u>	<u>1</u>	<u>1</u>							
3.																
4.																
5.																
6.																
7.																
8.																
9.																
10.																

Preservative Code

Field Filtered Y/N

Contact Terri Olson w/ questions.

BARR USE ONLY

Sampled by: MSJ

Barr Proj. Manager: Jeremy Gachnick

Barr DQ Manager: TERRI OLSON

Lab Name: MVTL

Lab Location: Bismarck, ND

Relinquished by: Matt B... On Ice? Y Date 4-21-20 Time 10:35

Relinquished by: On Ice? Date Time

Samples Shipped VIA: Courier Federal Express Sampler Air Bill Number:

Lab WO: Temperature on Receipt (°C): 4.5°C Custody Seal Intact? Y N None

Received by: [Signature] Date 21 Apr 2020 Time 10:25

Requested Due Date: Standard Turn Around Time Rush

(mm/dd/yyyy)

H:\RUG\STDFORMS\Chain of Custody Form 2015 RLG Rev. 06/16/15

Distribution - White-Original: Accompanies Shipment to Laboratory; Yellow Copy: Include in Field Documents; Pink Copy: Send to Data Management Administrators.

Quality Control Report

Lab IDs: 20-W733 to 20-W734

Project: 26411007.00

Work Order: 202082-0910

Analyte	LCS Spike Amt	LCS Rec %	LCS % Rec Limits	Matrix Spike Amt	Matrix Spike ID	Matrix Spike Orig Result	Matrix Spike Result	Matrix Spike Rec %	Matrix Spike % Rec Limits	MSD/ Dup Orig Result	MSD/ Dup Result	MSD Rec %	MSD/ Dup RPD	MSD/ Dup RPD Limit (<)	Known Rec (%)	Known % Rec Limits	Method Blank
Selenium - Total mg/l	0.1000	101	80-120	0.400 0.400	20W783q 20W789q	< 0.005 < 0.005	0.4602 0.4198	115 105	75-125 75-125	0.4602 0.4198	0.4448 0.3476	111 87	3.4 18.8	20 20	- -	- -	< 0.005

Samples were received in good condition on 21 Apr 2020 at 1025.

Temperature upon receipt at the Bismarck laboratory was 4.5°C.

All samples were properly preserved unless noted here and/or flagged on the individual analytical laboratory report.

All holding times were met.

Approved methodology was followed for all sample analyses.

All acceptance criteria were met for calibration, method blanks, laboratory control samples, laboratory fortified matrix/duplicates unless noted here.

Approved by: C. Cantelero
 30 Apr 2020



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Todd Peterson
Montana-Dakota Utilities Co.
400 N 4th St
Bismarck ND 58501

Report Date: 28 May 20
Lab Number: 20-W1299
Work Order #: 82-1230
Account #: 002800
Date Sampled: 19 May 20
Date Received: 20 May 20 13:13
Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark

PO #: 180534 OP

Sample Description: Dup 1

Temp at Receipt: 1.9C

Event and Year: May 2020

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2		HT
Lithium - Total	0.159 mg/l		0.020	6010D	27 May 20 14:32	SZ

Approved by:

Claudette K. Carroll ^{CC} 1 Jun 2020

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

The reporting limit was elevated for any analyte requiring a dilution as coded below:

0 = Due to sample matrix # = Due to concentration of other analytes
! = Due to sample quantity + = Due to internal standard response

CERTIFICATION: ND # ND-00016



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Page: 1 of 1

Todd Peterson
Montana-Dakota Utilities Co.
400 N 4th St
Bismarck ND 58501

Report Date: 28 May 20
Lab Number: 20-W1300
Work Order #: 82-1230
Account #: 002800
Date Sampled: 19 May 20
Date Received: 20 May 20 13:13
Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark

PO #: 180534 OP

Sample Description: Field Blank

Temp at Receipt: 1.9C

Event and Year: May 2020

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2		HT
Lithium - Total	< 0.02 mg/l		0.020	6010D	27 May 20 14:32	SZ

Approved by:

Claudette K. Carroll 1 Jun 2020

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

The reporting limit was elevated for any analyte requiring a dilution as coded below:

@ = Due to sample matrix # = Due to concentration of other analytes
! = Due to sample quantity + = Due to internal standard response

CERTIFICATION: ND # ND-00016



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Todd Peterson
Montana-Dakota Utilities Co.
400 N 4th St
Bismarck ND 58501

Report Date: 28 May 20
Lab Number: 20-W1301
Work Order #: 82-1230
Account #: 002800
Date Sampled: 19 May 20 14:16
Date Received: 20 May 20 13:13
Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark

PO #: 180534 OP

Sample Description: MW103

Temp at Receipt: 1.9C

Event and Year: May 2020

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2		HT
pH - Field	7.45	units	NA	SM 4500 H+ B	19 May 20 14:16	DJN
Temperature - Field	12.6	Degrees C	NA	SM 2550B	19 May 20 14:16	DJN
Conductivity - Field	1285	umhos/cm	1	EPA 120.1	19 May 20 14:16	DJN
Lithium - Total	0.043	mg/l	0.020	6010D	27 May 20 14:32	SZ

Approved by:

Claudette K. Carroll

rc
1 Jun 2020

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

The reporting limit was elevated for any analyte requiring a dilution as coded below:

@ = Due to sample matrix
! = Due to sample quantity

= Due to concentration of other analytes
+ = Due to internal standard response

CERTIFICATION: ND # ND-00016



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Todd Peterson
Montana-Dakota Utilities Co.
400 N 4th St
Bismarck ND 58501

Report Date: 28 May 20
Lab Number: 20-W1302
Work Order #: 82-1230
Account #: 002800
Date Sampled: 18 May 20 13:57
Date Received: 20 May 20 13:13
Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark

PO #: 180534 OP

Sample Description: MW110

Temp at Receipt: 1.9C

Event and Year: May 2020

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2		HT
pH - Field	7.44	units	NA	SM 4500 H+ B	18 May 20 13:57	DJN
Temperature - Field	10.2	Degrees C	NA	SM 2550B	18 May 20 13:57	DJN
Conductivity - Field	1246	umhos/cm	1	EPA 120.1	18 May 20 13:57	DJN
Lithium - Total	0.033	mg/l	0.020	6010D	27 May 20 14:32	SZ

Approved by:

Claudette K Carroll 1 Jun 2020

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

The reporting limit was elevated for any analyte requiring a dilution as coded below:

@ = Due to sample matrix # = Due to concentration of other analytes
! = Due to sample quantity + = Due to internal standard response

CERTIFICATION: ND # ND-00016



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Todd Peterson
Montana-Dakota Utilities Co.
400 N 4th St
Bismarck ND 58501

Report Date: 28 May 20
Lab Number: 20-W1303
Work Order #: 82-1230
Account #: 002800
Date Sampled: 18 May 20 15:29
Date Received: 20 May 20 13:13
Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark

PO #: 180534 OP

Sample Description: MW119

Temp at Receipt: 1.9C

Event and Year: May 2020

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2		HT
pH - Field	7.41	units	NA	SM 4500 H+ B	18 May 20 15:29	DJN
Temperature - Field	11.9	Degrees C	NA	SM 2550B	18 May 20 15:29	DJN
Conductivity - Field	1310	umhos/cm	1	EPA 120.1	18 May 20 15:29	DJN
Lithium - Total	0.035	mg/l	0.020	6010D	27 May 20 14:32	SZ

Approved by:

Claudette K. Carroll ^{CC} 1 Jun 2020

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

The reporting limit was elevated for any analyte requiring a dilution as coded below:

⊗ = Due to sample matrix # = Due to concentration of other analytes
! = Due to sample quantity + = Due to internal standard response

CERTIFICATION: ND # ND-00016



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Todd Peterson
 Montana-Dakota Utilities Co.
 400 N 4th St
 Bismarck ND 58501

Report Date: 28 May 20
 Lab Number: 20-W1304
 Work Order #: 82-1230
 Account #: 002800
 Date Sampled: 19 May 20 10:40
 Date Received: 20 May 20 13:13
 Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark

PO #: 180534 OP

Sample Description: MW111

Temp at Receipt: 1.9C

Event and Year: May 2020

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2		HT
pH - Field	7.34	units	NA	SM 4500 H+ B	19 May 20 10:40	DJN
Temperature - Field	11.9	Degrees C	NA	SM 2550B	19 May 20 10:40	DJN
Conductivity - Field	3730	umhos/cm	1	EPA 120.1	19 May 20 10:40	DJN
Lithium - Total	0.154	mg/l	0.020	6010D	27 May 20 14:32	SZ

Approved by:

cc
 Claudette K. Carroll 1 Jun 2020

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

The reporting limit was elevated for any analyte requiring a dilution as coded below:
 @ = Due to sample matrix || = Due to concentration of other analytes
 ! = Due to sample quantity + = Due to internal standard response

CERTIFICATION: ND # ND-00016



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Todd Peterson
Montana-Dakota Utilities Co.
400 N 4th St
Bismarck ND 58501

Report Date: 28 May 20
Lab Number: 20-W1305
Work Order #: 82-1230
Account #: 002800
Date Sampled: 19 May 20 8:33
Date Received: 20 May 20 13:13
Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark

PO #: 180534 OP

Sample Description: MW117

Temp at Receipt: 1.9C

Event and Year: May 2020

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2		HT
pH - Field	7.26	units	NA	SM 4500 H+ B	19 May 20 8:33	DJN
Temperature - Field	8.19	Degrees C	NA	SM 2550B	19 May 20 8:33	DJN
Conductivity - Field	7504	umhos/cm	1	EPA 120.1	19 May 20 8:33	DJN
Lithium - Total	0.115	mg/l	0.020	6010D	27 May 20 14:32	SZ

Approved by: Claudette K. Carroll 1 Jun 2020

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

The reporting limit was elevated for any analyte requiring a dilution as coded below:
@ = Due to sample matrix # = Due to concentration of other analytes
: = Due to sample quantity + = Due to internal standard response

CERTIFICATION: ND # ND-00016



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Todd Peterson
Montana-Dakota Utilities Co.
400 N 4th St
Bismarck ND 58501

Report Date: 28 May 20
Lab Number: 20-W1306
Work Order #: 82-1230
Account #: 002800
Date Sampled: 19 May 20 12:26
Date Received: 20 May 20 13:13
Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark

PO #: 180534 OP

Sample Description: MW118

Temp at Receipt: 1.9C

Event and Year: May 2020

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2		HT
pH - Field	7.40	units	NA	SM 4500 H+ B	19 May 20 12:26	DJN
Temperature - Field	11.3	Degrees C	NA	SM 2550B	19 May 20 12:26	DJN
Conductivity - Field	1949	umhos/cm	1	EPA 120.1	19 May 20 12:26	DJN
Lithium - Total	0.076	mg/l	0.020	6010D	27 May 20 14:32	SZ

Approved by:

Claudette K. Carroll ^{CC} 1 Jun 2020

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

The reporting limit was elevated for any analyte requiring a dilution as coded below:

@ = Due to sample matrix # = Due to concentration of other analytes
! = Due to sample quantity + = Due to internal standard response

CERTIFICATION: ND # ND-00016



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Todd Peterson
Montana-Dakota Utilities Co.
400 N 4th St
Bismarck ND 58501

Report Date: 28 May 20
Lab Number: 20-W1307
Work Order #: 82-1230
Account #: 002800
Date Sampled: 19 May 20 8:17
Date Received: 20 May 20 13:13
Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark

PO #: 180534 OP

Sample Description: MW120

Temp at Receipt: 1.9C

Event and Year: May 2020

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2		HT
pH - Field	6.80	units	NA	SM 4500 H+ B	19 May 20 8:17	DJN
Temperature - Field	8.42	Degrees C	NA	SM 2550B	19 May 20 8:17	DJN
Conductivity - Field	6119	umhos/cm	1	EPA 120.1	19 May 20 8:17	DJN
Lithium - Total	0.110	mg/l	0.020	6010D	27 May 20 14:32	SZ

Approved by:

Claudette K Carroll 1 Jun 2020

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

The reporting limit was elevated for any analyte requiring a dilution as coded below:
@ = Due to sample matrix # = Due to concentration of other analytes
! = Due to sample quantity + = Due to internal standard response

CERTIFICATION: ND # ND-00016

Quality Control Report

Lab IDs: 20-W1299 to 20-W1307

Project: MDU Lewis & Clark

Work Order: 202082-1230

Analyte	LCS Spike Amt	LCS Rec %	LCS % Rec Limits	Matrix Spike Amt	Matrix Spike ID	Matrix Spike Orig Result	Matrix Spike Result	Matrix Spike Rec %	Matrix Spike % Rec Limits	MSD/ Dup Orig Result	MSD/ Dup Result	MSD Rec %	MSD/ Dup RPD	MSD/ Dup RPD Limit (<)	Known Rec (%)	Known % Rec Limits	Method Blank
Lithium - Total mg/l	0.400	100	80-120	0.400	20-W1302	0.033	0.390	89	75-125	0.390	0.379	86	2.9	20	-	-	< 0.02
															-	-	< 0.02

Samples were received in good condition on 20 May 2020 at 1313.
 Temperature upon receipt at the Bismarck laboratory was 1.9°C.
 All samples were properly preserved unless noted here and/or flagged on the individual analytical laboratory report.
 All holding times were met.
 Approved methodology was followed for all sample analyses.
 All acceptance criteria were met for calibration, method blanks, laboratory control samples, laboratory fortified matrix/duplicates unless noted here.

Approved by: C. Cantel
 1 Jun 2020



2616 E. Broadway Ave
 Bismarck, ND 58501
 (701) 258-9720

Chain of Custody Record

Project Name: MDU Lewis & Clark	Event: May 2020	Work Order Number: 82-1230
Report To: MDU Lewis & Clark Attn: Todd Peterson Address: 400 N. 4th St Bismarck, ND 58501 Phone: 701-425-2427 Email: Todd.Peterson@mdu.com	CC:	Collected By: <i>Darren Nieswag</i>

Lab Number	Sample ID	Date	Time	Sample Type	Sample Type				Temp (°C)	Spec. Cond.	PH	Analysis Required
					1 Liter Raw	500 mL Nitric	500 mL Nitric (filtered)	1 Liter Nitric				
W1299	Dup 1	19 May 2020	NA	GW	X				NA	NA	NA	Lithium
W1300	Field Blank (FB)	19 May 2020	NA	GW	X				NA	NA	NA	
W1301	MW103	19 May 2020	1466	GW	X			12.62	1285	7.45		
W1302	MW110	18 May 2020	1357	GW	X			10.20	1246	7.44		
W1303	MW119	18 May 2020	1529	GW	X			11.92	1310	7.41		
W1304	MW111	19 May 2020	1040	GW	X			11.89	3730	7.34		
W1305	MW117	19 May 2020	0833	GW	X			8.19	7504	7.26		
W1306	MW118	19 May 2020	1226	GW	X			11.30	1949	7.40		
W1307	MW120	19 May 2020	0817	GW	X			8.42	6119	6.80		

Comments:

Relinquished By		Sample Condition		Received By	
Name	Date/Time	Location	Temp (°C)	Name	Date/Time
<i>[Signature]</i>	20 May 2020 1313	Log In Walk In #2	TM562 / TM805 1.9	<i>[Signature]</i>	20 May 2020 1313
1					
2					



Field Datasheet

Groundwater Assessment

Company: MDU Lewis & Clark

Event: May 2020

Sample ID: 103

Sampling Personal: Darren Nieswaag

2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

Weather Conditions: Temp: 65 °F Wind: South @ 10 Precip: Sunny / Partly Cloudy / Cloudy

WELL INFORMATION

Well Locked?	YES	NO
Well Labeled?	YES	NO
Casing Strait?	YES	NO
Grout Seal Intact?	YES	NO
Repairs Necessary?		Not Visible
Casing Diameter:	2"	
Water Level Before Purge:	10.93	ft
Total Depth of Well:	21.20	ft
Well Volume:	6.4	liters
Depth to Top of Pump:		ft
Water Level After Sample:	10.95	ft
Measurement Method:	Electric Water Level Indicator	

SAMPLING INFORMATION

Purging Method:	Bladder	
Sampling Method:	Bladder	
Dedicated Equipment?	YES	NO
Duplicate Sample?	YES	NO
Duplicate Sample ID:		

Control Settings:	
Purge:	4 Sec.
Recover:	56 Sec.
PSI:	

Bottle List:	
500mL Nitric	

FIELD READINGS

Stabilization Parameters (3 Consecutive)		Temp. (°C)	Spec. Cond.	pH	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Water Level (ft)	Pumping Rate mL/Min	mL Removed	Appearance or Comment
Purge Date	Time	±0.5°	±5%	±0.1	±10%	±10					clear, (slightly turbid) turbid
	1241	Start of Well Purge									
	1246	13.36	3170	7.43	0.77	201.4	1.11	10.95	100	500	ST
	1316	11.99	1373	7.49	0.46	206.3	42.4	10.95	100	3000	clear
	1346	12.37	1304	7.45	0.28	209.9	7.24	10.95	100	3000	clear
	1401	12.78	1287	7.45	0.30	210.8	5.88	10.95	100	1500	clear
	1406	12.98	1289	7.45	0.28	211.0	5.21	10.95	100	500	clear
	1411	12.53	1285	7.45	0.37	212.3	4.65	10.95	100	500	clear
	1416	12.62	1285	7.45	0.36	212.4	4.55	10.95	100	500	clear
	1421										

Well Stabilized? YES NO

Total Volume Purged: 9500 mL

Sample Date	Time	Temp. (°C)	Spec. Cond.	pH	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Water Level (ft)	Pumping Rate mL/Min	mL Removed	Appearance or Comment
											Clarity, Color, Odor, Ect.
19 May 2020	1416	12.62	1285	7.45	0.36	212.4	4.55				clear

Comments:



Field Datasheet

Groundwater Assessment

Company: MDU Lewis & Clark

Event: May 2020

Sample ID: 110

Sampling Personal: Darren Niswaa

2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

Weather Conditions: Temp: 72 °F Wind: South @ 25 Precip: Sunny/ Partly Cloudy/ Cloudy

WELL INFORMATION

Well Locked?	YES	NO
Well Labeled?	YES	NO
Casing Strait?	YES	NO
Grout Seal Intact?	YES	NO
Repairs Necessary?		Not Visible
Casing Diameter:	2"	
Water Level Before Purge:	9.42	ft
Total Depth of Well:	16.85	ft
Well Volume:	4.86	liters
Depth to Top of Pump:	-	ft
Water Level After Sample:	9.54	ft
Measurement Method:	Electric Water Level Indicator	

SAMPLING INFORMATION

Purging Method:	Bladder	
Sampling Method:	Bladder	
Dedicated Equipment?	YES	NO
	Tubing	
Duplicate Sample?	YES	NO
Duplicate Sample ID:		

Control Settings:	
Purge:	3 Sec.
Recover:	7 Sec.
PSI:	

Bottle List:	
500mL Nitric	

FIELD READINGS

Stabilization Parameters (3 Consecutive)		Temp. (°C)	Spec. Cond.	pH	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Water Level (ft)	Pumping Rate mL/Min	mL Removed	Appearance or Comment Clarity, Color, Odor, Ect.
Purge Date	Time	±0.5°	±5%	±0.1	±10%	±10					clear, slightly turbid, turbid
18 May 2020	1322	10.70	1250	7.33	9.28	110.9	13.0	9.54	100	500	clear
	1257	10.35	1247	7.43	2.13	146.1	9.86	9.54	100	2500	clear
	1327	10.19	1247	7.49	2.18	180.8	5.48	9.54	100	3000	clear
	1347	10.18	1245	7.44	2.12	192.3	4.91	9.54	100	2000	clear
	1352	10.23	1246	7.44	2.14	193.7	3.19	9.54	100	500	clear
	1357	10.20	1246	7.44	2.16	194.5	2.58	9.54	100	500	clear

Well Stabilized? YES NO

Total Volume Purged: 9,000 mL

Sample Date	Time	Temp. (°C)	Spec. Cond.	pH		Turbidity (NTU)			Appearance or Comment Clarity, Color, Odor, Ect.
18 May 2020	1357	10.20	1246	7.44		2.58			clear

Comments:



Field Datasheet

Groundwater Assessment

Company: MDU Lewis & Clark

Event: May 2020

Sample ID: 119

Sampling Personal: Darren Nieswamy

2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

Weather Conditions: Temp: 72 °F Wind: South @ 25 Precip: Sunny / Partly Cloudy / Cloudy

WELL INFORMATION

Well Locked?	YES	NO
Well Labeled?	YES	NO
Casing Strait?	YES	NO
Grout Seal Intact?	YES	NO
Repairs Necessary?		Not Visible
Casing Diameter:	2"	
Water Level Before Purge:	9.27	ft
Total Depth of Well:	16.64	ft
Well Volume:	4.6	liters
Depth to Top of Pump:		ft
Water Level After Sample:		ft
Measurement Method:	Electric Water Level Indicator	

SAMPLING INFORMATION

Purging Method:	Bladder
Sampling Method:	Bladder
Dedicated Equipment?	YES NO
Duplicate Sample?	YES NO
Duplicate Sample ID:	

Control Settings:	
Purge:	4 Sec.
Recover:	56 Sec.
PSI:	

Bottle List:	
500mL Nitric	

FIELD READINGS

Stabilization Parameters (3 Consecutive)		Temp. (°C)	Spec. Cond.	pH	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Water Level (ft)	Pumping Rate mL/Min	mL Removed	Appearance or Comment
Purge Date	Time	±0.5°	±5%	±0.1	±10%	±10					Clarity, Color, Odor, Ect.
Start of Well Purge											
18 May 2020	1414										
	1419	12.08	1290	7.38	1.56	177.7	63.3	9.33	100	500	clear
	1449	11.88	1296	7.39	1.49	190.6	19.9	9.36	100	3000	clear
	1519	12.14	1309	7.40	1.82	191.5	4.01	9.34	100	3000	clear
	1524	11.96	1306	7.40	1.88	193.3	3.17	9.35	100	500	clear
	1529	11.92	1310	7.41	1.85	190.9	3.08	9.35	100	500	clear

Well Stabilized? YES NO

Total Volume Purged: 7500 mL

Sample Date	Time	Temp. (°C)	Spec. Cond.	pH		Turbidity (NTU)				Appearance or Comment
										Clarity, Color, Odor, Ect.
18 May 2020	1529	11.92	1310	7.41		3.08				clear

Comments:



Field Datasheet

Groundwater Assessment

2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

Company: MDU Lewis & Clark

Event: May 2020

Sample ID:

Sampling Personal: Darren Nieswaag

Weather Conditions: Temp: 65 °F Wind: South @ 5 Precip: Sunny / Partly Cloudy / Cloudy

WELL INFORMATION

Well Locked?	YES NO
Well Labeled?	YES NO
Casing Strait?	YES NO
Grout Seal Intact?	YES NO Not Visible
Repairs Necessary?	
Casing Diameter:	2"
Water Level Before Purge:	8.03 ft
Total Depth of Well:	17.82 ft
Well Volume:	6.1 liters
Depth to Top of Pump:	
Water Level After Sample:	8.08 ft
Measurement Method:	Electric Water Level Indicator

SAMPLING INFORMATION

Purging Method:	Bladder
Sampling Method:	Bladder
Dedicated Equipment?	YES NO Tubing
Duplicate Sample?	YES NO
Duplicate Sample ID:	Dup-1

Control Settings:	
Purge:	4 Sec.
Recover:	56 Sec.
PSI:	

Bottle List:	
500mL Nitric	

FIELD READINGS

Stabilization Parameters (3 Consecutive)		Temp. (°C)	Spec. Cond.	pH	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Water Level (ft)	Pumping Rate mL/Min	mL Removed	Appearance or Comment
Purge Date	Time	±0.5°	±5%	±0.1	±10%	±10					Clarity, Color, Odor, Ect.
Start of Well Purge											
19 May 2020	0855										
	0900	10.16	3968	7.15	0.36	257.1	45.9	8.08	100	500	clear
	0930	9.77	3810	7.26	2.05	247.6	13.6	8.08	100	3000	clear
	1000	11.88	3716	7.32	3.05	248.1	7.84	8.08	100	3000	clear
	1030	12.22	3723	7.33	3.30	215.6	2.67	8.08	100	3000	clear
	1035	11.98	3731	7.34	3.35	211.9	1.24	8.08	100	500	clear
	1040	11.89	3730	7.34	3.36	208.8	1.25	8.08	100	500	clear

Well Stabilized? YES NO

Total Volume Purged: 10,500 mL

Sample Date	Time	Temp. (°C)	Spec. Cond.	pH		Turbidity (NTU)			Appearance or Comment
Clarity, Color, Odor, Ect.									
19 May 2020	1040	11.89	3730	7.34		1.25			clear

Comments:



Field Datasheet

Groundwater Assessment

2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

Company: MDU Lewis & Clark

Event: May 2020

Sample ID: 117

Sampling Personal: *Darran Alesna*

Weather Conditions: Temp: 60 °F Wind: South @ 5 Precip: Sunny / Partly Cloudy / Cloudy

WELL INFORMATION

Well Locked?	YES	NO	
Well Labeled?	YES	NO	
Casing Strait?	YES	NO	
Grout Seal Intact?	YES	NO	Not Visible
Repairs Necessary?			
Casing Diameter:	2"		
Water Level Before Purge:	5.68	ft	
Total Depth of Well:	11.50	ft	
Well Volume:	3.6	liters	
Depth to Top of Pump:	9.58	ft	
Water Level After Sample:	6.92	ft	
Measurement Method:	Electric Water Level Indicator		

SAMPLING INFORMATION

Purging Method:	Bladder	Control Settings:
Sampling Method:	Bladder	Purge: 4 Sec.
Dedicated Equipment?	YES <i>Tubing</i> NO	Recover: 56 Sec.
Duplicate Sample?	YES	PSI:
Duplicate Sample ID:		
Bottle List:		
500mL Nitric		

FIELD READINGS

Stabilization Parameters (3 Consecutive)		Temp. (°C)	Spec. Cond.	pH	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Water Level (ft)	Pumping Rate mL/Min	mL Removed	Appearance or Comment
Purge Date	Time	±0.5°	±5%	±0.1	±10%	±10					clear, (slightly turbid) turbid
	1548	Start of Well Purge									
<i>18 May 2020</i>	1553	9.98	7960	7.23	8.45	255.0	158	6.18	150	750	ST
	1623	9.60	7881	7.25	8.10	282.6	49.1	8.59	150	4500	clear
	1653	10.37	7755	7.25	6.35	288.9	50.2	9.58(BP)	150	4500	clear
	1700	10.98	7838	7.25	6.61	290.6	24.5	9.58(BP)	150	1050	clear
	0828		<i>19 May 2020 purged before sample</i>						6.11	100	500

Well Stabilized? YES NO

Total Volume Purged: ~~70,800~~ mL 11,300

Sample Date	Time	Temp. (°C)	Spec. Cond.	pH	DO	ORP	Turbidity (NTU)	WL			Appearance or Comment
											Clarity, Color, Odor, Ect.
<i>19 May 2020</i>	<i>0833</i>	<i>8.19</i>	<i>7504</i>	<i>7.26</i>	<i>9.62</i>	<i>233.0</i>	<i>4.34</i>	<i>6.78</i>	-	-	<i>clear</i>

Comments: * (BP) Below Pump



Field Datasheet

Groundwater Assessment

Company: MDU Lewis & Clark

Event: May 2020

Sample ID: 118

Sampling Personal: Darren Nieswag

2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

Weather Conditions: Temp: 65 °F Wind: South @ 5 Precip: Sunny / Partly Cloudy / Cloudy

WELL INFORMATION

Well Locked?	YES	NO
Well Labeled?	YES	NO
Casing Strait?	YES	NO
Grout Seal Intact?	YES	NO
Repairs Necessary?		Not Visible
Casing Diameter:	2"	
Water Level Before Purge:	8.70	ft
Total Depth of Well:	19.90	ft
Well Volume:	2.0	liters
Depth to Top of Pump:		ft
Water Level After Sample:	8.76	ft
Measurement Method:	Electric Water Level Indicator	

SAMPLING INFORMATION

Purging Method:	Bladder
Sampling Method:	Bladder
Dedicated Equipment?	YES NO

Control Settings:	
Purge:	4 Sec.
Recover:	56 Sec.
PSI:	

Duplicate Sample?	YES NO
Duplicate Sample ID:	

Bottle List:	
500mL Nitric	

FIELD READINGS

Stabilization Parameters (3 Consecutive)		Temp. (°C)	Spec. Cond.	pH	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Water Level (ft)	Pumping Rate mL/Min	mL Removed	Appearance or Comment
Purge Date	Time	±0.5°	±5%	±0.1	±10%	±10					Clarity, Color, Odor, Ect.
Start of Well Purge											
19 May 2020	1056										
	1101	10.76	1966	7.39	3.34	253.9	74.3	8.75	100	500	clear
	1131	11.00	1962	7.40	3.72	266.5	15.9	8.76	100	3000	clear
	1201	11.22	1956	7.40	3.59	272.9	7.93	8.76	100	3000	clear
	1226	11.27	1956	7.40	3.46	276.3	3.41	8.76	100	1500	clear
	1221	11.05	1953	7.40	3.46	277.5	1.96	8.76	100	500	clear
	1226	11.30	1949	7.40	3.41	277.8	1.90	8.76	100	500	clear

Well Stabilized? YES NO

Total Volume Purged: 9,000 mL

Sample Date	Time	Temp. (°C)	Spec. Cond.	pH		Turbidity (NTU)			Appearance or Comment
Clarity, Color, Odor, Ect.									
19 May 2020	1226	11.30	1949	7.40		1.90			clear

Comments:



Field Datasheet

Groundwater Assessment

2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

Company: MDU Lewis & Clark

Event: May 2020

Sample ID: 120

Sampling Personal: Darren Nieswaag

Weather Conditions: Temp: 60 °F Wind: South @ 5 Precip: Sunny / Partly Cloudy / Cloudy

WELL INFORMATION

Well Locked?	YES	NO	
Well Labeled?	YES	NO	
Casing Strait?	YES	NO	
Grout Seal Intact?	YES	NO	Not Visible
Repairs Necessary?			
Casing Diameter:	2"		
Water Level Before Purge:	14.09	ft	
Total Depth of Well:	18.86	ft	
Well Volume:	3.0	liters	
Depth to Top of Pump:		ft	
Water Level After Sample:	14.51	ft	
Measurement Method:	Electric Water Level Indicator		

SAMPLING INFORMATION

Purging Method:	Bladder	Control Settings:
Sampling Method:	Bladder	Purge: 4 Sec.
Dedicated Equipment?	YES NO	Recover: 56 Sec.
Duplicate Sample?	YES NO	PSI:
Duplicate Sample ID:		
Bottle List:		
500mL Nitric		

FIELD READINGS

Stabilization Parameters (3 Consecutive)		Temp. (°C)	Spec. Cond.	pH	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Water Level (ft)	Pumping Rate mL/Min	mL Removed	Appearance or Comment
Purge Date	Time	±0.5°	±5%	±0.1	±10%	±10					Clarity, Color, Odor, Ect.
	0727	Start of Well Purge									
19 May 2020	0732	8.53	6357	6.70	3.82	180.7	11.7	14.21	100	500	clear
	0802	8.29	5998	6.80	1.29	192.5	4.08	14.98	100	3000	clear
	0807	8.21	6038	6.80	0.95	193.8	1.14	14.50	100	500	clear
	0812	8.38	6061	6.80	0.94	194.9	0.79	14.51	100	500	clear
	0817	8.42	6119	6.80	0.99	197.8	0.68	14.51	100	500	clear

Well Stabilized? YES NO

Total Volume Purged: 5,000 mL

Sample Date	Time	Temp. (°C)	Spec. Cond.	pH			Turbidity (NTU)				Appearance or Comment
Clarity, Color, Odor, Ect.											
19 May 2020	0817	8.42	6119	6.80			0.68				clear

Comments:



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Todd Peterson
Montana-Dakota Utilities Co.
400 N 4th St
Bismarck ND 58501

Report Date: 31 Jul 20
Lab Number: 20-W2562
Work Order #: 82-1957
Account #: 002800
Date Sampled: 20 Jul 20
Date Received: 22 Jul 20 14:30
Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark
Sample Description: Dup 1

Temp at Receipt: 5.5C

Event and Year: July 2020

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	22 Jul 20	HT
Lithium - Total	0.146 mg/l		0.020	6010D	30 Jul 20 9:08	MDE

Approved by:

Claudette K. Carroll ^{CC} *4 Aug 2020*

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

The reporting limit was elevated for any analyte requiring a dilution as coded below:

@ = Due to sample matrix # = Due to concentration of other analytes
! = Due to sample quantity + = Due to internal standard response

CERTIFICATION: ND # ND-00016



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Todd Peterson
Montana-Dakota Utilities Co.
400 N 4th St
Bismarck ND 58501

Report Date: 31 Jul 20
Lab Number: 20-W2563
Work Order #: 82-1957
Account #: 002800
Date Sampled: 21 Jul 20
Date Received: 22 Jul 20 14:30
Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark
Sample Description: Field Blank

Temp at Receipt: 5.5C

Event and Year: July 2020

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	22 Jul 20	HT
Lithium - Total	< 0.02 mg/l		0.020	6010D	30 Jul 20 9:08	MDE

Approved by:

Claudette K Carroll

CC
4 Aug 2020

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

The reporting limit was elevated for any analyte requiring a dilution as coded below:

@ = Due to sample matrix # = Due to concentration of other analytes
! = Due to sample quantity + = Due to internal standard response

CERTIFICATION: ND # ND-00016



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Todd Peterson
Montana-Dakota Utilities Co.
400 N 4th St
Bismarck ND 58501

Report Date: 31 Jul 20
Lab Number: 20-W2564
Work Order #: 82-1957
Account #: 002800
Date Sampled: 21 Jul 20 8:35
Date Received: 22 Jul 20 14:30
Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark
Sample Description: MW103

Temp at Receipt: 5.5C

Event and Year: July 2020

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	22 Jul 20	HT
pH - Field	7.44	units	NA	SM 4500 H+ B	21 Jul 20 8:35	JSM
Turbidity, Field	3.7	NTU	0.1	180.1	21 Jul 20 8:35	JSM
Temperature - Field	12.2	Degrees C	NA	SM 2550B	21 Jul 20 8:35	JSM
Conductivity - Field	1316	umhos/cm	1	EPA 120.1	21 Jul 20 8:35	JSM
Lithium - Total	0.054	mg/l	0.020	6010D	30 Jul 20 9:08	MDE

Approved by:

Claudette K. Carroll

CC
4 Aug 2020

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

The reporting limit was elevated for any analyte requiring a dilution as coded below:

@ = Due to sample matrix # = Due to concentration of other analytes
! = Due to sample quantity * = Due to internal standard response

CERTIFICATION: ND # ND-00016



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Todd Peterson
Montana-Dakota Utilities Co.
400 N 4th St
Bismarck ND 58501

Report Date: 31 Jul 20
Lab Number: 20-W2565
Work Order #: 82-1957
Account #: 002800
Date Sampled: 20 Jul 20 11:00
Date Received: 22 Jul 20 14:30
Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark
Sample Description: MW110

Temp at Receipt: 5.5C

Event and Year: July 2020

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	22 Jul 20	HT
pH - Field	7.40	units	NA	SM 4500 H+ B	20 Jul 20 11:00	JSM
Turbidity, Field	4.3	NTU	0.1	180.1	20 Jul 20 11:00	JSM
Temperature - Field	15.4	Degrees C	NA	SM 2550B	20 Jul 20 11:00	JSM
Conductivity - Field	1172	umhos/cm	1	EPA 120.1	20 Jul 20 11:00	JSM
Lithium - Total	0.044	mg/l	0.020	6010D	30 Jul 20 9:08	MDE

Approved by:

Claudette K. Carroll

CC
4 Aug 2020

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

The reporting limit was elevated for any analyte requiring a dilution as coded below:

@ = Due to sample matrix # = Due to concentration of other analytes
! = Due to sample quantity + = Due to internal standard response

CERTIFICATION: ND # ND-00016



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Todd Peterson
Montana-Dakota Utilities Co.
400 N 4th St
Bismarck ND 58501

Report Date: 31 Jul 20
Lab Number: 20-W2566
Work Order #: 82-1957
Account #: 002800
Date Sampled: 20 Jul 20 12:20
Date Received: 22 Jul 20 14:30
Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark
Sample Description: MW119

Temp at Receipt: 5.5C

Event and Year: July 2020

Table with 6 columns: As Received Result, Method RL, Method Reference, Date Analyzed, Analyst. Rows include Metal Digestion, pH - Field, Turbidity, Field, Temperature - Field, Conductivity - Field, Lithium - Total.

Approved by:

Claudette K. Carroll 4 Aug 2020

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

The reporting limit was elevated for any analyte requiring a dilution as coded below:
@ = Due to sample matrix # = Due to concentration of other analytes
! = Due to sample quantity + = Due to internal standard response

CERTIFICATION: ND # ND-00016



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Todd Peterson
Montana-Dakota Utilities Co.
400 N 4th St
Bismarck ND 58501

Report Date: 31 Jul 20
Lab Number: 20-W2567
Work Order #: 82-1957
Account #: 002800
Date Sampled: 21 Jul 20 10:15
Date Received: 22 Jul 20 14:30
Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark
Sample Description: MW111

Temp at Receipt: 5.5C

Event and Year: July 2020

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	22 Jul 20	HT
pH - Field	7.24	units	NA	SM 4500 H+ B	21 Jul 20 10:15	JSM
Turbidity, Field	1.4	NTU	0.1	180.1	21 Jul 20 10:15	JSM
Temperature - Field	13.1	Degrees C	NA	SM 2550B	21 Jul 20 10:15	JSM
Conductivity - Field	4087	umhos/cm	1	EPA 120.1	21 Jul 20 10:15	JSM
Lithium - Total	0.204	mg/l	0.020	6010D	30 Jul 20 9:08	MDE

Approved by:

Claudette K. Carroll ^{cc} 4 Aug 2020

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

The reporting limit was elevated for any analyte requiring a dilution as coded below:

@ = Due to sample matrix # = Due to concentration of other analytes
! = Due to sample quantity + = Due to internal standard response

CERTIFICATION: ND # ND-00016



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Todd Peterson
Montana-Dakota Utilities Co.
400 N 4th St
Bismarck ND 58501

Report Date: 31 Jul 20
Lab Number: 20-W2568
Work Order #: 82-1957
Account #: 002800
Date Sampled: 21 Jul 20 8:55
Date Received: 22 Jul 20 14:30
Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark
Sample Description: MW117

Temp at Receipt: 5.5C

Event and Year: July 2020

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	22 Jul 20	HT
pH - Field	7.23	units	NA	SM 4500 H+ B	21 Jul 20 8:55	JSM
Turbidity, Field	4.5	NTU	0.1	180.1	21 Jul 20 8:55	JSM
Temperature - Field	13.6	Degrees C	NA	SM 2550B	21 Jul 20 8:55	JSM
Conductivity - Field	7504	umhos/cm	1	EPA 120.1	21 Jul 20 8:55	JSM
Lithium - Total	0.140	mg/l	0.020	6010D	30 Jul 20 9:08	MDE

Approved by:

Claudette K. Carroll

1C
4 Aug 2020

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

The reporting limit was elevated for any analyte requiring a dilution as coded below:
@ = Due to sample matrix # = Due to concentration of other analytes
! = Due to sample quantity + = Due to internal standard response

CERTIFICATION: ND # ND-00016



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Todd Peterson
Montana-Dakota Utilities Co.
400 N 4th St
Bismarck ND 58501

Report Date: 31 Jul 20
Lab Number: 20-W2569
Work Order #: 82-1957
Account #: 002800
Date Sampled: 21 Jul 20 11:15
Date Received: 22 Jul 20 14:30
Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark
Sample Description: MW118

Temp at Receipt: 5.5C

Event and Year: July 2020

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	22 Jul 20	HT
pH - Field	7.31	units	NA	SM 4500 H+ B	21 Jul 20 11:15	JSM
Turbidity, Field	1.8	NTU	0.1	180.1	21 Jul 20 11:15	JSM
Temperature - Field	15.6	Degrees C	NA	SM 2550B	21 Jul 20 11:15	JSM
Conductivity - Field	1854	umhos/cm	1	EPA 120.1	21 Jul 20 11:15	JSM
Lithium - Total	0.106	mg/l	0.020	6010D	30 Jul 20 9:08	MDE

Approved by: Claudette K. Carroll ^{CC} 4 Aug 2020
Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit
The reporting limit was elevated for any analyte requiring a dilution as coded below:
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! = Due to sample quantity + = Due to internal standard response
CERTIFICATION: ND # ND-00016



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Todd Peterson
Montana-Dakota Utilities Co.
400 N 4th St
Bismarck ND 58501

Report Date: 31 Jul 20
Lab Number: 20-W2570
Work Order #: 82-1957
Account #: 002800
Date Sampled: 20 Jul 20 14:02
Date Received: 22 Jul 20 14:30
Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark
Sample Description: MW120

Temp at Receipt: 5.5C

Event and Year: July 2020

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	22 Jul 20	HT
pH - Field	6.80	units	NA	SM 4500 H+ B	20 Jul 20 14:02	JSM
Turbidity, Field	0.2	NTU	0.1	180.1	20 Jul 20 14:02	JSM
Temperature - Field	10.8	Degrees C	NA	SM 2550B	20 Jul 20 14:02	JSM
Conductivity - Field	6361	umhos/cm	1	EPA 120.1	20 Jul 20 14:02	JSM
Lithium - Total	0.130	mg/l	0.020	6010D	30 Jul 20 9:08	MDE

Approved by:

Claudette K Carroll ^{CC} 4 Aug 2020

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

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CERTIFICATION: ND # ND-00016



2616 E. Broadway Ave
Bismarck, ND 58501
(701) 258-9720

Chain of Custody Record

Project Name: MDU Lewis & Clark	Event: July 2020	Work Order Number: <i>82-1957</i>
Report To: MDU Lewis & Clark Attn: Todd Peterson Address: 400 N. 4th St Bismarck, ND 58501 Phone: 701-425-2427 Email: Todd.Peterson@mdu.com	CC:	Collected By: <i>Severny Payer</i>

Lab Number	Sample ID	Date	Time	Sample Type	Sample Type				Temp (°C)	Spec. Cond.	pH	Turbidity (NTU)	Analysis Required
					1 Liter Raw	500 mL Nitric	250 mL Nitric (filtered)	1 Liter Nitric					
<i>W2562</i>	Dup 1	20 July 2020	NA	GW	X				NA	NA	NA	Lithium	
<i>W2563</i>	Field Blank (FB)	21 July 2020	NA	GW	X				NA	NA	NA		
<i>W2564</i>	MW103	21 July 2020	0835	GW	X			12.17	1316	7.44	3.72		
<i>W2565</i>	MW110	20 July 2020	1100	GW	X			15.37	1172	7.40	4.33		
<i>W2566</i>	MW119	20 July 2020	1220	GW	X			13.10	1209	7.39	1.16		
<i>W2567</i>	MW111	21 July 2020	1015	GW	X			13.09	4087	7.24	1.40		
<i>W2568</i>	MW117	21 July 2020	0855	GW	X			13.57	7504	7.23	4.52		
<i>W2569</i>	MW118	21 July 2020	1115	GW	X			15.63	1854	7.31	1.79		
<i>W2570</i>	MW120	20 July 2020	1402	GW	X			10.85	6361	6.80	0.21		

Comments:

Relinquished By		Sample Condition		Received By	
Name	Date/Time	Location	Temp (°C)	Name	Date/Time
<i>[Signature]</i>	22 July 2020 1430	LOG ID Walk In #2	5.5 TM562 / TM805	<i>[Signature]</i>	22 July 2020 1430
1					
2					



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CERTIFICATE of ANALYSIS - CCR

Todd Peterson
Montana-Dakota Utilities Co.
400 N 4th St
Bismarck ND 58501

Report Date: 9 Oct 20
Lab Number: 20-W3620
Work Order #: 82-2645
Account #: 002800
Date Sampled: 22 Sep 20
Date Received: 24 Sep 20 7:40
Sampled By: MVTL Field Service

Project Name: MDU Lewis & Clark

PO #: 180534 OP

Sample Description: Dup 1

Temp at Receipt: 5.3C

Event and Year: September 2020

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	24 Sep 20	HT
pH	* 7.5	units	0.1	SM4500-H+-B-11	24 Sep 20 17:00	SD
Fluoride	2.04	mg/l	0.10	SM4500-F-C	25 Sep 20 17:00	HT
Sulfate	2130	mg/l	5.00	ASTM D516-11	25 Sep 20 10:30	EMS
Chloride	37.7	mg/l	1.0	SM4500-Cl-E-11	28 Sep 20 8:39	SD
Mercury - Total	< 0.0002	mg/l	0.0002	7470A	29 Sep 20 12:25	MDE
Total Dissolved Solids	3930	mg/l	10	USGS I1750-85	25 Sep 20 10:35	HT
Calcium - Total	194	mg/l	1.0	6010D	29 Sep 20 11:01	MDE
Lithium - Total	0.224	mg/l	0.020	6010D	1 Oct 20 11:12	MDE
Boron - Total	8.32	mg/l	0.10	6010D	30 Sep 20 9:45	MDE
Antimony - Total	< 0.001	mg/l	0.0010	6020B	29 Sep 20 14:03	MDE
Arsenic - Total	< 0.002	mg/l	0.0020	6020B	29 Sep 20 14:03	MDE
Barium - Total	0.0296	mg/l	0.0020	6020B	29 Sep 20 14:03	MDE
Beryllium - Total	< 0.0005	mg/l	0.0005	6020B	29 Sep 20 14:03	MDE
Cadmium - Total	< 0.0005	mg/l	0.0005	6020B	29 Sep 20 14:03	MDE
Chromium - Total	0.0080	mg/l	0.0020	6020B	29 Sep 20 14:03	MDE
Cobalt - Total	< 0.002	mg/l	0.0020	6020B	29 Sep 20 14:03	MDE
Lead - Total	< 0.0005	mg/l	0.0005	6020B	29 Sep 20 14:03	MDE
Molybdenum - Total	0.0666	mg/l	0.0020	6020B	29 Sep 20 14:03	MDE
Selenium - Total	0.0761	mg/l	0.0050	6020B	29 Sep 20 14:03	MDE
Thallium - Total	< 0.0005	mg/l	0.0005	6020B	30 Sep 20 10:35	MDE

* Holding time exceeded

Approved by:

Claudette K. Carroll

CC
12 OCT 2020

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

The reporting limit was elevated for any analyte requiring a dilution as coded below:

@ = Due to sample matrix
! = Due to sample quantity

= Due to concentration of other analytes
+ = Due to internal standard response

CERTIFICATION: ND # ND-00016



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CERTIFICATE of ANALYSIS - CCR

Todd Peterson
Montana-Dakota Utilities Co.
400 N 4th St
Bismarck ND 58501

Report Date: 9 Oct 20
Lab Number: 20-W3621
Work Order #: 82-2645
Account #: 002800
Date Sampled: 22 Sep 20
Date Received: 24 Sep 20 7:40
Sampled By: MVTL Field Service

Project Name: MDU Lewis & Clark

Sample Description: Field Blank (FB)

PO #: 180534 OP

Event and Year: September 2020

Temp at Receipt: 5.3C

Table with columns: As Received Result, Method RL, Method Reference, Date Analyzed, Analyst. Rows include Metal Digestion, pH, Fluoride, Sulfate, Chloride, Mercury - Total, Total Dissolved Solids, Calcium - Total, Lithium - Total, Boron - Total, Antimony - Total, Arsenic - Total, Barium - Total, Beryllium - Total, Cadmium - Total, Chromium - Total, Cobalt - Total, Lead - Total, Molybdenum - Total, Selenium - Total, Thallium - Total.

* Holding time exceeded

Approved by:

Claudette K. Carroll

12 OCT 2020

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

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CERTIFICATION: ND # ND-00016



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CERTIFICATE of ANALYSIS - CCR

Todd Peterson
Montana-Dakota Utilities Co.
400 N 4th St
Bismarck ND 58501

Report Date: 9 Oct 20
Lab Number: 20-W3622
Work Order #: 82-2645
Account #: 002800
Date Sampled: 22 Sep 20 9:10
Date Received: 24 Sep 20 7:40
Sampled By: MVTL Field Service

Project Name: MDU Lewis & Clark

PO #: 180534 OP

Sample Description: MW103

Temp at Receipt: 5.3C

Event and Year: September 2020

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	24 Sep 20	HT
pH - Field	7.30	units	NA	SM 4500 H+ B	22 Sep 20 9:10	JSM
pH	* 7.7	units	0.1	SM4500-H+-B-11	24 Sep 20 17:00	SD
Temperature - Field	13.4	Degrees C	NA	SM 2550B	22 Sep 20 9:10	JSM
Conductivity - Field	1347	umhos/cm	1	EPA 120.1	22 Sep 20 9:10	JSM
Fluoride	0.73	mg/l	0.10	SM4500-F-C	25 Sep 20 17:00	HT
Sulfate	348	mg/l	5.00	ASTM D516-11	25 Sep 20 10:30	EMS
Chloride	23.2	mg/l	1.0	SM4500-Cl-E-11	28 Sep 20 8:39	SD
Mercury - Total	< 0.0002	mg/l	0.0002	7470A	29 Sep 20 12:25	MDE
Total Dissolved Solids	997	mg/l	10	USGS I1750-85	25 Sep 20 10:35	HT
Calcium - Total	106	mg/l	1.0	6010D	29 Sep 20 11:01	MDE
Lithium - Total	0.060	mg/l	0.020	6010D	1 Oct 20 11:12	MDE
Boron - Total	1.21	mg/l	0.10	6010D	30 Sep 20 9:45	MDE
Antimony - Total	0.0042	mg/l	0.0010	6020B	29 Sep 20 14:03	MDE
Arsenic - Total	0.0022	mg/l	0.0020	6020B	29 Sep 20 14:03	MDE
Barium - Total	0.0286	mg/l	0.0020	6020B	29 Sep 20 14:03	MDE
Beryllium - Total	< 0.0005	mg/l	0.0005	6020B	29 Sep 20 14:03	MDE
Cadmium - Total	< 0.0005	mg/l	0.0005	6020B	29 Sep 20 14:03	MDE
Chromium - Total	< 0.002	mg/l	0.0020	6020B	29 Sep 20 14:03	MDE
Cobalt - Total	0.0023	mg/l	0.0020	6020B	29 Sep 20 14:03	MDE
Lead - Total	< 0.0005	mg/l	0.0005	6020B	29 Sep 20 14:03	MDE
Molybdenum - Total	0.0202	mg/l	0.0020	6020B	29 Sep 20 14:03	MDE
Selenium - Total	0.0444	mg/l	0.0050	6020B	29 Sep 20 14:03	MDE
Thallium - Total	< 0.0005	mg/l	0.0005	6020B	30 Sep 20 10:35	MDE

* Holding time exceeded

CC

Approved by:

Claudette K. Carroll

12 OCT 2020

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

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CERTIFICATION: ND # ND-00016



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CERTIFICATE of ANALYSIS - CCR

Todd Peterson
Montana-Dakota Utilities Co.
400 N 4th St
Bismarck ND 58501

Report Date: 9 Oct 20
Lab Number: 20-W3623
Work Order #: 82-2645
Account #: 002800
Date Sampled: 21 Sep 20 12:58
Date Received: 24 Sep 20 7:40
Sampled By: MVTL Field Service

Project Name: MDU Lewis & Clark

PO #: 180534 OP

Sample Description: MW110

Temp at Receipt: 5.3C

Event and Year: September 2020

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	24 Sep 20	HT
pH - Field	7.36	units	NA	SM 4500 H+ B	21 Sep 20 12:58	JSM
pH	* 7.8	units	0.1	SM4500-H+-B-11	24 Sep 20 17:00	SD
Temperature - Field	16.9	Degrees C	NA	SM 2550B	21 Sep 20 12:58	JSM
Conductivity - Field	1124	umhos/cm	1	EPA 120.1	21 Sep 20 12:58	JSM
Fluoride	0.54	mg/l	0.10	SM4500-F-C	25 Sep 20 17:00	HT
Sulfate	204	mg/l	5.00	ASTM D516-11	25 Sep 20 10:30	EMS
Chloride	32.1	mg/l	1.0	SM4500-Cl-E-11	28 Sep 20 8:39	SD
Mercury - Total	< 0.0002	mg/l	0.0002	7470A	29 Sep 20 12:25	MDE
Total Dissolved Solids	759	mg/l	10	USGS I1750-85	25 Sep 20 10:35	HT
Calcium - Total	97.0	mg/l	1.0	6010D	29 Sep 20 11:01	MDE
Lithium - Total	0.045	mg/l	0.020	6010D	1 Oct 20 11:12	MDE
Boron - Total	0.33	mg/l	0.10	6010D	30 Sep 20 9:45	MDE
Antimony - Total	< 0.001	mg/l	0.0010	6020B	29 Sep 20 14:03	MDE
Arsenic - Total	< 0.002	mg/l	0.0020	6020B	29 Sep 20 14:03	MDE
Barium - Total	0.0352	mg/l	0.0020	6020B	29 Sep 20 14:03	MDE
Beryllium - Total	< 0.0005	mg/l	0.0005	6020B	29 Sep 20 14:03	MDE
Cadmium - Total	< 0.0005	mg/l	0.0005	6020B	29 Sep 20 14:03	MDE
Chromium - Total	< 0.002	mg/l	0.0020	6020B	29 Sep 20 14:03	MDE
Cobalt - Total	< 0.002	mg/l	0.0020	6020B	29 Sep 20 14:03	MDE
Lead - Total	< 0.0005	mg/l	0.0005	6020B	29 Sep 20 14:03	MDE
Molybdenum - Total	0.0037	mg/l	0.0020	6020B	29 Sep 20 14:03	MDE
Selenium - Total	< 0.005	mg/l	0.0050	6020B	29 Sep 20 14:03	MDE
Thallium - Total	< 0.0005	mg/l	0.0005	6020B	30 Sep 20 10:35	MDE

* Holding time exceeded

Approved by:

Claudette K Carroll 12 OCT 2020

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

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CERTIFICATION: ND # ND-00016



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CERTIFICATE of ANALYSIS - CCR

Todd Peterson
Montana-Dakota Utilities Co.
400 N 4th St
Bismarck ND 58501

Report Date: 9 Oct 20
Lab Number: 20-W3624
Work Order #: 82-2645
Account #: 002800
Date Sampled: 21 Sep 20 15:25
Date Received: 24 Sep 20 7:40
Sampled By: MVTL Field Service

Project Name: MDU Lewis & Clark

Sample Description: MW119

PO #: 180534 OP

Event and Year: September 2020

Temp at Receipt: 5.3C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	24 Sep 20	HT
pH - Field	7.29	units	NA	SM 4500 H+ B	21 Sep 20 15:25	JSM
pH	* 7.7	units	0.1	SM4500-H+-B-11	24 Sep 20 17:00	SD
Temperature - Field	22.0	Degrees C	NA	SM 2550B	21 Sep 20 15:25	JSM
Conductivity - Field	1195	umhos/cm	1	EPA 120.1	21 Sep 20 15:25	JSM
Fluoride	0.49	mg/l	0.10	SM4500-F-C	25 Sep 20 17:00	HT
Sulfate	210	mg/l	5.00	ASTM D516-11	25 Sep 20 10:30	EMS
Chloride	36.8	mg/l	1.0	SM4500-Cl-E-11	28 Sep 20 8:39	SD
Mercury - Total	< 0.0002	mg/l	0.0002	7470A	29 Sep 20 12:25	MDE
Total Dissolved Solids	805	mg/l	10	USGS I1750-85	25 Sep 20 10:35	HT
Calcium - Total	104	mg/l	1.0	6010D	29 Sep 20 11:01	MDE
Lithium - Total	0.048	mg/l	0.020	6010D	1 Oct 20 11:12	MDE
Boron - Total	0.30	mg/l	0.10	6010D	30 Sep 20 9:45	MDE
Antimony - Total	< 0.001	mg/l	0.0010	6020B	29 Sep 20 14:03	MDE
Arsenic - Total	< 0.002	mg/l	0.0020	6020B	29 Sep 20 14:03	MDE
Barium - Total	0.0356	mg/l	0.0020	6020B	29 Sep 20 14:03	MDE
Beryllium - Total	< 0.0005	mg/l	0.0005	6020B	29 Sep 20 14:03	MDE
Cadmium - Total	< 0.0005	mg/l	0.0005	6020B	29 Sep 20 14:03	MDE
Chromium - Total	< 0.002	mg/l	0.0020	6020B	29 Sep 20 14:03	MDE
Cobalt - Total	< 0.002	mg/l	0.0020	6020B	29 Sep 20 14:03	MDE
Lead - Total	< 0.0005	mg/l	0.0005	6020B	29 Sep 20 14:03	MDE
Molybdenum - Total	0.0037	mg/l	0.0020	6020B	29 Sep 20 14:03	MDE
Selenium - Total	< 0.005	mg/l	0.0050	6020B	29 Sep 20 14:03	MDE
Thallium - Total	< 0.0005	mg/l	0.0005	6020B	30 Sep 20 10:35	MDE

* Holding time exceeded

Approved by:

CC
Claudette K. Carroll 12 OCT 2020

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

The reporting limit was elevated for any analyte requiring a dilution as coded below:

@ = Due to sample matrix # = Due to concentration of other analytes
! = Due to sample quantity † = Due to internal standard response

CERTIFICATION: ND # ND-00016



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CERTIFICATE of ANALYSIS - CCR

Todd Peterson
Montana-Dakota Utilities Co.
400 N 4th St
Bismarck ND 58501

Report Date: 9 Oct 20
Lab Number: 20-W3625
Work Order #: 82-2645
Account #: 002800
Date Sampled: 22 Sep 20 13:25
Date Received: 24 Sep 20 7:40
Sampled By: MVTL Field Service

Project Name: MDU Lewis & Clark

PO #: 180534 OP

Sample Description: MW111

Temp at Receipt: 5.3C

Event and Year: September 2020

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	24 Sep 20	HT
pH - Field	7.12	units	NA	SM 4500 H+ B	22 Sep 20 13:25	JSM
pH	* 7.6	units	0.1	SM4500-H+-B-11	24 Sep 20 17:00	SD
Temperature - Field	17.2	Degrees C	NA	SM 2550B	22 Sep 20 13:25	JSM
Conductivity - Field	3846	umhos/cm	1	EPA 120.1	22 Sep 20 13:25	JSM
Fluoride	2.06	mg/l	0.10	SM4500-F-C	25 Sep 20 17:00	HT
Sulfate	1970	mg/l	5.00	ASTM D516-11	25 Sep 20 10:30	EMS
Chloride	35.8	mg/l	1.0	SM4500-Cl-E-11	28 Sep 20 8:39	SD
Mercury - Total	< 0.0002	mg/l	0.0002	7470A	29 Sep 20 12:25	MDE
Total Dissolved Solids	3840	mg/l	10	USGS 11750-85	25 Sep 20 10:35	HT
Calcium - Total	193	mg/l	1.0	6010D	29 Sep 20 11:01	MDE
Lithium - Total	0.227	mg/l	0.020	6010D	1 Oct 20 11:12	MDE
Boron - Total	8.04	mg/l	0.10	6010D	30 Sep 20 9:45	MDE
Antimony - Total	< 0.001	mg/l	0.0010	6020B	29 Sep 20 14:03	MDE
Arsenic - Total	< 0.002	mg/l	0.0020	6020B	29 Sep 20 14:03	MDE
Barium - Total	0.0240	mg/l	0.0020	6020B	29 Sep 20 14:03	MDE
Beryllium - Total	< 0.0005	mg/l	0.0005	6020B	29 Sep 20 14:03	MDE
Cadmium - Total	< 0.0005	mg/l	0.0005	6020B	29 Sep 20 14:03	MDE
Chromium - Total	0.0061	mg/l	0.0020	6020B	29 Sep 20 14:03	MDE
Cobalt - Total	< 0.002	mg/l	0.0020	6020B	29 Sep 20 14:03	MDE
Lead - Total	< 0.0005	mg/l	0.0005	6020B	29 Sep 20 14:03	MDE
Molybdenum - Total	0.0534	mg/l	0.0020	6020B	29 Sep 20 14:03	MDE
Selenium - Total	0.0634	mg/l	0.0050	6020B	29 Sep 20 14:03	MDE
Thallium - Total	< 0.0005	mg/l	0.0005	6020B	30 Sep 20 10:35	MDE

* Holding time exceeded

Approved by:

Claudette K Carroll ^{CC} 12 OCT 2020

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

The reporting limit was elevated for any analyte requiring a dilution as coded below:
@ = Due to sample matrix # = Due to concentration of other analytes
! = Due to sample quantity + = Due to internal standard response

CERTIFICATION: ND # ND-00016



CERTIFICATE of ANALYSIS - CCR

Todd Peterson
Montana-Dakota Utilities Co.
400 N 4th St
Bismarck ND 58501

Report Date: 9 Oct 20
Lab Number: 20-W3626
Work Order #: 82-2645
Account #: 002800
Date Sampled: 22 Sep 20 11:32
Date Received: 24 Sep 20 7:40
Sampled By: MVTL Field Service

Project Name: MDU Lewis & Clark

PO #: 180534 OP

Sample Description: MW117

Temp at Receipt: 5.3C

Event and Year: September 2020

Table with 6 columns: As Received Result, Method RL, Method Reference, Date Analyzed, Analyst. Rows include Metal Digestion, pH, Temperature, Conductivity, Fluoride, Sulfate, Chloride, Mercury, Total Dissolved Solids, Calcium, Lithium, Boron, Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium, Cobalt, Lead, Molybdenum, Selenium, and Thallium.

* Holding time exceeded

Approved by:

Claudette K Carroll 12 OCT 2020

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

The reporting limit was elevated for any analyte requiring a dilution as coded below:

- @ = Due to sample matrix
! = Due to sample quantity
= Due to concentration of other analytes
+ = Due to internal standard response

CERTIFICATION: ND # ND-00016



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.mvttl.com



Page: 8 of 9

CERTIFICATE of ANALYSIS - CCR

Todd Peterson
Montana-Dakota Utilities Co.
400 N 4th St
Bismarck ND 58501

Report Date: 9 Oct 20
Lab Number: 20-W3627
Work Order #: 82-2645
Account #: 002800
Date Sampled: 22 Sep 20 16:30
Date Received: 24 Sep 20 7:40
Sampled By: MVTL Field Service

Project Name: MDU Lewis & Clark

Sample Description: MW118

PO #: 180534 OP

Event and Year: September 2020

Temp at Receipt: 5.3C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	24 Sep 20	HT
pH - Field	7.11	units	NA	SM 4500 H+ B	22 Sep 20 16:30	JSM
pH	* 7.7	units	0.1	SM4500-H+-B-11	24 Sep 20 17:00	SD
Temperature - Field	17.2	Degrees C	NA	SM 2550B	22 Sep 20 16:30	JSM
Conductivity - Field	1638	umhos/cm	1	EPA 120.1	22 Sep 20 16:30	JSM
Fluoride	1.14	mg/l	0.10	SM4500-F-C	25 Sep 20 17:00	HT
Sulfate	571	mg/l	5.00	ASTM D516-11	25 Sep 20 10:30	EMS
Chloride	22.2	mg/l	1.0	SM4500-Cl-E-11	28 Sep 20 8:39	SD
Mercury - Total	< 0.0002	mg/l	0.0002	7470A	29 Sep 20 12:25	MDE
Total Dissolved Solids	1310	mg/l	10	USGS I1750-85	25 Sep 20 10:35	HT
Calcium - Total	96.9	mg/l	1.0	6010D	29 Sep 20 11:01	MDE
Lithium - Total	0.095	mg/l	0.020	6010D	1 Oct 20 11:12	MDE
Boron - Total	1.74	mg/l	0.10	6010D	30 Sep 20 9:45	MDE
Antimony - Total	< 0.001	mg/l	0.0010	6020B	29 Sep 20 14:03	MDE
Arsenic - Total	< 0.002	mg/l	0.0020	6020B	29 Sep 20 14:03	MDE
Barium - Total	0.0232	mg/l	0.0020	6020B	29 Sep 20 14:03	MDE
Beryllium - Total	< 0.0005	mg/l	0.0005	6020B	29 Sep 20 14:03	MDE
Cadmium - Total	< 0.0005	mg/l	0.0005	6020B	29 Sep 20 14:03	MDE
Chromium - Total	< 0.002	mg/l	0.0020	6020B	29 Sep 20 14:03	MDE
Cobalt - Total	< 0.002	mg/l	0.0020	6020B	29 Sep 20 14:03	MDE
Lead - Total	0.0024	mg/l	0.0005	6020B	29 Sep 20 14:03	MDE
Molybdenum - Total	0.0393	mg/l	0.0020	6020B	29 Sep 20 14:03	MDE
Selenium - Total	0.0689	mg/l	0.0050	6020B	29 Sep 20 14:03	MDE
Thallium - Total	< 0.0005	mg/l	0.0005	6020B	30 Sep 20 10:35	MDE

* Holding time exceeded

Approved by: Claudette K. Carroll 12 OCT 2020

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

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@ = Due to sample matrix # = Due to concentration of other analytes
! = Due to sample quantity + = Due to internal standard response

CERTIFICATION: ND # ND-00016



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CERTIFICATE of ANALYSIS - CCR

Todd Peterson
Montana-Dakota Utilities Co.
400 N 4th St
Bismarck ND 58501

Report Date: 9 Oct 20
Lab Number: 20-W3628
Work Order #: 82-2645
Account #: 002800
Date Sampled: 22 Sep 20 10:35
Date Received: 24 Sep 20 7:40
Sampled By: MVTL Field Service

Project Name: MDU Lewis & Clark

PO #: 180534 OP

Sample Description: MW120

Temp at Receipt: 5.3C

Event and Year: September 2020

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	24 Sep 20	HT
pH - Field	6.70	units	NA	SM 4500 H+ B	22 Sep 20 10:35	JSM
pH	* 7.6	units	0.1	SM4500-H+-B-11	24 Sep 20 18:00	SD
Temperature - Field	12.5	Degrees C	NA	SM 2550B	22 Sep 20 10:35	JSM
Conductivity - Field	5828	umhos/cm	1	EPA 120.1	22 Sep 20 10:35	JSM
Fluoride	0.41	mg/l	0.10	SM4500-F-C	25 Sep 20 17:00	HT
Sulfate	4180	mg/l	5.00	ASTM D516-11	25 Sep 20 10:30	EMS
Chloride	60.4	mg/l	1.0	SM4500-Cl-E-11	28 Sep 20 8:39	SD
Mercury - Total	< 0.0002	mg/l	0.0002	7470A	29 Sep 20 12:25	MDE
Total Dissolved Solids	6880	mg/l	10	USGS I1750-85	25 Sep 20 10:35	HT
Calcium - Total	456	mg/l	1.0	6010D	29 Sep 20 12:01	MDE
Lithium - Total	0.135	mg/l	0.020	6010D	1 Oct 20 11:12	MDE
Boron - Total	10.1	mg/l	0.10	6010D	30 Sep 20 9:45	MDE
Antimony - Total	< 0.001	mg/l	0.0010	6020B	29 Sep 20 14:03	MDE
Arsenic - Total	< 0.002	mg/l	0.0020	6020B	29 Sep 20 14:03	MDE
Barium - Total	0.0226	mg/l	0.0020	6020B	29 Sep 20 14:03	MDE
Beryllium - Total	< 0.0005	mg/l	0.0005	6020B	29 Sep 20 14:03	MDE
Cadmium - Total	< 0.0005	mg/l	0.0005	6020B	29 Sep 20 14:03	MDE
Chromium - Total	0.0032	mg/l	0.0020	6020B	29 Sep 20 14:03	MDE
Cobalt - Total	< 0.002	mg/l	0.0020	6020B	29 Sep 20 14:03	MDE
Lead - Total	0.0013	mg/l	0.0005	6020B	29 Sep 20 14:03	MDE
Molybdenum - Total	0.0039	mg/l	0.0020	6020B	29 Sep 20 14:03	MDE
Selenium - Total	< 0.005	mg/l	0.0050	6020B	29 Sep 20 14:03	MDE
Thallium - Total	< 0.0005	mg/l	0.0005	6020B	30 Sep 20 10:35	MDE

* Holding time exceeded

Approved by: Claudette K. Carroll ^{CC} 12 OCT 2020

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

The reporting limit was elevated for any analyte requiring a dilution as coded below:
@ = Due to sample matrix # = Due to concentration of other analytes
! = Due to sample quantity + = Due to internal standard response

CERTIFICATION: ND # ND-00016



Field Datasheet

Groundwater Assessment

Company: MDU Lewis & Clark
 Event: September 2020
 Sample ID: 103
 Sampling Personal: J. [Signature]

2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

Weather Conditions: Temp: 60 °F Wind: S @ 5-10 Precip: Sunny / Partly Cloudy / Cloudy

WELL INFORMATION

Well Locked?	YES	NO	
Well Labeled?	YES	NO	
Casing Strait?	YES	NO	
Grout Seal Intact?	YES	NO	<u>Not Visible</u>
Repairs Necessary?			
Casing Diameter:	<u>2"</u>		
Water Level Before Purge:	<u>10.48</u>	ft	
Total Depth of Well:	<u>—</u>	ft	
Well Volume:	<u>—</u>	liters	
Depth to Top of Pump:	<u>—</u>	ft	
Water Level After Sample:	<u>10.49</u>	ft	
Measurement Method:	<u>Electric Water Level Indicator</u>		

SAMPLING INFORMATION

Purging Method:	<u>Bladder</u>
Sampling Method:	<u>Bladder</u>
Dedicated Equipment?	YES <u>NO</u>
Duplicate Sample?	YES <u>NO</u>
Duplicate Sample ID:	<u>—</u>

Control Settings:	
Purge: <u>5</u>	Sec.
Recover: <u>55</u>	Sec.
PSI: <u>20</u>	

Bottle List:	
1 Liter Raw	4- 1L Nitric
500mL Nitric	
500mL Nitric (filtered)	
250mL Sulfuric	

FIELD READINGS

Stabilization Parameters (3 Consecutive)		Temp. (°C)	Spec. Cond.	pH	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Water Level (ft)	Pumping Rate mL/Min	mL Removed	Appearance or Comment Clarity, Color, Odor, Ect.
Purge Date	Time	±0.5°	±5%	±0.1	±10%	±10					clear, slightly turbid, turbid
22 Sept 2020	0745	Start of Well Purge									
	0750	12.44	1841	7.42	1.56	242.1	104.23	10.48	100.0	500.0	Clear
	0820	13.39	1374	7.29	0.15	149.7	12.84	10.48	100.0	300.0	Clear
	0840	13.08	1352	7.30	0.14	89.2	8.60	10.48	100.0	2000.0	Clear
	0900	13.30	1346	7.30	0.16	71.9	4.48	10.48	100.0	2000.0	Clear
	0905	13.29	1347	7.30	0.16	72.6	4.17	10.49	100.0	500.0	Clear
	0910	13.38	1347	7.30	0.15	75.3	4.29	10.49	100.0	500.0	Clear

Well Stabilized? YES NO

Total Volume Purged: 8500.0 mL

Sample Date	Time	Temp. (°C)	Spec. Cond.	pH	Turbidity (NTU)	Appearance or Comment Clarity, Color, Odor, Ect.
22 Sept 2020	0910	13.38	1347	7.30	4.29	Clear

Comments:

Field Blank 22 Sept 2020 @ 0800



Field Datasheet

Groundwater Assessment

2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

Company: MDU Lewis & Clark

Event: September 2020

Sample ID: 110

Sampling Personal: Jerry [Signature]

Weather Conditions: Temp: 70 °F Wind: S @ 5-10 Precip: Sunny / Partly Cloudy / Cloudy

WELL INFORMATION

Well Locked?	YES	NO	
Well Labeled?	YES	NO	
Casing Strait?	YES	NO	
Grout Seal Intact?	YES	NO	Not Visible
Repairs Necessary?			
Casing Diameter:	<u>2"</u>		
Water Level Before Purge:	<u>8.96</u>		ft
Total Depth of Well:	<u>16.85</u>		ft
Well Volume:	<u>—</u>		liters
Depth to Top of Pump:	<u>—</u>		ft
Water Level After Sample:	<u>9.06</u>		ft
Measurement Method:	<u>Electric Water Level Indicator</u>		

SAMPLING INFORMATION

Purging Method:	Bladder
Sampling Method:	Bladder
Dedicated Equipment?	YES NO
Duplicate Sample?	YES NO
Duplicate Sample ID:	<u>—</u>

Control Settings:	
Purge: <u>3</u>	Sec.
Recover: <u>7</u>	Sec.
PSI: <u>20</u>	

Bottle List:	
1 Liter Raw	4- 1L Nitric
500mL Nitric	
500mL Nitric (filtered)	
250mL Sulfuric	

FIELD READINGS

Stabilization Parameters (3 Consecutive)		Temp. (°C)	Spec. Cond.	pH	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Water Level (ft)	Pumping Rate mL/Min	mL Removed	Appearance or Comment Clarity, Color, Odor, Ect.
Purge Date	Time	±0.5°	±5%	±0.1	±10%	±10					clear, slightly turbid, turbid
21 Sep 2020											
	1143	Start of Well Purge									
	1148	16.49	1129	7.36	2.27	141.3	52.46	9.01	100.0	500.0	Clear
	1218	16.35	1124	7.35	1.85	179.7	11.30	9.05	100.0	3000.0	Clear
	1248	16.72	1123	7.35	1.88	182.9	4.97	9.05	100.0	3000.0	Clear
	1253	16.80	1123	7.35	1.88	189.3	4.82	9.06	100.0	500.0	Clear
	1258	16.87	1124	7.36	1.88	185.0	4.91	9.06	100.0	500.0	Clear

Well Stabilized? YES ~~NO~~

Total Volume Purged: 7500.0 mL

Sample Date	Time	Temp. (°C)	Spec. Cond.	pH		Turbidity (NTU)		Appearance or Comment Clarity, Color, Odor, Ect.
21 Sep 2020	1258	16.87	1124	7.36		4.91		Clear

Comments:



Field Datasheet

Groundwater Assessment

2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

Company: MDU Lewis & Clark

Event: September 2020

Sample ID:

Sampling Personal: *Jim Khan*

Weather Conditions: Temp: 75°F Wind: S @ 5-10 Precip: Sunny / ~~Partly~~ Cloudy / Cloudy

WELL INFORMATION

Well Locked?	YES NO
Well Labeled?	YES NO
Casing Strait?	YES NO
Grout Seal Intact?	YES NO
Repairs Necessary?	Not Visible
Casing Diameter:	2"
Water Level Before Purge:	8.82 ft
Total Depth of Well:	ft
Well Volume:	liters
Depth to Top of Pump:	ft
Water Level After Sample:	8.92 ft
Measurement Method:	Electric Water Level Indicator

SAMPLING INFORMATION

Purging Method:	Bladder	Control Settings:
Sampling Method:	Bladder	Purge: 5 Sec.
Dedicated Equipment?	YES NO	Recover: 35 Sec.
Duplicate Sample?	YES NO	PSI: 20
Duplicate Sample ID:		
Bottle List:		
1 Liter Raw	4- 1L Nitric	
500mL Nitric		
500mL Nitric (filtered)		
250mL Sulfuric		

FIELD READINGS

Stabilization Parameters		Temp. (°C)	Spec. Cond. (±5%)	pH (±0.1)	DO (mg/L) (±10%)	ORP (mV) (±10)	Turbidity (NTU)	Water Level (ft)	Pumping Rate (mL/Min)	mL Removed	Appearance or Comment
(3 Consecutive)		±0.5°									Clarity, Color, Odor, Ect.
Purge Date	Time										clear, slightly turbid, turbid
21 Sept 2020	1400	Start of Well Purge									
	1405	18.18	1189	7.29	1.61	183.3	28.59	8.87	100.0	500.0	Clear
	1435	19.48	1186	7.29	0.80	181.1	37.66	8.89	100.0	3000.0	Clear
	1455	21.77	1197	7.29	0.88	182.1	11.93	8.89	100.0	2000.0	Clear
	1515	21.83	1197	7.29	0.92	191.2	4.87	8.89	100.0	2000.0	Clear
	1520	21.96	1202	7.29	0.94	192.5	3.05	8.89	100.0	500.0	Clear
	1525	21.95	1195	7.29	0.97	186.2	2.93	8.88	100.0	500.0	Clear

Well Stabilized? YES NO

Total Volume Purged: 8500.0 mL

Sample Date	Time	Temp. (°C)	Spec. Cond.	pH		Turbidity (NTU)				Appearance or Comment
										Clarity, Color, Odor, Ect.
21 Sept 2020	1525	21.95	1195	7.29		2.93				Clear

Comments:



Field Datasheet

Groundwater Assessment

Company: MDU Lewis & Clark

Event: September 2020

Sample ID: 111

Sampling Personal: Jay

2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

Weather Conditions: Temp: 65°F Wind: S @ 5-10 Precip: Sunny / Partly Cloudy / Cloudy

WELL INFORMATION

Well Locked?	YES	NO
Well Labeled?	YES	NO
Casing Strait?	YES	NO
Grout Seal Intact?	YES	NO
Repairs Necessary?		<u>Not Visible</u>
Casing Diameter:	<u>2"</u>	
Water Level Before Purge:	<u>7.83</u>	ft
Total Depth of Well:		ft
Well Volume:		liters
Depth to Top of Pump:		ft
Water Level After Sample:	<u>7.91</u>	ft
Measurement Method:	<u>Electric Water Level Indicator</u>	

SAMPLING INFORMATION

Purging Method:	<u>Bladder</u>
Sampling Method:	<u>Bladder</u>
Dedicated Equipment?	YES NO

Control Settings:	
Purge:	<u>5</u> Sec.
Recover:	<u>55</u> Sec.
PSI:	<u>20</u>

Duplicate Sample?	YES <u>NO</u>
Duplicate Sample ID:	<u>Dup 1</u>

Bottle List:	
1 Liter Raw	4- 1L Nitric
500mL Nitric	
500mL Nitric (filtered)	
250mL Sulfuric	

FIELD READINGS

Stabilization Parameters (3 Consecutive)		Temp. (°C)	Spec. Cond.	pH	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Water Level (ft)	Pumping Rate mL/Min	mL Removed	Appearance or Comment Clarity, Color, Odor, Ect.
Purge Date	Time	±0.5°	±5%	±0.1	±10%	±10					clear, slightly turbid, turbid
<u>22 Sept 2020</u>	<u>1210</u>	<u>Start of Well Purge</u>									
	<u>1215</u>	<u>16.93</u>	<u>4416</u>	<u>7.00</u>	<u>0.68</u>	<u>221.9</u>	<u>19.10</u>	<u>7.88</u>	<u>100.0</u>	<u>500.0</u>	<u>Clear</u>
	<u>1245</u>	<u>16.87</u>	<u>4153</u>	<u>7.04</u>	<u>0.49</u>	<u>186.1</u>	<u>17.90</u>	<u>7.88</u>	<u>100.0</u>	<u>3000.0</u>	<u>Clear</u>
	<u>1305</u>	<u>17.06</u>	<u>3917</u>	<u>7.10</u>	<u>1.57</u>	<u>122.0</u>	<u>8.69</u>	<u>7.88</u>	<u>100.0</u>	<u>2000.0</u>	<u>Clear</u>
	<u>1315</u>	<u>16.80</u>	<u>3874</u>	<u>7.12</u>	<u>1.87</u>	<u>78.1</u>	<u>4.98</u>	<u>7.88</u>	<u>100.0</u>	<u>1000.0</u>	<u>Clear</u>
	<u>1320</u>	<u>17.00</u>	<u>3861</u>	<u>7.12</u>	<u>1.93</u>	<u>72.3</u>	<u>3.53</u>	<u>7.89</u>	<u>100.0</u>	<u>500.0</u>	<u>Clear</u>
	<u>1325</u>	<u>17.16</u>	<u>3846</u>	<u>7.12</u>	<u>2.04</u>	<u>70.1</u>	<u>2.65</u>	<u>7.89</u>	<u>100.0</u>	<u>500.0</u>	<u>Clear</u>

Well Stabilized? YES ~~NO~~

Total Volume Purged: 7500.0 mL

Sample Date	Time	Temp. (°C)	Spec. Cond.	pH		Turbidity (NTU)			Appearance or Comment Clarity, Color, Odor, Ect.
<u>22 Sept 2020</u>	<u>1325</u>	<u>17.16</u>	<u>3846</u>	<u>7.12</u>		<u>2.65</u>			<u>Clear</u>

Comments:



Field Datasheet

Groundwater Assessment

2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

Company: MDU Lewis & Clark

Event: September 2020

Sample ID: _____

Sampling Personal: J. [Signature]

Weather Conditions: _____ Temp: 60 °F Wind: S @ 5-10 Precip: Sunny / Partly Cloudy / Cloudy

WELL INFORMATION

Well Locked?	<u>YES</u>	<u>NO</u>
Well Labeled?	<u>YES</u>	<u>NO</u>
Casing Strait?	<u>YES</u>	<u>NO</u>
Grout Seal Intact?	<u>YES</u>	<u>NO</u>
Repairs Necessary?		<u>Not Visible</u>
Casing Diameter:	<u>2"</u>	
Water Level Before Purge:	<u>5.80</u>	ft
Total Depth of Well:	<u>11.51</u>	ft
Well Volume:	<u>3.5</u>	liters
Depth to Top of Pump:	<u>9.48</u>	ft
Water Level After Sample:	<u>Below Pump</u>	ft
Measurement Method:	<u>Electric Water Level Indicator</u>	

SAMPLING INFORMATION

Purging Method:	<u>Bladder</u>
Sampling Method:	<u>Bladder</u>
Dedicated Equipment?	<u>YES</u> <u>NO</u>
Duplicate Sample?	<u>YES</u> <u>NO</u>
Duplicate Sample ID:	<u> </u>

Control Settings:	
Purge: <u>5</u>	Sec.
Recover: <u>55</u>	Sec.
PSI: <u>20</u>	

Bottle List:	
1 Liter Raw	4- 1L Nitric
500mL Nitric	
500mL Nitric (filtered)	
250mL Sulfuric	

FIELD READINGS

Stabilization Parameters (3 Consecutive)		Temp. (°C)	Spec. Cond.	pH	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Water Level (ft)	Pumping Rate mL/Min	mL Removed	Appearance or Comment Clarity, Color, Odor, Ect.
Purge Date	Time	±0.5°	±5%	±0.1	±10%	±10					clear, slightly turbid, turbid
<u>21 Sept 2020</u>	<u>1640</u>	<u>Start of Well Purge</u>									
	<u>1645</u>	<u>16.15</u>	<u>7384</u>	<u>7.05</u>	<u>7.69</u>	<u>267.2</u>	<u>18.77</u>	<u>6.65</u>	<u>150.0</u>	<u>750.0</u>	<u>Clear</u>
	<u>1700</u>	<u>16.14</u>	<u>7432</u>	<u>7.05</u>	<u>8.01</u>	<u>232.6</u>	<u>24.06</u>	<u>9.00</u>	<u>150.0</u>	<u>2250.0</u>	<u>Clear</u>
	<u>1715</u>	<u>16.38</u>	<u>7458</u>	<u>7.13</u>	<u>7.19</u>	<u>267.8</u>	<u>5.30</u>	<u>Below Pump</u>	<u>150.0</u>	<u>2250.0</u>	<u>Clear</u>
		<u>Purged</u>	<u>Dry</u>								
<u>22 Sept 2020</u>	<u>1127</u>	<u>Purged well for 5 min to clear line</u>									
	<u>1132</u>	<u>16.68</u>	<u>7066</u>	<u>6.99</u>	<u>6.47</u>	<u>237.4</u>	<u>2.79</u>	<u>6.38</u>	<u>100.0</u>	<u>500.0</u>	<u>Clear</u>

Well Stabilized? YES NO

Total Volume Purged: 5750.0 mL

Sample Date	Time	Temp. (°C)	Spec. Cond.	pH	Turbidity (NTU)	Appearance or Comment Clarity, Color, Odor, Ect.
<u>22 Sept 2020</u>	<u>1132</u>	<u>16.68</u>	<u>7066</u>	<u>6.99</u>	<u>2.79</u>	<u>Clear</u>

Comments: _____



Field Datasheet

Groundwater Assessment

2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

Company: MDU Lewis & Clark

Event: September 2020

Sample ID: 118

Sampling Personal: [Signature]

Weather Conditions: Temp: 80°F Wind: S @ 5-10 Precip: Sunny / Partly Cloudy / Cloudy

WELL INFORMATION

Well Locked?	<u>YES</u>	<u>NO</u>
Well Labeled?	<u>YES</u>	<u>NO</u>
Casing Strait?	<u>YES</u>	<u>NO</u>
Grout Seal Intact?	<u>YES</u>	<u>NO</u>
Repairs Necessary?	<u>Not Visible</u>	
Casing Diameter:	<u>2"</u>	
Water Level Before Purge:	<u>8.38</u>	ft
Total Depth of Well:	<u>—</u>	ft
Well Volume:	<u>—</u>	liters
Depth to Top of Pump:	<u>—</u>	ft
Water Level After Sample:	<u>8.50</u>	ft
Measurement Method:	<u>Electric Water Level Indicator</u>	

SAMPLING INFORMATION

Purging Method:	<u>Bladder</u>
Sampling Method:	<u>Bladder</u>
Dedicated Equipment?	<u>YES</u> <u>NO</u>
Duplicate Sample?	<u>YES</u> <u>NO</u>
Duplicate Sample ID:	<u>—</u>
Bottle List:	
1 Liter Raw	4- 1L Nitric
500mL Nitric	
500mL Nitric (filtered)	
250mL Sulfuric	

Control Settings:	
Purge: <u>5</u>	Sec.
Recover: <u>55</u>	Sec.
PSI: <u>20</u>	

FIELD READINGS

Stabilization Parameters (3 Consecutive)		Temp. (°C)	Spec. Cond.	pH	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Water Level (ft)	Pumping Rate mL/Min	mL Removed	Appearance or Comment
Purge Date	Time	±0.5°	±5%	±0.1	±10%	±10					Clarity, Color, Odor, Ect.
											clear, slightly turbid, turbid
<u>22 Sept 2020</u>	<u>1540</u>	<u>Start of Well Purge</u>									
	<u>1545</u>	<u>21.92</u>	<u>1795</u>	<u>7.27</u>	<u>3.81</u>	<u>201.7</u>	<u>181.35</u>	<u>8.44</u>	<u>100.0</u>	<u>500.0</u>	<u>Clear</u>
	<u>1615</u>	<u>17.25</u>	<u>1569</u>	<u>7.09</u>	<u>4.03</u>	<u>201.0</u>	<u>2.66</u>	<u>8.46</u>	<u>100.0</u>	<u>3000.0</u>	<u>Clear</u>
	<u>1620</u>	<u>17.15</u>	<u>1613</u>	<u>7.09</u>	<u>3.91</u>	<u>199.0</u>	<u>1.51</u>	<u>8.46</u>	<u>100.0</u>	<u>500.0</u>	<u>Clear</u>
	<u>1625</u>	<u>17.15</u>	<u>1630</u>	<u>7.10</u>	<u>3.87</u>	<u>195.8</u>	<u>1.89</u>	<u>8.47</u>	<u>100.0</u>	<u>500.0</u>	<u>Clear</u>
	<u>1630</u>	<u>17.19</u>	<u>1638</u>	<u>7.11</u>	<u>3.85</u>	<u>191.4</u>	<u>1.32</u>	<u>8.47</u>	<u>100.0</u>	<u>500.0</u>	<u>Clear</u>

Well Stabilized? YES NO

Total Volume Purged: 5000.0 mL

Sample Date	Time	Temp. (°C)	Spec. Cond.	pH			Turbidity (NTU)				Appearance or Comment
											Clarity, Color, Odor, Ect.
<u>22 Sept 2020</u>	<u>1630</u>	<u>17.19</u>	<u>1638</u>	<u>7.11</u>			<u>1.32</u>				<u>Clear</u>

Comments:



Field Datasheet

Groundwater Assessment

2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

Company: MDU Lewis & Clark

Event: September 2020

Sample ID: 120

Sampling Personal: Jerry [Signature]

Weather Conditions: Temp: 65°F Wind: S @ 5-10 Precip: Sunny / Partly Cloudy / Cloudy

WELL INFORMATION

Well Locked?	YES	NO
Well Labeled?	<u>YES</u>	NO
Casing Strait?	<u>YES</u>	NO
Grout Seal Intact?	YES	NO
Repairs Necessary?		<u>Not Visible</u>
Casing Diameter:	<u>2"</u>	
Water Level Before Purge:	<u>14.41</u>	ft
Total Depth of Well:	<u>—</u>	ft
Well Volume:	<u>—</u>	liters
Depth to Top of Pump:	<u>—</u>	ft
Water Level After Sample:	<u>14.80</u>	ft
Measurement Method:	<u>Electric Water Level Indicator</u>	

SAMPLING INFORMATION

Purging Method:	<u>Bladder</u>	Control Settings:
Sampling Method:	<u>Bladder</u>	Purge: <u>5</u> Sec.
Dedicated Equipment?	YES <u>NO</u>	Recover: <u>55</u> Sec.
Duplicate Sample?	YES <u>NO</u>	PSI: <u>20</u>
Duplicate Sample ID:	<u>—</u>	
Bottle List:		
1 Liter Raw	4- 1L Nitric	
500mL Nitric		
500mL Nitric (filtered)		
250mL Sulfuric		

FIELD READINGS

Stabilization Parameters (3 Consecutive)		Temp. (°C)	Spec. Cond.	pH	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Water Level (ft)	Pumping Rate (mL/Min)	mL Removed	Appearance or Comment
Purge Date	Time	±0.5°	±5%	±0.1	±10%	±10		(ft)			Clarity, Color, Odor, Ect.
<u>22 Sept 2020</u>	<u>1000</u>	<u>Start of Well Purge</u>									
	<u>1005</u>	<u>11.75</u>	<u>6099</u>	<u>6.70</u>	<u>0.44</u>	<u>212.1</u>	<u>0.84</u>	<u>14.56</u>	<u>100.0</u>	<u>500.0</u>	<u>Clear</u>
	<u>1015</u>	<u>12.13</u>	<u>5562</u>	<u>6.70</u>	<u>0.64</u>	<u>156.8</u>	<u>1.13</u>	<u>14.65</u>	<u>100.0</u>	<u>1000.0</u>	<u>Clear</u>
	<u>1020</u>	<u>12.22</u>	<u>5535</u>	<u>6.70</u>	<u>0.73</u>	<u>93.4</u>	<u>0.75</u>	<u>14.68</u>	<u>100.0</u>	<u>500.0</u>	<u>Clear</u>
	<u>1025</u>	<u>12.34</u>	<u>5620</u>	<u>6.70</u>	<u>0.65</u>	<u>66.0</u>	<u>0.24</u>	<u>14.70</u>	<u>100.0</u>	<u>500.0</u>	<u>Clear</u>
	<u>1030</u>	<u>12.48</u>	<u>5686</u>	<u>6.70</u>	<u>0.62</u>	<u>59.4</u>	<u>0.19</u>	<u>14.71</u>	<u>100.0</u>	<u>500.0</u>	<u>Clear</u>
	<u>1035</u>	<u>12.49</u>	<u>5828</u>	<u>6.70</u>	<u>0.62</u>	<u>57.3</u>	<u>0.21</u>	<u>14.73</u>	<u>100.0</u>	<u>500.0</u>	<u>Clear</u>

Well Stabilized? YES NO

Total Volume Purged: 3500.0 mL

Sample Date	Time	Temp. (°C)	Spec. Cond.	pH			Turbidity (NTU)				Appearance or Comment
											Clarity, Color, Odor, Ect.
<u>22 Sept 2020</u>	<u>1035</u>	<u>12.49</u>	<u>5828</u>	<u>6.70</u>			<u>0.21</u>				<u>Clear</u>

Comments:



Field Datasheet

Surface water Assessment

2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

Company: MDU Lewis & Clark

Event: September 2020

Sample ID: _____

Sampling Personal: Jerry [Signature]

Weather Conditions: _____ Temp: 60 °F Wind: S @ 5-10 Precip: Sunny / Partly Cloudy / Cloudy

Well ID	Date	Time	Casing Diameter	Water Level (ft)	Comments
MW101	22 Sept 2020	0952	2"	9.06	
MW105	22 Sept 2020	1730	2"	8.75	
MW106	22 Sept 2020	1536	2"	9.44	
MW107	22 Sept 2020	0954	2"	4.38	
MW108	22 Sept 2020	1203	2"	16.03	
MW116	22 Sept 2020	1201	2"	11.82	



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Quality Control Report

Lab IDs: 20-W3620 to 20-W3628

Project: MDU Lewis & Clark

Work Order: 202082-2645

Analyte	LCS Spike Amt	LCS Rec %	LCS % Rec Limits	Matrix Spike Amt	Matrix Spike ID	Matrix Spike Orig Result	Matrix Spike Result	Matrix Spike Rec %	Matrix Spike % Rec Limits	MSD/ Dup Orig Result	MSD/ Dup Result	MSD Rec %	MSD/ Dup RPD	MSD/ Dup RPD Limit (<)	Known Rec (%)	Known % Rec Limits	Method Blank
Antimony - Total mg/l	0.1000	102	80-120	0.400	20W3529q	0.0037	0.3928	97	75-125	0.3928	0.4134	102	5.1	20	-	-	< 0.001
				0.400	20W3627q	< 0.001	0.3962	99	75-125	0.3962	0.3990	100	0.7	20	-	-	< 0.001
				0.400	20W3646q	< 0.001	0.4056	101	75-125	0.4056	0.4124	103	1.7	20	-	-	< 0.001
Arsenic - Total mg/l	0.1000	96	80-120	0.400	20W3529q	0.0039	0.3810	94	75-125	0.3810	0.3982	99	4.4	20	-	-	< 0.002
				0.400	20W3627q	< 0.002	0.3876	97	75-125	0.3876	0.3874	97	0.1	20	-	-	< 0.002
				0.400	20W3646q	0.0026	0.3956	98	75-125	0.3956	0.4000	99	1.1	20	-	-	< 0.002
Barium - Total mg/l	0.1000	96	80-120	0.400	20W3529q	0.2434	0.5874	86	75-125	0.5874	0.6052	90	3.0	20	-	-	< 0.002
				0.400	20W3627q	0.0232	0.4074	96	75-125	0.4074	0.3964	93	2.7	20	-	-	< 0.002
				0.400	20W3646q	0.0660	0.4472	95	75-125	0.4472	0.4608	99	3.0	20	-	-	< 0.002
Beryllium - Total mg/l	0.1000	96	80-120	0.400	20W3529q	< 0.0005	0.3708	93	75-125	0.3708	0.3946	99	6.2	20	-	-	< 0.0005
				0.400	20W3627q	< 0.0005	0.4204	105	75-125	0.4204	0.4136	103	1.6	20	-	-	< 0.0005
				0.400	20W3646q	< 0.0005	0.4278	107	75-125	0.4278	0.4344	109	1.5	20	-	-	< 0.0005
Boron - Total mg/l	0.40	98	80-120	2.00	20-W3627	1.74	3.54	90	75-125	3.54	3.51	88	0.9	20	-	-	< 0.1 < 0.1
Cadmium - Total mg/l	0.1000	102	80-120	0.400	20W3529q	< 0.0005	0.3704	93	75-125	0.3704	0.3926	98	5.8	20	-	-	< 0.0005
				0.400	20W3627q	< 0.0005	0.3974	99	75-125	0.3974	0.3978	99	0.1	20	-	-	< 0.0005
				0.400	20W3646q	< 0.0005	0.4068	102	75-125	0.4068	0.4132	103	1.6	20	-	-	< 0.0005
Calcium - Total mg/l	20.0 20.0	114 114	80-120 80-120	500	20W3626q	352	880	106	75-125	880	880	106	0.0	20	-	-	< 1
				500	20W3651q	22.8	545	104	75-125	545	540	103	0.9	20	-	-	< 1
				500	20W3654q	266	760	99	75-125	760	765	100	0.7	20	-	-	< 1
Chloride mg/l	30.0 30.0	97 97	80-120 80-120	30.0	20-W3621	< 1	31.0	103	80-120	31.0	30.8	103	0.6	20	-	-	< 1
																	< 1
Chromium - Total mg/l	0.1000	95	80-120	0.400	20W3529q	0.0066	0.3820	94	75-125	0.3820	0.3894	96	1.9	20	-	-	< 0.002
				0.400	20W3627q	< 0.002	0.3940	98	75-125	0.3940	0.3894	97	1.2	20	-	-	< 0.002
				0.400	20W3646q	< 0.002	0.3954	99	75-125	0.3954	0.4036	101	2.1	20	-	-	< 0.002
Cobalt - Total mg/l	0.1000	95	80-120	0.400	20W3529q	< 0.002	0.3714	93	75-125	0.3714	0.3886	97	4.5	20	-	-	< 0.002
				0.400	20W3627q	< 0.002	0.3896	97	75-125	0.3896	0.3888	97	0.2	20	-	-	< 0.002
				0.400	20W3646q	< 0.002	0.3924	98	75-125	0.3924	0.4038	101	2.9	20	-	-	< 0.002



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Quality Control Report

Lab IDs: 20-W3620 to 20-W3628

Project: MDU Lewis & Clark

Work Order: 202082-2645

Analyte	LCS Spike Amt	LCS Rec %	LCS % Rec Limits	Matrix Spike Amt	Matrix Spike ID	Matrix Spike Orig Result	Matrix Spike Result	Matrix Spike Rec %	Matrix Spike % Rec Limits	MSD/ Dup Orig Result	MSD/ Dup Result	MSD Rec %	MSD/ Dup RPD	MSD/ Dup RPD Limit (<)	Known Rec (%)	Known % Rec Limits	Method Blank
Fluoride mg/l	0.50	106	90-110	0.500	20-W3624	0.49	1.00	102	80-120	1.00	1.01	104	1.0	20	-	-	< 0.1 < 0.1
Lead - Total mg/l	0.1000	96	80-120	0.400 0.400 0.400	20W3529q 20W3627q 20W3646q	< 0.0005 0.0024 < 0.0005	0.3528 0.3880 0.3906	88 96 98	75-125 75-125 75-125	0.3528 0.3880 0.3906	0.3694 0.3816 0.3986	92 95 100	4.6 1.7 2.0	20 20 20	- - -	- - -	< 0.0005
Lithium - Total mg/l	0.400	108	80-120	0.400	20-W3627	0.095	0.523	107	75-125	0.523	0.530	109	1.3	20	- - -	- - -	< 0.02 < 0.02 < 0.02
Mercury - Total mg/l	0.0020	95	85-115	0.002 0.002 0.002	20-D3095 20-W3627 20-W3665	< 0.0002 < 0.0002 < 0.0002	0.0017 0.0017 0.0015	85 85 75	70-130 70-130 70-130	0.0017 0.0017 0.0015	0.0017 0.0017 0.0015	85 85 75	0.0 0.0 0.0	20 20 20	- - -	- - -	< 0.0002
Molybdenum - Total mg/l	0.1000	102	80-120	0.400 0.400 0.400	20W3529q 20W3627q 20W3646q	0.1346 0.0393 0.0023	0.5064 0.4310 0.3952	93 98 98	75-125 75-125 75-125	0.5064 0.4310 0.3952	0.5516 0.4292 0.4028	104 97 100	8.5 0.4 1.9	20 20 20	- - -	- - -	< 0.002
pH units	- -	- -	- -	- -	- -	- -	- -	- -	- -	7.7 7.4	8.1 7.5	- -	5.1 1.3	20 20	- -	- -	- -
Selenium - Total mg/l	0.1000	98	80-120	0.400 0.400 0.400	20W3529q 20W3627q 20W3646q	0.0124 0.0689 < 0.005	0.3872 0.5140 0.4320	94 111 108	75-125 75-125 75-125	0.3872 0.5140 0.4320	0.3810 0.4890 0.4414	92 105 110	1.6 5.0 2.2	20 20 20	- - -	- - -	< 0.005
Sulfate mg/l	100	97	80-120	100	20-W3621	< 5	97.1	97	80-120	97.1	96.6	97	0.5	20	-	-	< 5
Thallium - Total mg/l	0.1000	90	80-120	0.400 0.400	20-W3627 20-W3646	< 0.0005 < 0.0005	0.3528 0.3614	88 90	75-125 75-125	0.3528 0.3614	0.3472 0.3638	87 91	1.6 0.7	20 20	- -	- -	< 0.0005
Total Dissolved Solids mg/l	- -	- -	- -	- -	- -	- -	- -	- -	- -	3410 1660	3410 1660	- -	0.0 0.0	20 20	- -	- -	< 10

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Page: 3 of 3

Quality Control Report

Lab IDs: 20-W3620 to 20-W3628

Project: MDU Lewis & Clark

Work Order: 202082-2645

Samples were received in good condition on 24 Sep 2020 at 0740.

Temperature upon receipt at the Bismarck laboratory was 5.3°C.

All samples were properly preserved unless noted here and/or flagged on the individual analytical laboratory report.

With the exception of pH, all holding times were met.

Approved methodology was followed for all sample analyses.

All acceptance criteria were met for calibration, method blanks, laboratory control samples, laboratory fortified matrix/duplicates unless noted here.

Approved by: _____

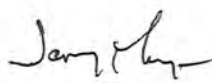
C. Cantep

12 OCT 2020



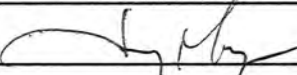
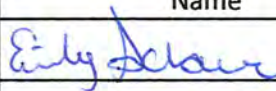
2616 E. Broadway Ave
Bismarck, ND 58501
(701) 258-9720

Chain of Custody Record

Project Name: MDU Lewis & Clark	Event: September 2020	Work Order Number: 82-2645
Report To: MDU Attn: Todd Peterson Address: 400 N. 4th St Bismarck, ND 58501 Phone: 701-425-2427 Email: Todd.Peterson@mdu.com	CC:	Collected By: 

Lab Number	Sample ID	Date	Time	Sample Type	Sample Type				Temp (°C)	Spec. Cond.	pH	Turbidity (NTU)	Analysis Required
					1 Liter Raw	500 mL Nitric	500 mL Nitric	250 mL Nitric (filtered)					
W3620	Dup 1	22 Sept 2020	NA	GW	X	X	X	X	NA	NA	NA	NA	MDU Lewis & Clark List
W3621	Field Blank (FB)	22 Sept 2020	NA	GW	X	X	X	X	NA	NA	NA	NA	
W3622	MW103	22 Sept 2020	0910	GW	X	X	X	X	13.38	1347	7.30	4.29	
W3623	MW110	21 Sept 2020	1258	GW	X	X	X	X	16.87	1124	7.36	4.91	
W3624	MW119	21 Sept 2020	1525	GW	X	X	X	X	21.95	1195	7.29	2.93	
W3625	MW111	22 Sept 2020	1325	GW	X	X	X	X	17.16	3846	7.12	2.65	
W3626	MW117	22 Sept 2020	1132	GW	X	X	X	X	16.68	7066	6.99	2.79	
W3627	MW118	22 Sept 2020	1630	GW	X	X	X	X	17.19	1638	7.11	1.32	
W3628	MW120	22 Sept 2020	1035	GW	X	X	X	X	12.49	5828	6.70	0.21	

Comments:

Relinquished By		Sample Condition		Received By	
Name	Date/Time	Location	Temp (°C)	Name	Date/Time
	24 Sept 2020 0740	Log In Walk In #2	5.3 TM562 / TM805		24 Sept 2020 0740
1					
2					



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Page: 1 of 9

CERTIFICATE of ANALYSIS - STATE

Todd Peterson
Montana-Dakota Utilities Co.
400 N 4th St
Bismarck ND 58501

Report Date: 9 Oct 20
Lab Number: 20-W3620
Work Order #: 82-2645
Account #: 002800
Date Sampled: 22 Sep 20
Date Received: 24 Sep 20 7:40
Sampled By: MVTL Field Service

Project Name: MDU Lewis & Clark

PO #: 180534 OP

Sample Description: Dup 1

Temp at Receipt: 5.3C

Event and Year: September 2020

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	24 Sep 20	HT
Total Suspended Solids	5	mg/l	2	USGS I3765-85	24 Sep 20 14:12	HT
Total Alkalinity	444	mg/l CaCO3	20	SM2320B-11	24 Sep 20 17:00	SD
Nitrate-Nitrite as N	10.4	mg/l	0.10	EPA 353.2	1 Oct 20 8:57	EV
Mercury - Dissolved	< 0.0002	mg/l	0.0002	EPA 245.1	29 Sep 20 13:10	MDE
Magnesium - Total	561	mg/l	1.0	6010D	29 Sep 20 11:01	MDE
Sodium - Total	144	mg/l	1.0	6010D	29 Sep 20 11:01	MDE
Potassium - Total	13.6	mg/l	1.0	6010D	29 Sep 20 11:01	MDE
Calcium - Dissolved	191	mg/l	1.0	6010D	29 Sep 20 11:01	MDE
Magnesium - Dissolved	537	mg/l	1.0	6010D	29 Sep 20 11:01	MDE
Sodium - Dissolved	138	mg/l	1.0	6010D	29 Sep 20 11:01	MDE
Potassium - Dissolved	12.7	mg/l	1.0	6010D	29 Sep 20 11:01	MDE
Lithium - Dissolved	0.219	mg/l	0.020	6010D	1 Oct 20 11:12	MDE
Boron - Dissolved	8.15	mg/l	0.10	6010D	30 Sep 20 12:45	MDE
Antimony - Dissolved	< 0.001	mg/l	0.0010	6020B	29 Sep 20 15:50	MDE
Arsenic - Dissolved	< 0.002	mg/l	0.0020	6020B	29 Sep 20 15:50	MDE
Barium - Dissolved	0.0236	mg/l	0.0020	6020B	29 Sep 20 15:50	MDE
Beryllium - Dissolved	< 0.0005	mg/l	0.0005	6020B	29 Sep 20 15:50	MDE
Cadmium - Dissolved	< 0.0005	mg/l	0.0005	6020B	29 Sep 20 15:50	MDE
Chromium - Dissolved	0.0057	mg/l	0.0020	6020B	29 Sep 20 15:50	MDE
Cobalt - Dissolved	< 0.002	mg/l	0.0020	6020B	29 Sep 20 15:50	MDE
Lead - Dissolved	< 0.0005	mg/l	0.0005	6020B	29 Sep 20 15:50	MDE
Molybdenum - Dissolved	0.0518	mg/l	0.0020	6020B	29 Sep 20 15:50	MDE
Selenium - Dissolved	0.0652	mg/l	0.0050	6020B	29 Sep 20 15:50	MDE
Thallium - Dissolved	< 0.0005	mg/l	0.0005	6020B	30 Sep 20 10:35	MDE

* Holding time exceeded

Approved by:

CC
Claudette K. Carroll 12 OCT 2020

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

The reporting limit was elevated for any analyte requiring a dilution as coded below:
@ = Due to sample matrix # = Due to concentration of other analytes
! = Due to sample quantity * = Due to internal standard response

CERTIFICATION: ND # ND-00016



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CERTIFICATE of ANALYSIS - STATE

Todd Peterson
Montana-Dakota Utilities Co.
400 N 4th St
Bismarck ND 58501

Report Date: 9 Oct 20
Lab Number: 20-W3621
Work Order #: 82-2645
Account #: 002800
Date Sampled: 22 Sep 20
Date Received: 24 Sep 20 7:40
Sampled By: MVTL Field Service

Project Name: MDU Lewis & Clark

PO #: 180534 OP

Sample Description: Field Blank (FB)

Temp at Receipt: 5.3C

Event and Year: September 2020

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	24 Sep 20	HT
Total Suspended Solids	< 2	mg/l	2	USGS I3765-85	24 Sep 20 14:12	HT
Total Alkalinity	< 20	mg/l CaCO3	20	SM2320B-11	24 Sep 20 17:00	SD
Nitrate-Nitrite as N	< 0.1	mg/l	0.10	EPA 353.2	1 Oct 20 8:57	EV
Mercury - Dissolved	< 0.0002	mg/l	0.0002	EPA 245.1	29 Sep 20 13:10	MDE
Magnesium - Total	< 1	mg/l	1.0	6010D	29 Sep 20 11:01	MDE
Sodium - Total	< 1	mg/l	1.0	6010D	29 Sep 20 11:01	MDE
Potassium - Total	< 1	mg/l	1.0	6010D	29 Sep 20 11:01	MDE
Calcium - Dissolved	< 1	mg/l	1.0	6010D	29 Sep 20 11:01	MDE
Magnesium - Dissolved	< 1	mg/l	1.0	6010D	29 Sep 20 11:01	MDE
Sodium - Dissolved	< 1	mg/l	1.0	6010D	29 Sep 20 11:01	MDE
Potassium - Dissolved	< 1	mg/l	1.0	6010D	29 Sep 20 11:01	MDE
Lithium - Dissolved	< 0.02	mg/l	0.020	6010D	1 Oct 20 11:12	MDE
Boron - Dissolved	< 0.1	mg/l	0.10	6010D	30 Sep 20 12:45	MDE
Antimony - Dissolved	< 0.001	mg/l	0.0010	6020B	29 Sep 20 15:50	MDE
Arsenic - Dissolved	< 0.002	mg/l	0.0020	6020B	29 Sep 20 15:50	MDE
Barium - Dissolved	< 0.002	mg/l	0.0020	6020B	29 Sep 20 15:50	MDE
Beryllium - Dissolved	< 0.0005	mg/l	0.0005	6020B	29 Sep 20 15:50	MDE
Cadmium - Dissolved	< 0.0005	mg/l	0.0005	6020B	29 Sep 20 15:50	MDE
Chromium - Dissolved	< 0.002	mg/l	0.0020	6020B	29 Sep 20 15:50	MDE
Cobalt - Dissolved	< 0.002	mg/l	0.0020	6020B	29 Sep 20 15:50	MDE
Lead - Dissolved	< 0.0005	mg/l	0.0005	6020B	29 Sep 20 15:50	MDE
Molybdenum - Dissolved	< 0.002	mg/l	0.0020	6020B	29 Sep 20 15:50	MDE
Selenium - Dissolved	< 0.005	mg/l	0.0050	6020B	29 Sep 20 15:50	MDE
Thallium - Dissolved	< 0.0005	mg/l	0.0005	6020B	30 Sep 20 10:35	MDE

* Holding time exceeded

Approved by:

Claudette K Carroll 12 OCT 2020

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

The reporting limit was elevated for any analyte requiring a dilution as coded below:

⊗ = Due to sample matrix # = Due to concentration of other analytes
! = Due to sample quantity + = Due to internal standard response

CERTIFICATION: ND # ND-00016



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CERTIFICATE of ANALYSIS - STATE

Todd Peterson
Montana-Dakota Utilities Co.
400 N 4th St
Bismarck ND 58501

Report Date: 9 Oct 20
Lab Number: 20-W3623
Work Order #: 82-2645
Account #: 002800
Date Sampled: 21 Sep 20 12:58
Date Received: 24 Sep 20 7:40
Sampled By: MVTL Field Service

Project Name: MDU Lewis & Clark

PO #: 180534 OP

Sample Description: MW110

Temp at Receipt: 5.3C

Event and Year: September 2020

Table with 6 columns: As Received Result, Method RL, Method Reference, Date Analyzed, Analyst. Rows include Metal Digestion, Total Suspended Solids, pH - Field, Temperature - Field, Total Alkalinity, Conductivity - Field, Nitrate-Nitrite as N, Mercury - Dissolved, Magnesium - Total, Sodium - Total, Potassium - Total, Calcium - Dissolved, Magnesium - Dissolved, Sodium - Dissolved, Potassium - Dissolved, Lithium - Dissolved, Boron - Dissolved, Antimony - Dissolved, Arsenic - Dissolved, Barium - Dissolved, Beryllium - Dissolved, Cadmium - Dissolved, Chromium - Dissolved, Cobalt - Dissolved, Lead - Dissolved, Molybdenum - Dissolved, Selenium - Dissolved, Thallium - Dissolved.

* Holding time exceeded

Approved by:

Claudette K Carroll 12 OCT 2020

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

The reporting limit was elevated for any analyte requiring a dilution as coded below:
@ = Due to sample matrix # = Due to concentration of other analytes
! = Due to sample quantity + = Due to internal standard response

CERTIFICATION: ND # ND-00016



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CERTIFICATE of ANALYSIS - STATE

Todd Peterson
Montana-Dakota Utilities Co.
400 N 4th St
Bismarck ND 58501

Report Date: 9 Oct 20
Lab Number: 20-W3624
Work Order #: 82-2645
Account #: 002800
Date Sampled: 21 Sep 20 15:25
Date Received: 24 Sep 20 7:40
Sampled By: MVTL Field Service

Project Name: MDU Lewis & Clark

PO #: 180534 OP

Sample Description: MW119

Temp at Receipt: 5.3C

Event and Year: September 2020

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	24 Sep 20	HT
Total Suspended Solids	3	mg/l	2	USGS I3765-85	24 Sep 20 14:12	HT
pH - Field	7.29	units	NA	SM 4500 H+ B	21 Sep 20 15:25	JSM
Temperature - Field	22.0	Degrees C	NA	SM 2550B	21 Sep 20 15:25	JSM
Total Alkalinity	381	mg/l CaCO3	20	SM2320B-11	24 Sep 20 17:00	SD
Conductivity - Field	1195	umhos/cm	1	EPA 120.1	21 Sep 20 15:25	JSM
Nitrate-Nitrite as N	8.65	mg/l	0.10	EPA 353.2	1 Oct 20 8:57	EV
Mercury - Dissolved	< 0.0002	mg/l	0.0002	EPA 245.1	29 Sep 20 13:10	MDE
Magnesium - Total	62.5	mg/l	1.0	6010D	29 Sep 20 11:01	MDE
Sodium - Total	97.6	mg/l	1.0	6010D	29 Sep 20 11:01	MDE
Potassium - Total	8.8	mg/l	1.0	6010D	29 Sep 20 11:01	MDE
Calcium - Dissolved	100	mg/l	1.0	6010D	29 Sep 20 11:01	MDE
Magnesium - Dissolved	61.8	mg/l	1.0	6010D	29 Sep 20 11:01	MDE
Sodium - Dissolved	96.1	mg/l	1.0	6010D	29 Sep 20 11:01	MDE
Potassium - Dissolved	8.7	mg/l	1.0	6010D	29 Sep 20 11:01	MDE
Lithium - Dissolved	0.046	mg/l	0.020	6010D	1 Oct 20 11:12	MDE
Boron - Dissolved	0.29	mg/l	0.10	6010D	30 Sep 20 12:45	MDE
Antimony - Dissolved	< 0.001	mg/l	0.0010	6020B	29 Sep 20 15:50	MDE
Arsenic - Dissolved	< 0.002	mg/l	0.0020	6020B	29 Sep 20 15:50	MDE
Barium - Dissolved	0.0330	mg/l	0.0020	6020B	29 Sep 20 15:50	MDE
Beryllium - Dissolved	< 0.0005	mg/l	0.0005	6020B	29 Sep 20 15:50	MDE
Cadmium - Dissolved	< 0.0005	mg/l	0.0005	6020B	29 Sep 20 15:50	MDE
Chromium - Dissolved	< 0.002	mg/l	0.0020	6020B	29 Sep 20 15:50	MDE
Cobalt - Dissolved	< 0.002	mg/l	0.0020	6020B	29 Sep 20 15:50	MDE
Lead - Dissolved	< 0.0005	mg/l	0.0005	6020B	29 Sep 20 15:50	MDE
Molybdenum - Dissolved	0.0036	mg/l	0.0020	6020B	29 Sep 20 15:50	MDE
Selenium - Dissolved	< 0.005	mg/l	0.0050	6020B	29 Sep 20 15:50	MDE
Thallium - Dissolved	< 0.0005	mg/l	0.0005	6020B	30 Sep 20 10:35	MDE

* Holding time exceeded

Approved by:

Claudette K. Carroll 12 OCT 20 20

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

The reporting limit was elevated for any analyte requiring a dilution as coded below:

@ = Due to sample matrix # = Due to concentration of other analytes
! = Due to sample quantity + = Due to internal standard response

CERTIFICATION: ND # ND-00016



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CERTIFICATE of ANALYSIS - STATE

Todd Peterson
Montana-Dakota Utilities Co.
400 N 4th St
Bismarck ND 58501

Report Date: 9 Oct 20
Lab Number: 20-W3625
Work Order #: 82-2645
Account #: 002800
Date Sampled: 22 Sep 20 13:25
Date Received: 24 Sep 20 7:40
Sampled By: MVTL Field Service

Project Name: MDU Lewis & Clark

PO #: 180534 OP

Sample Description: MW111

Temp at Receipt: 5.3C

Event and Year: September 2020

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	24 Sep 20	HT
Total Suspended Solids	4	mg/l	2	USGS I3765-85	24 Sep 20 14:12	HT
pH - Field	7.12	units	NA	SM 4500 H+ B	22 Sep 20 13:25	JSM
Temperature - Field	17.2	Degrees C	NA	SM 2550B	22 Sep 20 13:25	JSM
Total Alkalinity	454	mg/l CaCO3	20	SM2320B-11	24 Sep 20 17:00	SD
Conductivity - Field	3846	umhos/cm	1	EPA 120.1	22 Sep 20 13:25	JSM
Nitrate-Nitrite as N	10.5	mg/l	0.10	EPA 353.2	1 Oct 20 8:57	EV
Mercury - Dissolved	< 0.0002	mg/l	0.0002	EPA 245.1	29 Sep 20 13:10	MDE
Magnesium - Total	551	mg/l	1.0	6010D	29 Sep 20 11:01	MDE
Sodium - Total	142	mg/l	1.0	6010D	29 Sep 20 11:01	MDE
Potassium - Total	13.2	mg/l	1.0	6010D	29 Sep 20 11:01	MDE
Calcium - Dissolved	190	mg/l	1.0	6010D	29 Sep 20 11:01	MDE
Magnesium - Dissolved	534	mg/l	1.0	6010D	29 Sep 20 11:01	MDE
Sodium - Dissolved	138	mg/l	1.0	6010D	29 Sep 20 11:01	MDE
Potassium - Dissolved	12.7	mg/l	1.0	6010D	29 Sep 20 11:01	MDE
Lithium - Dissolved	0.218	mg/l	0.020	6010D	1 Oct 20 11:12	MDE
Boron - Dissolved	7.78	mg/l	0.10	6010D	30 Sep 20 12:45	MDE
Antimony - Dissolved	< 0.001	mg/l	0.0010	6020B	29 Sep 20 15:50	MDE
Arsenic - Dissolved	< 0.002	mg/l	0.0020	6020B	29 Sep 20 15:50	MDE
Barium - Dissolved	0.0231	mg/l	0.0020	6020B	29 Sep 20 15:50	MDE
Beryllium - Dissolved	< 0.0005	mg/l	0.0005	6020B	29 Sep 20 15:50	MDE
Cadmium - Dissolved	< 0.0005	mg/l	0.0005	6020B	29 Sep 20 15:50	MDE
Chromium - Dissolved	0.0057	mg/l	0.0020	6020B	29 Sep 20 15:50	MDE
Cobalt - Dissolved	< 0.002	mg/l	0.0020	6020B	29 Sep 20 15:50	MDE
Lead - Dissolved	< 0.0005	mg/l	0.0005	6020B	29 Sep 20 15:50	MDE
Molybdenum - Dissolved	0.0506	mg/l	0.0020	6020B	29 Sep 20 15:50	MDE
Selenium - Dissolved	0.0691	mg/l	0.0050	6020B	29 Sep 20 15:50	MDE
Thallium - Dissolved	< 0.0005	mg/l	0.0005	6020B	30 Sep 20 10:35	MDE

* Holding time exceeded

Approved by:

CC
Claudette K Carroll 12 OCT 2020

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

The reporting limit was elevated for any analyte requiring a dilution as coded below:
@ = Due to sample matrix # = Due to concentration of other analytes
! = Due to sample quantity † = Due to internal standard response

CERTIFICATION: ND # ND-00016



MINNESOTA VALLEY TESTING LABORATORIES, INC.

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www.mvtl.com



CERTIFICATE of ANALYSIS - STATE

Todd Peterson
Montana-Dakota Utilities Co.
400 N 4th St
Bismarck ND 58501

Report Date: 9 Oct 20
Lab Number: 20-W3626
Work Order #: 82-2645
Account #: 002800
Date Sampled: 22 Sep 20 11:32
Date Received: 24 Sep 20 7:40
Sampled By: MVTL Field Service

Project Name: MDU Lewis & Clark

Sample Description: MW117

PO #: 180534 OP

Event and Year: September 2020

Temp at Receipt: 5.3C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	24 Sep 20	HT
Total Suspended Solids	5	mg/l	2	USGS I3765-85	24 Sep 20 14:12	HT
pH - Field	6.99	units	NA	SM 4500 H+ B	22 Sep 20 11:32	JSM
Temperature - Field	16.7	Degrees C	NA	SM 2550B	22 Sep 20 11:32	JSM
Total Alkalinity	375	mg/l CaCO3	20	SM2320B-11	24 Sep 20 17:00	SD
Conductivity - Field	7066	umhos/cm	1	EPA 120.1	22 Sep 20 11:32	JSM
Nitrate-Nitrite as N	39.4	mg/l	0.10	EPA 353.2	1 Oct 20 8:57	EV
Mercury - Dissolved	< 0.0002	mg/l	0.0002	EPA 245.1	29 Sep 20 13:10	MDE
Magnesium - Total	965	mg/l	1.0	6010D	29 Sep 20 11:01	MDE
Sodium - Total	570	mg/l	1.0	6010D	29 Sep 20 11:01	MDE
Potassium - Total	28.4	mg/l	1.0	6010D	29 Sep 20 11:01	MDE
Calcium - Dissolved	340	mg/l	1.0	6010D	29 Sep 20 11:01	MDE
Magnesium - Dissolved	940	mg/l	1.0	6010D	29 Sep 20 11:01	MDE
Sodium - Dissolved	560	mg/l	1.0	6010D	29 Sep 20 11:01	MDE
Potassium - Dissolved	28.1	mg/l	1.0	6010D	29 Sep 20 11:01	MDE
Lithium - Dissolved	0.130	mg/l	0.020	6010D	1 Oct 20 11:12	MDE
Boron - Dissolved	10.3	mg/l	0.10	6010D	30 Sep 20 12:45	MDE
Antimony - Dissolved	< 0.001	mg/l	0.0010	6020B	29 Sep 20 15:50	MDE
Arsenic - Dissolved	< 0.002	mg/l	0.0020	6020B	29 Sep 20 15:50	MDE
Barium - Dissolved	0.0164	mg/l	0.0020	6020B	29 Sep 20 15:50	MDE
Beryllium - Dissolved	< 0.0005	mg/l	0.0005	6020B	29 Sep 20 15:50	MDE
Cadmium - Dissolved	< 0.0005	mg/l	0.0005	6020B	29 Sep 20 15:50	MDE
Chromium - Dissolved	0.0023	mg/l	0.0020	6020B	29 Sep 20 15:50	MDE
Cobalt - Dissolved	< 0.002	mg/l	0.0020	6020B	29 Sep 20 15:50	MDE
Lead - Dissolved	< 0.0005	mg/l	0.0005	6020B	29 Sep 20 15:50	MDE
Molybdenum - Dissolved	0.0046	mg/l	0.0020	6020B	29 Sep 20 15:50	MDE
Selenium - Dissolved	0.0362	mg/l	0.0050	6020B	29 Sep 20 15:50	MDE
Thallium - Dissolved	< 0.0005	mg/l	0.0005	6020B	30 Sep 20 10:35	MDE

* Holding time exceeded

Approved by:

Claudette K. Carroll *12 OCT 2020*

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

The reporting limit was elevated for any analyte requiring a dilution as coded below:

@ = Due to sample matrix # = Due to concentration of other analytes
! = Due to sample quantity * = Due to internal standard response

CERTIFICATION: ND # ND-00016



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CERTIFICATE of ANALYSIS - STATE

Todd Peterson
Montana-Dakota Utilities Co.
400 N 4th St
Bismarck ND 58501

Report Date: 9 Oct 20
Lab Number: 20-W3627
Work Order #: 82-2645
Account #: 002800
Date Sampled: 22 Sep 20 16:30
Date Received: 24 Sep 20 7:40
Sampled By: MVTL Field Service

Project Name: MDU Lewis & Clark

PO #: 180534 OP

Sample Description: MW118

Temp at Receipt: 5.3C

Event and Year: September 2020

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	24 Sep 20	HT
Total Suspended Solids	3	mg/l	2	USGS I3765-85	24 Sep 20 14:12	HT
pH - Field	7.11	units	NA	SM 4500 H+ B	22 Sep 20 16:30	JSM
Temperature - Field	17.2	Degrees C	NA	SM 2550B	22 Sep 20 16:30	JSM
Total Alkalinity	342	mg/l CaCO3	20	SM2320B-11	24 Sep 20 17:00	SD
Conductivity - Field	1638	umhos/cm	1	EPA 120.1	22 Sep 20 16:30	JSM
Nitrate-Nitrite as N	8.05	mg/l	0.10	EPA 353.2	1 Oct 20 8:57	EV
Mercury - Dissolved	< 0.0002	mg/l	0.0002	EPA 245.1	29 Sep 20 13:10	MDE
Magnesium - Total	155	mg/l	1.0	6010D	29 Sep 20 11:01	MDE
Sodium - Total	88.5	mg/l	1.0	6010D	29 Sep 20 11:01	MDE
Potassium - Total	8.9	mg/l	1.0	6010D	29 Sep 20 11:01	MDE
Calcium - Dissolved	101	mg/l	1.0	6010D	29 Sep 20 11:01	MDE
Magnesium - Dissolved	161	mg/l	1.0	6010D	29 Sep 20 11:01	MDE
Sodium - Dissolved	90.5	mg/l	1.0	6010D	29 Sep 20 11:01	MDE
Potassium - Dissolved	9.3	mg/l	1.0	6010D	29 Sep 20 11:01	MDE
Lithium - Dissolved	0.097	mg/l	0.020	6010D	1 Oct 20 11:12	MDE
Boron - Dissolved	1.68	mg/l	0.10	6010D	30 Sep 20 13:45	MDE
Antimony - Dissolved	< 0.001	mg/l	0.0010	6020B	29 Sep 20 15:50	MDE
Arsenic - Dissolved	< 0.002	mg/l	0.0020	6020B	29 Sep 20 15:50	MDE
Barium - Dissolved	0.0230	mg/l	0.0020	6020B	29 Sep 20 15:50	MDE
Beryllium - Dissolved	< 0.0005	mg/l	0.0005	6020B	29 Sep 20 15:50	MDE
Cadmium - Dissolved	< 0.0005	mg/l	0.0005	6020B	29 Sep 20 15:50	MDE
Chromium - Dissolved	< 0.002	mg/l	0.0020	6020B	29 Sep 20 15:50	MDE
Cobalt - Dissolved	< 0.002	mg/l	0.0020	6020B	29 Sep 20 15:50	MDE
Lead - Dissolved	< 0.0005	mg/l	0.0005	6020B	29 Sep 20 15:50	MDE
Molybdenum - Dissolved	0.0404	mg/l	0.0020	6020B	29 Sep 20 15:50	MDE
Selenium - Dissolved	0.0752	mg/l	0.0050	6020B	29 Sep 20 15:50	MDE
Thallium - Dissolved	< 0.0005	mg/l	0.0005	6020B	30 Sep 20 10:35	MDE

* Holding time exceeded

Approved by: Claudette K. Carroll 12 OCT 2020

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

The reporting limit was elevated for any analyte requiring a dilution as coded below:
@ = Due to sample matrix # = Due to concentration of other analytes
! = Due to sample quantity + = Due to internal standard response

CERTIFICATION: ND # ND-00016



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CERTIFICATE of ANALYSIS - STATE

Todd Peterson
Montana-Dakota Utilities Co.
400 N 4th St
Bismarck ND 58501

Report Date: 9 Oct 20
Lab Number: 20-W3628
Work Order #: 82-2645
Account #: 002800
Date Sampled: 22 Sep 20 10:35
Date Received: 24 Sep 20 7:40
Sampled By: MVTL Field Service

Project Name: MDU Lewis & Clark

PO #: 180534 OP

Sample Description: MW120

Temp at Receipt: 5.3C

Event and Year: September 2020

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	24 Sep 20	HT
Total Suspended Solids	5	mg/l	2	USGS I3765-85	24 Sep 20 14:12	HT
pH - Field	6.70	units	NA	SM 4500 H+ B	22 Sep 20 10:35	JSM
Temperature - Field	12.5	Degrees C	NA	SM 2550B	22 Sep 20 10:35	JSM
Total Alkalinity	674	mg/l CaCO3	20	SM2320B-11	24 Sep 20 18:00	SD
Conductivity - Field	5828	umhos/cm	1	EPA 120.1	22 Sep 20 10:35	JSM
Nitrate-Nitrite as N	4.30	mg/l	0.10	EPA 353.2	1 Oct 20 8:57	EV
Mercury - Dissolved	< 0.0002	mg/l	0.0002	EPA 245.1	29 Sep 20 13:10	MDE
Magnesium - Total	875	mg/l	1.0	6010D	29 Sep 20 12:01	MDE
Sodium - Total	368	mg/l	1.0	6010D	29 Sep 20 12:01	MDE
Potassium - Total	30.6	mg/l	1.0	6010D	29 Sep 20 12:01	MDE
Calcium - Dissolved	426	mg/l	1.0	6010D	29 Sep 20 11:01	MDE
Magnesium - Dissolved	790	mg/l	1.0	6010D	29 Sep 20 11:01	MDE
Sodium - Dissolved	338	mg/l	1.0	6010D	29 Sep 20 11:01	MDE
Potassium - Dissolved	27.8	mg/l	1.0	6010D	29 Sep 20 11:01	MDE
Lithium - Dissolved	0.125	mg/l	0.020	6010D	1 Oct 20 11:12	MDE
Boron - Dissolved	9.25	mg/l	0.10	6010D	30 Sep 20 13:45	MDE
Antimony - Dissolved	< 0.001	mg/l	0.0010	6020B	29 Sep 20 15:50	MDE
Arsenic - Dissolved	< 0.002	mg/l	0.0020	6020B	29 Sep 20 15:50	MDE
Barium - Dissolved	0.0204	mg/l	0.0020	6020B	29 Sep 20 15:50	MDE
Beryllium - Dissolved	< 0.0005	mg/l	0.0005	6020B	29 Sep 20 15:50	MDE
Cadmium - Dissolved	< 0.0005	mg/l	0.0005	6020B	29 Sep 20 15:50	MDE
Chromium - Dissolved	0.0026	mg/l	0.0020	6020B	29 Sep 20 15:50	MDE
Cobalt - Dissolved	< 0.002	mg/l	0.0020	6020B	29 Sep 20 15:50	MDE
Lead - Dissolved	< 0.0005	mg/l	0.0005	6020B	29 Sep 20 15:50	MDE
Molybdenum - Dissolved	0.0030	mg/l	0.0020	6020B	29 Sep 20 15:50	MDE
Selenium - Dissolved	< 0.005	mg/l	0.0050	6020B	29 Sep 20 15:50	MDE
Thallium - Dissolved	< 0.0005	mg/l	0.0005	6020B	30 Sep 20 10:35	MDE

* Holding time exceeded

cc

Approved by: Claudette K Carroll 12 OCT 2020

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

The reporting limit was elevated for any analyte requiring a dilution as coded below:
@ = Due to sample matrix # = Due to concentration of other analytes
! = Due to sample quantity + = Due to internal standard response

CERTIFICATION: ND # ND-00016



Field Datasheet

Groundwater Assessment

2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

Company: MDU Lewis & Clark

Event: September 2020

Sample ID: 103

Sampling Personal: J. Kelly

Weather Conditions: 60°F Temp: 60°F Wind: S @ 5-10 Precip: Sunny / Partly Cloudy / Cloudy

WELL INFORMATION

Well Locked?	YES	NO
Well Labeled?	YES	NO
Casing Strait?	YES	NO
Grout Seal Intact?	YES	NO
Repairs Necessary?	<u>Not Visible</u>	
Casing Diameter:	<u>2"</u>	
Water Level Before Purge:	<u>10.48</u>	ft
Total Depth of Well:	—	
Well Volume:	— liters	
Depth to Top of Pump:	— ft	
Water Level After Sample:	<u>10.49</u>	ft
Measurement Method:	<u>Electric Water Level Indicator</u>	

SAMPLING INFORMATION

Purging Method:	<u>Bladder</u>	Control Settings:
Sampling Method:	<u>Bladder</u>	Purge: <u>5</u> Sec.
Dedicated Equipment?	YES NO	Recover: <u>55</u> Sec.
Duplicate Sample?	YES NO	PSI: <u>20</u>
Duplicate Sample ID:	—	
Bottle List:		
1 Liter Raw	4- 1L Nitric	
500mL Nitric		
500mL Nitric (filtered)		
250mL Sulfuric		

FIELD READINGS

Stabilization Parameters (3 Consecutive)	Temp. (°C)	Spec. Cond.	pH	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Water Level (ft)	Pumping Rate mL/Min	mL Removed	Appearance or Comment	
Purge Date	Time	±0.5°	±5%	±0.1	±10%	±10	(ft)	mL/Min		clear, slightly turbid, turbid	
22 Sept 2020	0745	Start of Well Purge									
	0750	12.44	1841	7.42	1.56	242.1	104.23	10.48	100.0	500.0	Clear
	0820	13.39	1374	7.29	0.15	149.7	17.84	10.48	100.0	300.0	Clear
	0840	13.08	1352	7.30	0.14	89.2	8.60	10.48	100.0	2000.0	Clear
	0900	13.30	1346	7.30	0.16	71.9	4.48	10.48	100.0	2000.0	Clear
	0905	13.29	1347	7.30	0.16	72.6	4.17	10.49	100.0	500.0	Clear
	0910	13.38	1347	7.30	0.15	75.3	4.29	10.49	100.0	500.0	Clear

Well Stabilized? YES ~~NO~~ Total Volume Purged: 8500.0 mL

Sample Date	Time	Temp. (°C)	Spec. Cond.	pH	Turbidity (NTU)	Appearance or Comment
						Clarity, Color, Odor, Ect.
22 Sept 2020	0910	13.38	1347	7.30	4.29	Clear

Comments: Field Blank 22 Sept 2020 @ 0800



Field Datasheet

Groundwater Assessment

Company: MDU Lewis & Clark
 Event: September 2020
 Sample ID: 110
 Sampling Personal: Jerry [Signature]

2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

Weather Conditions: Temp: 70 °F Wind: S @ 5-10 Precip: Sunny / Partly Cloudy / Cloudy

WELL INFORMATION

Well Locked?	<u>YES</u>	<u>NO</u>	
Well Labeled?	<u>YES</u>	<u>NO</u>	
Casing Strait?	<u>YES</u>	<u>NO</u>	
Grout Seal Intact?	<u>YES</u>	<u>NO</u>	<u>Not Visible</u>
Repairs Necessary?			
Casing Diameter:	<u>2"</u>		
Water Level Before Purge:	<u>8.96</u>		ft
Total Depth of Well:	<u>16.85</u>		ft
Well Volume:	<u>—</u>		liters
Depth to Top of Pump:	<u>—</u>		ft
Water Level After Sample:	<u>9.06</u>		ft
Measurement Method:	<u>Electric Water Level Indicator</u>		

SAMPLING INFORMATION

Purging Method:	<u>Bladder</u>
Sampling Method:	<u>Bladder</u>
Dedicated Equipment?	<u>YES</u> <u>NO</u>
Duplicate Sample?	<u>YES</u> <u>NO</u>
Duplicate Sample ID:	<u>—</u>

Control Settings:	
Purge:	<u>3</u> Sec.
Recover:	<u>7</u> Sec.
PSI:	<u>20</u>

Bottle List:	
1 Liter Raw	4- 1L Nitric
500mL Nitric	
500mL Nitric (filtered)	
250mL Sulfuric	

FIELD READINGS

Stabilization Parameters (3 Consecutive)		Temp. (°C)	Spec. Cond.	pH	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Water Level (ft)	Pumping Rate mL/Min	mL Removed	Appearance or Comment Clarity, Color, Odor, Ect.
Purge Date	Time	±0.5°	±5%	±0.1	±10%	±10					clear, slightly turbid, turbid
<u>21 Sept 2020</u>	<u>1143</u>	<u>Start of Well Purge</u>									
	<u>1148</u>	<u>16.49</u>	<u>1129</u>	<u>7.36</u>	<u>2.27</u>	<u>141.3</u>	<u>52.46</u>	<u>9.01</u>	<u>100.0</u>	<u>500.0</u>	<u>Clear</u>
	<u>1218</u>	<u>16.35</u>	<u>1124</u>	<u>7.35</u>	<u>1.85</u>	<u>179.7</u>	<u>11.30</u>	<u>9.05</u>	<u>100.0</u>	<u>3000.0</u>	<u>Clear</u>
	<u>1248</u>	<u>16.72</u>	<u>1123</u>	<u>7.35</u>	<u>1.88</u>	<u>182.9</u>	<u>4.97</u>	<u>9.05</u>	<u>100.0</u>	<u>3000.0</u>	<u>Clear</u>
	<u>1253</u>	<u>16.80</u>	<u>1123</u>	<u>7.35</u>	<u>1.88</u>	<u>189.3</u>	<u>4.82</u>	<u>9.06</u>	<u>100.0</u>	<u>500.0</u>	<u>Clear</u>
	<u>1258</u>	<u>16.87</u>	<u>1124</u>	<u>7.36</u>	<u>1.88</u>	<u>185.0</u>	<u>4.91</u>	<u>9.06</u>	<u>100.0</u>	<u>500.0</u>	<u>Clear</u>

Well Stabilized? YES NO

Total Volume Purged: 7500.0 mL

Sample Date	Time	Temp. (°C)	Spec. Cond.	pH	Turbidity (NTU)	Appearance or Comment Clarity, Color, Odor, Ect.
<u>21 Sept 2020</u>	<u>1258</u>	<u>16.87</u>	<u>1124</u>	<u>7.36</u>	<u>4.91</u>	<u>Clear</u>

Comments:



2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

Field Datasheet

Groundwater Assessment

Company: MDU Lewis & Clark

Event: September 2020

Sample ID: 119

Sampling Personal: *[Signature]*

Weather Conditions: Temp: 75°F Wind: S @ 5-10 Precip: Sunny / Partly Cloudy / Cloudy

WELL INFORMATION

Well Locked?	YES	NO
Well Labeled?	YES	NO
Casing Strait?	YES	NO
Grout Seal Intact?	YES	NO
Repairs Necessary?		Not Visible
Casing Diameter:	2"	
Water Level Before Purge:	8.82	ft
Total Depth of Well:		ft
Well Volume:		liters
Depth to Top of Pump:		ft
Water Level After Sample:	8.92	ft
Measurement Method:	Electric Water Level Indicator	

SAMPLING INFORMATION

Purging Method:	Bladder
Sampling Method:	Bladder
Dedicated Equipment?	YES NO

Control Settings:	
Purge:	5 Sec.
Recover:	35 Sec.
PSI:	20

Duplicate Sample?	YES NO
Duplicate Sample ID:	

Bottle List:	
1 Liter Raw	4- 1L Nitric
500mL Nitric	
500mL Nitric (filtered)	
250mL Sulfuric	

FIELD READINGS

Stabilization Parameters (3 Consecutive)		Temp. (°C)	Spec. Cond. ±5%	pH ±0.1	DO (mg/L) ±10%	ORP (mV) ±10	Turbidity (NTU)	Water Level (ft)	Pumping Rate mL/Min	mL Removed	Appearance or Comment Clarity, Color, Odor, Ect.
Purge Date	Time	±0.5°									clear, slightly turbid, turbid
21 Sept 2020	1400	Start of Well Purge									
	1405	18.18	1189	7.29	1.61	183.3	28.59	8.87	100.0	500.0	Clear
	1435	19.48	1186	7.29	0.80	181.1	37.66	8.88	100.0	300.0	Clear
	1455	21.77	1197	7.29	0.88	182.1	11.98	8.89	100.0	200.0	Clear
	1515	21.83	1197	7.29	0.92	191.2	4.87	8.89	100.0	200.0	Clear
	1520	21.96	1202	7.29	0.94	192.5	3.05	8.89	100.0	500.0	Clear
	1525	21.95	1195	7.29	0.97	186.2	2.93	8.88	100.0	500.0	Clear

Well Stabilized? YES NO

Total Volume Purged: 8500.0 mL

Sample Date	Time	Temp. (°C)	Spec. Cond.	pH	Turbidity (NTU)	Appearance or Comment Clarity, Color, Odor, Ect.
21 Sept 2020	1525	21.95	1195	7.29	2.93	Clear

Comments:



Field Datasheet

Groundwater Assessment

Company: MDU Lewis & Clark
 Event: September 2020
 Sample ID: 111
 Sampling Personal: Jay [Signature]

2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

Weather Conditions: Temp: 65°F Wind: S @ 5-10 Precip: Sunny / Partly Cloudy / Cloudy

WELL INFORMATION

Well Locked?	YES	NO
Well Labeled?	YES	NO
Casing Strait?	YES	NO
Grout Seal Intact?	YES	NO
Repairs Necessary?		<u>Not Visible</u>
Casing Diameter:	<u>2"</u>	
Water Level Before Purge:	<u>7.83</u>	ft
Total Depth of Well:		ft
Well Volume:		liters
Depth to Top of Pump:		ft
Water Level After Sample:	<u>7.91</u>	ft
Measurement Method:	<u>Electric Water Level Indicator</u>	

SAMPLING INFORMATION

Purging Method:	Bladder	Control Settings:
Sampling Method:	Bladder	Purge: <u>5</u> Sec.
Dedicated Equipment?	YES NO	Recover: <u>55</u> Sec.
Duplicate Sample?	YES <u>NO</u>	PSI: <u>20</u>
Duplicate Sample ID:	<u>Dy 1</u>	
Bottle List:		
1 Liter Raw	4- 1L Nitric	
500mL Nitric		
500mL Nitric (filtered)		
250mL Sulfuric		

FIELD READINGS

Stabilization Parameters (3 Consecutive)		Temp. (°C)	Spec. Cond.	pH	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Water Level (ft)	Pumping Rate mL/Min	mL Removed	Appearance or Comment
Purge Date	Time	±0.5°	±5%	±0.1	±10%	±10					Clarity, Color, Odor, Ect.
22 Sept 2020	1210	Start of Well Purge									
	1215	16.93	4416	7.00	0.68	221.9	19.10	7.88	100.0	500.0	Clear
	1245	16.87	4153	7.04	0.49	186.1	17.90	7.88	100.0	3000.0	Clear
	1305	17.06	3917	7.10	1.57	122.0	8.69	7.88	100.0	2000.0	Clear
	1315	16.80	3874	7.12	1.87	78.1	4.98	7.88	100.0	1000.0	Clear
	1320	17.00	3861	7.12	1.93	72.3	3.53	7.89	100.0	500.0	Clear
	1325	17.16	3846	7.12	2.04	70.1	2.65	7.89	100.0	500.0	Clear

Well Stabilized? YES NO

Total Volume Purged: 7500.0 mL

Sample Date	Time	Temp. (°C)	Spec. Cond.	pH	Turbidity (NTU)	Appearance or Comment
						Clarity, Color, Odor, Ect.
22 Sept 2020	1325	17.16	3846	7.12	2.65	Clear

Comments:



Field Datasheet

Groundwater Assessment

Company: MDU Lewis & Clark

Event: September 2020

Sample ID: 117

Sampling Personal: J. M. [Signature]

2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

Weather Conditions: Temp: 60 °F Wind: S @ 5-10 Precip: Sunny / Partly Cloudy / Cloudy

WELL INFORMATION

Well Locked?	YES	NO
Well Labeled?	YES	NO
Casing Strait?	YES	NO
Grout Seal Intact?	YES	NO
Repairs Necessary?		Not Visible
Casing Diameter:	2"	
Water Level Before Purge:	5.80	ft
Total Depth of Well:	11.51	ft
Well Volume:	3.5	liters
Depth to Top of Pump:	9.48	ft
Water Level After Sample:	Below Pump	ft
Measurement Method:	Electric Water Level Indicator	

SAMPLING INFORMATION

Purging Method:	Bladder
Sampling Method:	Bladder
Dedicated Equipment?	YES NO

Control Settings:	
Purge: 5	Sec.
Recover: 55	Sec.
PSI: 20	

Duplicate Sample?	YES NO
Duplicate Sample ID:	—

Bottle List:	
1 Liter Raw	4- 1L Nitric
500mL Nitric	
500mL Nitric (filtered)	
250mL Sulfuric	

FIELD READINGS

Stabilization Parameters (3 Consecutive)		Temp. (°C)	Spec. Cond.	pH	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Water Level (ft)	Pumping Rate (mL/Min)	mL Removed	Appearance or Comment
Purge Date	Time	±0.5°	±5%	±0.1	±10%	±10					Clarity, Color, Odor, Ect.
21 Sept 2020	1640	Start of Well Purge									
	1645	16.15	7384	7.05	7.69	267.2	18.77	6.65	150.0	750.0	Clear
	1700	16.14	7432	7.05	8.01	232.6	24.06	9.00	150.0	2250.0	Clear
	1715	16.38	7458	7.13	7.19	267.8	5.30	Below Pump	150.0	2250.0	Clear
			Purged	Dry							
22 Sept 2020	1127	Purged well for 5 min to clear line									
	1132	16.68	7066	6.99	6.47	237.4	2.79	6.38	100.0	500.0	Clear

Well Stabilized?

YES

~~NO~~

Total Volume Purged: 5750.0 mL

Sample Date	Time	Temp. (°C)	Spec. Cond.	pH		Turbidity (NTU)			Appearance or Comment
Clarity, Color, Odor, Ect.									
22 Sept 2020	1132	16.68	7066	6.99		2.79			Clear

Comments:



Field Datasheet

Groundwater Assessment

Company: MDU Lewis & Clark
 Event: September 2020
 Sample ID: 118
 Sampling Personal: [Signature]

2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

Weather Conditions: Temp: 80°F Wind: S @ 5-10 Precip: Sunny / Partly Cloudy / Cloudy

WELL INFORMATION

Well Locked?	YES	<u>NO</u>
Well Labeled?	<u>YES</u>	NO
Casing Strait?	<u>YES</u>	NO
Grout Seal Intact?	<u>YES</u>	NO
Repairs Necessary?	Not Visible	
Casing Diameter:	2"	
Water Level Before Purge:	8.38	ft
Total Depth of Well:	—	
Well Volume:	—	
Depth to Top of Pump:	—	
Water Level After Sample:	8.50	ft
Measurement Method:	Electric Water Level Indicator	

SAMPLING INFORMATION

Purging Method:	Bladder	Control Settings:
Sampling Method:	Bladder	Purge: <u>5</u> Sec.
Dedicated Equipment?	YES <u>NO</u>	Recover: <u>55</u> Sec.
Duplicate Sample?	YES <u>NO</u>	PSI: <u>20</u>
Duplicate Sample ID:	—	
Bottle List:		
1 Liter Raw	4- 1L Nitric	
500mL Nitric		
500mL Nitric (filtered)		
250mL Sulfuric		

FIELD READINGS

Stabilization Parameters (3 Consecutive)		Temp. (°C)	Spec. Cond.	pH	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Water Level (ft)	Pumping Rate mL/Min	mL Removed	Appearance or Comment
Purge Date	Time	±0.5°	±5%	±0.1	±10%	±10					Clarity, Color, Odor, Ect.
	1540	Start of Well Purge									
22 Sept 2020	1545	21.92	1795	7.27	3.81	201.7	181.35	8.44	100.0	500.0	Clear
	1615	17.25	1569	7.09	4.03	201.0	2.66	8.46	100.0	3000.0	Clear
	1620	17.15	1613	7.09	3.91	199.0	1.51	8.46	100.0	500.0	Clear
	1625	17.15	1630	7.10	3.87	195.8	1.89	8.47	100.0	500.0	Clear
	1630	17.19	1638	7.11	3.85	191.4	1.32	8.47	100.0	500.0	Clear

Well Stabilized? YES NO

Total Volume Purged: 5000.0 mL

Sample Date	Time	Temp. (°C)	Spec. Cond.	pH	Turbidity (NTU)	Appearance or Comment
						Clarity, Color, Odor, Ect.
22 Sept 2020	1630	17.19	1638	7.11	1.32	Clear

Comments:



Field Datasheet

Groundwater Assessment

Company: MDU Lewis & Clark

Event: September 2020

Sample ID: 120

Sampling Personal: Jay [Signature]

2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

Weather Conditions: Temp: 65°F Wind: S @ 5-10 Precip: Sunny / Partly Cloudy / Cloudy

WELL INFORMATION

Well Locked?	YES	NO
Well Labeled?	YES	NO
Casing Strait?	YES	NO
Grout Seal Intact?	YES	NO
Repairs Necessary?		<u>Not Visible</u>
Casing Diameter:	<u>2"</u>	
Water Level Before Purge:	<u>14.41</u>	ft
Total Depth of Well:	<u>—</u>	ft
Well Volume:	<u>—</u>	liters
Depth to Top of Pump:	<u>—</u>	ft
Water Level After Sample:	<u>14.80</u>	ft
Measurement Method:	<u>Electric Water Level Indicator</u>	

SAMPLING INFORMATION

Purging Method:	<u>Bladder</u>
Sampling Method:	<u>Bladder</u>
Dedicated Equipment?	YES <u>NO</u>

Control Settings:	
Purge: <u>5</u>	Sec.
Recover: <u>55</u>	Sec.
PSI: <u>20</u>	

Duplicate Sample?	YES <u>NO</u>
Duplicate Sample ID:	<u>—</u>

Bottle List:	
1 Liter Raw	4- 1L Nitric
500mL Nitric	
500mL Nitric (filtered)	
250mL Sulfuric	

FIELD READINGS

Stabilization Parameters (3 Consecutive)		Temp. (°C)	Spec. Cond.	pH	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Water Level (ft)	Pumping Rate mL/Min	mL Removed	Appearance or Comment Clarity, Color, Odor, Ect.
Purge Date	Time	±0.5°	±5%	±0.1	±10%	±10					clear, slightly turbid, turbid
<u>22 Sept 2020</u>	<u>1000</u>	<u>Start of Well Purge</u>									
	<u>1005</u>	<u>11.75</u>	<u>6099</u>	<u>6.70</u>	<u>0.44</u>	<u>212.1</u>	<u>0.84</u>	<u>14.56</u>	<u>100.0</u>	<u>500.0</u>	<u>Clear</u>
	<u>1015</u>	<u>12.13</u>	<u>5562</u>	<u>6.70</u>	<u>0.64</u>	<u>156.8</u>	<u>1.13</u>	<u>14.65</u>	<u>100.0</u>	<u>1000.0</u>	<u>Clear</u>
	<u>1020</u>	<u>12.22</u>	<u>5535</u>	<u>6.70</u>	<u>0.73</u>	<u>93.4</u>	<u>0.75</u>	<u>14.68</u>	<u>100.0</u>	<u>500.0</u>	<u>Clear</u>
	<u>1025</u>	<u>12.34</u>	<u>5620</u>	<u>6.70</u>	<u>0.65</u>	<u>66.0</u>	<u>0.24</u>	<u>14.70</u>	<u>100.0</u>	<u>500.0</u>	<u>Clear</u>
	<u>1030</u>	<u>12.48</u>	<u>5686</u>	<u>6.70</u>	<u>0.62</u>	<u>59.4</u>	<u>0.19</u>	<u>14.71</u>	<u>100.0</u>	<u>500.0</u>	<u>Clear</u>
	<u>1035</u>	<u>12.49</u>	<u>5828</u>	<u>6.70</u>	<u>0.62</u>	<u>57.3</u>	<u>0.21</u>	<u>14.73</u>	<u>100.0</u>	<u>500.0</u>	<u>Clear</u>

Well Stabilized? YES NO

Total Volume Purged: 3500.0 mL

Sample Date	Time	Temp. (°C)	Spec. Cond.	pH	Turbidity (NTU)	Appearance or Comment Clarity, Color, Odor, Ect.
<u>22 Sept 2020</u>	<u>1035</u>	<u>12.49</u>	<u>5828</u>	<u>6.70</u>	<u>0.21</u>	<u>Clear</u>

Comments:



Field Datasheet

Surface water Assessment

2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

Company: MDU Lewis & Clark

Event: September 2020

Sample ID: _____

Sampling Personal: Jay [Signature]

Weather Conditions: Temp: 60 °F Wind: S @ 5-10 Precip: Sunny / Partly Cloudy / Cloudy

Well ID	Date	Time	Casing Diameter	Water Level (ft)	Comments
MW101	22 Sept 2020	0952	2"	9.06	
MW105	22 Sept 2020	1730	2"	8.75	
MW106	22 Sept 2020	1536	2"	9.44	
MW107	22 Sept 2020	0954	2"	4.38	
MW108	22 Sept 2020	1203	2"	16.03	
MW116	22 Sept 2020	1201	2"	11.82	



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MEMBER
ACIL

Quality Control Report

Lab IDs: 20-W3620 to 20-W3628

Project: MDU Lewis & Clark

Work Order: 202082-2645

Analyte	LCS Spike Amt	LCS Rec %	LCS % Rec Limits	Matrix Spike Amt	Matrix Spike ID	Matrix Spike Orig Result	Matrix Spike Result	Matrix Spike Rec %	Matrix Spike % Rec Limits	MSD/ Dup Orig Result	MSD/ Dup Result	MSD Rec %	MSD/ Dup RPD	MSD/ Dup RPD Limit (<)	Known Rec (%)	Known % Rec Limits	Method Blank
Antimony - Dissolved mg/l	0.1000	98	80-120	0.100 0.100	20W3628Dq 20W3629Dq	< 0.001 < 0.001	0.0999 0.1004	100 100	75-125 75-125	0.0999 0.1004	0.0995 0.0965	100 96	0.4 4.0	20 20	- -	- -	< 0.001
Arsenic - Dissolved mg/l	0.1000	97	80-120	0.100 0.100	20W3628Dq 20W3629Dq	< 0.002 < 0.002	0.0995 0.1012	100 101	75-125 75-125	0.0995 0.1012	0.0964 0.0947	96 95	3.2 6.6	20 20	- -	- -	< 0.002
Barium - Dissolved mg/l	0.1000	98	80-120	0.100 0.100	20W3628Dq 20W3629Dq	0.0204 0.0798	0.1142 0.1760	94 96	75-125 75-125	0.1142 0.1760	0.1124 0.1680	92 88	1.6 4.7	20 20	- -	- -	< 0.002
Beryllium - Dissolved mg/l	0.1000	105	80-120	0.100 0.100	20W3628Dq 20W3629Dq	< 0.0005 < 0.0005	0.1010 0.1036	101 104	75-125 75-125	0.1010 0.1036	0.0994 0.0967	99 97	1.6 6.9	20 20	- -	- -	< 0.0005
Boron - Dissolved mg/l	0.40 0.40	100 100	80-120 80-120	4.00 4.00	20-W3626 20-W3628	10.3 9.25	13.5 12.6	80 84	75-125 75-125	13.5 12.6	13.3 12.7	75 86	1.5 0.8	20 20	- - - -	- - - -	< 0.1 < 0.1 < 0.1 < 0.1
Cadmium - Dissolved mg/l	0.1000	102	80-120	0.100 0.100	20W3628Dq 20W3629Dq	< 0.0005 < 0.0005	0.0948 0.0977	95 98	75-125 75-125	0.0948 0.0977	0.0921 0.0934	92 93	2.9 4.5	20 20	- -	- -	< 0.0005
Calcium - Dissolved mg/l	20.0	114	80-120	500	20W3626q	340	855	103	75-125	855	865	105	1.2	20	- -	- -	< 1 < 1
Chromium - Dissolved mg/l	0.1000	99	80-120	0.100 0.100	20W3628Dq 20W3629Dq	0.0026 < 0.002	0.1064 0.1050	104 105	75-125 75-125	0.1064 0.1050	0.1072 0.0982	105 98	0.7 6.7	20 20	- -	- -	< 0.002
Cobalt - Dissolved mg/l	0.1000	99	80-120	0.100 0.100	20W3628Dq 20W3629Dq	< 0.002 < 0.002	0.1030 0.1041	103 104	75-125 75-125	0.1030 0.1041	0.1026 0.0976	103 98	0.4 6.4	20 20	- -	- -	< 0.002
Lead - Dissolved mg/l	0.1000	100	80-120	0.100 0.100	20W3628Dq 20W3629Dq	< 0.0005 < 0.0005	0.0916 0.0938	92 94	75-125 75-125	0.0916 0.0938	0.0908 0.0894	91 89	0.9 4.8	20 20	- -	- -	< 0.0005
Lithium - Dissolved mg/l	0.400	108	80-120	2.00	20-W3626	0.130	2.16	102	75-125	2.16	2.18	102	0.9	20	- - -	- - -	< 0.02 < 0.02 < 0.02
Magnesium - Dissolved mg/l	20.0	110	80-120	500	20W3626q	940	1380	88	75-125	1380	1400	92	1.4	20	- -	- -	< 1 < 1



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MEMBER
ACIL

Quality Control Report

Lab IDs: 20-W3620 to 20-W3628

Project: MDU Lewis & Clark

Work Order: 202082-2645

Analyte	LCS Spike Amt	LCS Rec %	LCS % Rec Limits	Matrix Spike Amt	Matrix Spike ID	Matrix Spike Orig Result	Matrix Spike Result	Matrix Spike Rec %	Matrix Spike % Rec Limits	MSD/ Dup Orig Result	MSD/ Dup Result	MSD Rec %	MSD/ Dup RPD	MSD/ Dup RPD Limit (<)	Known Rec (%)	Known % Rec Limits	Method Blank
Magnesium - Total mg/l	20.0	110	80-120	500	20W3626q	965	1440	95	75-125	1440	1440	95	0.0	20	-	-	< 1
	20.0	110	80-120	500	20W3651q	8.8	520	102	75-125	520	520	102	0.0	20	-	-	< 1
				500	20W3654q	308	790	96	75-125	790	795	97	0.6	20	-	-	< 1
Mercury - Dissolved mg/l	0.0020	90	85-115	0.002	20-W3629	< 0.0002	0.0017	85	70-130	0.0017	0.0017	85	0.0	20	-	-	< 0.0002
Molybdenum - Dissolved mg/l	0.1000	100	80-120	0.100	20W3628Dq	0.0030	0.1111	108	75-125	0.1111	0.1084	105	2.5	20	-	-	< 0.002
				0.100	20W3629Dq	0.0557	0.1606	105	75-125	0.1606	0.1540	98	4.2	20	-	-	< 0.002
Nitrate-Nitrite as N mg/l	0.50	104	90-110	1.00	20-W3621	< 0.1	1.11	111	90-110	1.11	1.12	112	0.9	20	-	-	< 0.1
Potassium - Dissolved mg/l	10.0	104	80-120	100	20W3626q	28.1	126	98	75-125	126	130	102	3.1	20	-	-	< 1
Potassium - Total mg/l	10.0	104	80-120	100	20W3626q	28.4	131	103	75-125	131	132	104	0.8	20	-	-	< 1
	10.0	105	80-120	100	20W3651q	6.4	108	102	75-125	108	108	102	0.0	20	-	-	< 1
				100	20W3654q	11.4	112	101	75-125	112	112	101	0.0	20	-	-	< 1
Selenium - Dissolved mg/l	0.1000	96	80-120	0.100	20W3628Dq	< 0.005	0.1026	103	75-125	0.1026	0.1031	103	0.5	20	-	-	< 0.005
				0.100	20W3629Dq	0.0182	0.1234	105	75-125	0.1234	0.1156	97	6.5	20	-	-	< 0.005
Sodium - Dissolved mg/l	20.0	108	80-120	500	20W3626q	560	1000	88	75-125	1000	1010	90	1.0	20	-	-	< 1
Sodium - Total mg/l	20.0	106	80-120	500	20W3626q	570	1060	98	75-125	1060	1040	94	1.9	20	-	-	< 1
	20.0	107	80-120	500	20W3651q	1220	1610	78	75-125	1610	1600	76	0.6	20	-	-	< 1
				1000	20W3654q	740	1670	93	75-125	1670	1670	93	0.0	20	-	-	< 1

Quality Control Report

Lab IDs: 20-W3620 to 20-W3628

Project: MDU Lewis & Clark

Work Order: 202082-2645

Analyte	LCS Spike Amt	LCS Rec %	LCS % Rec Limits	Matrix Spike Amt	Matrix Spike ID	Matrix Spike Orig Result	Matrix Spike Result	Matrix Spike Rec %	Matrix Spike % Rec Limits	MSD/ Dup Orig Result	MSD/ Dup Result	MSD Rec %	MSD/ Dup RPD	MSD/ Dup RPD Limit (<)	Known Rec (%)	Known % Rec Limits	Method Blank
Thallium - Dissolved mg/l	0.1000	90	80-120	0.100	20-W3629	< 0.0005	0.0867	87	75-125	0.0867	0.0810	81	6.8	20	-	-	< 0.0005
Total Alkalinity mg/l CaCO3	410	96	90-110	410	20-D3052	454	835	93	80-120	835	835	93	0.0	20	98	80-120	< 20
	410	95	90-110	410	20-W3620	444	835	95	80-120	835	841	97	0.7	20			< 20
	410	103	90-110	410	20-W3628	674	1079	99	80-120	1079	1051	92	2.6	20			< 20
	410	104	90-110	-	-	-	-	-	-	-	-	-	-	-			< 20
Total Suspended Solids mg/l	-	-	-	-	-	-	-	-	-	152	156	-	2.6	20	-	-	< 2
	-	-	-	-	-	-	-	-	-	91	97	-	6.4	20	-	-	< 2

Samples were received in good condition on 24 Sep 2020 at 0740.

Temperature upon receipt at the Bismarck laboratory was 5.3°C.

All samples were properly preserved unless noted here and/or flagged on the individual analytical laboratory report.

With the exception of pH, all holding times were met.

Approved methodology was followed for all sample analyses.

All acceptance criteria were met for calibration, method blanks, laboratory control samples, laboratory fortified matrix/duplicates unless noted here.

- The recoveries for one nitrate matrix spike/matrix spike duplicate were outside the acceptable limits. RPD for the recoveries was within limits. Poor recoveries were determined to be due to sample matrix. LCS was acceptable. No further action was taken.

Approved by: C. [Signature]

12/01/2020



2616 E. Broadway Ave
Bismarck, ND 58501
(701) 258-9720

Chain of Custody Record

Project Name: MDU Lewis & Clark	Event: September 2020	Work Order Number: 82-2645
Report To: MDU Attn: Todd Peterson Address: 400 N. 4th St Bismarck, ND 58501 Phone: 701-425-2427 Email: Todd.Peterson@mdu.com	CC:	Collected By:

Lab Number	Sample ID	Date	Time	Sample Type	Sample Type				Temp (°C)	Spec. Cond.	pH	Turbidity (NTU)	Analysis Required
					1 Liter Raw	500 mL Nitric	500 mL Nitric	250 mL Nitric (filtered)					
W3620	Dup 1	22 Sept 2020	NA	GW	X	X	X	X	NA	NA	NA	NA	MDU Lewis & Clark List
W3621	Field Blank (FB)	22 Sept 2020	NA	GW	X	X	X	X	NA	NA	NA	NA	
W3622	MW103	22 Sept 2020	0910	GW	X	X	X	X	13.38	1347	7.30	4.29	
W3623	MW110	21 Sept 2020	1258	GW	X	X	X	X	16.87	1124	7.36	4.91	
W3624	MW119	21 Sept 2020	1525	GW	X	X	X	X	21.95	1195	7.29	2.93	
W3625	MW111	22 Sept 2020	1325	GW	X	X	X	X	17.16	3846	7.12	2.65	
W3626	MW117	22 Sept 2020	1132	GW	X	X	X	X	16.68	7066	6.99	2.79	
W3627	MW118	22 Sept 2020	1630	GW	X	X	X	X	17.19	1638	7.11	1.32	
W3628	MW120	22 Sept 2020	1035	GW	X	X	X	X	12.49	5828	6.70	0.21	

Comments:

Relinquished By		Sample Condition		Received By	
Name	Date/Time	Location	Temp (°C)	Name	Date/Time
	24 Sept 2020 0740	Log In Walk In #2	5.3 TM562 / TM805		24 Sept 2020 0740
1					
2					



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Todd Peterson
Montana-Dakota Utilities Co.
400 N 4th St
Bismarck ND 58501

Report Date: 22 Oct 20
Lab Number: 20-W3630
Work Order #: 82-2647
Account #: 002800
Date Sampled: 22 Sep 20
Date Received: 24 Sep 20 7:40
Sampled By: MVTL Field Service

Project Name: MDU Lewis & Clark

PO #: 180534 OP

Sample Description: Dup 1

Temp at Receipt: 17.2C

Event and Year: September 2020

Table with 6 columns: Analyte, As Received Result, Method RL, Method Reference, Date Analyzed, Analyst. Rows include Radium 226 and Radium 228.

OL = Analysis performed by an Outside Laboratory.

Approved by: Claudette K. Carroll 22 OCT 2020

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

The reporting limit was elevated for any analyte requiring a dilution as coded below:
@ = Due to sample matrix # = Due to concentration of other analytes
! = Due to sample quantity * = Due to internal standard response

CERTIFICATION: ND # ND-00016



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Todd Peterson
Montana-Dakota Utilities Co.
400 N 4th St
Bismarck ND 58501

Report Date: 22 Oct 20
Lab Number: 20-W3631
Work Order #: 82-2647
Account #: 002800
Date Sampled: 22 Sep 20
Date Received: 24 Sep 20 7:40
Sampled By: MVTL Field Service

Project Name: MDU Lewis & Clark
Sample Description: Field Blank (FB)
Event and Year: September 2020

PO #: 180534 OP
Temp at Receipt: 17.2C

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
Radium 226	See Attached Report			12 Oct 20	OL
Radium 228	See Attached Report			6 Oct 20	OL

OL = Analysis performed by an Outside Laboratory.

CC

Approved by: Claudette K. Carroll 22 OCT 2020

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

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CERTIFICATION: ND # ND-00016



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Todd Peterson
Montana-Dakota Utilities Co.
400 N 4th St
Bismarck ND 58501

Report Date: 22 Oct 20
Lab Number: 20-W3632
Work Order #: 82-2647
Account #: 002800
Date Sampled: 22 Sep 20 9:10
Date Received: 24 Sep 20 7:40
Sampled By: MVTL Field Service

Project Name: MDU Lewis & Clark

PO #: 180534 OP

Sample Description: MW103

Temp at Receipt: 17.2C

Event and Year: September 2020

Table with 6 columns: As Received Result, Method RL, Method Reference, Date Analyzed, and Analyst. Rows include pH - Field, Turbidity, Field, Temperature - Field, Conductivity - Field, Radium 226, and Radium 228.

OL = Analysis performed by an Outside Laboratory.

Approved by: Claudette K. Carroll 22 OCT 2020

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

The reporting limit was elevated for any analyte requiring a dilution as coded below:
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! = Due to sample quantity * = Due to internal standard response

CERTIFICATION: ND # ND-00016



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Todd Peterson
Montana-Dakota Utilities Co.
400 N 4th St
Bismarck ND 58501

Report Date: 22 Oct 20
Lab Number: 20-W3633
Work Order #: 82-2647
Account #: 002800
Date Sampled: 21 Sep 20 12:58
Date Received: 24 Sep 20 7:40
Sampled By: MVTL Field Service

Project Name: MDU Lewis & Clark

Sample Description: MW110

PO #: 180534 OP

Event and Year: September 2020

Temp at Receipt: 17.2C

Table with 6 columns: As Received Result, Method RL, Method Reference, Date Analyzed, Analyst. Rows include pH - Field, Turbidity, Field, Temperature - Field, Conductivity - Field, Radium 226, and Radium 228.

OL = Analysis performed by an Outside Laboratory.

Approved by: Claudette K. Carroll 22 OCT 2020
Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit
The reporting limit was elevated for any analyte requiring a dilution as coded below:
@ = Due to sample matrix
! = Due to sample quantity
= Due to concentration of other analytes
* = Due to internal standard response

CERTIFICATION: ND # ND-00016

MVTL guarantees the accuracy of the analysis done on the sample submitted for testing. It is not possible for MVTL to guarantee that a test result obtained on a particular sample will be the same on any other sample unless all conditions affecting the sample are the same, including sampling by MVTL. As a mutual protection to clients, the public and ourselves, all reports are submitted as the confidential property of clients, and authorization for publication of statements, conclusions or extracts from or regarding our reports is reserved pending our written approval.



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Todd Peterson
Montana-Dakota Utilities Co.
400 N 4th St
Bismarck ND 58501

Report Date: 22 Oct 20
Lab Number: 20-W3634
Work Order #: 82-2647
Account #: 002800
Date Sampled: 21 Sep 20 15:25
Date Received: 24 Sep 20 7:40
Sampled By: MVTL Field Service

Project Name: MDU Lewis & Clark

PO #: 180534 OP

Sample Description: MW119

Temp at Receipt: 17.2C

Event and Year: September 2020

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	7.29	units	NA	SM 4500 H+ B	21 Sep 20 15:25	JSM
Turbidity, Field	2.9	NTU	0.1	180.1	21 Sep 20 15:25	JSM
Temperature - Field	22.0	Degrees C	NA	SM 2550B	21 Sep 20 15:25	JSM
Conductivity - Field	1195	umhos/cm	1	EPA 120.1	21 Sep 20 15:25	JSM
Radium 226	See Attached Report				12 Oct 20	OL
Radium 228	See Attached Report				6 Oct 20	OL

OL = Analysis performed by an Outside Laboratory.

Approved by: Claudette K Carroll 22 OCT 2020

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

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! = Due to sample quantity + = Due to internal standard response

CERTIFICATION: ND # ND-00016



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Todd Peterson
Montana-Dakota Utilities Co.
400 N 4th St
Bismarck ND 58501

Report Date: 22 Oct 20
Lab Number: 20-W3635
Work Order #: 82-2647
Account #: 002800
Date Sampled: 22 Sep 20 13:25
Date Received: 24 Sep 20 7:40
Sampled By: MVTL Field Service

Project Name: MDU Lewis & Clark

PO #: 180534 OP

Sample Description: MW111

Temp at Receipt: 17.2C

Event and Year: September 2020

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	7.12	units	NA	SM 4500 H+ B	22 Sep 20 13:25	JSM
Turbidity, Field	2.6	NTU	0.1	180.1	22 Sep 20 13:25	JSM
Temperature - Field	17.2	Degrees C	NA	SM 2550B	22 Sep 20 13:25	JSM
Conductivity - Field	3846	umhos/cm	1	EPA 120.1	22 Sep 20 13:25	JSM
Radium 226	See Attached Report				12 Oct 20	OL
Radium 228	See Attached Report				6 Oct 20	OL

OL = Analysis performed by an Outside Laboratory.

Approved by: Claudette K. Carroll ^{lc} 22 OCT 2020

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

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! = Due to sample quantity + = Due to internal standard response

CERTIFICATION: ND # ND-00016



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Todd Peterson
Montana-Dakota Utilities Co.
400 N 4th St
Bismarck ND 58501

Report Date: 22 Oct 20
Lab Number: 20-W3636
Work Order #: 82-2647
Account #: 002800
Date Sampled: 22 Sep 20 11:32
Date Received: 24 Sep 20 7:40
Sampled By: MVTL Field Service

Project Name: MDU Lewis & Clark

PO #: 180534 OP

Sample Description: MW117

Temp at Receipt: 17.2C

Event and Year: September 2020

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	6.99	units	NA	SM 4500 H+ B	22 Sep 20 11:32	JSM
Turbidity, Field	2.8	NTU	0.1	180.1	22 Sep 20 11:32	JSM
Temperature - Field	16.7	Degrees C	NA	SM 2550B	22 Sep 20 11:32	JSM
Conductivity - Field	7066	umhos/cm	1	EPA 120.1	22 Sep 20 11:32	JSM
Radium 226	See Attached Report				12 Oct 20	OL
Radium 228	See Attached Report				6 Oct 20	OL

OL = Analysis performed by an Outside Laboratory.

CC

Approved by: Claudette K. Carroll 22 OCT 2020

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

The reporting limit was elevated for any analyte requiring a dilution as coded below:

@ = Due to sample matrix # = Due to concentration of other analytes
! = Due to sample quantity + = Due to internal standard response

CERTIFICATION: ND # ND-00016



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Todd Peterson
Montana-Dakota Utilities Co.
400 N 4th St
Bismarck ND 58501

Report Date: 22 Oct 20
Lab Number: 20-W3637
Work Order #: 82-2647
Account #: 002800
Date Sampled: 22 Sep 20 16:30
Date Received: 24 Sep 20 7:40
Sampled By: MVTL Field Service

Project Name: MDU Lewis & Clark

Sample Description: MW118

PO #: 180534 OP

Event and Year: September 2020

Temp at Receipt: 17.2C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	7.11	units	NA	SM 4500 H+ B	22 Sep 20 16:30	JSM
Turbidity, Field	1.3	NTU	0.1	180.1	22 Sep 20 16:30	JSM
Temperature - Field	17.2	Degrees C	NA	SM 2550B	22 Sep 20 16:30	JSM
Conductivity - Field	1638	umhos/cm	1	EPA 120.1	22 Sep 20 16:30	JSM
Radium 226	See Attached Report				12 Oct 20	OL
Radium 228	See Attached Report				6 Oct 20	OL

OL = Analysis performed by an Outside Laboratory.

Approved by: Claudette K. Carroll ^{CC} 22 OCT 2020

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

The reporting limit was elevated for any analyte requiring a dilution as coded below:

- @ = Due to sample matrix
- ! = Due to sample quantity
- # = Due to concentration of other analytes
- * = Due to internal standard response

CERTIFICATION: ND # ND-00016



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.mvttl.com



Page: 1 of 1

Todd Peterson
Montana-Dakota Utilities Co.
400 N 4th St
Bismarck ND 58501

Report Date: 22 Oct 20
Lab Number: 20-W3638
Work Order #: 82-2647
Account #: 002800
Date Sampled: 22 Sep 20 10:35
Date Received: 24 Sep 20 7:40
Sampled By: MVTl Field Service

Project Name: MDU Lewis & Clark

Sample Description: MW120

Event and Year: September 2020

PO #: 180534 OP

Temp at Receipt: 17.2C

Table with 6 columns: As Received Result, Method RL, Method Reference, Date Analyzed, Analyst. Rows include pH - Field, Turbidity, Field, Temperature - Field, Conductivity - Field, Radium 226, and Radium 228.

OL = Analysis performed by an Outside Laboratory.

Approved by: Claudette K Carroll 22 OCT 2020

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

The reporting limit was elevated for any analyte requiring a dilution as coded below:
@ = Due to sample matrix # = Due to concentration of other analytes
! = Due to sample quantity + = Due to internal standard response

CERTIFICATION: ND # ND-00016



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ANALYTICAL SUMMARY REPORT

October 19, 2020

Minnesota Valley Testing Laboratories
1126 N Front St
New Ulm, MN 56073-1176

Work Order: C20091113

Project Name: 202082-2647

Energy Laboratories, Inc. Casper WY received the following 9 samples for Minnesota Valley Testing Laboratories on 9/28/2020 for analysis.

Lab ID	Client Sample ID	Collect Date	Receive Date	Matrix	Test
C20091113-001	20-W3630; Dup 1	09/22/20 0:00	09/28/20	Groundwater	pH Check for Nitric Radiochem FIRST Radium 226 + Radium 228 Radium 226, Total Radium 228, Total
C20091113-002	20-W3631; Field Blank (FB)	09/22/20 0:00	09/28/20	Groundwater	Same As Above
C20091113-003	20-W3632; MW103	09/22/20 9:10	09/28/20	Groundwater	Same As Above
C20091113-004	20-W3633; MW110	09/21/20 12:58	09/28/20	Groundwater	Same As Above
C20091113-005	20-W3634; MW119	09/21/20 15:25	09/28/20	Groundwater	Same As Above
C20091113-006	20-W3635; MW111	09/22/20 13:25	09/28/20	Groundwater	Same As Above
C20091113-007	20-W3636; MW117	09/22/20 11:32	09/28/20	Groundwater	Same As Above
C20091113-008	20-W3637; MW118	09/22/20 16:30	09/28/20	Groundwater	Same As Above
C20091113-009	20-W3638; MW120	09/22/20 10:35	09/28/20	Groundwater	Same As Above

The analyses presented in this report were performed by Energy Laboratories, Inc., 2393 Salt Creek Hwy., Casper, WY 82601, unless otherwise noted. Any exceptions or problems with the analyses are noted in the Laboratory Analytical Report, the QA/QC Summary Report, or the Case Narrative. Any issues encountered during sample receipt are documented in the Work Order Receipt Checklist.

The results as reported relate only to the item(s) submitted for testing. This report shall be used or copied only in its entirety. Energy Laboratories, Inc. is not responsible for the consequences arising from the use of a partial report.

Report Approved By:

Kasey Vidick
Project Manager

Digitally signed by
Kasey Vidick
Date: 2020.10.19 12:14:19 -06:00



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LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Minnesota Valley Testing Laboratories
Project: 202082-2647
Lab ID: C20091113-001
Client Sample ID: 20-W3630; Dup 1

Report Date: 10/19/20
Collection Date: 09/22/20
Date Received: 09/28/20
Matrix: Groundwater

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
RADIONUCLIDES, TOTAL							
Radium 226	0.3	pCi/L				E903.0	10/12/20 14:35 / trs
Radium 226 precision (±)	0.2	pCi/L				E903.0	10/12/20 14:35 / trs
Radium 226 MDC	0.2	pCi/L				E903.0	10/12/20 14:35 / trs
Radium 228	1.1	pCi/L				RA-05	10/06/20 13:52 / plj
Radium 228 precision (±)	0.7	pCi/L				RA-05	10/06/20 13:52 / plj
Radium 228 MDC	1.0	pCi/L				RA-05	10/06/20 13:52 / plj
Radium 226 + Radium 228	1.4	pCi/L				A7500-RA	10/13/20 12:00 / dmf
Radium 226 + Radium 228 precision (±)	0.7	pCi/L				A7500-RA	10/13/20 12:00 / dmf
Radium 226 + Radium 228 MDC	1.0	pCi/L				A7500-RA	10/13/20 12:00 / dmf

Report RL - Analyte Reporting Limit
Definitions: QCL - Quality Control Limit

MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)



LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Minnesota Valley Testing Laboratories
Project: 202082-2647
Lab ID: C20091113-002
Client Sample ID: 20-W3631; Field Blank (FB)

Report Date: 10/19/20
Collection Date: 09/22/20
Date Received: 09/28/20
Matrix: Groundwater

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
RADIONUCLIDES, TOTAL							
Radium 226	0.3	pCi/L			E903.0		10/12/20 14:35 / trs
Radium 226 precision (±)	0.2	pCi/L			E903.0		10/12/20 14:35 / trs
Radium 226 MDC	0.3	pCi/L			E903.0		10/12/20 14:35 / trs
Radium 228	0.1	pCi/L	U		RA-05		10/06/20 13:52 / plj
Radium 228 precision (±)	0.8	pCi/L			RA-05		10/06/20 13:52 / plj
Radium 228 MDC	1.3	pCi/L			RA-05		10/06/20 13:52 / plj
Radium 226 + Radium 228	0.4	pCi/L	U		A7500-RA		10/13/20 12:00 / dmf
Radium 226 + Radium 228 precision (±)	0.8	pCi/L			A7500-RA		10/13/20 12:00 / dmf
Radium 226 + Radium 228 MDC	1.3	pCi/L			A7500-RA		10/13/20 12:00 / dmf

Report RL - Analyte Reporting Limit MCL - Maximum Contaminant Level
Definitions: QCL - Quality Control Limit ND - Not detected at the Reporting Limit (RL)
U - Not detected at Minimum Detectable Concentration (MDC)



LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Minnesota Valley Testing Laboratories
Project: 202082-2647
Lab ID: C20091113-003
Client Sample ID: 20-W3632; MW103

Report Date: 10/19/20
Collection Date: 09/22/20 09:10
Date Received: 09/28/20
Matrix: Groundwater

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
RADIONUCLIDES, TOTAL							
Radium 226	0.3	pCi/L				E903.0	10/12/20 14:35 / trs
Radium 226 precision (±)	0.2	pCi/L				E903.0	10/12/20 14:35 / trs
Radium 226 MDC	0.2	pCi/L				E903.0	10/12/20 14:35 / trs
Radium 228	-0.01	pCi/L	U			RA-05	10/06/20 13:52 / plj
Radium 228 precision (±)	0.7	pCi/L				RA-05	10/06/20 13:52 / plj
Radium 228 MDC	1.1	pCi/L				RA-05	10/06/20 13:52 / plj
Radium 226 + Radium 228	0.3	pCi/L	U			A7500-RA	10/13/20 12:00 / dmf
Radium 226 + Radium 228 precision (±)	0.7	pCi/L				A7500-RA	10/13/20 12:00 / dmf
Radium 226 + Radium 228 MDC	1.2	pCi/L				A7500-RA	10/13/20 12:00 / dmf

Report RL - Analyte Reporting Limit MCL - Maximum Contaminant Level
Definitions: QCL - Quality Control Limit ND - Not detected at the Reporting Limit (RL)
U - Not detected at Minimum Detectable Concentration (MDC)



LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Minnesota Valley Testing Laboratories
Project: 202082-2647
Lab ID: C20091113-004
Client Sample ID: 20-W3633; MW110

Report Date: 10/19/20
Collection Date: 09/21/20 12:58
Date Received: 09/28/20
Matrix: Groundwater

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
RADIONUCLIDES, TOTAL							
Radium 226	0.3	pCi/L				E903.0	10/12/20 14:35 / trs
Radium 226 precision (±)	0.2	pCi/L				E903.0	10/12/20 14:35 / trs
Radium 226 MDC	0.2	pCi/L				E903.0	10/12/20 14:35 / trs
Radium 228	-0.1	pCi/L	U			RA-05	10/06/20 13:52 / plj
Radium 228 precision (±)	0.6	pCi/L				RA-05	10/06/20 13:52 / plj
Radium 228 MDC	1.0	pCi/L				RA-05	10/06/20 13:52 / plj
Radium 226 + Radium 228	0.2	pCi/L		U		A7500-RA	10/13/20 12:00 / dmf
Radium 226 + Radium 228 precision (±)	0.6	pCi/L				A7500-RA	10/13/20 12:00 / dmf
Radium 226 + Radium 228 MDC	1.0	pCi/L				A7500-RA	10/13/20 12:00 / dmf

Report RL - Analyte Reporting Limit MCL - Maximum Contaminant Level
Definitions: QCL - Quality Control Limit ND - Not detected at the Reporting Limit (RL)
U - Not detected at Minimum Detectable Concentration (MDC)



LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Minnesota Valley Testing Laboratories
Project: 202082-2647
Lab ID: C20091113-005
Client Sample ID: 20-W3634; MW119

Report Date: 10/19/20
Collection Date: 09/21/20 15:25
Date Received: 09/28/20
Matrix: Groundwater

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
RADIONUCLIDES, TOTAL							
Radium 226	0.2	pCi/L				E903.0	10/12/20 14:35 / trs
Radium 226 precision (±)	0.2	pCi/L				E903.0	10/12/20 14:35 / trs
Radium 226 MDC	0.2	pCi/L				E903.0	10/12/20 14:35 / trs
Radium 228	0.5	pCi/L	U			RA-05	10/06/20 13:52 / plj
Radium 228 precision (±)	0.7	pCi/L				RA-05	10/06/20 13:52 / plj
Radium 228 MDC	1.1	pCi/L				RA-05	10/06/20 13:52 / plj
Radium 226 + Radium 228	0.7	pCi/L	U			A7500-RA	10/13/20 12:00 / dmf
Radium 226 + Radium 228 precision (±)	0.7	pCi/L				A7500-RA	10/13/20 12:00 / dmf
Radium 226 + Radium 228 MDC	1.1	pCi/L				A7500-RA	10/13/20 12:00 / dmf

Report RL - Analyte Reporting Limit MCL - Maximum Contaminant Level
Definitions: QCL - Quality Control Limit ND - Not detected at the Reporting Limit (RL)
U - Not detected at Minimum Detectable Concentration (MDC)



LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Minnesota Valley Testing Laboratories
Project: 202082-2647
Lab ID: C20091113-006
Client Sample ID: 20-W3635; MW111

Report Date: 10/19/20
Collection Date: 09/22/20 13:25
Date Received: 09/28/20
Matrix: Groundwater

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
RADIONUCLIDES, TOTAL							
Radium 226	0.3	pCi/L				E903.0	10/12/20 14:35 / trs
Radium 226 precision (±)	0.2	pCi/L				E903.0	10/12/20 14:35 / trs
Radium 226 MDC	0.2	pCi/L				E903.0	10/12/20 14:35 / trs
Radium 228	0.9	pCi/L	U			RA-05	10/06/20 15:36 / plj
Radium 228 precision (±)	0.8	pCi/L				RA-05	10/06/20 15:36 / plj
Radium 228 MDC	1.3	pCi/L				RA-05	10/06/20 15:36 / plj
Radium 226 + Radium 228	1.2	pCi/L	U			A7500-RA	10/13/20 12:00 / dmf
Radium 226 + Radium 228 precision (±)	0.9	pCi/L				A7500-RA	10/13/20 12:00 / dmf
Radium 226 + Radium 228 MDC	1.3	pCi/L				A7500-RA	10/13/20 12:00 / dmf

Report RL - Analyte Reporting Limit MCL - Maximum Contaminant Level
Definitions: QCL - Quality Control Limit ND - Not detected at the Reporting Limit (RL)
U - Not detected at Minimum Detectable Concentration (MDC)



LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Minnesota Valley Testing Laboratories
Project: 202082-2647
Lab ID: C20091113-007
Client Sample ID: 20-W3636; MW117

Report Date: 10/19/20
Collection Date: 09/22/20 11:32
Date Received: 09/28/20
Matrix: Groundwater

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
RADIONUCLIDES, TOTAL							
Radium 226	0.8	pCi/L				E903.0	10/12/20 16:13 / trs
Radium 226 precision (±)	0.2	pCi/L				E903.0	10/12/20 16:13 / trs
Radium 226 MDC	0.2	pCi/L				E903.0	10/12/20 16:13 / trs
Radium 228	1.9	pCi/L				RA-05	10/06/20 15:36 / plj
Radium 228 precision (±)	0.9	pCi/L				RA-05	10/06/20 15:36 / plj
Radium 228 MDC	1.1	pCi/L				RA-05	10/06/20 15:36 / plj
Radium 226 + Radium 228	2.7	pCi/L				A7500-RA	10/13/20 12:00 / dmf
Radium 226 + Radium 228 precision (±)	0.9	pCi/L				A7500-RA	10/13/20 12:00 / dmf
Radium 226 + Radium 228 MDC	1.1	pCi/L				A7500-RA	10/13/20 12:00 / dmf

Report RL - Analyte Reporting Limit
Definitions: QCL - Quality Control Limit

MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)



LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Minnesota Valley Testing Laboratories
Project: 202082-2647
Lab ID: C20091113-008
Client Sample ID: 20-W3637; MW118

Report Date: 10/19/20
Collection Date: 09/22/20 16:30
Date Received: 09/28/20
Matrix: Groundwater

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
RADIONUCLIDES, TOTAL							
Radium 226	0.1	pCi/L	U		E903.0		10/12/20 16:13 / trs
Radium 226 precision (±)	0.2	pCi/L			E903.0		10/12/20 16:13 / trs
Radium 226 MDC	0.2	pCi/L			E903.0		10/12/20 16:13 / trs
Radium 228	0.1	pCi/L	U		RA-05		10/06/20 15:36 / plj
Radium 228 precision (±)	0.8	pCi/L			RA-05		10/06/20 15:36 / plj
Radium 228 MDC	1.4	pCi/L			RA-05		10/06/20 15:36 / plj
Radium 226 + Radium 228	0.2	pCi/L	U		A7500-RA		10/13/20 12:00 / dmf
Radium 226 + Radium 228 precision (±)	0.8	pCi/L			A7500-RA		10/13/20 12:00 / dmf
Radium 226 + Radium 228 MDC	1.4	pCi/L			A7500-RA		10/13/20 12:00 / dmf

Report RL - Analyte Reporting Limit MCL - Maximum Contaminant Level
Definitions: QCL - Quality Control Limit ND - Not detected at the Reporting Limit (RL)
U - Not detected at Minimum Detectable Concentration (MDC)



LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Minnesota Valley Testing Laboratories
Project: 202082-2647
Lab ID: C20091113-009
Client Sample ID: 20-W3638; MW120

Report Date: 10/19/20
Collection Date: 09/22/20 10:35
Date Received: 09/28/20
Matrix: Groundwater

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
RADIONUCLIDES, TOTAL							
Radium 226	0.2	pCi/L	U			E903.0	10/12/20 16:13 / trs
Radium 226 precision (±)	0.1	pCi/L				E903.0	10/12/20 16:13 / trs
Radium 226 MDC	0.2	pCi/L				E903.0	10/12/20 16:13 / trs
Radium 228	1	pCi/L	U			RA-05	10/06/20 15:36 / plj
Radium 228 precision (±)	0.7	pCi/L				RA-05	10/06/20 15:36 / plj
Radium 228 MDC	1.1	pCi/L				RA-05	10/06/20 15:36 / plj
Radium 226 + Radium 228	1.2	pCi/L				A7500-RA	10/13/20 12:00 / dmf
Radium 226 + Radium 228 precision (±)	0.8	pCi/L				A7500-RA	10/13/20 12:00 / dmf
Radium 226 + Radium 228 MDC	1.2	pCi/L				A7500-RA	10/13/20 12:00 / dmf

Report RL - Analyte Reporting Limit MCL - Maximum Contaminant Level
Definitions: QCL - Quality Control Limit ND - Not detected at the Reporting Limit (RL)
U - Not detected at Minimum Detectable Concentration (MDC)



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QA/QC Summary Report

Prepared by Casper, WY Branch

Client: Minnesota Valley Testing Laboratories

Work Order: C20091113

Report Date: 10/13/20

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E903.0								Batch: RA226-9790		
Lab ID: LCS-RA226-9790	3	Laboratory Control Sample				Run: G542M_200929E			10/12/20 14:35	
Radium 226		8.8	pCi/L		82	70	130			
Radium 226 precision (±)		1.7	pCi/L							
Radium 226 MDC		0.21	pCi/L							
Lab ID: MB-RA226-9790	3	Method Blank				Run: G542M_200929E			10/12/20 14:35	
Radium 226		0.2	pCi/L							U
Radium 226 precision (±)		0.2	pCi/L							
Radium 226 MDC		0.2	pCi/L							
Lab ID: C20091113-005ADUP	3	Sample Duplicate				Run: G542M_200929E			10/12/20 16:13	
Radium 226		0.21	pCi/L					9.1	30	U
Radium 226 precision (±)		0.16	pCi/L							
Radium 226 MDC		0.21	pCi/L							

Qualifiers:

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)

U - Not detected at Minimum Detectable Concentration (MDC)



QA/QC Summary Report

Prepared by Casper, WY Branch

Client: Minnesota Valley Testing Laboratories

Work Order: C20091113

Report Date: 10/13/20

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: RA-05								Batch: RA228-6330		
Lab ID: LCS-228-RA226-9790	3	Laboratory Control Sample								10/06/20 13:52
Radium 228		8.9	pCi/L		102	70	130			
Radium 228 precision (±)		1.9	pCi/L							
Radium 228 MDC		1.0	pCi/L							
Lab ID: MB-RA226-9790	3	Method Blank								10/06/20 13:52
Radium 228		0.5	pCi/L							U
Radium 228 precision (±)		0.6	pCi/L							
Radium 228 MDC		1	pCi/L							
Lab ID: C20091113-005ADUP	3	Sample Duplicate								10/06/20 15:36
Radium 228		-0.22	pCi/L					580	30	UR
Radium 228 precision (±)		0.74	pCi/L							
Radium 228 MDC		1.3	pCi/L							

- Duplicate RPD is outside of the acceptance range for this analysis. However, the RER is less than the limit of 3, the RER result is 0.68.

Qualifiers:

RL - Analyte Reporting Limit

R - Relative Percent Difference (RPD) exceeds advisory limit

ND - Not detected at the Reporting Limit (RL)

U - Not detected at Minimum Detectable Concentration (MDC)



Work Order Receipt Checklist

Minnesota Valley Testing Laboratories

C20091113

Login completed by: Kylie A. Griffee

Date Received: 9/28/2020

Reviewed by: Misty Stephens

Received by: kag

Reviewed Date: 9/28/2020

Carrier name: Ground

- Shipping container/cooler in good condition? Yes No Not Present
- Custody seals intact on all shipping container(s)/cooler(s)? Yes No Not Present
- Custody seals intact on all sample bottles? Yes No Not Present
- Chain of custody present? Yes No
- Chain of custody signed when relinquished and received? Yes No
- Chain of custody agrees with sample labels? Yes No
- Samples in proper container/bottle? Yes No
- Sample containers intact? Yes No
- Sufficient sample volume for indicated test? Yes No
- All samples received within holding time?
(Exclude analyses that are considered field parameters such as pH, DO, Res Cl, Sulfite, Ferrous Iron, etc.) Yes No
- Temp Blank received in all shipping container(s)/cooler(s)? Yes No Not Applicable
- Container/Temp Blank temperature: 14.4°C No Ice
- Water - VOA vials have zero headspace? Yes No No VOA vials submitted
- Water - pH acceptable upon receipt? Yes No Not Applicable

Standard Reporting Procedures:

Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH, Dissolved Oxygen and Residual Chlorine, are qualified as being analyzed outside of recommended holding time.

Solid/soil samples are reported on a wet weight basis (as received) unless specifically indicated. If moisture corrected, data units are typically noted as –dry. For agricultural and mining soil parameters/characteristics, all samples are dried and ground prior to sample analysis.

Radiochemical precision results represent a 2-sigma Total Measurement Uncertainty.

Contact and Corrective Action Comments:

None



LABORATORIES, Inc.
 2616 E Broadway Ave
 Bismarck, ND 58501

Chain of Custody Record

Phone: (701) 258-9720
 Toll Free: (800) 279-6885 Fax: (701) 258-9724

202082-2647

Company Name and Address: <u>MVTL</u> 2616 E Broadway Bismarck, ND 58501	Account #:	Phone #: 701-258-9720
	Contact: Claudette	Fax #: For faxed report check box <input type="checkbox"/>
Billing Address (indicate if different from above): PO Box 249 New Ulm, MN 56073	Name of Sampler:	E-mail: <u>ccarroll@mvtl.com</u> For e-mail report check box <input type="checkbox"/>
	Quote Number	Date Submitted: 24-Sep-20
	Project Name/Number:	Purchase Order #: BL6335

Sample Information						Bottle Type						Analysis
IML Lab Number	MVTL Lab Number	Client Sample ID	Sample Type	Date Sampled	Time Sampled	Untreated	1000 ml HNO3	VOC Vials	Unpreserved	Glass Jar	Other	Analysis Required
	20-W3630	Dup 1	GW	22-Sep-20	NA		4					Ra226 & Ra228
	20-W3631	Field Blank (FB)	GW	22-Sep-20	NA		4					Ra226 & Ra228
	20-W3632	MW103	GW	22-Sep-20	910		4					Ra226 & Ra228
	20-W3633	MW110	GW	21-Sep-20	1258		4					Ra226 & Ra228
	20-W3634	MW119	GW	21-Sep-20	1525		4					Ra226 & Ra228
	20-W3635	MW111	GW	22-Sep-20	1325		4					Ra226 & Ra228
	20-W3636	MW117	GW	22-Sep-20	1132		4					Ra226 & Ra228
	20-W3637	MW118	GW	22-Sep-20	1630		4					Ra226 & Ra228
	20-W3638	MW120	GW	22-Sep-20	1035		4					Ra226 & Ra228

c20091113

All results must be reported as a numerical value

Transferred by:	Date:	Time:	Sample Condition:	Received by:	Date:	Temp:
T. Olson	24-Sep-20	1700		<i>Thylina Saff</i>	24-Sep-20 1032	
2.						



Field Datasheet

Groundwater Assessment

2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

Company: MDU Lewis & Clark

Event: September 2020

Sample ID: 103

Sampling Personal: *J. Clark*

Weather Conditions: Temp: 60 °F Wind: S @ 5-10 Precip: Sunny / Partly Cloudy / Cloudy

WELL INFORMATION

Well Locked?	YES	NO
Well Labeled?	YES	NO
Casing Strait?	YES	NO
Grout Seal Intact?	YES	NO
Repairs Necessary?		Not Visible
Casing Diameter:	2"	
Water Level Before Purge:	10.48	ft
Total Depth of Well:	—	ft
Well Volume:	—	liters
Depth to Top of Pump:	—	ft
Water Level After Sample:	10.49	ft
Measurement Method:	Electric Water Level Indicator	

SAMPLING INFORMATION

Purging Method:	Bladder
Sampling Method:	Bladder
Dedicated Equipment?	YES NO
Duplicate Sample?	YES NO
Duplicate Sample ID:	—

Control Settings:	
Purge: 5	Sec.
Recover: 55	Sec.
PSI: 20	

Bottle List:	
1 Liter Raw	4- 1L Nitric
500mL Nitric	
500mL Nitric (filtered)	
250mL Sulfuric	

FIELD READINGS

Stabilization Parameters (3 Consecutive)		Temp. (°C)	Spec. Cond.	pH	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Water Level (ft)	Pumping Rate mL/Min	mL Removed	Appearance or Comment Clarity, Color, Odor, Ect.
Purge Date	Time	±0.5°	±5%	±0.1	±10%	±10					clear, slightly turbid, turbid
22 Sept 2020		Start of Well Purge									
	0745										
	0750	12.44	1841	7.42	1.56	242.1	104.23	10.48	100.0	500.0	Clear
	0820	13.39	1374	7.29	0.15	149.7	17.84	10.48	100.0	3000.0	Clear
	0840	13.08	1352	7.30	0.14	89.2	8.60	10.48	100.0	2000.0	Clear
	0900	13.30	1346	7.30	0.16	71.9	4.48	10.48	100.0	2000.0	Clear
	0905	13.29	1347	7.30	0.16	72.6	4.17	10.49	100.0	500.0	Clear
	0910	13.38	1347	7.30	0.15	75.3	4.29	10.49	100.0	500.0	Clear

Well Stabilized? YES NO

Total Volume Purged: 8500.0 mL

Sample Date	Time	Temp. (°C)	Spec. Cond.	pH	Turbidity (NTU)	Appearance or Comment Clarity, Color, Odor, Ect.
22 Sept 2020	0910	13.38	1347	7.30	4.29	Clear

Comments: field blank 22Sept2020 @ 0800



Field Datasheet

Groundwater Assessment

2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

Company: MDU Lewis & Clark
 Event: September 2020
 Sample ID: 110
 Sampling Personal: Jerry

Weather Conditions: Temp: 70 °F Wind: S @ 5-10 Precip: Sunny / Partly Cloudy / Cloudy

WELL INFORMATION

Well Locked?	YES NO
Well Labeled?	YES NO
Casing Strait?	YES NO
Grout Seal Intact?	YES NO Not Visible
Repairs Necessary?	
Casing Diameter:	<u>2"</u>
Water Level Before Purge:	<u>8.96</u> ft
Total Depth of Well:	<u>16.85</u> ft
Well Volume:	— liters
Depth to Top of Pump:	— ft
Water Level After Sample:	<u>9.06</u> ft
Measurement Method:	Electric Water Level Indicator

SAMPLING INFORMATION

Purging Method:	Bladder
Sampling Method:	Bladder
Dedicated Equipment?	YES NO

Control Settings:	
Purge:	<u>3</u> Sec.
Recover:	<u>7</u> Sec.
PSI:	<u>20</u>

Duplicate Sample?	YES NO
Duplicate Sample ID:	—

Bottle List:	
1 Liter Raw	4- 1L Nitric
500mL Nitric	
500mL Nitric (filtered)	
250mL Sulfuric	

FIELD READINGS

Stabilization Parameters (3 Consecutive)		Temp. (°C)	Spec. Cond.	pH	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Water Level (ft)	Pumping Rate mL/Min	mL Removed	Appearance or Comment Clarity, Color, Odor, Ect.
Purge Date	Time	±0.5°	±5%	±0.1	±10%	±10					clear, slightly turbid, turbid
21 Sept 2020	1143	Start of Well Purge									
	1148	16.49	1129	7.36	2.27	141.3	52.46	9.01	100.0	500.0	Clear
	1218	16.35	1124	7.35	1.85	179.7	11.30	9.05	100.0	3000.0	Clear
	1248	16.72	1123	7.35	1.88	182.9	4.97	9.05	100.0	3000.0	Clear
	1253	16.80	1123	7.35	1.88	189.3	4.82	9.06	100.0	500.0	Clear
	1258	16.87	1124	7.36	1.88	185.0	4.91	9.06	100.0	500.0	Clear

Well Stabilized? **YES** ~~NO~~

Total Volume Purged: 7500.0 mL

Sample Date	Time	Temp. (°C)	Spec. Cond.	pH	Turbidity (NTU)	Appearance or Comment Clarity, Color, Odor, Ect.
21 Sept 2020	1258	16.87	1124	7.36	4.91	Clear

Comments:



Field Datasheet

Groundwater Assessment

2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

Company: MDU Lewis & Clark
 Event: September 2020
 Sample ID: 111
 Sampling Personal: Jay [Signature]

Weather Conditions: Temp: 65°F Wind: S @ 5-10 Precip: Sunny / Partly Cloudy / Cloudy

WELL INFORMATION

Well Locked?	YES	NO
Well Labeled?	YES	NO
Casing Strait?	YES	NO
Grout Seal Intact?	YES	NO
Repairs Necessary?		<u>Not Visible</u>
Casing Diameter:	<u>2"</u>	
Water Level Before Purge:	<u>7.83</u>	ft
Total Depth of Well:		ft
Well Volume:		liters
Depth to Top of Pump:		ft
Water Level After Sample:	<u>7.91</u>	ft
Measurement Method:	<u>Electric Water Level Indicator</u>	

SAMPLING INFORMATION

Purging Method:	<u>Bladder</u>
Sampling Method:	<u>Bladder</u>
Dedicated Equipment?	YES NO

Control Settings:	
Purge:	<u>5</u> Sec.
Recover:	<u>55</u> Sec.
PSI:	<u>20</u>

Duplicate Sample?	YES <u>NO</u>
Duplicate Sample ID:	<u>Dup 1</u>

Bottle List:	
1 Liter Raw	4- 1L Nitric
500mL Nitric	
500mL Nitric (filtered)	
250mL Sulfuric	

FIELD READINGS

Stabilization Parameters (3 Consecutive)		Temp. (°C)	Spec. Cond.	pH	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Water Level (ft)	Pumping Rate mL/Min	mL Removed	Appearance or Comment
Purge Date	Time	±0.5°	±5%	±0.1	±10%	±10					Clarity, Color, Odor, Ect.
22 Sept 2020	1210	Start of Well Purge									
	1215	16.93	4416	7.00	0.68	221.9	19.10	7.88	100.0	500.0	Clear
	1245	16.87	4153	7.04	0.49	186.1	17.90	7.88	100.0	3000.0	Clear
	1305	17.06	3917	7.10	1.57	122.0	8.64	7.88	100.0	2000.0	Clear
	1315	16.80	3874	7.12	1.87	78.1	4.98	7.88	100.0	1000.0	Clear
	1320	17.00	3861	7.12	1.98	72.3	3.53	7.89	100.0	500.0	Clear
	1325	17.16	3846	7.12	2.04	70.1	2.65	7.89	100.0	500.0	Clear

Well Stabilized? YES NO

Total Volume Purged: 7500.0 mL

Sample Date	Time	Temp. (°C)	Spec. Cond.	pH	Turbidity (NTU)	Appearance or Comment
						Clarity, Color, Odor, Ect.
22 Sept 2020	1325	17.16	3846	7.12	2.65	Clear

Comments:



Field Datasheet

Groundwater Assessment

2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

Company: MDU Lewis & Clark

Event: September 2020

Sample ID: 117

Sampling Personal: *J. [Signature]*

Weather Conditions: Temp: 60 °F Wind: S @ 5-10 Precip: Sunny / Partly Cloudy / Cloudy

WELL INFORMATION

Well Locked?	YES	NO
Well Labeled?	YES	NO
Casing Strait?	YES	NO
Grout Seal Intact?	YES	NO
Repairs Necessary?		Not Visible
Casing Diameter:	2"	
Water Level Before Purge:	5.80	ft
Total Depth of Well:	11.51	ft
Well Volume:	3.5	liters
Depth to Top of Pump:	9.48	ft
Water Level After Sample:	Below Pump	ft
Measurement Method:	Electric Water Level Indicator	

SAMPLING INFORMATION

Purging Method:	Bladder
Sampling Method:	Bladder
Dedicated Equipment?	YES NO

Control Settings:	
Purge: 5	Sec.
Recover: 55	Sec.
PSI: 20	

Duplicate Sample?	YES NO
Duplicate Sample ID:	

Bottle List:	
1 Liter Raw	4- 1L Nitric
500mL Nitric	
500mL Nitric (filtered)	
250mL Sulfuric	

FIELD READINGS

Stabilization Parameters (3 Consecutive)		Temp. (°C)	Spec. Cond.	pH	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Water Level (ft)	Pumping Rate mL/Min	mL Removed	Appearance or Comment Clarity, Color, Odor, Ect.
Purge Date	Time	±0.5°	±5%	±0.1	±10%	±10					clear, slightly turbid, turbid
21 Sept 2020	1640	Start of Well Purge									
	1645	16.15	7384	7.05	7.69	267.2	18.77	6.65	150.0	750.0	Clear
	1700	16.14	7432	7.05	8.01	232.6	24.06	9.00	150.0	2250.0	Clear
	1715	16.38	7458	7.13	7.19	267.8	5.30	Below Pump	150.0	2250.0	Clear
		Purged	Dry								
22 Sept 2020	1127	Purged well for 5 min to clear line									
	1132	16.68	7066	6.99	6.47	237.4	2.79	6.08	100.0	500.0	Clear

Well Stabilized? YES

~~NO~~

Total Volume Purged: 5750.0 mL

Sample Date	Time	Temp. (°C)	Spec. Cond.	pH		Turbidity (NTU)				Appearance or Comment Clarity, Color, Odor, Ect.
22 Sept 2020	1132	16.68	7066	6.99		2.79				Clear

Comments:



2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

Field Datasheet

Groundwater Assessment

Company: MDU Lewis & Clark

Event: September 2020

Sample ID: 118

Sampling Personal: [Signature]

Weather Conditions: Temp: 80°F Wind: S @ 5-10 Precip: Sunny / Partly Cloudy / Cloudy

WELL INFORMATION

Well Locked?	YES	NO	
Well Labeled?	YES	NO	
Casing Strait?	YES	NO	
Grout Seal Intact?	YES	NO	Not Visible
Repairs Necessary?			
Casing Diameter:	2"		
Water Level Before Purge:	8.38	ft	
Total Depth of Well:		ft	
Well Volume:		liters	
Depth to Top of Pump:		ft	
Water Level After Sample:	8.50	ft	
Measurement Method:	Electric Water Level Indicator		

SAMPLING INFORMATION

Purging Method:	Bladder	Control Settings:	
Sampling Method:	Bladder	Purge:	5 Sec.
Dedicated Equipment?	YES	Recover:	55 Sec.
		PSI:	20

Duplicate Sample?	YES	NO
Duplicate Sample ID:	[Signature]	

Bottle List:	
1 Liter Raw	4- 1L Nitric
500mL Nitric	
500mL Nitric (filtered)	
250mL Sulfuric	

FIELD READINGS

Stabilization Parameters (3 Consecutive)		Temp. (°C)	Spec. Cond.	pH	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Water Level (ft)	Pumping Rate mL/Min	mL Removed	Appearance or Comment Clarity, Color, Odor, Ect.
Purge Date	Time	±0.5°	±5%	±0.1	±10%	±10					clear, slightly turbid, turbid
22 Sept 2020	1540	Start of Well Purge									
	1545	21.92	1795	7.27	3.81	201.7	181.35	8.44	100.0	500.0	Clear
	1615	17.25	1569	7.09	4.03	201.0	2.66	8.46	100.0	3000.0	Clear
	1620	17.15	1613	7.09	3.91	199.0	1.51	8.46	100.0	500.0	Clear
	1625	17.15	1630	7.10	3.87	195.8	1.89	8.47	100.0	500.0	Clear
	1630	17.19	1638	7.11	3.85	191.4	1.32	8.47	100.0	500.0	Clear

Well Stabilized? YES NO

Total Volume Purged: 5000.0 mL

Sample Date	Time	Temp. (°C)	Spec. Cond.	pH	Turbidity (NTU)	Appearance or Comment Clarity, Color, Odor, Ect.
22 Sept 2020	1630	17.19	1638	7.11	1.32	Clear

Comments:



Field Datasheet

Groundwater Assessment

2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

Company: MDU Lewis & Clark
 Event: September 2020
 Sample ID: 120
 Sampling Personal: [Signature]

Weather Conditions: Temp: 65°F Wind: S @ 5-10 Precip: Sunny / Partly Cloudy / Cloudy

WELL INFORMATION

Well Locked?	YES	NO
Well Labeled?	YES	NO
Casing Strait?	YES	NO
Grout Seal Intact?	YES	NO
Repairs Necessary?	<u>Not Visible</u>	
Casing Diameter:	<u>2"</u>	
Water Level Before Purge:	<u>14.41</u>	ft
Total Depth of Well:	<u>—</u>	ft
Well Volume:	<u>—</u>	liters
Depth to Top of Pump:	<u>—</u>	ft
Water Level After Sample:	<u>14.80</u>	ft
Measurement Method:	<u>Electric Water Level Indicator</u>	

SAMPLING INFORMATION

Purging Method:	Bladder
Sampling Method:	Bladder
Dedicated Equipment?	YES <u>NO</u>
Duplicate Sample?	YES <u>NO</u>
Duplicate Sample ID:	<u>—</u>

Control Settings:	
Purge:	<u>5</u> Sec.
Recover:	<u>55</u> Sec.
PSI:	<u>20</u>

Bottle List:	
1 Liter Raw	4- 1L Nitric
500mL Nitric	
500mL Nitric (filtered)	
250mL Sulfuric	

FIELD READINGS

Stabilization Parameters (3 Consecutive)		Temp. (°C)	Spec. Cond.	pH	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Water Level (ft)	Pumping Rate mL/Min	mL Removed	Appearance or Comment Clarity, Color, Odor, Ect.
Purge Date	Time	±0.5°	±5%	±0.1	±10%	±10					clear, slightly turbid, turbid
22 Sept 2020	1000	Start of Well Purge									
	1005	11.75	6099	6.70	0.44	212.1	0.84	14.56	100.0	500.0	Clear
	1015	12.13	5562	6.70	0.64	156.8	1.13	14.65	100.0	1000.0	Clear
	1020	12.22	5535	6.70	0.73	93.4	0.75	14.68	100.0	500.0	Clear
	1025	12.34	5620	6.70	0.65	66.0	0.24	14.70	100.0	500.0	Clear
	1030	12.48	5686	6.70	0.62	59.4	0.19	14.71	100.0	500.0	Clear
	1035	12.49	5828	6.70	0.62	57.3	0.21	14.73	100.0	500.0	Clear

Well Stabilized? YES NO

Total Volume Purged: 3500.0 mL

Sample Date	Time	Temp. (°C)	Spec. Cond.	pH	Turbidity (NTU)	Appearance or Comment Clarity, Color, Odor, Ect.
22 Sept 2020	1035	12.49	5828	6.70	0.21	Clear

Comments:



Field Datasheet

Surface water Assessment

2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

Company: MDU Lewis & Clark

Event: September 2020

Sample ID: _____

Sampling Personal: Jerry [Signature]

Weather Conditions: _____ Temp: 60°F Wind: S @ 5-10 Precip: Sunny / Partly Cloudy / Cloudy

Well ID	Date	Time	Casing Diameter	Water Level (ft)	Comments
MW101	22 Sept 2020	0952	2"	9.06	
MW105	22 Sept 2020	1730	2"	8.75	
MW106	22 Sept 2020	1536	2"	9.44	
MW107	22 Sept 2020	0954	2"	4.38	
MW108	22 Sept 2020	1203	2"	16.03	
MW116	22 Sept 2020	1201	2"	11.82	



2616 E. Broadway Ave
Bismarck, ND 58501
(701) 258-9720

Chain of Custody Record

Project Name: MDU Lewis & Clark	Event: September 2020	Work Order Number: 82-2647
Report To: MDU Attn: Todd Peterson Address: 400 N. 4th St Bismarck, ND 58501 Phone: 701-425-2427 Email: Todd.Peterson@mdu.com	CC:	Collected By:

Lab Number	Sample ID	Date	Time	Sample Type	Nitric				Temp (°C)	Spec. Cond.	pH	Analysis Required	
					1 Liter Raw	500 mL Nitric	500 mL Nitric (filtered)	1 Liter Nitric					
W3630	Dup 1	22 Sept 2020	NA	GW				4	NA	NA	NA	Rad 226 & 228	
W3631	Field Blank (FB)	22 Sept 2020	NA	GW				4	NA	NA	NA		
W3632	MW103	22 Sept 2020	0910	GW				4	13.38	1347	7.30		4.29
W3633	MW110	21 Sept 2020	1258	GW				4	16.87	1124	7.36		4.91
W3634	MW119	21 Sept 2020	1525	GW				4	21.95	1195	7.29		2.93
W3635	MW111	22 Sept 2020	1325	GW				4	17.16	3846	7.12		2.65
W3636	MW117	22 Sept 2020	1132	GW				4	16.68	7066	6.99		2.79
W3637	MW118	22 Sept 2020	1630	GW				4	17.19	1638	7.11		1.32
W3638	MW120	22 Sept 2020	1035	GW				4	12.49	5828	6.70		0.21

Comments:

	Relinquished By		Sample Condition		Received By	
	Name	Date/Time	Location	Temp (°C)	Name	Date/Time
1		24 Sept 2020 0740	Log In Walk In #2	7.2 TM562 / TM805		24 Sept 2020 0740
2						

Appendix B

Montana-Dakota Utilities Co., Lewis & Clark Station,
Alternative Source Demonstration – Temporary Storage Pad

Technical Memorandum

To: Todd Peterson, Montana-Dakota Utilities Co.
From: Paul Swenson and John Greer
Subject: Alternative Source Demonstration (ASD), Temporary Storage Pad, Lewis & Clark Station
Date: November 13, 2020
Project: 26411007

Montana-Dakota Utilities Co. (MDU) owns and operates Lewis & Clark Station (Site), a coal-fired electricity generation unit near Sidney, Montana. Operation of the Lewis & Clark Station results in coal combustion residuals (CCR) as a by-product. Two storage ponds and a CCR pile that has been physically closed are situated at the property to manage CCR. The storage ponds—which comprise a single, multi-unit CCR surface impoundment under the US Environmental Protection Agency (EPA) CCR Rule (40 CFR Parts 257 and 261 Disposal of Coal Combustion Residuals from Electric Utilities) (CCR Rule)—are named the East and West Scrubber Ponds, or collectively the Scrubber Ponds.

The Scrubber Ponds store sluiced flue-gas desulfurization (FGD) solids. The closed CCR pile was referred to as the Temporary Storage Pad (TSP). The TSP was used to store FGD solids (excavated from the Scrubber Ponds) where they drained to prior to loading and hauling for disposal. The TSP has been reconstructed as a paved area that is no longer subject to the CCR Rule.

1.0 Introduction

Closure by removal of CCR began at the TSP in 2018 with the removal of CCR and CCR-contaminated sediments. Although physical removal actions have been completed, demonstration that groundwater meets the quality requirements of CCR Rule §257.102(c) has been ongoing. The locations of the Scrubber Ponds and former TSP are shown on Large Figure 1. The groundwater monitoring system is a multi-unit groundwater monitoring system, as allowed in §257.91(d), meaning that both the Scrubber Ponds and the TSP are monitored by the groundwater monitoring system.

The CCR units are currently in assessment monitoring. Baseline groundwater monitoring was completed in 2017, as documented in the 2017 Annual Groundwater Monitoring and Corrective Action Report, Scrubber Pond and Temporary Storage Area (Barr, 2018). A detection monitoring program began on October 17, 2017, and continued until April 14, 2018 (Barr, 2019). A statistically significant increase (SSI) over background levels was determined for one or more of the constituents listed in appendix III to the CCR Rule (§257.95(a)) in 2018, which resulted in initiation of the assessment monitoring program on April 15, 2018, and which continues through 2020.

It was determined on January 2, 2019, that the initial assessment monitoring and resample events resulted in detections of lithium and selenium at statistically significant levels above applicable groundwater protection standards (GWPS). An assessment of corrective measures (ACM) was initiated on April 2, 2019, and completed on August 29, 2019 (Barr, 2019b). The Scrubber Ponds and former TSP are currently in selection of remedy, as described in §257.97, subject to the ongoing evaluation of a potential alternative source.

1.1 Purpose

This memorandum provides written documentation of an Alternative Source Demonstration (ASD) supporting closure by removal in accordance with §257.102(f)(3). The ASD evaluation presented is consistent with requirements of §257.95(g)(3)(ii) of the CCR Rule.

1.2 Description of the Monitoring Well System

The monitoring well system around the CCR units consists of three hydraulically upgradient wells (MW-103, MW-110 and MW-119) and four downgradient wells (MW-111, MW-117, MW-118, and MW-120). The downgradient monitoring wells are located hydraulically downgradient of the CCR units along the waste boundary and are spaced approximately 500 feet (or less) apart. The downgradient wells are positioned to detect contaminants from a hypothetical release from the CCR units. The number, spacing, and hydraulic positions of the monitoring wells comply with requirements outlined in §257.91 (a)-(c) of the CCR Rule. The monitoring system is designed as a multi-unit groundwater monitoring system as allowed by §257.91 (d). It was not feasible to install a separate groundwater monitoring system for each CCR unit.

1.3 Groundwater Standards for Closure by Removal

Once assessment monitoring is triggered for a CCR unit, CCR Rule § 257.95(d)(2) requires that GWPS be established for appendix IV constituents detected in groundwater. GWPS are defined as the higher of the MCL or default GWPS and the background concentration level for the detected constituent based on statistical methods established in § 257.93(f-g). Based on § 257.95(h)(2) and the July 30, 2018 Phase 1 CCR Rule revision, a final GWPS was established for all appendix IV constituents.

The criteria for "closure by removal of CCR" (§257.102(c)) states:

CCR removal and decontamination of the CCR unit are complete when constituent concentrations throughout the CCR unit and any areas affected by releases from the CCR unit have been removed and groundwater monitoring concentrations do not exceed the groundwater protection standard established pursuant to § 257.95(h) for constituents listed in appendix IV to this part.

While nearly all monitoring results satisfied this requirement, the post-closure groundwater samples exceeded the lithium GWPS during assessment monitoring for all four downgradient monitoring wells

(MW-111, MW-117, MW-118, and MW-120). The post-closure samples exceeded the selenium GWPS during assessment monitoring for monitoring wells MW-111 and MW-118 only.

1.4 Description of TSP Operation and Relevant Historical Changes to Site Configuration

The first Scrubber Ponds were excavated in 1975 to support newly installed plant air quality equipment. FGD solids were brought directly from the 1975 Scrubber Ponds to historical bottom ash ponds, which ceased receipt of ash in 2015. The first TSP was constructed in 1993 with the construction of the 1993 lined Scrubber Ponds. The general operation of the TSP was as follows:

1. After one of the Scrubber Ponds is drained, FGD material was allowed to dewater within the drained Scrubber Pond until the material was dry enough move to the TSP.
2. Material was then piled on the TSP.
3. The material remained on the TSP until it was dry enough for transportation to an offsite disposal location.

The following is a short summary of changes in configuration of the Scrubber Ponds and TSP that are relevant to this ASD. All dates are approximate.

- 1975: Unlined, incised Scrubber Ponds were constructed in the area east of Lewis & Clark generating station. Based on available historical data, it appears that the ponds were excavated to bedrock (Barr, 2016)(Barr, 2019b), meaning that the Scrubber Ponds were in direct contact with the aquifer.
- 1993: Lined Scrubber Ponds were constructed in the footprint of the original unlined ponds with base elevations that were higher than the 1975 ponds, and placement of materials on the TSP area began.
- 1998: The TSP was retrofitted with a geomembrane liner.
- 2018: Scrubber ponds were retrofitted with a composite liner in the footprint of the former 1993 Scrubber Ponds, with base elevations that were higher than the 1993 ponds and some expansion of footprint to the northeast.
- 2018: TSP closure by removal construction was completed.

2.0 Hypothesis No. 1

If the TSP is a source of lithium and selenium to downgradient monitoring wells, material testing data should show a high potential for significant infiltration from the material stored on the TSP and modeling should show a significant impact on downgradient water quality from the infiltration.

The hypothesis was tested to determine if data and modeling support the hypothesis. Data and modeling results reviewed to evaluate the hypotheses included:

- Water content of the material on the TSP
- Groundwater flow and contaminant transport modeling

The results of the test show that there are multiple lines of evidence supporting the ASD and establish that interpretation of the GWPS exceedance for lithium and selenium meets the alternative source requirements of the CCR Rule (§257.95(g)(3)(ii)) for the TSP.

2.1 Water Content of Material on TSP

To understand the percentage of water potentially released from the FGD material while stockpiled on the TSP, 16 samples of the material were collected in August 2020. Two piles were identified on the TSP that were typical of FGD operations, one that had recently been placed on the TSP (representative of initial moisture content), and the second that had sat for a period of time and was about to be removed for off-site disposal (representative of final moisture content). Capturing the moisture content of both conditions allowed characterization of the variability in water content of the material placed on the TSP.

Each pile was divided into eight grid cells of approximately the same size. Shelby tube samples were attempted to be obtained from each grid cell. The ends of the Shelby tube were capped immediately upon retrieval of the sample. A total of 16 samples were collected and analyzed for average initial water content, total porosity, field capacity, and grain size distribution. During lab testing, five of the samples from the pile sitting on the TSP the longest were too dry to collect intact material from the Shelby tube. Testing proceeded on the eight samples from the newly placed pile and the three samples from the pile sitting the longest.

The results of laboratory testing were used to estimate the average water content within the TSP materials that would be available for drainage into groundwater. The water content available for drainage was calculated by subtracting field capacity from the initial water content for each sample (Table 1 TSP Material Water Content and Field Capacity Sampling ResultsTable 1).

Table 1 TSP Material Water Content and Field Capacity Sampling Results

Sample ID	Initial Water Content [% vol.]	Water Content @ 1/3 Bar (Field Capacity) [% vol.]	Estimated Water Content Available for Drainage [% vol.]
TSP-Ash-01	59.5	44.9	14.6
TSP-Ash-02	58.3	57.3	1.1
TSP-Ash-03	57.0	56.6	0.4
TSP-Ash-04	54.0	52.3	1.7
TSP-Ash-05	50.9	46.4	4.5
TSP-Ash-06	55.1	54.0	1.1
TSP-Ash-07	56.2	53.1	3.1
TSP-Ash-08	58.6	58.3	0.4
TSP-Ash-13	48.4	35.0	13.4
TSP-Ash-14	53.8	53.0	0.8
TSP-Ash-09	TD	TD	0.0
TSP-Ash-10	TD	TD	0.0
TSP-Ash-11	TD	TD	0.0
TSP-Ash-12	TD	TD	0.0
TSP-Ash-15	TD	TD	0.0
median			0.8

TD: Sample too dry for analysis, assumed to have water content available for drainage equal to zero.

Based on the values presented in Table 1, material placed on the TSP had a typical (median) water content available for drainage of 0.8%. The annual material volume was estimated to range between 22,000 and 29,000 cubic yards per year, with an average of approximately 28,000 cubic yards per year. This average was based on annual tonnage and bulk density estimates used for design calculations of the 2018 pond retrofit and represents analysis of material storage over time (not a simple average of the minimum and maximum storage values). Multiplying the median free water content by the range in TSP material volume produced a seepage of between 100 and 130 gallons per day (gpd), with an average of 120 gpd.

2.2 Estimated Discharge to Groundwater from Material Placed on the TSP

The discharges from the TSP materials to groundwater were estimated for both the unlined TSP (which operated from 1993-1998) and the lined TSP (which operated from 1998-2018).

To estimate the discharge to groundwater from materials placed on the unlined 1993-1998 TSP, it was assumed that the estimated average TSP material seepage of 120 gpd discharged completely to groundwater. This was a conservative assumption, as some of the water would evaporate. To estimate a recharge from the TSP materials, the average TSP material seepage rate of 120 gpd was applied over the TSP area (1.7 acres). This resulted in a calculated average seepage rate of 7.8E-08 centimeters per second

(cm/s) from the TSP materials. For comparison, the estimated recharge rate from infiltration of precipitation is 1.9E-08 cm/s (Attachment C, Barr, 2020).

The effect of the liner in the 1998-2018 TSP was estimated using a MODFLOW simulation in which a low permeability material was simulated under the TSP area to represent the liner (Barr, 2020). The properties and extent of the simulated liner material are based on historical site information that indicates a 20-mil poly liner was installed under the TSP pile area. Modeling results indicate seepage from the TSP pile to groundwater was approximately 10% to 20% less than from the unlined TSP with an average reduction of approximately 15% (Barr, 2020). Applying these reductions to the average TSP material seepage rate of 120 gpd, it was estimated that seepage from the lined TSP ranged between approximately 80 and 120 gpd, with an average of approximately 100 gpd. Based on available information, the seepage rate from the TSP materials is low and the addition of the low permeability liner resulted in a reduction in the already low seepage rate.

Similar to the unlined TSP, the discharge to groundwater from materials placed on the 1998-2018 lined TSP was estimated assuming all of the estimated average TSP material seepage of 120 gpd discharges completely to groundwater.

The selenium and lithium concentration of water draining from materials placed on the TSP was estimated to be a dilution of the Scrubber Pond water due to mixing of pond water and precipitation which infiltrates the material pile. When the material was initially removed from the pond, it was assumed that the pore water within the material was at a concentration equal to that of the pond water. Over time, the concentration of the pore water was assumed to be reduced as mixing of infiltrated precipitation occurs. For the purposes of this study, it was assumed that the concentration of seepage from materials placed on the TSP was a recharge weighted average of the concentrations in the pond and site-specific background concentrations (Table 2). These background concentrations were developed for modeling purposes and were intended to approximate the average concentrations of groundwater entering the Site groundwater monitoring system from upgradient flow or precipitation recharge. These concentrations were estimated by taking the geometric mean of lithium and selenium concentrations for samples collected at upgradient wells within the CCR monitoring system for data available prior to August 2019.

Table 2 Estimated TSP Material Seepage Concentrations

	Estimated annual average recharge rate [cm/s]	Lithium concentration [mg/L]	Selenium concentration [mg/L]
TSP material (initial conc. From Scrubber Ponds)	7.8E-08	0.560	0.226
Precipitation infiltration	1.8E-08	0.043	0.043
Estimated mixture concentration		0.464	0.192

By inclusion of infiltrated precipitation at the background concentration rather than a concentration of 0, it was assumed that some desorption of constituents from the TSP materials to the infiltrated precipitation was occurring. The actual impact of desorption from the TSP materials on the infiltrated precipitation was the result of a complex transient geochemical reaction. Due to the short contact time of the TSP materials and infiltrated precipitation, the assumption that desorption from the TSP materials resulted in a concentration comparable to the long-term average background concentration at the Site was deemed to be reasonable. Note that the precipitation infiltration rate was approximately 25% of the TSP material infiltration rate, so the estimated concentration of the precipitation infiltration had a relatively small impact on the average concentration compared to the TSP material infiltration rate.

The equation for the recharge weighted concentration calculation is provided in Equation 1.

Equation 1 Calculation of Recharge Weighted Concentration of Infiltration from the TSP

$$\bar{C}_{tsp} = \frac{(r_{inf} * c_{inf}) + (r_{tsp} * c_{pond})}{(r_{inf} + r_{tsp})}$$

Where:

- \bar{C}_{tsp} = the average recharge weighted concentration of infiltration from the TSP
- r_{inf} = the infiltration recharge rate
- r_{tsp} = the TSP infiltration rate
- c_{inf} = the infiltration recharge concentration (background)
- c_{pond} = the Scrubber Pond concentration

For comparison, it is estimated based on groundwater flow and transport modeling that the original, unlined 1975 Scrubber Ponds contributed an average of 1,300 gpd to groundwater with undiluted concentrations of lithium and selenium (Barr, 2020). Table 3 below compares the estimated groundwater seepage, lithium mass loading rates, and selenium mass loading rates of the TSP to the original unlined Scrubber Ponds.

Table 3 Comparison of Estimated TSP to the 1975 Scrubber Ponds

Source	Median Estimated Seepage (gpd)	Lithium concentration (mg/L)	Median Estimated Lithium Mass Loading Rate (mg/d)	Selenium concentration (mg/L)	Median Estimated Selenium Mass Loading Rate (mg/d)
1975 Scrubber Ponds (unlined)	1300	0.56	2800	0.23	1100
Unlined TSP	120	0.46	210	0.19	87
Lined TSP	100	0.46	180	0.19	74

3.0 Hypothesis No. 2

The impacts at downgradient wells within the CCR monitoring network are primarily attributable to the 1975 Scrubber Ponds and/or other sources, not the TSP. Groundwater flow and contaminant transport modeling was reviewed and tested to determine if site data supported the hypothesis.

3.1 Groundwater Transport Modeling

The current distribution of lithium and selenium in Site groundwater is the result of contributions from multiple historical sources. To estimate the proportion of the current lithium and selenium distribution attributable to the unlined and lined TSP, a groundwater flow and transport computer model was used to simulate the impacts of both TSP configurations (Barr, 2020). The unlined and lined TSPs were simulated as recharge areas, with recharge rates and concentrations based on the analysis discussed in Section 2.2. The groundwater flow and transport models were originally developed as part of the Assessment of Corrective Measures (ACM), and were substantially updated and recalibrated with relevant additional Site data collected or discovered since the original model development for the TSP evaluation (Barr, 2020).

Historical sources simulated with the groundwater flow and transport model include the 1975 Scrubber Ponds, the 1993 Scrubber Ponds, the 2018 Scrubber Ponds, the unlined TSP, the lined TSP, and the sewage lagoon as sources. Other sources, such as metals that are naturally occurring in finer grained soils and carbonaceous zones that have been identified on the site, may have affected groundwater quality in downgradient wells, but they have not been included in the model. The groundwater flow and transport model with all known historical sources simulated reasonably matches the lithium and selenium concentrations at the wells in the CCR monitoring system, indicating that application of the model to estimate the proportional impact of various historical sources to evaluate impacts of the TSP is appropriate.

Comparisons of lithium and selenium concentrations measured September 21 and 22, 2020 to model-simulated concentrations are presented on Figure 2 and Figure 3, respectively. Note that the modeling includes a background concentration of 0.0427 mg/L for lithium and 0.0434 mg/L for selenium. Since the model cannot predict concentrations below the background concentrations, measured concentrations less than background are plotted at the background concentrations.

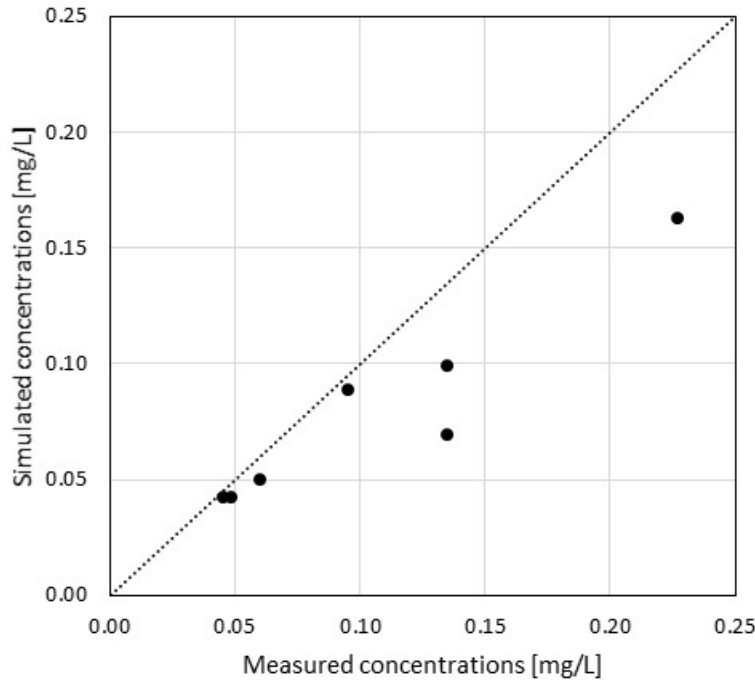


Figure 2 Fall 2020 Measured vs. Simulated Lithium Concentrations at Wells in the CCR System

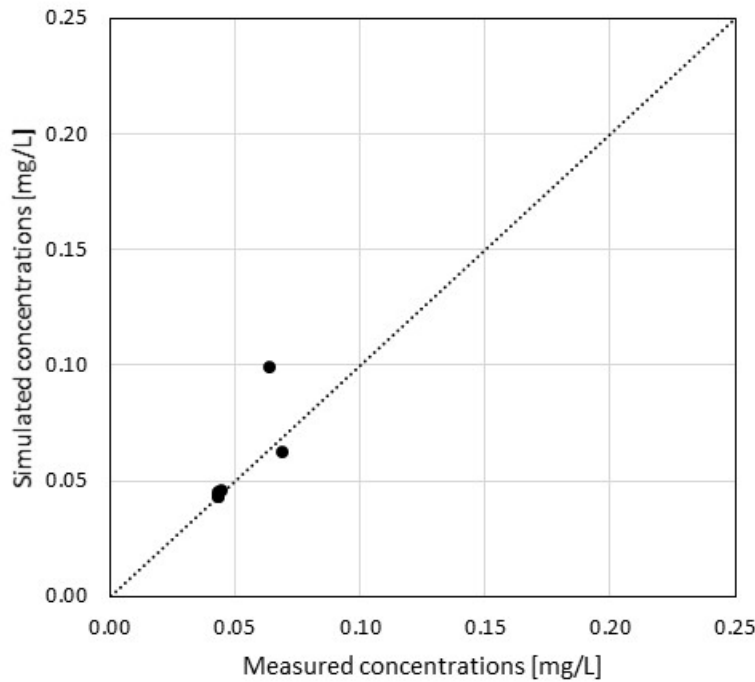


Figure 3 Fall 2020 Measured vs. Simulated Selenium Concentrations at Wells in the CCR Monitoring System

To estimate the relative impact of the unlined and lined TSP as well as other historical sources of lithium and selenium, the sources were simulated individually and the impacts on wells within the CCR monitoring system were evaluated. To evaluate the individual effect of lithium and selenium from sources other than

the TSP, the other sources were removed from the model and it was run for the full period of Site activity (1975-2020). The simulated lithium concentrations as of fall 2020 at downgradient wells within the CCR monitoring system resulting from each source when simulated individually are presented in Table 4. The simulated proportional contribution of the historical sources to fall 2020 concentrations above the background concentration are presented in Table 5. The same results for selenium are presented in Table 6 and Table 7. Note that concentrations measured less than background are targeted for simulation at the background concentrations presented above.

Table 4 Estimated Relative Impact of the TSP on Fall 2020 Lithium Concentrations at the Downgradient CCR Monitoring System Wells

CCR Monitoring System Well	Measured Concentration Fall 2020 [mg/L]	Simulated Concentrations [mg/L]			
		All sources	Unlined TSP only	Lined TSP only	1975 Pond only
MW-111	0.227	0.163	0.0446	0.0545	0.125
MW-117	0.135	0.0994	0.0427	0.0427	0.0429
MW-118	0.0950	0.0888	0.0427	0.0427	0.0757
MW-120	0.135	0.0694	0.0502	0.0466	0.0580

Lithium background concentration in the simulations was 0.0427 mg/L

Table 5 Simulated Proportional Contribution of the Historical Sources to Fall 2020 Lithium Concentrations Above the Background Concentration at Downgradient CCR Monitoring Wells

CCR Monitoring System Well	Simulated Attributable Contribution Percent Above Background		
	Unlined TSP only	Lined TSP only	1975 Pond only
MW-111	2%	10%	68%
MW-117	0%	0%	0%
MW-118	0%	0%	72%
MW-120	28%	15%	57%

Table 6 Estimated Relative Impact of the TSP on Fall 2020 Selenium Concentrations at the Downgradient CCR Monitoring System Wells

CRR Monitoring System Well	Measured Concentration Fall 2020 [mg/L]	Simulated Concentrations [mg/L]			
		All sources	Unlined TSP only	Lined TSP only	1975 Pond only
MW-111	0.0634	0.100	0.0453	0.0454	0.0901
MW-117	0.0322	0.0434	0.0434	0.0434	0.0434
MW-118	0.0689	0.0627	0.0434	0.0434	0.0582
MW-120	<0.0050	0.0450	0.0435	0.0434	0.0449

Selenium background concentration in the simulations was 0.0434 mg/L

Table 7 Simulated Proportional Contribution of the Historical Sources to Fall 2020 Selenium Concentrations Above the Background Concentration at Downgradient CCR Monitoring Wells

CRR Monitoring System Well	Simulated Attributable Contribution Percent Above Background		
	Unlined TSP only	Lined TSP only	1975 Pond only
MW-111	3%	4%	81%
MW-117	0%	0%	0%
MW-118	0%	0%	74%
MW-120	4%	0%	63%

The results of the analysis indicate that only a small portion of the lithium and selenium concentrations measured at wells within the CCR monitoring system in the fall of 2020 are attributable to either the unlined or the lined TSP and that the impacts from these units are insufficient to result in concentrations above the GWPS.

The conclusion that the majority of the impacts at downgradient wells within the CCR monitoring system are attributable to sources other than the TSP is consistent with the conceptual understanding of groundwater flow at the Site. Some key points in this understanding are outlined below:

- The 1975 ponds were unlined and appear to have been excavated down to bedrock, meaning that the ponds were directly connected to the groundwater system. In comparison, the 1993 and 2018 ponds were constructed above the water table and lined.
- Due to a generally low hydraulic gradient and the presence of low permeability materials at the Site, it can take groundwater years to decades to move off site. Therefore, lingering impacts from the 1975 ponds (which ended operation in 1993) or other sources should be expected.
- The 1975 ponds were directly connected to the groundwater system and would have caused mounding of the water table. This mounding would have resulted in a higher horizontal hydraulic gradient in the water table aquifer than under conditions post-1993. The mounding would also

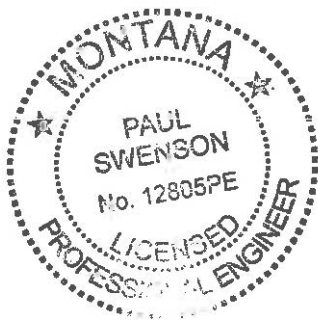
have made it possible for groundwater and contaminants to more easily move into areas of the Site where, under lower gradient conditions, lower permeability materials would otherwise retard movement. When operation of the 1975 ponds ceased, the driving head was removed and the hydraulic gradient in the water table aquifer decreased. This caused impacted groundwater to flow more slowly across the site.

4.0 Conclusion

The analysis summarized in this memorandum supports a demonstration, consistent with requirements of §257.95(g)(3)(ii) of the CCR Rule, that the presence of statistically significant concentrations of lithium and selenium above the GWPS are not attributed to releases at the TSP. This conclusion is based on the low potential for infiltration from the TSP as compared to other historical site sources and groundwater flow and transport modeling which indicates that impacts from the TSP would be insufficient to result in concentrations of lithium and selenium that are statistically significantly above the GWPS. Taken as a whole, the lines of evidence presented above provide adequate documentation that a source other than the TSP is responsible for the presence of lithium and selenium at statistically significant concentrations above the GWPS.

5.0 Certification

I certify that the written demonstration provided herein for lithium and selenium concentrations at monitoring wells MW-111, MW-117, MW-118, MW-120, supported by the data in the referenced documents, is accurate and consistent with our review of the groundwater data collected to date and as required under the CCR Rule (§257.95(g)(3)(ii)).



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To: Todd Peterson, Montana-Dakota Utilities Co.
From: Paul Swenson and John Greer
Subject: Alternative Source Demonstration (ASD), Temporary Storage Pad, Lewis & Clark Station
Date: November 13, 2020
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References

Barr Engineering Co., 2016. Evaluation of Existing Surface Impoundment Liner, West and East Scrubber Ponds. Prepared for Montana-Dakota Utilities, September 2016.

Barr Engineering Co., 2018. 2017 Annual Groundwater Monitoring and Corrective Action Report, Scrubber Pond and Temporary Storage Area. Prepared for Montana Dakota Utilities, January 2018.

Barr Engineering Co., 2019a. 2018 Annual Groundwater Monitoring and Corrective Action Report, Scrubber Pond and Temporary Storage Area, Lewis & Clark Station. Prepared for Montana Dakota Utilities, January 2020.

Barr Engineering Co., 2019b. Assessment of Corrective Measures, Lewis & Clark Station. Prepared for Montana-Dakota Utilities, August 2019

Barr Engineering Co., 2020. *Update of the Preliminary Groundwater Flow and Transport Modeling, Lewis & Clark Station, Sidney, MT.* Prepared for Montana-Dakota Utilities, November 2020.

Large Figures

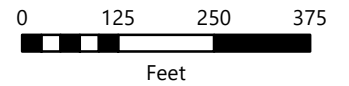
Figure 1 Site Layout

To: Todd Peterson, Montana-Dakota Utilities Co.
From: Paul Swenson and John Greer
Subject: Alternative Source Demonstration (ASD), Temporary Storage Pad, Lewis & Clark Station
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Large Figures



- Upgradient Monitoring Well
- Downgradient Monitoring Well
- ▨ Scrubber Ponds
- ▭ Temporary Storage Pad (TSP)



SITE LAYOUT
Lewis & Clark Station
Montana-Dakota Utilities Co.

FIGURE 1



Appendix C

Montana-Dakota Utilities Co., Lewis & Clark Station,
Alternative Source Demonstration – Scrubber Ponds



Alternative Source Demonstration (ASD) for Lithium and Selenium

Lewis & Clark Station

Prepared for
Montana-Dakota Utilities Co.

January 2021

Alternative Source Demonstration (ASD) for Lithium and Selenium Lewis & Clark Station

January 2021

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Appendix A	Site Boring Logs
Appendix B	Analytical Results for Hypothesis No. 1

Certifications

I hereby certify that the written demonstration provided herein, supported by the data in the referenced documents, is accurate and consistent with our review of the groundwater and other data collected to date, as required under the CCR Rule (§257.95(g)(3)(ii)). Based on this review I have determined that a source other than the units regulated under the CCR Rule at the Site caused the statistically significant increases over the applicable groundwater protection standards (GWPS) for lithium and selenium in wells that are downgradient from those units.



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PE #: 12805PE

02/01/2021

Date

1 Introduction

Montana-Dakota Utilities Co. (MDU) operates a coal-fired electrical generation plant at the Lewis & Clark Station (Site) near Sidney, Montana. Operation of the plant results in coal combustion residuals (CCR) as a by-product. Management of CCR at the Site is subject to regulation under 40 CFR Part 257, Disposal of Coal Combustion Residuals From Electric Utilities (the CCR Rule).

Since the 1970s, CCR has been managed at the Site at various CCR management facilities. In particular:

- In 1975, two unlined surface impoundments were constructed on the Site. Based on available historical data, it appears that construction of the ponds involved excavating materials down to the Ft. Union Formation (Barr, 2016; Barr, 2019b), meaning that the sides of the surface impoundments were likely in direct contact with the aquifer. These surface impoundments were closed before the CCR Rule was promulgated, and therefore are not regulated under the CCR Rule.
- In 1993, clay-lined scrubber ponds were constructed generally in the footprint of the unlined surface impoundments, described above, with base elevations that were higher than the base elevations of the former surface impoundments. Once these scrubber ponds became operational, MDU started placing solid materials from them on top of a temporary storage pad (TSP) at the Site. In particular, the TSP stored flue-gas desulfurization (FGD) solids (excavated from the scrubber ponds) where it drained prior to loading and hauling for off-site disposal. The locations of these scrubber ponds and former TSP are shown on Figure 1. These ponds were in existence on the effective date of the CCR Rule. Throughout this report, they are referred to as the "Scrubber Ponds."
- In 1998, the TSP was retrofitted with a geomembrane liner.
- In 2018, the Scrubber Ponds were retrofitted with a composite liner with a small lateral expansion of each pond to the northeast, with base elevations that were higher than the original 1993 construction.
- In 2020, the lined TSP was closed using the closure-by-removal method after the Alternative Source Demonstration (ASD), Temporary Storage Pad, Lewis & Clark Station (Barr, 2020a) was completed.

The units at the Site that are regulated under the CCR Rule are the TSP and the Scrubber Ponds. An ASD for the TSP determined that the TSP did not cause the SSIs in the downgradient wells. This ASD pertains to the Scrubber Ponds. As explained below, it was concluded that the Scrubber Ponds did not cause the SSIs in the downgradient wells. Rather, such SSIs are related to natural variations in groundwater quality at the Site and certain statistical methods that were utilized.

1.1 Purpose

In accordance with the CCR Rule, assessment monitoring was undertaken at the Site and identified concentrations of lithium and selenium in downgradient wells that potentially result in statistically significant increases (SSIs) over background levels. According to the CCR Rule, Section § 257.94(e)(2):

The owner or operator may demonstrate that a source other than the CCR unit caused the statistically significant increase over background levels for a constituent or that the statistically significant increase resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality.

This report provides written documentation of an Alternative Source Demonstration (ASD) supporting discontinuation of the selection of remedy in accordance with § 257.95(g)(3)(iii) of the CCR Rule.

1.2 Scope of Work

As part of the ASD, site data were evaluated to determine whether the regulated CCR units caused the SSIs over background levels for lithium and selenium in downgradient monitoring wells. As part of this evaluation, four hypotheses were developed and then tested with lines of evidence based on site data to determine if those hypotheses were valid. The evidence confirms that the SSIs were caused by a natural variation in groundwater quality and certain statistical methods that were used rather than the Scrubber Ponds. As a result, it was determined an alternative source exists for the SSIs and resulting exceedances of the Ground Water Protection Standard (GWPS) for lithium and selenium under the CCR Rule (§ 257.95(g)(3)(ii)).

1.3 Regulatory Framework

As noted above, the Scrubber Ponds are currently in assessment monitoring. Baseline groundwater monitoring was completed in 2017, as documented in the 2017 Annual Groundwater Monitoring and Corrective Action Report, Scrubber Pond and Temporary Storage Area (Barr, 2018). A detection monitoring program began on October 17, 2017, and continued until April 14, 2018 (Barr, 2019a). SSIs over background levels were determined for certain constituents listed in appendix III to the CCR Rule (§ 257.95(a)) in 2018 (total dissolved solids (TDS), fluoride, boron, calcium, chloride, pH, and sulfate). In response to these SSIs, an assessment monitoring program was initiated on April 15, 2018. This program continued through 2020.

On January 2, 2019, it was determined that the initial assessment monitoring and resample events resulted in detections of lithium and selenium at statistically significant levels above applicable GWPS. An assessment of corrective measures (ACM) was initiated on April 2, 2019, and completed on August 29, 2019 (Barr, 2019b). The Scrubber Ponds are currently in selection of remedy, as described in § 257.97, subject to the outcome of the ASD.

1.4 Description of the Monitoring Well System

The groundwater monitoring system is a multi-unit groundwater monitoring system, as provided in § 257.91(d), meaning that both the Scrubber Ponds and the TSP are monitored by a single groundwater monitoring system. The monitoring well system around the CCR units consists of three hydraulically upgradient wells (MW-103, MW-110 and MW-119) and four downgradient wells (MW-111, MW-117, MW-118, and MW-120) as shown on Figure 1.

The geological strata at the Site consists of fine- and coarse-grained unconsolidated alluvial sediments overlying bedrock (Ft. Union Formation). The upgradient wells are screened in primarily coarse-grained sediments. The downgradient monitoring wells are located hydraulically downgradient of the CCR units along the waste boundary, are spaced approximately 500 feet (or less) apart, and are screened in primarily fine-grained sediments. The number, spacing, and hydraulic positions of the monitoring wells comply with requirements outlined in § 257.91(a-c) of the CCR Rule.

1.5 Groundwater Standards

Once assessment monitoring is triggered for a CCR unit, § 257.95(d)(2) requires that GWPS be established for appendix IV constituents detected in groundwater. GWPS are defined as the higher of the Maximum Contaminant Level (MCL) or default GWPS, and the background concentration level for the detected constituent based on statistical methods established in § 257.93(f-g). Based on § 257.95(h)(2) and the July 30, 2018, Phase 1 CCR Rule revision, a final GWPS was established for the appendix IV constituents detected in groundwater.

2 ASD Hypotheses

The hypotheses and corresponding determinations supporting the ASD are summarized below. Hypotheses 1 and 2 support an ASD for lithium only and Hypotheses 3 and 4 support an ASD for selenium only.

2.1 Hypothesis No. 1: Natural Variation (Lithium)

More naturally occurring lithium is present in the fine-grained sediments than in coarse-grained sediments. As a result, groundwater in zones of fine-grained sediments will typically have higher lithium concentrations than groundwater in zones of coarse-grained sediments. The upgradient wells at the Site are screened in primarily coarse-grained sediments and downgradient wells at the Site are screened in primarily fine-grained sediments. Therefore, due to the natural variability between sediments in which upgradient and downgradient wells are screened at the Site, it is possible that the observed downgradient lithium concentrations are due to natural variation in lithium content in the sediments.

2.1.1 Variation in Solids Concentration with Sediment Type within the Aquifer Matrix

To test the hypothesis No. 1, a total of eight Site sediment samples (see Table 1) from five different borings were sent to Pace Inter-Mountain Laboratories (Pace) in Sheridan, Wyoming. The sediment samples were crushed in a mill and analyzed for total lithium (Total Metals) using EPA's *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, 3rd Edition*, methods 3050 and 6010. Logs for the five borings are presented in Appendix A.

Both samples from boring SB-3 were judged to be relatively well graded. As such, the samples were sieved using a no. 230 sieve. The fraction retained on the sieve is sand and gravel (coarse-grained sediments) and the fraction passing the sieve is silt and clay (fine-grained sediments). Both fractions were crushed and analyzed for lithium. The remaining samples were determined to be more homogenous and, therefore, did not require sieving.

Analytical results for the sediment samples are summarized in Table 1. The lithium concentrations for fine-grained sediments (clay and silt) ranged from 11.5 milligrams per kilogram (mg/kg) to 22.7 mg/kg, with an average concentration of 16.1 mg/kg. In the coarse-grained sediments (sand and gravel), the concentrations ranged from 4.0 mg/kg to 6.9 mg/kg, with an average concentration of 5.4 mg/kg. The results indicate that the average lithium concentration in the fine-grained sediments is more than three times the average lithium solids concentration in the coarse-grained sediments. The laboratory report for the analysis of the sediment samples is presented in Appendix B.

Table 1 Lithium Solids Concentration by Sample Material Type

Texture	Sample ID	Sample Depth within Boring (ft)	Lithium Result (mg/kg)
Fine	SB-2	2 to 5	11.5
Fine	SB-3	3.5 to 10.5	13.6
Fine	SB-3	10.5 to 15	14.2
Fine	T-2	23.5 to 30	18.1
Fine	T-13	3.5 to 10	16.2
Fine	T-13	15 to 20	22.7
Fine Average			16.1
Fine Range			11.5 to 22.7
Coarse	SB-2	10 to 20	4.9
Coarse	SB-3	3.5 to 10.5	5.8
Coarse	SB-3	10.5 to 15	6.9
Coarse	T-1	19 to 23	4.0
Coarse Average			5.4
Coarse Range			4.0 to 6.9

2.1.2 Variation in Lithium Mobility with Sediment Type

The sediment analysis presented above confirmed that fine-grained sediments at the Site have more lithium within the solid matrix than coarse-grained sediments. Leach tests, which simulate what the lithium concentrations would be in groundwater, were done on sediment samples from areas at the Site that have not been affected by the CCR units to estimate how much naturally occurring lithium could be mobilized from the solid matrix to groundwater.

Ten additional borings (T-14 through T-23) and associated temporary wells were installed across the Site, scattered upgradient and side gradient of the CCR units to obtain samples for this evaluation. Borings T-14 through T-22 were located in areas that are not hydraulically downgradient from any of the current or former CCR units (Figure 2). It was subsequently determined that boring location T-23 may have been affected by historical (pre-CCR Rule) Site activities not associated with any CCR units so the analytical results for the sample from boring T-23 were not carried forward in the evaluation. Logs for these borings are presented in Appendix A.

Pace analyzed sediment samples from these borings by a saturated paste extract procedure (SPE Method; Pace SOP S-SATPASTE-1.1). Samples that had dried and hardened were crushed using a mortar and pestle; however, rock fragments larger than #10 mesh (2 mm) were removed from the samples for the SPE Method analyses.

Analytical results for samples classified as fine-grained or coarse-grained from borings T-14 through T-22 are summarized in Table 2. The laboratory report for the analyses is presented in Appendix B. The lithium concentrations leached from the fine-grained material in the liquid extract ranged from 0.02 to 0.14 mg/L,

with an average of 0.06 mg/L. The lithium concentrations leached from the coarse-grained material in the liquid extract ranged from 0.02 to 0.06 mg/L, with an average of 0.03 mg/L. These results indicate that in areas that could not have been influenced by the CCR units the fine-grained sediments release more lithium to groundwater, and with greater variation, than coarse-grained sediments. The results also indicate that the average SPE leachate lithium concentration from fine-grained sediments was approximately twice the average leachate lithium concentration from the coarse-grained sediments.

Table 2 Summary Saturated Paste Extracts for Lithium

Sediment Type	Boring ID	Sample Depth within Boring (ft)	Sediment Type	Lithium Result (mg/L)
			(field-estimated composition in boring logs)	
Fine	T-14	5-7	>95% fines	0.03
Fine	T-14	7-10	>90% fines	0.04
Fine	T-14	10-13	>90% fines	0.03
Fine	T-15	14.25-17.5	100% fines	0.04
Fine	T-16	11-13	100% fines	0.02
Fine	T-17	10.75-15	100% fines	0.07
Fine	T-18	12.5-14.5	100% fines	0.14
Fine	T-20	5.5-8.25	100% fines	0.02
Fine	T-21	13.75-15	100% fines	0.08
Fine	T-22	3.5-10	100% fines	0.03
Fine	T-22	10-15	100% fines	0.10
Fine	T-22	15-20	100% fines	0.10
Fine Average				0.06
Fine Range				0.02 to 0.14
Coarse	T-15	5-10	Poorly graded sand with silt and gravel (20% gravel, 70% sand, 10% fines)	0.03
Coarse	T-15	10-14.25	Poorly graded sand with silt and gravel (20% gravel, 70% sand, 10% fines)	0.02
Coarse	T-16	3-11	Poorly graded sand with silt and gravel (20% gravel, 70% sand, 10% fines)	0.03
Coarse	T-17	5-10.75	Well graded sand with silt (5% gravel, 85% sand, 10% fines)	0.02
Coarse	T-18	5-10	Well graded sand with silt and gravel (15% gravel, 75% sand, 10% fines)	0.03
Coarse	T-18	10-12.5	Well graded sand with silt and gravel	0.02
Coarse	T-19	3.5-5	Poorly graded sand with silt and gravel (20% gravel, 70% sand, 10% fines)	0.06
Coarse	T-19	5-10	Poorly graded sand with silt and gravel (20% gravel, 70% sand, 10% fines)	0.02
Coarse	T-19	10-14.5	Poorly graded sand with silt and gravel (20% gravel, 70% sand, 10% fines)	0.02
Coarse	T-21	5-13.75	Poorly graded sand with silt and gravel (15% gravel, 70% sand, 15% fines)	0.05
Coarse Average				0.03
Coarse Range				0.02 to 0.06

Temporary wells were installed in borings T-14 through T-22 to facilitate collection of groundwater samples. The groundwater samples were analyzed for lithium at Minnesota Valley Testing Laboratories. As can be seen on Figure 2, the lithium concentrations detected in the samples from temporary wells T-20 and T-22, which were completed in fine-grained sediments, were 1.6 to 2.3 times the lithium concentrations in the samples collected from temporary wells completed in coarse-grained sediments. These analytical results for the groundwater samples corroborate the results of the leach testing. Field sampling forms and the laboratory report for the analyses of the groundwater samples are presented in Appendix B.

2.1.3 Statistical Upper Limit of Natural Variability

As shown above, fine-grained sediments at the Site have generally higher lithium content than coarse-grained sediments at the Site. As a result, higher lithium concentrations can be leached from fine-grained sediments than from coarse-grained sediments at that Site. The lithium GWPS (0.0627 mg/L) was established by calculating the parametric upper prediction limit for background lithium concentrations measured in groundwater samples from the upgradient wells in the CCR monitoring network, consistent with the CCR Rule. Well logs (Appendix A) show that upgradient wells are screened in primarily coarse-grained soils while downgradient wells are screened in primarily fine-grained soils. Therefore, the effect of the geologic variability at the Site on naturally occurring lithium concentrations in groundwater is not captured in the existing GWPS determination.

To understand an upper limit of lithium concentration in groundwater that might result from natural variability, the fine-grained sediment leaching data presented in Table 2 was used to calculate an interwell prediction limit of 0.16 mg/L (Figure 3), which is more than 2.5 times the established GWPS. This upper limit of natural variability more accurately represents potential downgradient background concentrations.

2.1.4 Conclusions

The analytical data confirm that more naturally occurring lithium is present in fine-grained sediments than in coarse-grained sediments at the Site and that more lithium is mobilized to the liquid phase from the fine-grained sediments than from the coarse-grained sediments. As a result of the natural variation in lithium content, groundwater in zones of fine-grained sediments will contain more lithium than groundwater in zones of coarse-grained sediments. The average lithium concentration in SPE leachate, intended to simulate groundwater conditions, from fine-grained sediments is approximately twice the concentration in leachate from coarse-grained sediments.

The upgradient wells in the CCR monitoring network are screened in predominantly coarse-grained sediments whereas the downgradient wells are screened in predominantly fine-grained sediments (Figure 2).

Finally, statistical evaluation of lithium concentrations obtained from the analyses of SPE leachate resulted in an interwell prediction limit that more than 2.5 times the GWPS. Therefore, based on these geologic

relationships, elevated concentrations of lithium in downgradient wells MW-117 and MW-118 are lower than the upper limit of natural variability for the Site, and exceedances of the GWPS in these wells are the result of natural variation in groundwater quality.

2.2 Hypothesis No. 2: Carbonaceous Zone (Lithium)

Naturally occurring carbonaceous zones within the aquifer matrix, which typically exhibit elevated lithium concentrations, are present in fine-grained sediments within or near the screened intervals of downgradient wells in the CCR monitoring network. As a result, it is possible that the GWPS based on upgradient wells is not representative of the background lithium concentrations in downgradient wells.

2.2.1 Lithium Concentrations within Carbonaceous Material

Carbonaceous materials are defined herein to include lignite or other types of coal, or other organic materials, that are inferred to contain visually significant amounts of carbon. To determine if the carbonaceous material could be contributing to the elevated downgradient groundwater concentrations, eight samples of carbonaceous material were extracted from available sediment cores (obtained from previous Site investigations) and subjected to the SPE leachate extraction analysis. Logs for the borings associated with these sediment cores are presented in Appendix A.

SPE leachate analyses of carbonaceous samples for lithium shown in Table 3 identified concentrations ranging from 0.06 to 0.13 mg/L, with an average concentration of 0.09 mg/L. The average lithium concentration in the carbonaceous material SPE leachate, intended to simulate groundwater conditions, is 1.5 times the average concentration from fine-grained samples and three times the average concentration from coarse-grained samples. The laboratory report for the analyses of carbonaceous material samples is presented in Appendix B.

Table 3 Summary of SPEs for Lithium in Carbonaceous Materials

Boring ID	Sample Depth within Boring (ft)	Lithium Result (mg/L)
SB-2	20.5-21	0.11
T-2	22.5-23.5	0.07
T-3	30-32.5	0.13
T-5	10-15	0.09
T-6	19.5-20	0.08
T-17	10.75-15	0.10
T-18	12.5-14.5	0.09
T-22	10-15	0.06
average		0.09
range		0.06 to 0.13

2.2.2 Carbonaceous Material Location Compared to Downgradient Wells

Carbonaceous material was identified in the MW-111 boring log (Appendix A) at a depth of approximately 3 feet below the well screen. Common industry practice is to backfill any over-drilled depth below the well screen using filter pack sand. This backfill below the well screen would allow transfer of groundwater from the carbonaceous zone to the well screen during sampling, likely affecting water quality.

The boring logs for the remaining downgradient wells did not identify carbonaceous material, though the older Site wells provide little detail on the materials encountered during well construction. Since carbonaceous zones can be thin, these zones could be present in the downgradient wells even though they were not noted on the well logs. While downgradient CCR monitoring network wells MW-117, MW-118, and MW-120 do not document carbonaceous material at the well locations, additional borings surrounding these downgradient wells provided evidence of carbonaceous zones (Figure 2). Table 4 provides maximum lithium concentrations in downgradient wells and the approximate distances from the downgradient wells to the nearest boring in which carbonaceous material was identified. Measured lithium concentrations tended to be higher in groundwater where a downgradient carbonaceous zone was identified closer to the well, with the highest lithium concentration correlating to well MW-111 where carbonaceous material was documented within the boring (Appendix B).

Table 4 Carbonaceous Zone Correlation to Downgradient Groundwater Concentrations

Downgradient CCR Well	Maximum Lithium Concentration in Groundwater Measured during Assessment Monitoring (µg/L)	Distance to Closest Boring with Documented Carbonaceous Material (ft)
MW-111	227	within boring
MW-120	175	125
MW-117	155	160
MW-118	106	280

By inference from the information presented above, elevated concentrations of lithium in MW-111 is attributable to the presence of carbonaceous materials within the well boring. The site investigation boring logs document that carbonaceous material is present within 125 feet from MW-120 based on the boring conducted closest to the well. Carbonaceous material may be closer to MW-120 than documented by the borings.

Since the average lithium concentration SPE leachate analyses is about 1.5 times the average for fine-grained materials, it would be anticipated that lithium in groundwater samples that are influenced by carbonaceous materials would be much higher. It is apparent that carbonaceous materials in the downgradient monitoring zone has a significant impact on lithium concentrations in these wells and the regulated CCR units are not the cause of elevated concentrations at MW-111 and MW-120.

2.2.3 Conclusion

The average lithium concentration in the carbonaceous material SPE leachate is greater than the average concentrations in leachate from fine-grained or coarse-grained sediment samples. The locations where carbonaceous material was identified in boring logs also appears to correlate with the elevated lithium concentrations in CCR monitoring network wells, with monitoring well MW-111 having the highest lithium concentrations as well as being the only downgradient well with carbonaceous material encountered in the wellbore. These data show that the presence of carbonaceous material in the aquifer matrix causes elevated lithium in downgradient groundwater and has a stronger influence on MW-111 and MW-120, and is therefore responsible for exceedances of the GWPS in these two wells.

2.3 Hypothesis No. 3: Contaminant Transport Modeling (Selenium)

Selenium concentrations attributed to the regulated CCR units may not be sufficient to exceed the GWPS at downgradient wells within the CCR monitoring system.

2.3.1 Groundwater Transport Modeling Methodology

The current distribution of selenium in Site groundwater is the result of contributions from multiple historical sources. To estimate the proportion of the current selenium distribution attributable to the regulated CCR units, a groundwater flow and transport computer model was used to simulate the impacts of the regulated CCR units (Barr, 2020b). Historical sources simulated with the groundwater flow and transport model include the 1975 scrubber ponds, the Scrubber Ponds at different stages of design, the unlined TSP, the lined TSP, and the sewage lagoon. The groundwater flow and transport model, with all known historical sources simulated, was calibrated to Site data and closely matches the selenium concentrations at the wells in the CCR monitoring system (Barr, 2020b), indicating that application of the model to estimate the proportional impacts of various historical sources is appropriate.

To estimate the impacts of the Scrubber Ponds over time, the sources were simulated individually and the impacts on downgradient wells within the CCR monitoring system were evaluated. The simulated selenium concentrations as of fall 2020 at downgradient wells within the CCR monitoring system resulting from the Scrubber Ponds are presented in Table 5. It should be noted that the transport modeling includes a background concentration of 0.043 mg/L for selenium (Barr, 2020b).

Table 5 Proportional Contribution to Fall 2020 Selenium Concentrations

Location	CCR Monitoring System Well	Simulated Selenium Concentrations (mg/L)	
		Pond Design as of Effective Date of Rule	Pond Design after Retrofit
Downgradient	MW-111	0.049	0.043
	MW-117	0.043	0.043
	MW-118	0.048	0.044
	MW-120	0.043	0.043

As shown in Table 5, the maximum selenium concentration attributed to the CCR units in the downgradient wells (0.049 mg/L) is less than the established GWPS for selenium of 0.0705 mg/L.

2.3.2 Conclusion

Based on the results above, releases from the Scrubber Ponds would not be sufficient to produce observed selenium concentrations above the GWPS at downgradient wells within the CCR monitoring system. Therefore, it is apparent that sources other than the Scrubber Ponds caused the observed exceedances of the GWPS at these wells.

2.4 Hypothesis No. 4: Statistical Methods (Selenium)

An evaluation of statistical methods could indicate that, based on the selenium data collected through 2020, selenium is not present at levels that are statistically significantly above the GWPS. Instead, it is possible that the previous SSIs were the result of the utilization of an inappropriate statistical methodology rather than a release from the CCR units.

2.4.1 Initial Method Used to Make SSI Determination

The determination that there was an SSI for selenium in MW-111 and MW-118 was based on non-parametric interwell prediction limits calculated from data collected between March 2016 and June 2017. This approach was based on the Statistical Method Selection Certification (Barr, 2017). Further review of this certification and guidance documents suggest that the specifics of the methods outlined in the Statistical Method Selection Certification are designed for detection monitoring, and additional refinements may be more appropriate for assessment monitoring. Upon further evaluation, it has been determined that the original statistical method used to identify SSIs for selenium was not appropriate for the assessment monitoring phase and data distribution. In this ASD, the appropriate statistical method was applied, and the analysis was updated accordingly. As explained below, the appropriate statistical method and the corresponding corrected statistical analysis indicate that the monitoring results did not, in fact, represent SSIs for selenium.

2.4.2 Alternate Methods

The U.S. EPA's Unified Guidance (U.S. EPA, 2009) provides recommendations for statistical methods to be used in assessment monitoring (Chapter 7). The methods described below are acceptable practices under the Unified Guidance for defining a GWPS. These general methods are also included in the Statistical Method Selection Certification (Barr, 2017).

Although the Unified Guidance (U.S. EPA, 2009) considers prediction limits to be an acceptable method for GWPS evaluations, it also recommends confidence interval testing against a fixed GWPS for assessment monitoring and suggests an upper tolerance limit for identifying the GWPS.

To compare data from a compliance well to the background tolerance limit GWPS, the guidance recommends evaluating whether the lower confidence limit of the mean of the compliance data exceeds the GWPS. The use of a lower confidence limit of the mean of the compliance data assumes that the compliance data are stationary over time. In cases where the compliance data are trending, lower

confidence limit of the mean method is not appropriate, and an alternative method should be used. Two types of trends were identified in the selenium data from MW-111 and MW-118. Statistical analysis accounting for these trends shows that the increase in selenium concentrations in these wells relative to background is not statistically significant.

2.4.2.1 Linear Trend Method

A linear trend refers to a series of consecutive measurements that evidence successively increasing or decreasing concentration levels. Guidance suggests the use of a confidence band around the trend line if the data follow a linear trend. The lower confidence limit of the trend can then be evaluated relative to the GWPS.

2.4.2.2 Shift Method

Alternatively, if the non-stationary behavior exhibits a shift, in which the data shift from one stationary level to a significantly different level, guidance suggests limiting the confidence limit calculation to the recent level. Although this approach will reduce sample size, the reduction will be offset by the gain in statistical power from lower variability. Welch's *t*-test can be used as a means to determine whether the shift represents a statistically significant difference.

2.4.3 Selenium Results

Using the upgradient baseline data to calculate a background tolerance limit yields a fixed background GWPS of 70.5 µg/L (Figure 4). Selenium in downgradient wells MW-111 and MW-118 has shown exceedances of the GWPS in individual measurements but appears to have decreased since the monitoring program began. Both the trend and shift confidence interval methods were evaluated for the downgradient selenium data.

2.4.3.1 Linear Trend Method Results

The full data sets for selenium in downgradient monitoring wells MW-111 and MW-118 exhibit significantly decreasing linear trends (Figure 5 and Figure 6). When a 95% confidence envelope (dotted lines on figures) is applied to these trend lines (solid line on figures), the trend line and lower confidence limits for selenium in both wells are below the GWPS (dashed line on figures) for all of 2020 (March and September sampling events).

2.4.3.2 Shift Method Results

Visual examination of the selenium time-series data for downgradient wells MW-111 and MW-118 suggests a shift between data collected during baseline (pre-2018) and assessment monitoring (2018 and later). The *t*-test of data from these two periods indicates that the mean selenium concentrations during baseline in the two wells were statistically significantly higher than the mean concentrations during assessment monitoring (Figure 7 and Figure 8). Therefore, the mean confidence intervals for selenium in downgradient monitoring wells MW-111 and MW-118 were reevaluated based on the data collected during the assessment monitoring period (n=6 per well in September 2020 and 5 per well in March 2020). The results of this evaluation showed the lower confidence limits as below the GWPS for these two consecutive sampling events (Figure 9 and Figure 10).

2.4.4 Conclusion

Correcting the method of evaluating SSIs above background concentrations in assessment monitoring demonstrates that the two 2020 selenium samples collected from the downgradient monitoring wells did not represent SSIs. The alternate methods are consistent with the CCR Rule and U.S. EPA guidance. Therefore, the previous SSI determinations for selenium at wells MW-111 and MW-118 were due to the statistical method used and were not due to a release from the CCR units.

3 Conclusion

The analysis summarized in this report supports a demonstration, consistent with requirements of § 257.95(g)(3)(ii) of the CCR Rule, that the presence of statistically significant concentrations of lithium and selenium above the GWPS are not attributed to releases from the Scrubber Ponds. The following hypotheses were proven to support this determination:

- **Hypothesis No. 1:** Due to the natural variability between sediments in which upgradient and downgradient wells are screened, the observed downgradient concentrations are due to the natural variation in lithium content of the sediments.
- **Hypothesis No. 2:** The GWPS based on upgradient wells is not representative of the background lithium concentrations in downgradient wells due to naturally occurring carbonaceous zones within the aquifer matrix present in fine-grained sediments within or near the screened intervals of the downgradient wells.
- **Hypothesis No. 3:** Solute transport modeling results indicate that the selenium concentrations attributed to the Scrubber Ponds are not sufficient to exceed the GWPS at downgradient wells within the CCR monitoring system.
- **Hypothesis No. 4:** Correcting the method of evaluating SSIs above background concentrations demonstrates the previous SSIs were the result of statistical methodology rather than a release from the Scrubber Ponds.

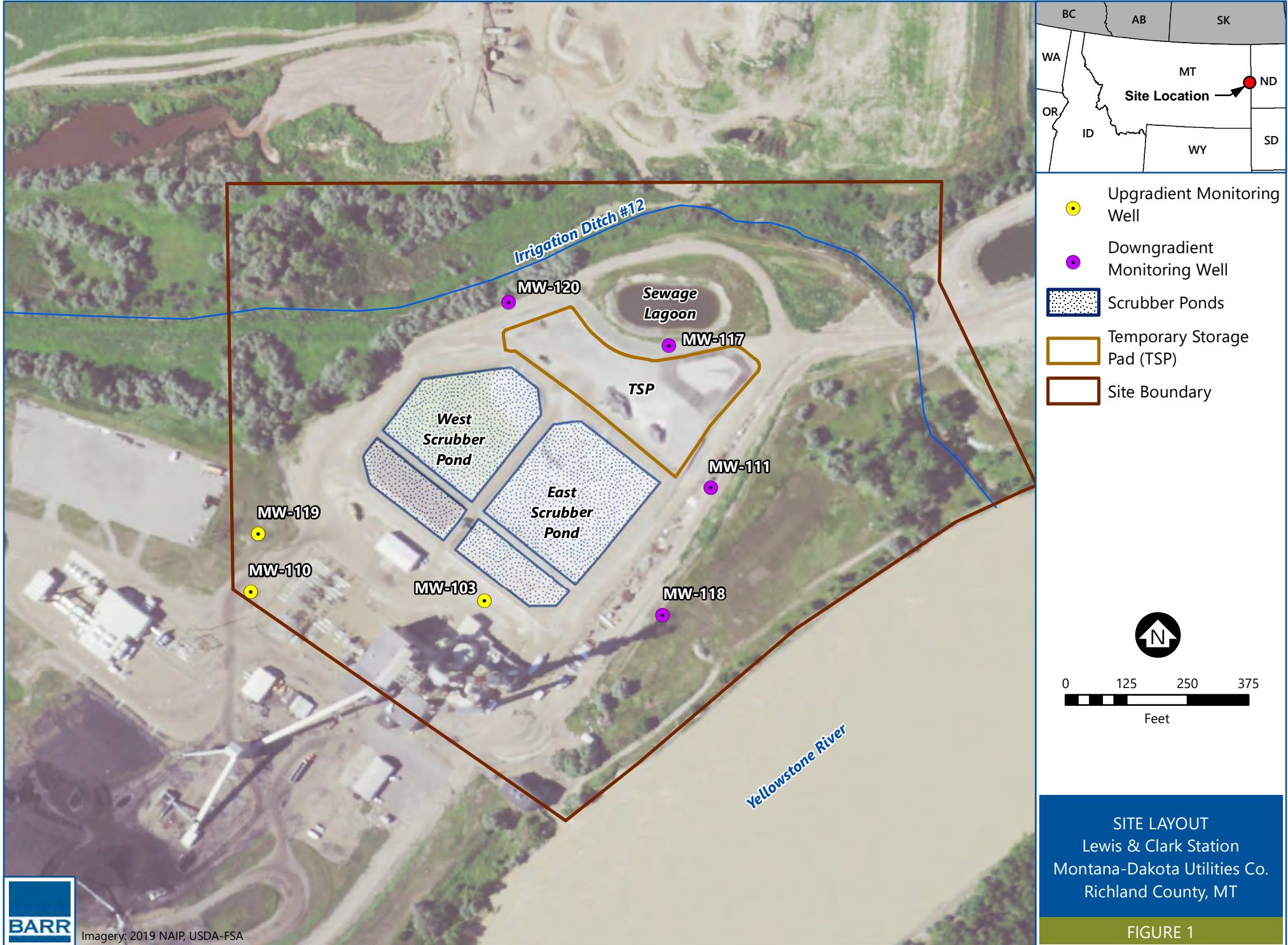
Taken individually or as a whole, the lines of evidence presented above provide adequate documentation and support that an alternative source is responsible for the presence of lithium and selenium at statistically significant concentrations above the GWPS and there does not appear to be a release from the Scrubber Ponds.

4 References

- Barr Engineering Co., 2016. Evaluation of Existing Surface Impoundment Liner, West and East Scrubber Ponds. Prepared for Montana-Dakota Utilities, September 2016.
- Barr Engineering Co., 2017. Statistical Method Selection Certification, Lewis & Clark Station. Prepared for Montana-Dakota Utilities, October 2017.
- Barr Engineering Co., 2018. 2017 Annual Groundwater Monitoring and Corrective Action Report, Scrubber Pond and Temporary Storage Area. Prepared for Montana Dakota Utilities, January 2018.
- Barr Engineering Co., 2019a. 2018 Annual Groundwater Monitoring and Corrective Action Report, Scrubber Pond and Temporary Storage Area, Lewis & Clark Station. Prepared for Montana Dakota Utilities, January 2019.
- Barr Engineering Co., 2019b. Assessment of Corrective Measures, Lewis & Clark Station. Prepared for Montana-Dakota Utilities, August 2019.
- Barr Engineering Co., 2020a. Alternative Source Demonstration, Temporary Storage Pad, Lewis & Clark Station. Prepared for Montana Dakota Utilities, November 2020.
- Barr Engineering Co., 2020b. Construction and Calibration of a Groundwater Flow and Transport Model, Lewis & Clark Station, Sidney, MT. Prepared for Montana-Dakota Utilities, November 2020.
- U.S. Environmental Protection Agency, 2009. Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Unified Guidance. EPA-530-R-09-007.

Figures

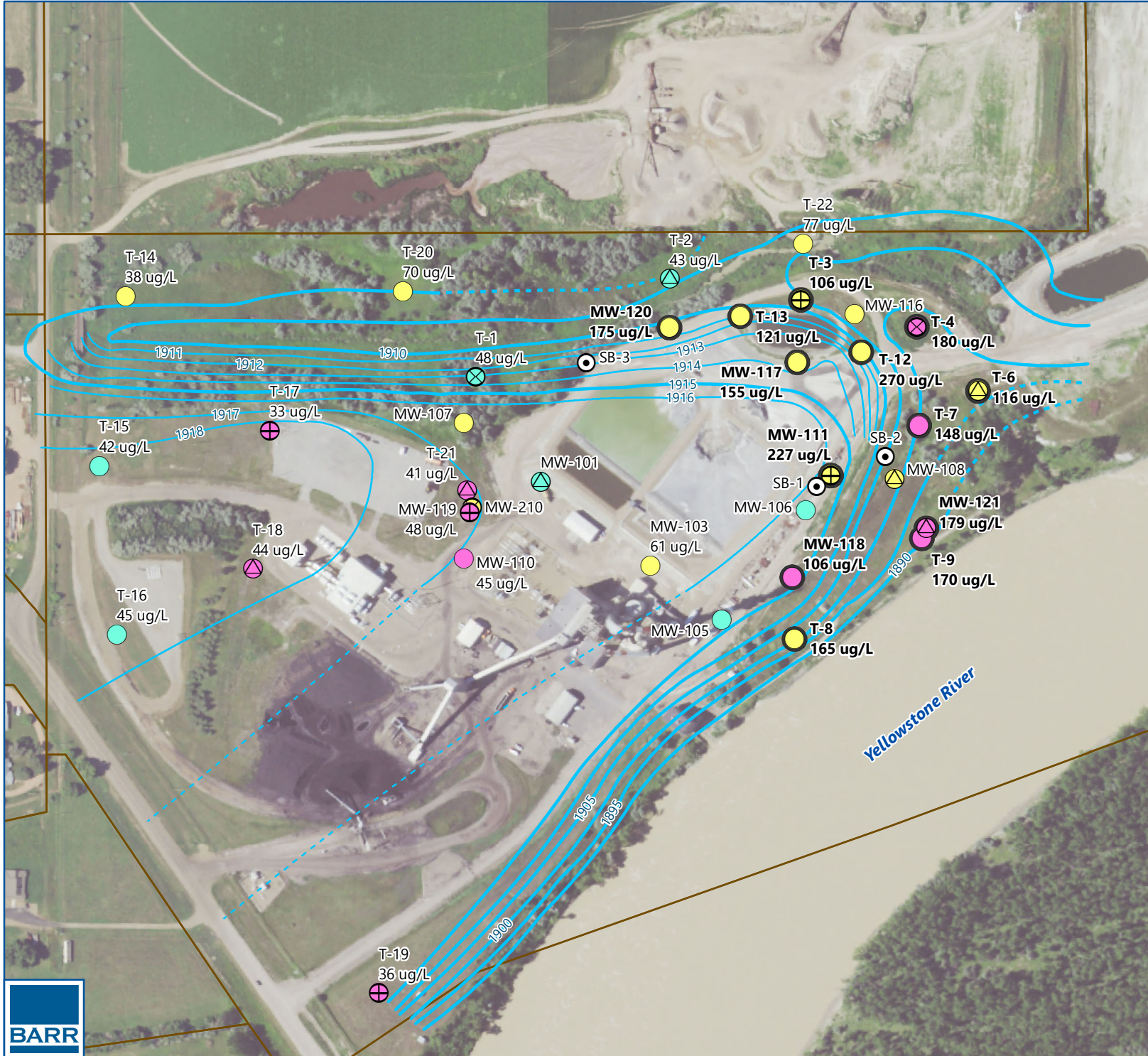
Figure 1 **Site Layout**



SITE LAYOUT
Lewis & Clark Station
Montana-Dakota Utilities Co.
Richland County, MT

FIGURE 1

Figure 2 **Well Material Types and Lithium Concentrations**



- Soil Boring Location
 - Groundwater Contour (dashed where inferred)
 - ▭ Parcel Boundary
- Material Type within Well Screen**
- Coarse Material
 - Fine Material
 - Mixed Material
- Carbonaceous Material Presence**
- ⊗ Above Well Screen
 - ⊕ In Well Screen
 - ⊕ Below Well Screen

Note:
Data shown represent the highest groundwater Lithium concentrations sampled. Concentrations exceeding groundwater protection standards are bolded.



0 175 350 525



Feet

Imagery: 2019 NAIP, USDA-FSA

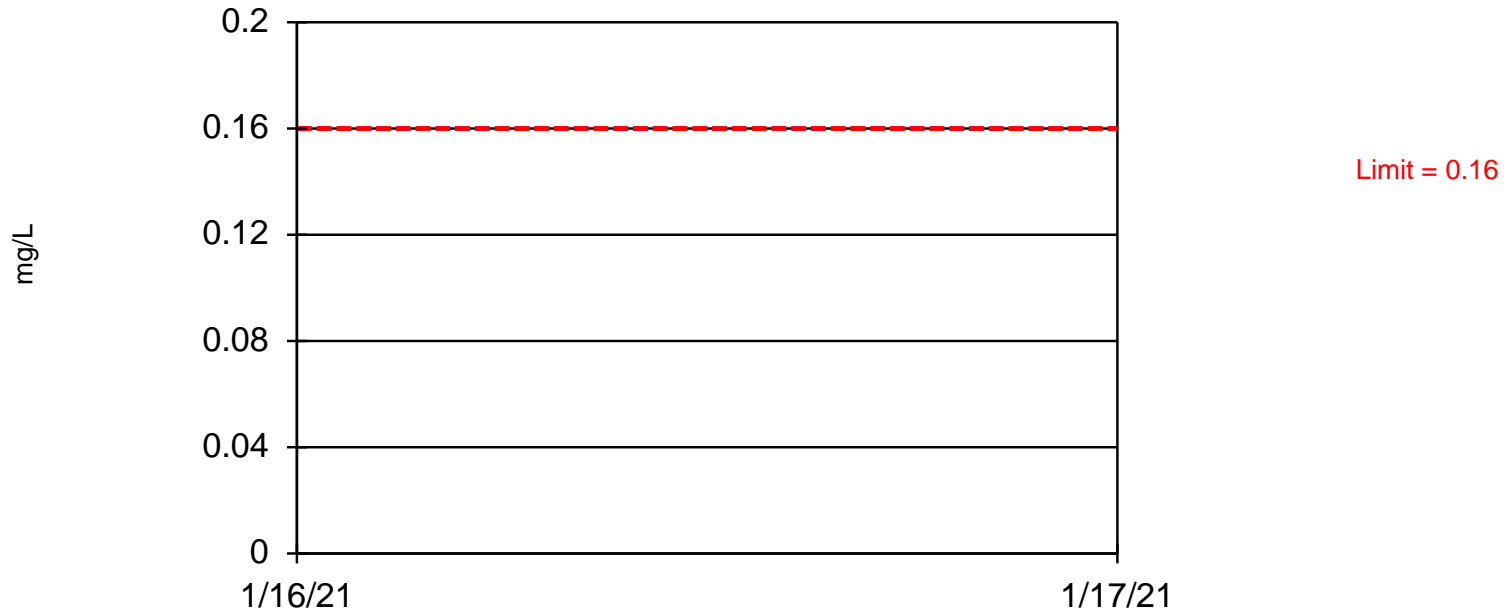
WELL MATERIAL TYPES AND LITHIUM CONCENTRATIONS
Lewis & Clark Station
Montana-Dakota Utilities Co.
Richland County, MT

FIGURE 2



Figure 3 Lithium Upper Limit of Natural Variability

Lithium - Fine Interwell Parametric



Background Data Summary: Mean=0.05833, Std. Dev.=0.03904, n=12. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.8638, critical = 0.859. Kappa = 2.525 (c=15, w=4, 1 of 2, event alpha = 0.05132). Report alpha = 0.003506. Individual comparison alpha = 0.0008776. Assumes 4 future values.

Prediction Limit Analysis Run 1/6/2021 1:11 PM

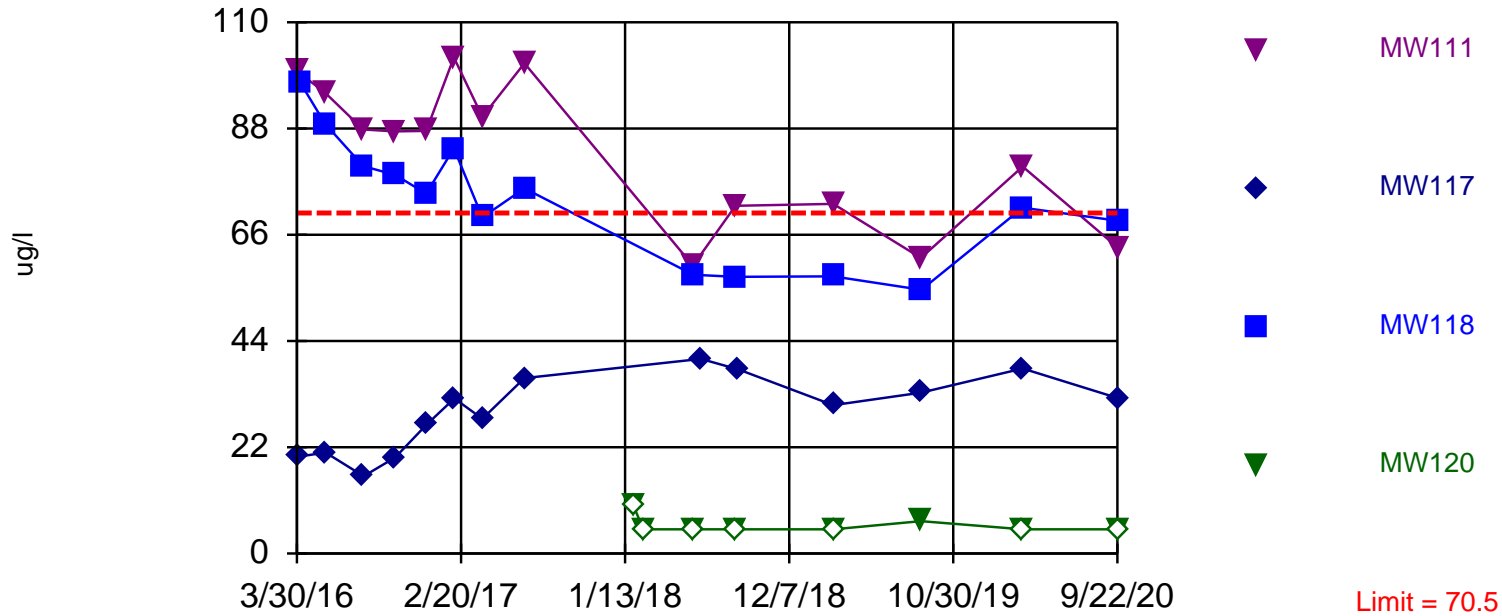
Lewis & Clark Station Client: Barr Engineering Company Data: LCLileaching

Figure 3
Lithium Upper Limit of Natural Variability

Figure 4 Selenium Tolerance Limit

Within Limit

Selenium, total Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because censored data exceeded 50%. Most recent observation is compared with limit. Limit is highest of 24 background values. 62.5% NDs. 82.62% coverage at alpha=0.01; 88.09% coverage at alpha=0.05; 97.07% coverage at alpha=0.5. Report alpha = 0.292.

Figure 4

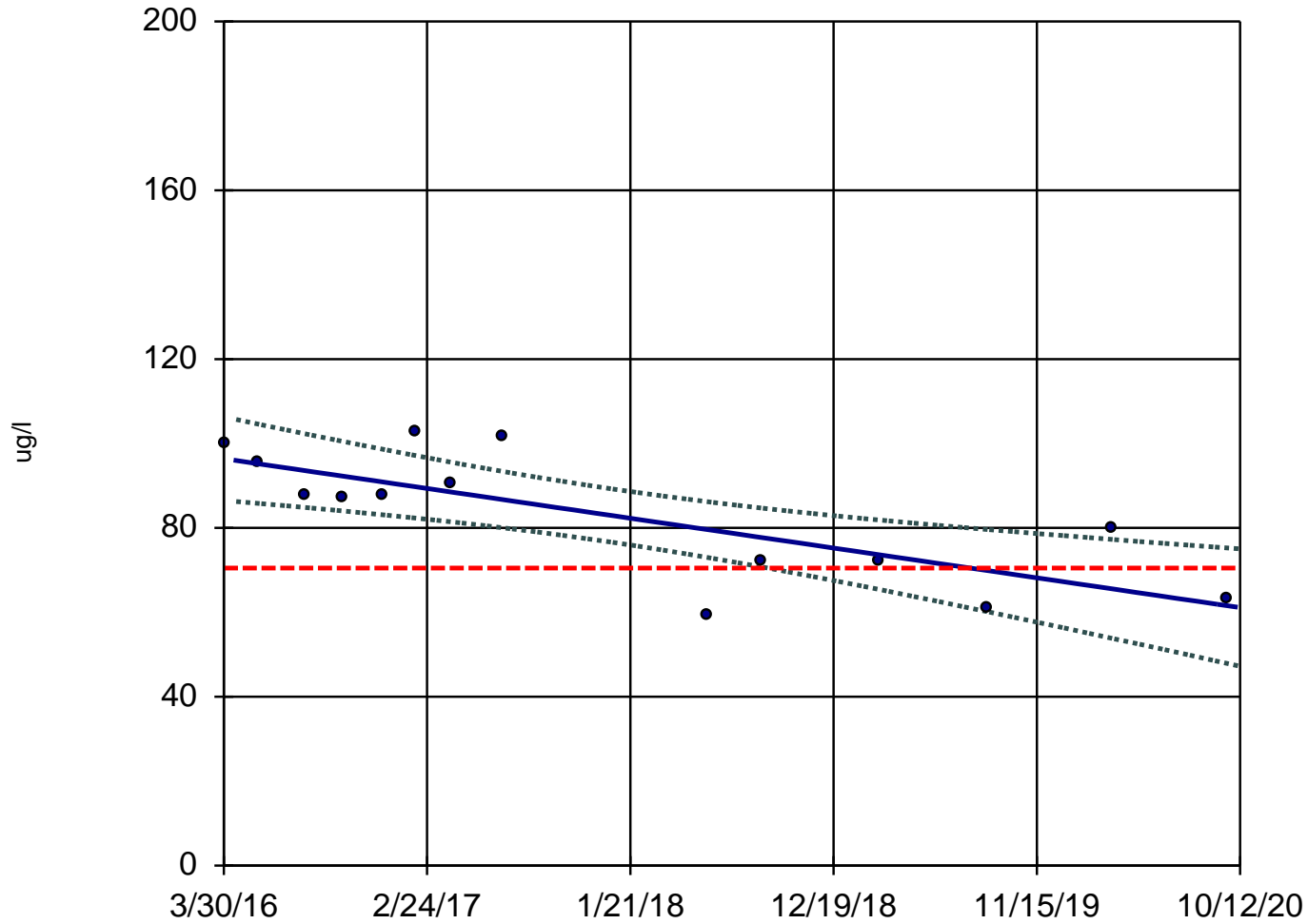
Tolerance Limit Analysis Run 12/21/2020 12:23 PM

Lewis & Clark Station Client: Barr Engineering Company Data: LC_CCR_Sanitas_CCRonly

Figure 5 Selenium Linear Regression – MW111

Selenium, total and 95% Confidence Band

MW111



n = 14

Slope = -7.776
units/year.

alpha = 0.05
t = -4.177
critical = -1.782

Significant decreasing trend.

Normality test on residuals:
Shapiro Wilk @alpha
= 0.05, calculated
= 0.9386, critical
= 0.874.

GWPS = 70.5.

Figure 5

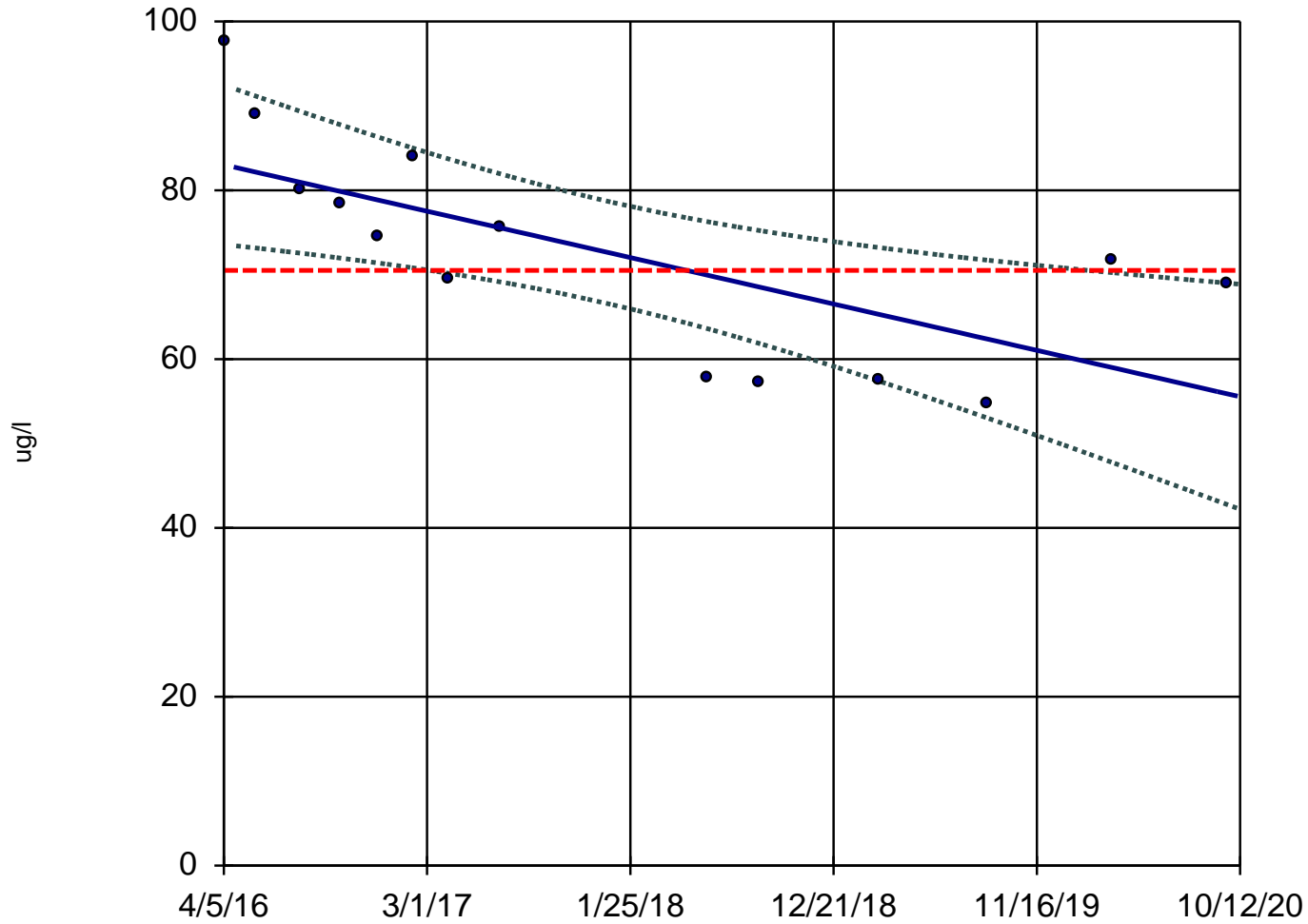
Linear Regression Analysis Run 12/18/2020 3:54 PM

Lewis & Clark Station Client: Barr Engineering Company Data: LC_CCR_Sanitas_CCRonly

Figure 6 Selenium Linear Regression – MW118

Selenium, total and 95% Confidence Band

MW118



n = 14

Slope = -6.078
units/year.

alpha = 0.05
t = -3.403
critical = -1.782

Significant decreasing trend.

Normality test on residuals:
Shapiro Wilk @alpha
= 0.05, calculated
= 0.9212, critical
= 0.874.

GWPS = 70.5.

Figure 6

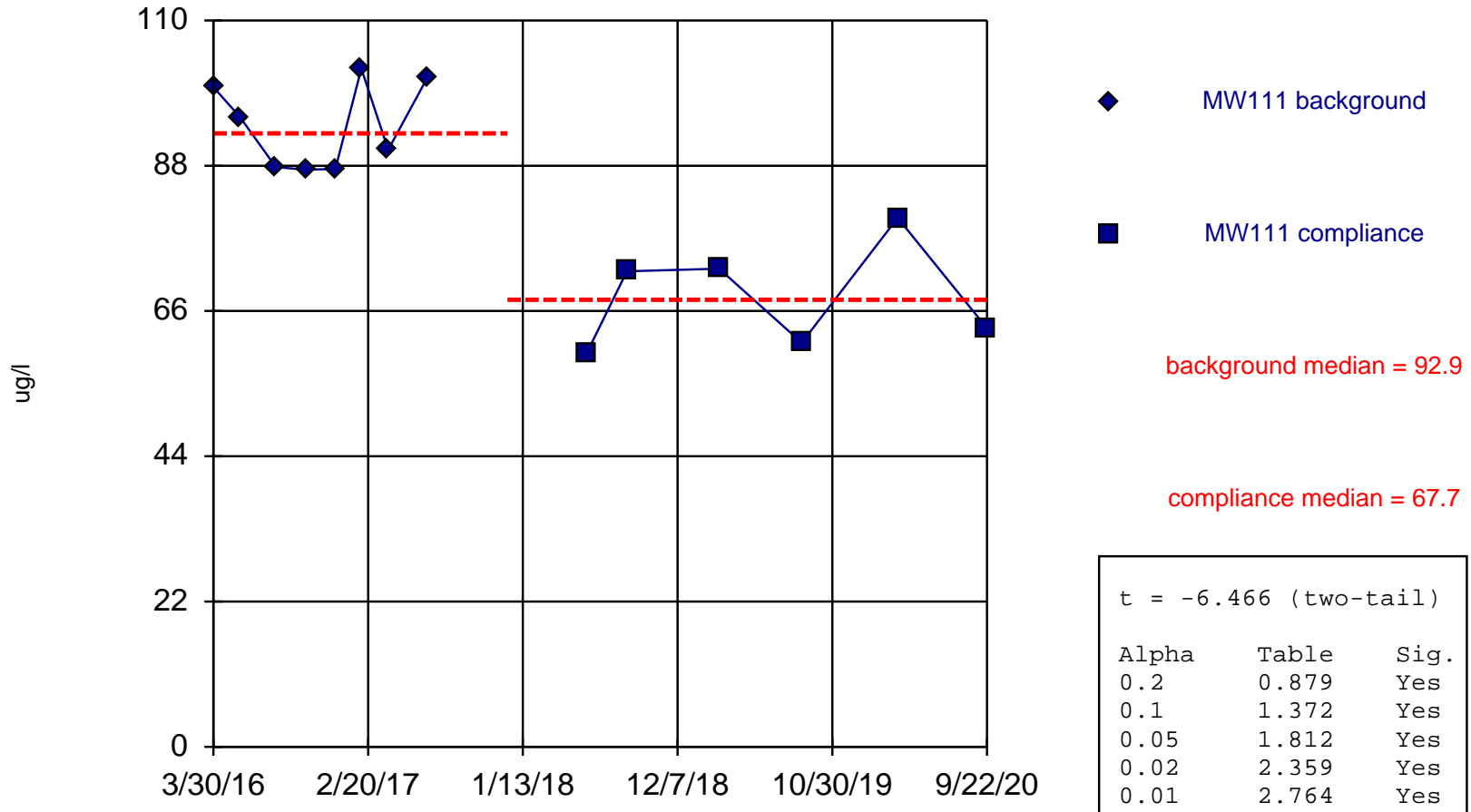
Linear Regression Analysis Run 12/18/2020 3:54 PM

Lewis & Clark Station Client: Barr Engineering Company Data: LC_CCR_Sanitas_CCRonly

Figure 7 Selenium Welch's t-Test - MW111

Selenium, total

MW111



Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.8452, critical = 0.818.

Figure 7

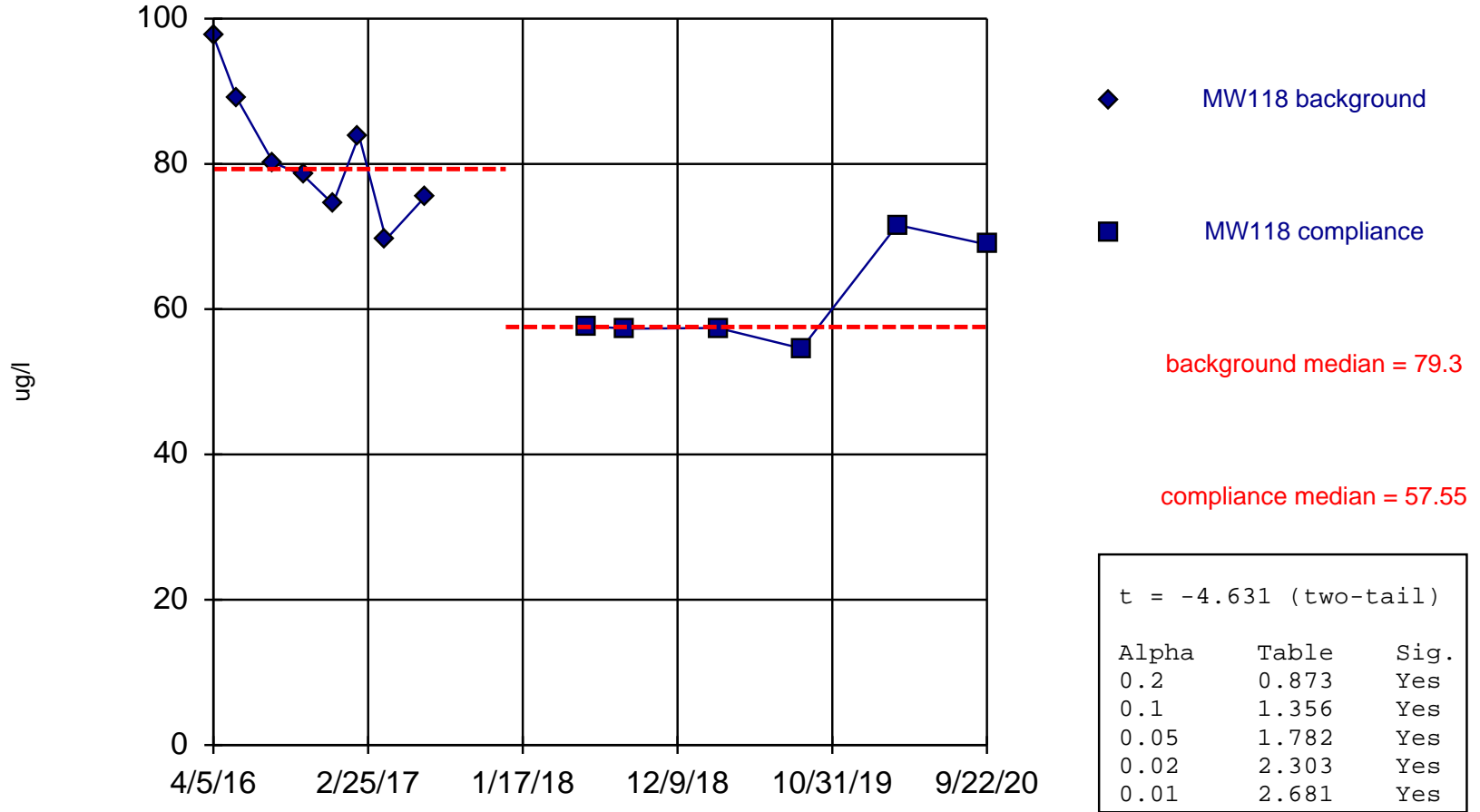
Welch's t-test Analysis Run 12/21/2020 12:28 PM

Lewis & Clark Station Client: Barr Engineering Company Data: LC_CCR_Sanitas_CCRonly

Figure 8 Selenium Welch's t-Test - MW118

Selenium, total

MW118



Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.957, critical = 0.818.

Figure 8

Welch's t-test Analysis Run 12/21/2020 12:28 PM

Lewis & Clark Station Client: Barr Engineering Company Data: LC_CCR_Sanitas_CCRonly

Figure 9 Selenium Parametric Confidence Interval

Parametric and Non-Parametric (NP) Confidence Interval

Compliance Limit is not exceeded. Normality Test: Shapiro Wilk at Alpha = 0.05.

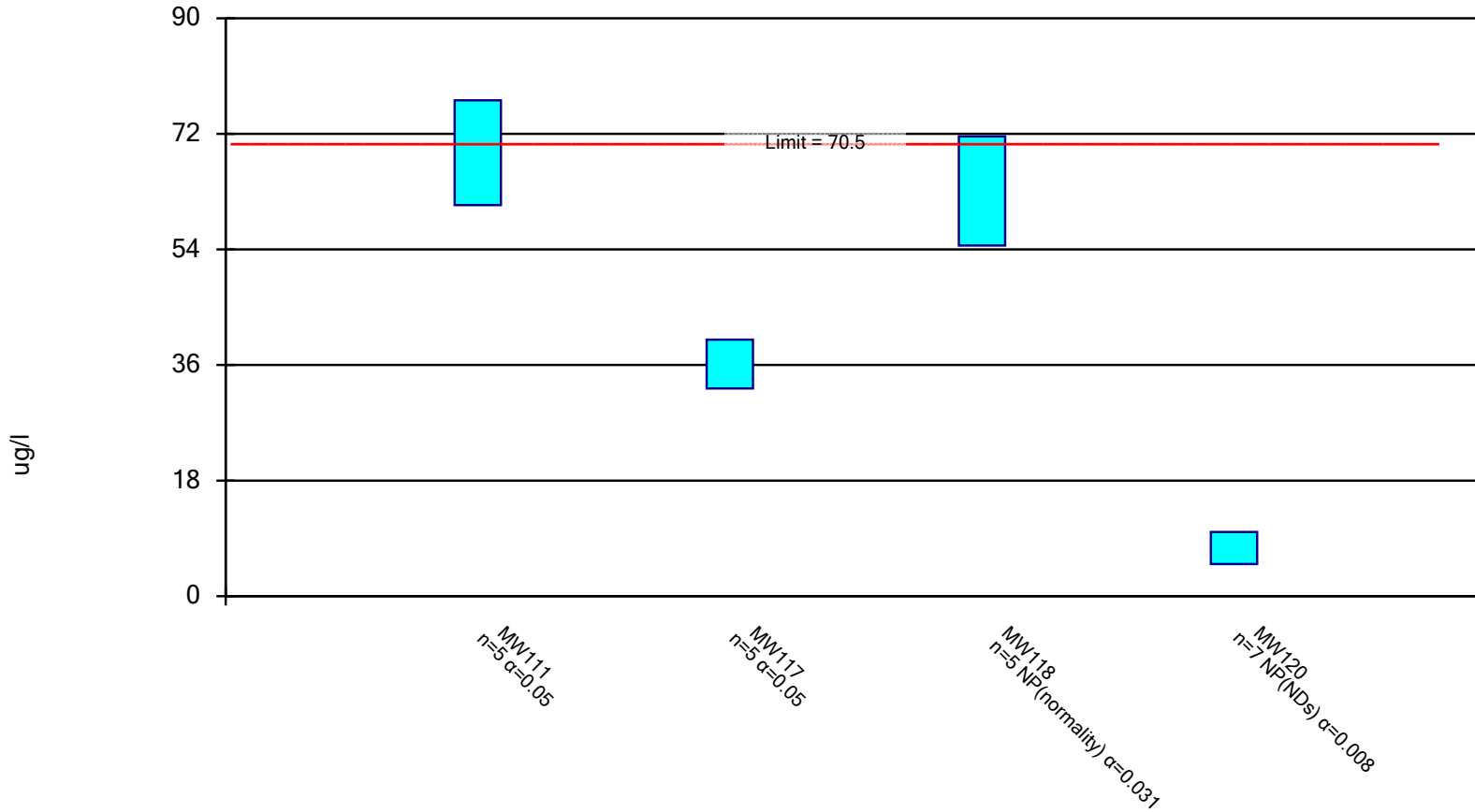


Figure 9

Constituent: Selenium, total Analysis Run 12/21/2020 12:12 PM

Lewis & Clark Station Client: Barr Engineering Company Data: LC_CCR_Sanitas_CCRonly

Figure 10 Selenium Non-Parametric Confidence Interval

Parametric and Non-Parametric (NP) Confidence Interval

Compliance Limit is not exceeded. Normality Test: Shapiro Wilk at Alpha = 0.05.

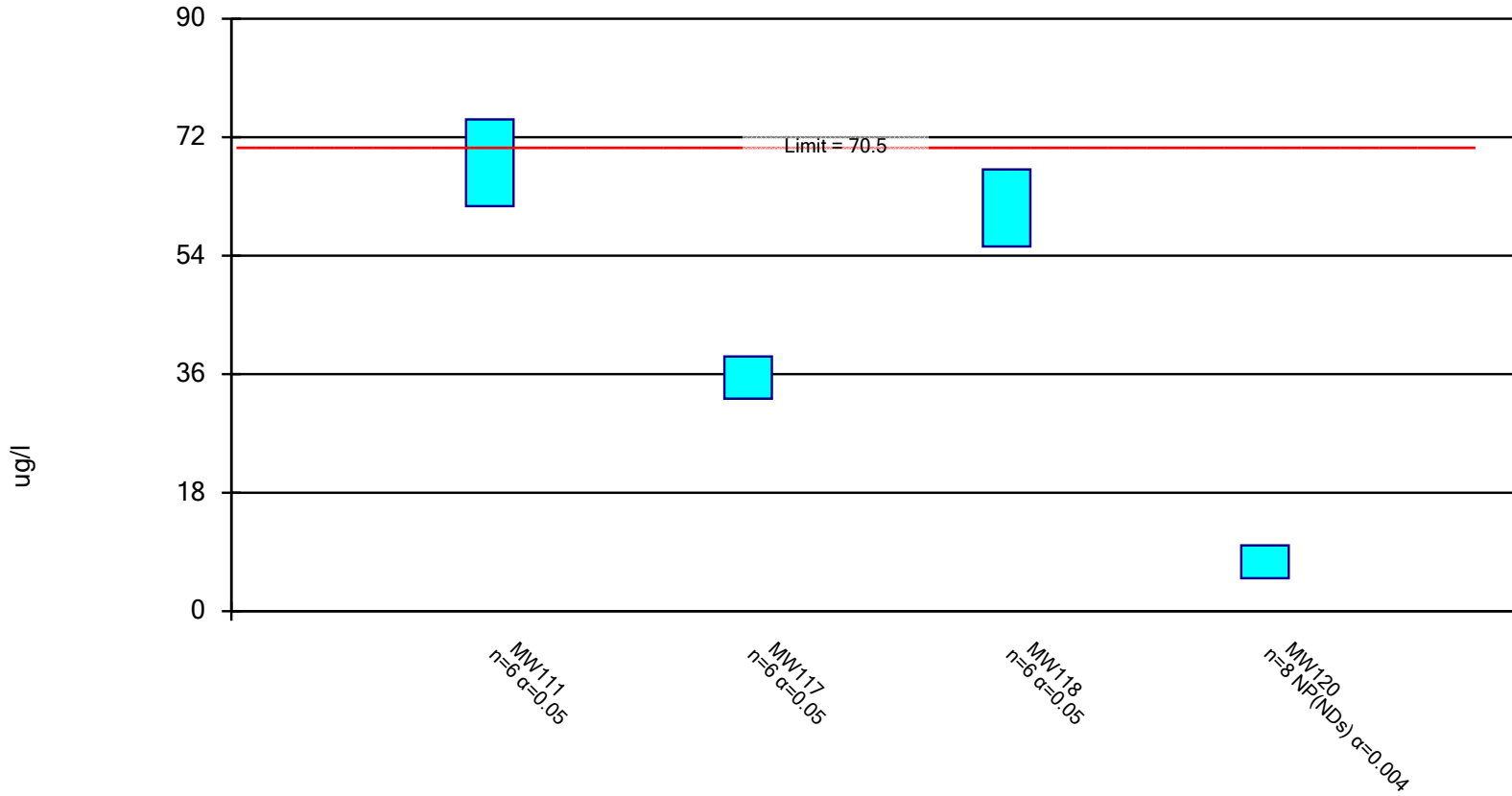


Figure 10

Constituent: Selenium, total Analysis Run 12/21/2020 12:12 PM

Lewis & Clark Station Client: Barr Engineering Company Data: LC_CCR_Sanitas_CCRonly

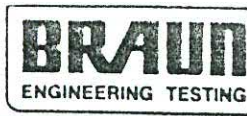
Appendices

Appendix A

Site Boring Logs

Appendix A Site Boring Logs

LOG OF BORING



PROJECT: W86-007 SOIL BORINGS Fly Ash Sludge Lagoons MDU Lewis & Clark Station Sidney, MT	BORING: ST-103W LOCATION: Middle of SW side of lagoons, see N.C.C. drawing
DATE: 1/21/86	SCALE: 1"=4'

(See Report and Standard Plates for evaluation and descriptive terminology.)

Elev.	Depth	ASTM D2487 Symbol	Description of Materials (ASTM D2488)	BPF	WL	Tests or Notes
23.2						
22.7	.5		GRAVEL surfacing			gp
19.7	3½	CL	SILTY CLAY, low to medium plasticity, dark brown to grayish brown, moist, very stiff (fine alluvium)	21		4+
16.7	6½	CL	SANDY CLAY, low plasticity, brown, moist, rather stiff (fine alluvium)	10		2
		GW-GM	SANDY GRAVEL, fine to medium grained, a little silt, wet to waterbearing, loose to dense (coarse alluvium)	17		
				5		
				57		
08.2	15					
06.2	17	ML	SANDY SILT, nonplastic, light gray, moist, very dense (siltstone)	52		1 3/4
		CH	FAT CLAY, high plasticity, light gray, moist, hard (claystone)			
02.7	20½			38		4+
			Water level down 10.1' with 19' of hollow-stem auger in the ground			
			Water level down 9.3' immediately after withdrawal of auger			
			2" PVC monitoring well installed to a depth of 19', see sketch			

State law requires that the Bureau's copy be filed by the water well driller within 60 days after completion of the well.

1. WELL OWNER
Name MDU Lewis & Clark Sta

2. CURRENT MAILING ADDRESS
400 North 4th
Bismarck, ND 58501

3. WELL LOCATION
SE 1/4 NW 1/4 SW 1/4 Section 9
Township 22 Range 59 County Richland
Gov'n't Lot _____, or Lot _____, Block _____
Subdivision Name _____
Tract Number _____

4. PROPOSED USE: Domestic Stock Irrigation
Other specify Monitoring

5. TYPE OF WORK: Hollowstem Auger x
New well Method: Dug Bored
Deepened Cable Driven
Reconditioned Rotary Jetted

6. DIMENSIONS: Diameter of Hole
Dia. 8 in. from 0 ft. to 18 ft.
Dia. _____ in. from _____ ft. to _____ ft.
Dia. _____ in. from _____ ft. to _____ ft.

7. CONSTRUCTION DETAILS:
Casing; Steel Dia. _____ from _____ ft. to _____ ft.
Threaded Welded Dia. _____ from _____ ft. to _____ ft.
Type _____ Wall Thickness _____
Casing; Plastic Dia. 2 from +1.8 ft. to 8 ft.
Weight SDR-21 Dia. _____ from _____ ft. to _____ ft.
PERFORATIONS: Yes No
Type of perforator used _____
Size of perforations _____ in. by _____ in.
_____ perforations from _____ ft. to _____ ft.
_____ perforations from _____ ft. to _____ ft.
_____ perforations from _____ ft. to _____ ft.

SCREENS: Yes No
Manufacturer's Name Timco PVC
Type _____ Model No. _____
Dia. 2 Slot size #10 from 8 ft. to 15 ft.
Dia. _____ Slot size _____ from _____ ft. to _____ ft.

GRAVEL PACKED: Yes No Size of gravel _____
Gravel placed from _____ ft. to _____ ft.

ROUTED: To what depth? 7 ft.
Material used in grouting 263# bentonite chips

8. WELL HEAD COMPLETION:
Pitless Adapter Yes No

9. PUMP (if installed)
Manufacturer's name _____
Type _____ Model No. _____ HP. _____

10. WELL TEST DATA
The information requested in this section is required for all wells. All depth measurements shall be from the top of the well casing.
All wells under 100 gpm must be tested for a minimum of one hour and provide the following information:
a) Air _____ Pump _____ Bailer _____
b) Static water level immediately before testing _____ ft. If flowing; closed-in pressure _____ psi. _____ gpm.
Flow controlled by: _____ valve, _____ reducers, _____ other, (specify) _____
c) Depth at which pump is set for test _____
d) The pumping rate: _____ gpm.
e) Pumping water level _____ ft. at _____ hrs. after pumping began.

f) Duration of test: Pumping time _____ hrs.
g) Recovery time _____ hrs.
h) Recovery water level _____ ft. at _____ hrs. after pumping stopped.

Wells intended to yield 100 gpm or more shall be tested for a period of 8 hours or more. The test shall follow the development of the well, and shall be conducted continuously at a constant discharge at least as great as the intended appropriation. In addition to the above information, water level data shall be collected and recorded on the Department's "Aquifer Test Data" form.

NOTE: All wells shall be equipped with an access port 1/2 inch minimum or a pressure gauge that will indicate the shut-in pressure of a flowing well. Removable caps are acceptable as access ports.

11. WAS WELL PLUGGED OR ABANDONED? Yes No
If yes, how? _____

12. WELL LOG #3, 110.
Depth (ft.) From To Formation

0	0.3	Silt, sandy w/gravel, dark brown
0.3	1	Silt, sandy w/gravel, reddish brown
1	4	Silt, sandy w/gravel & cobbles, medium brown
4	14	Gravel, to coarse, w/cobbles, abt 30% sand, med. brown
14	18	Silt, light blue, Bedrock

ATTACH ADDITIONAL SHEETS IF NECESSARY

13. DATE COMPLETED 8/28/91

14. DRILLER/CONTRACTOR'S CERTIFICATION
This well was drilled under my jurisdiction and this report is true to the best of my knowledge.
Date 1 Dec 91
Firm Name Water Supply Inc
Address 2501 Twin City Dr
Mandan, ND 58504
Signature [Signature] License No. 296/004

Project: Lewis and Clark Station
 Project No.: 26411007.00 PH1-014
 Location: Sidney, Montana
 Coordinates: UTM 13N N:2248510.70m, E:3584876.38m
 Datum: NAVD88

Surface Elevation: 1917.5 ft
 Drilling Method: Hollow Stem Auger
 Sampling Method: Split Spoon
 Completion Depth: 19.0 ft

Top of Casing Elev.: 1920.3 ft
 Unique Well No.:

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Depth, feet	Sample Type & Recovery	Sample No.	SCSU	Graphic Log	LITHOLOGIC DESCRIPTION	MAJOR UNIT	WELL OR PIEZOMETER CONSTRUCTION DETAIL	Elevation, feet
0.0			CL		TOPSOIL - SANDY CLAY (CL): fine grained; brown; frozen.	Fill	PRO. CASING Diameter: 6" Type: Steel Interval: Surface + 3'	1917.5
2.5			CL/ML		FILL - SILTY CLAY (CL/ML): yellow; moist; medium to high plasticity; strong HCl reaction; 0% gravel, 5% sand, 95% fines, orange staining.			1915.0
5.0			CL/ML		SILTY CLAY TO CLAY (CL/ML): light yellow brown - to olive yellow; moist to wet; low to medium plasticity; 0% gravel, 0% sand, 100% fines, hard to very hard, black oxidation spots, trace orange oxidation, rusty oxidation on fracture boundaries, very fine grain sand.	Alluvium	RISER CASING Diameter: 2" Type: Sch 40 PVC Interval:	1912.5
7.5			CL/ML					GROUT Type: Concrete Interval: 0-1' bgs
10.0			CL		CLAY (CL): gray; dry to moist; high plasticity; strong HCl reaction; 0% gravel, 0% sand, 100% fines, very hard, Fort Union Formation, black oxidation spots, rusty oxidation on fracture boundaries, occurrence of silty clay, low to high plasticity.	Fort Union	SEAL Type: Bentonite chips Interval: 1-4.5' bgs	1907.5
12.5			CL		13': Dry, no oxidation, non-plastic.		SANDPACK Type: 20/40 Interval: 4.5-10' bgs	1905.0
15.0			CL				SCREEN Diameter: 2" Type: No. 10 Sch 40 Interval: PVC 5-10' bgs	1902.5
17.5								1900.0
19.0					End of well 19.0 feet			

Date Boring Started: 2/20/16
 Date Boring Completed: 2/21/16
 Logged By: DJZ
 Drilling Contractor: Terracon
 Drill Rig: CME-55

Remarks:

Additional data may have been collected in the field which is not included on this log.
 Weather: 25°F, overcast

Project: Lewis and Clark Station
 Project No.: 26411007.00 PH1-014
 Location: Sidney, Montana
 Coordinates: UTM 13N N:2247960.01m, E:3584863.71m
 Datum: NAVD88

Surface Elevation: 1921.1 ft
 Drilling Method: Hollow Stem Auger
 Sampling Method: Split Spoon
 Completion Depth: 12.0 ft

Top of Casing Elev.: 1924.1 ft
 Unique Well No.:

Depth, feet	Sample Type & Recovery	Sample No.	SCSU	Graphic Log	LITHOLOGIC DESCRIPTION	MAJOR UNIT	WELL OR PIEZOMETER CONSTRUCTION DETAIL	Elevation, feet
0.0			CL		TOPSOIL - SANDY CLAY (CL): dark olive gray; frozen.	Fill		
2.5			SW		SAND WITH GRAVEL (SW): very dark grayish brown; dry to wet; 25% gravel, 75% sand, 0% fines, fine-to-medium-grained subangular sand; subangular gravel with some cobbles, well graded.	Alluvium	PRO. CASING Diameter: 6" Type: Steel Interval: Surface + 3' RISER CASING Diameter: 2" Type: Sch 40 PVC Interval:	1920.0
5.0							GROUT Type: Concrete Interval: 0-1' bgs	1917.5
7.5					8: Medium/coarse grained, subangular sand with small to large subangular cobbles and gravels.		SEAL Type: Bentonite chips Interval: 1-5' bgs	1915.0
10.0			ML		Rusty brown water at contact. SILT (ML): very pale brown; moist; low plasticity; some brown layers within.	Fort Union	SANDPACK Type: 20/40 Interval: 5-12' bgs	1912.5
12.5			CL		CLAY (CL): gray; moist; very hard, homogenous, Fort Union Formation, non-plastic. End of well 12.0 feet		SCREEN Diameter: 2" Type: No. 10 Sch 40 Interval: PVC 6-11' bgs	1910.0

Date Boring Started: 2/21/16
 Date Boring Completed: 2/22/16
 Logged By: DJZ
 Drilling Contractor: Terracon
 Drill Rig: CME-55

Remarks:

Additional data may have been collected in the field which is not included on this log.
 Weather: 20°F, fog

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Project: Lewis and Clark Station
 Project No.: 26411007.00 PH1-014
 Location: Sidney, Montana
 Coordinates: UTM 13N N:2248125.79m, E:3584035.03m
 Datum: NAVD88

Surface Elevation: 1923.3 ft
 Drilling Method: Hollow Stem Auger
 Sampling Method: Split Spoon
 Completion Depth: 16.0 ft

Top of Casing Elev.: 1926.3 ft
 Unique Well No.:

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Depth, feet	Sample Type & Recovery	Sample No.	SCSC	Graphic Log	LITHOLOGIC DESCRIPTION	MAJOR UNIT	WELL OR PIEZOMETER CONSTRUCTION DETAIL	Elevation, feet
0.0					TOPSOIL - SANDY CLAY MIX: black; dry; less than 1".			
2.5			GW		FILL - GRAVEL WITH SAND (GW): pinkish gray; dry to wet; 50% gravel, 50% sand, 0% fines, well graded, large to small subrounded gravel and cobbles, fine to coarse grained subangular sand, no HCL reaction.	Fill	PRO. CASING Diameter: 6" Type: Steel Interval: Surface + 3' RISER CASING Diameter: 2" Type: Sch 40 PCV Interval:	1922.5
5.0			SW		SAND WITH GRAVEL (SW): pinkish gray; moist to wet; 40% gravel, 55% sand, 5% fines, well graded fine to coarse grained sand, large to small subrounded gravel and cobbles.	Alluvium	Interval: GROUT Type: Neat Cement Interval: 3-5' bgs SEAL Type: Bentonite chips Interval: 5-7' bgs	1920.0
7.5					7': Some orange/black oxidation in sand.			1917.5
10.0					10': Some heaving sand.			1915.0
12.5							SANDPACK Type: 20/40 Interval: 7-16' bgs SCREEN Diameter: 2" Type: No. 10 Sch 40 Interval: PVC 9-14' bgs	1912.5
15.0			ML		SILT (ML): gray; moist; 0% gravel, 0% sand, 100% fines, very hard, non-plastic, low HCL reaction.	Fort Union		1910.0
15.75					15.75: Lignite lense.			1907.5
16.0					End of well 16.0 feet			

Date Boring Started: 2/18/16
 Date Boring Completed: 2/18/16
 Logged By: DJZ
 Drilling Contractor: Terracon
 Drill Rig: CME-55

Remarks:

Additional data may have been collected in the field which is not included on this log.
 Weather: 35°F, overcast

Project:	Lewis and Clark Station	Surface Elevation:	1919.0 ft	Top of Casing Elev.:	1922.0 ft
Project No.:	26411007.00 PH1-014	Drilling Method:	Hollow Stem Auger		
Location:	Sidney, Montana	Sampling Method:	Split Spoon		
Coordinates:	UTM 13N N:m, E:m	Completion Depth:	16.0 ft		
Datum:	NAVD88				

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Depth, feet	Sample Type & Recovery	Sample No.	Blows/6in.	ENVIRONMENTAL DATA	U C S S	Graphic Log	LITHOLOGIC DESCRIPTION	WELL OR PIEZOMETER CONSTRUCTION DETAIL	Elevation, feet
0.0							CLAY FILL (CL-CH): yellowish brown (10YR 5/4); frozen; hard; roots.		
2.5			7-9-14-18.	G/S/F:0%/ 0%/ 100% G/S/F:15%/ 60%/ 25%			SAND W/ GRAVEL (SP-SC): brown (10YR 4/3); moist; very fine grained sand, subround gravels, large to small.	PRO. CASING Diameter: 6" Type: Steel Interval: Surface + 3'	1917.5
5.0			8-12-13-10.	G/S/F:5%/ 70%/ 25% G/S/F:0%/ 5%/ 95%			CLAY (CL-CH): light yellowish brown (2.5Y /4); moist to wet; hard; crumbly, areas of CLAYSTONE within.	RISER CASING Diameter: 2" Type: Sch 40 PCV Interval:	1915.0
7.5			5-6-7-11.	G/S/F:15%/ 15%/ 80%			At 5': 4" FAT CLAY (CH), brown (10YR 4/3), hard Increasing sand and gravels within claystone. Mostly fine grained sand, smal gravels, subround. At 6-7.5': Mix of fat clay and claystone w/ sand/gravel within w/ little silt pockets.	GROUT Type: Cement Interval: 0-1.5' bgs	1912.5
10.0			2-4-3-0.	G/S/F:5%/ 20%/ 75%			At 7.5': Transitions to SANDY CLAY (CL/CH), high plasticity with very fine to coarse grained sand within, subround to subangular. Trace gravels, small to large. Rusty red oxidation spots and fractures. Few black manganese oxidation spots. Few white precipitate veins/spots.	SEAL Type: Bentonite chips Interval: 1.5-9' bgs	1910.0
12.5			1-2-3-0.	G/S/F:10%/ 20%/ 70%	CL-CH		At 11': Color change to dark grayish brown (10YR 4/2), softer. At 12': Sample, wet.	SANDPACK Type: 10/20 Interval: 9-16' bgs	1907.5
15.0			1-3-3-0.	G/S/F:10%/ 20%/ 70%				SCREEN Diameter: 2" Type: No. 12 Sch 40 PVC Interval: 11-16' bgs	1905.0
17.5			1-2-3-4.	G/S/F:0%/ 0%/ 100%	CL-ML		SILTY CLAY/CLAYEY SILT (CL-ML): light gray/gray; wet; soft; with trace black roots and rusty orange oxidations stains.		
20.0							End of well 16.0 feet		

Date Boring Started: 1/29/18
 Date Boring Completed: 1/29/18
 Logged By: DJZ
 Drilling Contractor: SK Geotechnical
 Drill Rig:

Remarks: After 15 min., water level was at 12.9 ft bgs. After 40 min., water level was at 12.6 ft bgs.

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
 Additional data may have been collected in the field which is not included on this log.

Project: Lewis and Clark Station	Surface Elevation: 1902.4 ft	Top of Casing Elev.: 1904.6 ft
Project No.: 26411007.14 Boundary Well	Drilling Method: Hollow Stem Auger	
Location: Sidney, Montana	Sampling Method:	
Coordinates: UTM 13N N:17326179m, E:1848702m	Completion Depth: 14.0 ft	
Datum:		

Depth, feet	Sample Type & Recovery	Sample No.	Blows/6in.	ENVIRONMENTAL DATA	S C S U	Graphic Log	LITHOLOGIC DESCRIPTION	WELL OR PIEZOMETER CONSTRUCTION DETAIL	Elevation, feet
0.0		1	W-2-3-3.	G/S/F:0%/ 5%/ 95%	CL		CLAY (CL): dark grayish brown (10YR 4/2); moist to wet; roots; thin fine grained sand laminations.	-6" steel protop: +3 to 2 ft bgs	
2.5		2	1-1-4-6.	G/S/F:0%/ 60%/ 40%	SM		SILTY SAND (SM): olive brown (2.5Y 4/3); moist to wet; roots; fine grained sand within; few sandy lenses.	-concrete: 0 to 2 ft bgs	1900.0
5.0		3	2-2-3-3.	G/S/F:0%/ 90%/ 10%	SP		SAND (SP): fine grained sand; trace fines, loose; light olive brown (2.5Y 5/3); moist.	-bentonite seal: 2 to 6 ft bgs	1897.5
7.5		4	1-3-3-.	G/S/F:0%/ 90%/ 10%			At 5.75 ft, 2 in lens silty clay, mottled w/ rusty orange oxidation spots. At 5.95 ft and 6.25 ft, 2 in silt lens w/ fine grained sand and mottled w/ rusty orange oxidation spots.	-2" PVC schedule 40 riser: +2.5 to 8 ft bgs	1895.0
		5	1-5-4-.	G/S/F:0%/ 95%/ 5%			At 8 ft, trace fine grained orange terracotta fragments.		
		6	W-3-5-3.	G/S/F:0%/ 90%/ 10%			At 9 ft, saturated.		
10.0		7	2-2-3-.	G/S/F:0%/ 90%/ 10% G/S/F:90%/ 10%/ 0%	GP		GRAVEL (GP): fine to coarse grained; subrounded; trace fine to coarse grained sand.	-10/20 silica sand filter pack: 6 to 13 ft bgs	1892.5
12.5		8	1-1-1-.	G/S/F:0%/ 0%/ 100%	CL-CH		CLAY [FORT UNION FORMATION] (CL-CH): very dark gray; wet; soft; high plasticity.	-2" #10 schedule 40 PVC screen: 8 to 13 ft bgs	1890.0
15.0							End of boring 14.0 feet		

Date Boring Started: 9/26/19 2:45 pm
 Date Boring Completed: 9/26/19 4:00 pm
 Logged By: DJZ
 Drilling Contractor: S&K Geotechnical
 Drill Rig:

Remarks: Dashed line indicates an inferred contact depth.
 Water level measured at time of drilling.

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
 Additional data may have been collected in the field which is not included on this log.

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Barr Engineering Company
 234 West Century Avenue
 Bismarck, ND 58503
 Telephone: 701-255-5460

LOG OF BORING SB-2

DRAFT
 SHEET 1 OF 1

Project: GeoProbe Investigation
 Project No.: 26411007.10
 Location: Lewis & Clark Station, Sidney, MT
 Coordinates: N 2,248,187.2 ft E 3,585,135.6 ft
 Datum: NAVD88

Surface Elevation: 1914.4 ft
 Drilling Method: GeoProbe Direct-Push
 Sampling Method: GeoProbe
 Completion Depth: 25.0 ft

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Depth, feet	Sample Type & Recovery	Sample No.	USCS	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
0			CL		CLAY (CL): dark brown; frozen; with roots; 0% gravel, 0% sand, 100% fines.	
5			CL		SILTY CLAY (CL): dark yellowish brown; moist; with roots, trace fine grained sand lenses within; weak HCl reaction; 0% gravel, 1% sand, 99% fines.	1910
10			SP		SAND (SP): fine grained; light gray/tan; moist to wet; subrounded; few areas with silty sand mix within; 0% gravel, 90% sand, 10% fines.	1905
15			SP			1900
20			CL-CH		CLAY (CL-CH): Fort Union Formation; gray; moist; lean to fat; high plasticity; 0% gravel, 5% sand, 95% fines, red oxidation staining on veins/fractures.	1895
					LIGNITE COAL: black; dry.	
			CL-CH		CLAY (CL-CH): gray & tan; moist; hard; lean to fat; 0% gravel, 5% sand, 95% fines, red oxidation staining on veins/fractures, with few mottles, with black organics within.	
25					End of boring 25.0 feet	1890

Date Boring Started: 1/31/19 9:55 am
 Date Boring Completed: 1/31/19 10:15 am
 Logged By: DJZ
 Drilling Contractor: AET
 Drill Rig: 6620 DT

Remarks: Log is duplicate of MW-108
 Cave: 24.45' bgs before abandoning borehole
 Weather: 15°F, overcast, windy
 Additional data may have been collected in the field which is not included on this log.



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LOG OF BORING SB-3

DRAFT
 SHEET 1 OF 1

Project:	GeoProbe Investigation	Surface Elevation:	1925.2 ft
Project No.:	26411007.10	Drilling Method:	GeoProbe Direct-Push
Location:	Lewis & Clark Station, Sidney, MT	Sampling Method:	GeoProbe
Coordinates:	N 2,248,493.0 ft E 3,584,337.9 ft	Completion Depth:	20.0 ft
Datum:	NAVD88		

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Depth, feet	Sample Type & Recovery	Sample No.	USCS	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
0					FILL: push through road, no recovery.	1925
			CL		FILL - CLAY (CL): dark grayish brown; moist; with trace fine-medium grained sand mix within; high plasticity; 0% gravel, 5% sand, 95% fines.	
5			SC		CLAYEY SAND (SC): mostly fine grained with trace medium and coarse grained; subrounded; with few subrounded gravels; 10% gravel, 55% sand, 35% fines.	1920
10			SP		9.5' SAND (SP): 3-inch lens of fine grained; tan; moist to wet.	1915
			CL		SANDY CLAY (CL): dark gray; moist to wet; with fine to coarse sand and few gravels within, trace roots.	
15			SM		SILTY SAND (SM): fine grained with few medium and coarse grained; grayish brown; saturated; with trace to few small subrounded gravels within; 10% gravel, 60% sand, 30% fines.	1910
			ML		SANDY SILT (ML): very fine to fine grained; light olive brown; wet to saturated; mottled.	
			CL-CH		LEAN TO FAT CLAY (CL-CH): olive yellow; moist; with golden brown mottles, trace manganese oxidation stains; medium plasticity.	
20					End of boring 20.0 feet	

Date Boring Started:	1/31/19 2:05 pm	Remarks:	WL: 10.20' bgs, not allowed to equilibrate
Date Boring Completed:	1/31/19 2:25 pm	Weather:	25°F, clear/sunny, windy
Logged By:	DJZ		
Drilling Contractor:	AET		
Drill Rig:	6620 DT		Additional data may have been collected in the field which is not included on this log.



Barr Engineering Company
 234 West Century Avenue
 Bismarck, ND 58503
 Telephone: 701-255-5460

LOG OF BORING T-1

DRAFT
 SHEET 1 OF 1

Project: GeoProbe Investigation
 Project No.: 26411007.10
 Location: Lewis & Clark Station, Sidney, MT
 Coordinates: N 2,248,474.2 ft E 3,584,051.4 ft
 Datum: NAVD88

Surface Elevation: 1914.6 ft
 Drilling Method: GeoProbe Direct-Push
 Sampling Method: GeoProbe
 Completion Depth: 25.0 ft

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Depth, feet	Sample Type & Recovery	Sample No.	USCS	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
0						
0 - 3.5			SC		CLAYEY SAND (SC): fine grained few medium and coarse grained; subrounded; very dark grayish brown; frozen; with few small subrounded gravels; 10% gravel, 50% sand, 40% fines.	
3.5 - 4.5			CL		SILTY CLAY (CL): dark grayish brown; moist; 0% gravel, 0% sand, 100% fines.	1910
4.5 - 8.5			CL-CH		CLAY (CL-CH): dark grayish brown; moist; mottled with orange/red and gray; high plasticity; 0% gravel, 0% sand, 100% fines.	
8.5 - 9.0					8.5': color change to gray and dark gray.	
9.0 - 13.0					9.0': wet, fragments of black organics and lignite coal within.	1905
13.0 - 15.0					13': color change to grayish brown with mottles.	
15.0 - 20.0			CL		CLAY WITH SAND (CL): fine to medium grained; grayish brown; subrounded to subangular; wet to moist; 0% gravel, 25% sand, 75% fines.	1900
20.0 - 23.0			SW		SAND (SW): fine to coarse grained; wet; subrounded to subangular; well graded with gravels at contact.	1895
23.0 - 25.0			CL-CH		CLAY (CL-CH): Fort Union Formation; gray; moist; silt laminations as fractures within.	1890
25.0					End of boring 25.0 feet	

Date Boring Started: 1/31/19 3:10 pm
 Date Boring Completed: 1/31/19 4:20 pm
 Logged By: DJZ
 Drilling Contractor: AET
 Drill Rig: 6620 DT

Remarks: WL: 0.99' bgs
 Weather: 25°F, partly cloudy, windy

Additional data may have been collected in the field which is not included on this log.

LOG OF BORING T-2



Barr Engineering Company
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DRAFT
 SHEET 1 OF 1

Project: GeoProbe Investigation	Surface Elevation: 1911.9 ft
Project No.: 26411007.10	Drilling Method: GeoProbe Direct-Push
Location: Lewis & Clark Station, Sidney, MT	Sampling Method: GeoProbe
Coordinates: N 2,248,725.2 ft E 3,584,548.7 ft	Completion Depth: 30.0 ft
Datum: NAVD88	

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Depth, feet	Sample Type & Recovery	Sample No.	USCS	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
0			OL		CLAY WITH ORGANICS (OL): dark grayish brown; frozen; roots; medium plasticity; 0% gravel, 0% sand, 100% fines.	1910
5			CL		LEAN CLAY (CL): gray; moist to wet; soft; rusty/oxidized mottles; high plasticity; 0% gravel, 1% sand, 99% fines. 8': Darker gray with black organics, soft.	1905
10			CL-CH		CLAY (CL-CH): gray; moist to wet; soft; mottled with rusty golden spots; high plasticity; 0% gravel, 0% sand, 100% fines.	1900
15			SM		SILTY SAND (SM): very fine to fine grained; grayish brown; trace medium to coarse grained sand; 0% gravel, 60% sand, 40% fines.	1895
18			CL-CH		CLAY (CL-CH): grayish brown; moist to wet; trace medium grained sand, mottled with gray spots; high plasticity.	
20			SM		SILTY SAND (SM): very fine to fine grained; grayish brown; trace medium to coarse grained sand; 0% gravel, 60% sand, 40% fines.	
22			SW		WELL GRADED SAND (SW): fine to coarse grained; subrounded to subangular; small to large gravels, subrounded to subangular.	1890
24			CL-CH		CLAY (CL-CH): olive brown; wet; soft; fragments of wood/roots within.	
25			CH		LIGNITE: black; wet; horizontal layering. CLAY (CH): Fort Union Formation; gray to dark gray; moist; hard.	
28			CL-CH		CLAY (CL-CH): gray; moist; hard; 0% gravel, 5% sand, 95% fines, breaks on fine grained sand veins, horizontal and paper thin, possible silt laminations with fine sand.	1885
30					End of boring 30.0 feet	

Date Boring Started: 2/1/19 8:40 am
 Date Boring Completed: 2/1/19 12:30 pm
 Logged By: DJZ
 Drilling Contractor: AET
 Drill Rig: 6620 DT

Remarks: Artesian conditions once rods removed, no temp well installed, borehole sealed with bentonite chips, pipes were used to verify that no bridging occurred.
 Weather: 25°F, partly cloudy
 Additional data may have been collected in the field which is not included on this log.



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LOG OF BORING T-3

DRAFT
 SHEET 1 OF 1

Project:	GeoProbe Investigation	Surface Elevation:	1915.0 ft
Project No.:	26411007.10	Drilling Method:	GeoProbe Direct-Push
Location:	Lewis & Clark Station, Sidney, MT	Sampling Method:	GeoProbe
Coordinates:	N 2,248,671.5 ft E 3,584,884.7 ft	Completion Depth:	32.5 ft
Datum:	NAVD88		

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Depth, feet	Sample Type & Recovery	Sample No.	USCS	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
0					LEAN CLAY (CL): brown; frozen to moist; lenses of silt, roots, few mottles; high plasticity; weak HCl reaction; 0% gravel, 0% sand, 100% fines.	
5			CL			1910
			ML		SILT (ML): brown; moist to wet; soft; 0% gravel, 0% sand, 100% fines.	
			CL		SILTY CLAY (CL): brown; moist to wet; few gray mottles and thin gray silt laminations, trace orange medium to coarse grained sand; 0% gravel, 1% sand, 99% fines.	
10			CH		FAT CLAY (CH): pale brown; moist; frequent gray mottles; high plasticity; 0% gravel, 0% sand, 100% fines.	1905
15			ML		SANDY SILT (ML): very fine grained; light olive brown; wet; soft; no HCl reaction; 0% gravel, 35% sand, 65% fines.	1900
20			SM		SILTY SAND (SM): very fine to fine grained; light olive brown; wet to saturated; very soft; trace gravels; 2% gravel, 60% sand, 38% fines.	1895
25			SP		SAND (SP): fine grained with trace medium to coarse grained; brown; wet; subrounded; trace small subrounded gravels.	1890
			CL		CLAY TO SILTY CLAY (CL): light olive brown; moist; hard; gray mottles, black organic lenses with fragments of lignite and roots; medium plasticity; 0% gravel, 5% sand, 95% fines.	
30			CH		FAT CLAY (CH): Fort Union Formation; gray; moist; hard; black organics and fragments of lignite; lignite at bottom of sample, 32.5'.	1885
					End of boring 32.5 feet	

Date Boring Started: 1/1/19 10:40 am
 Date Boring Completed: 2/1/19 3:00 pm
 Logged By: DJZ
 Drilling Contractor: AET
 Drill Rig: 6620 DT

Remarks: WL: 11.93' bgs, temp well removed prior to advancing past 20'.
 Weather: -5°F, clear/sunny, windy
 Additional data may have been collected in the field which is not included on this log.



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LOG OF BORING T-5

DRAFT
 SHEET 1 OF 1

Project:	GeoProbe Investigation	Surface Elevation:	1912.8 ft
Project No.:	26411007.10	Drilling Method:	GeoProbe Direct-Push
Location:	Lewis & Clark Station, Sidney, MT	Sampling Method:	GeoProbe
Coordinates:	N 2,248,649.6 ft E 3,585,434.0 ft	Completion Depth:	20.0 ft
Datum:	NAVD88		

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Depth, feet	Sample Type & Recovery	Sample No.	SSU	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
0					FILL - CLAY (CL): grayish brown; frozen to moist; varying amounts of sand and gravels, fine to coarse grained, subrounded; weak HCl reaction; 15% gravel, 15% sand, 70% fines.	1910
5					SILT (ML): brown; moist to wet; soft; fine grained silty sand lenses, areas of gray and rusty mottles; weak HCl reaction; 0% gravel, 10% sand, 90% fines.	1905
10					SAND (SP): fine grained; brown; wet.	
15					SILTY CLAY & CLAYEY SILT (ML-CL): brown; wet; areas of gray and rusty mottles; weak HCl reaction.	1900
18.95					SILT (ML): dark grayish brown; wet; soft; 0% gravel, 0% sand, 100% fines.	1895
20					FAT CLAY (CH): Fort Union Formation; gray; wet; soft; high plasticity; 0% gravel, 0% sand, 100% fines.	
20					End of boring 20.0 feet	

Date Boring Started: 1/30/19 1:10 pm
 Date Boring Completed: 1/30/19 1:35 pm
 Logged By: DJZ
 Drilling Contractor: AET
 Drill Rig: 6620 DT

Remarks: WL: 14.36' bgs
 Weather: 5°F, clear/sunny, windy
 Additional data may have been collected in the field which is not included on this log.



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LOG OF BORING T-6

DRAFT
 SHEET 1 OF 1

Project:	GeoProbe Investigation	Surface Elevation:	1916.8 ft
Project No.:	26411007.10	Drilling Method:	GeoProbe Direct-Push
Location:	Lewis & Clark Station, Sidney, MT	Sampling Method:	GeoProbe
Coordinates:	N 2,248,437.8 ft E 3,585,340.5 ft	Completion Depth:	20.0 ft
Datum:	NAVD88		

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Depth, feet	Sample Type & Recovery	Sample No.	USCS	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
0					LEAN CLAY (CL): brown; frozen to moist; few subrounded gravels and few subrounded to subangular sands; 10% gravel, 5% sand, 85% fines.	1915
5			CL		SILTY CLAY (CL): brown; moist; trace subrounded gravels, few fine grained clayey sand lenses, loose; 5% gravel, 20% sand, 75% fines.	1910
10			ML		SILT (ML): brown; wet; areas of clay/clayey silt within; 0% gravel, 0% sand, 100% fines.	1905
15			SP		SAND (SP): fine grained; tan; wet; loose; 0% gravel, 90% sand, 10% fines.	
			SM		CLAYEY SAND (SM): fine grained; brown; wet; loose to soft; 0% gravel, 65% sand, 35% fines.	
			CH		FAT CLAY (CH): Fort Union Formation; light olive brown to dark yellow; wet; hard; 2% gravel, 0% sand, 98% fines, trace gravel or mudstone at 18'.	1900
20			CH		CARBONACEOUS CLAY (CH): black; moist; hard; lignite within.	
					End of boring 20.0 feet	

Date Boring Started: 1/30/19 2:20 pm
 Date Boring Completed: 1/30/19 2:40 pm
 Logged By: DJZ
 Drilling Contractor: AET
 Drill Rig: 6620 DT

Remarks: WL: 17.52' bgs
 Weather: 5°F, cloudy, windy
 Additional data may have been collected in the field which is not included on this log.



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LOG OF BORING T-13

DRAFT
 SHEET 1 OF 1

Project:	GeoProbe Investigation	Surface Elevation:	1916.9 ft
Project No.:	26411007.10	Drilling Method:	GeoProbe Direct-Push
Location:	Lewis & Clark Station, Sidney, MT	Sampling Method:	GeoProbe
Coordinates:	N 2,248,629.2 ft E 3,584,730.4 ft	Completion Depth:	22.5 ft
Datum:	NAVD88		

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Depth, feet	Sample Type & Recovery	Sample No.	S U C S U	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
0					CLAY (CL-CH): brown; frozen; few fine to coarse sand and gravel, subrounded; 10% gravel, 10% sand, 80% fines.	1915
			CL-CH			
			GP		GRAVELLY LENS (GP).	
5			ML-CL		SILT WITH CLAY (ML-CL): light yellowish brown; wet; interbedded silt and clay lenses with rusty mottles.	1910
10			ML-CL		SILTY CLAY (ML-CL): light yellowish brown to light gray; moist to wet; hard; mottles, trace coal; 0% gravel, 0% sand, 100% fines.	1905
15			CL-CH		LEAN TO FAT CLAY (CL-CH): Fort Union Formation; gray; moist to wet; frequent fine silt laminations.	1900
20			CL-CH		17.5'-22.5': water bearing silt lenses throughout.	1895
					End of boring 22.5 feet	

Date Boring Started: 1/30/19 9:15 am
 Date Boring Completed: 1/30/19 10:15 am
 Logged By: DJZ
 Drilling Contractor: AET
 Drill Rig: 6620 DT

Remarks: WL: 8.77' bgs
 Weather: -5°F, clear/sunny, windy
 Additional data may have been collected in the field which is not included on this log.

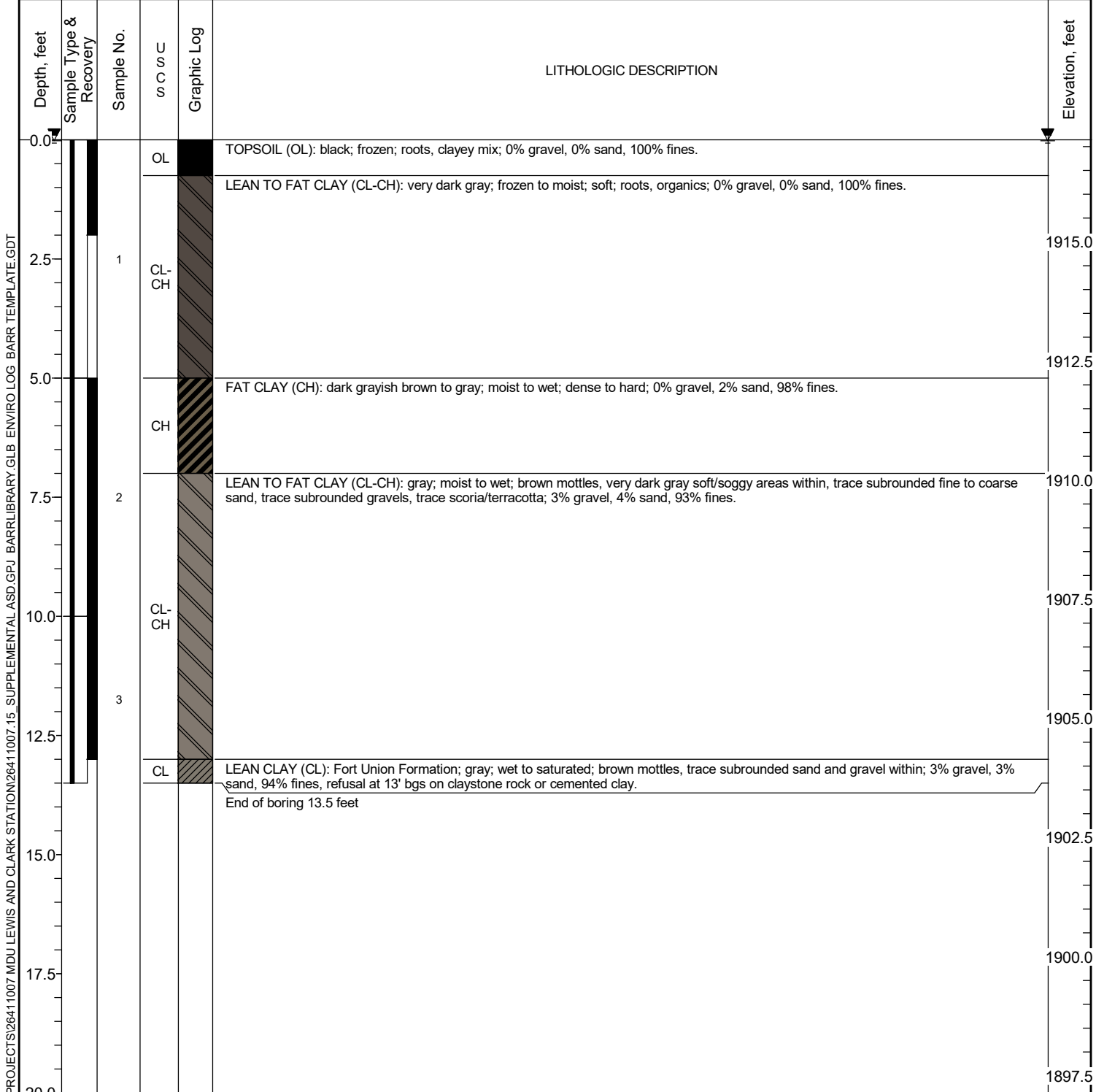


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LOG OF BORING T-14

DRAFT
 SHEET 1 OF 1

Project:	Supplemental ASD	Surface Elevation:	1917.1 ft
Project No.:	26411007.15	Drilling Method:	Geoprobe Direct-Push
Location:	Lewis and Clark Station, Sidney, MT	Sampling Method:	Geoprobe
Coordinates:	N 2,248,679.6 ft E 3,583,153.0 ft	Completion Depth:	13.5 ft
Datum:	NAVD88		



Date Boring Started: 4/7/20 8:35 am
 Date Boring Completed: 4/7/20 9:05 am
 Logged By: DJZ
 Drilling Contractor: AET
 Drill Rig:

Remarks: Refusal at 13.5' bgs - dense.
 Driller commented that 2-5' bgs was very soft (no push) - no recovery
 Temp well screen 3.5-13.5' bgs.
 Water at surface visible in bore hole/well.

Additional data may have been collected in the field which is not included on this log.

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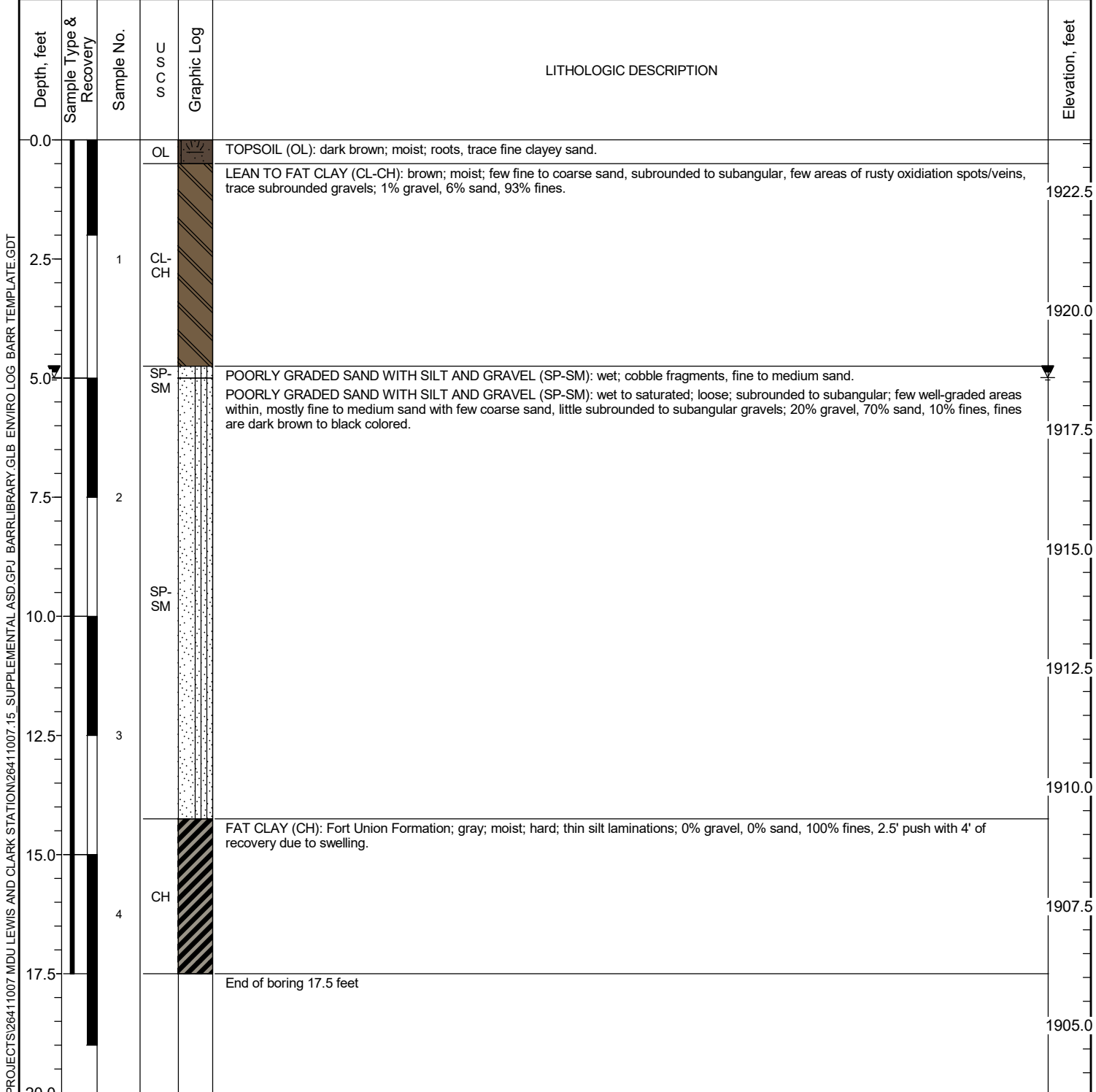


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LOG OF BORING T-15

DRAFT
 SHEET 1 OF 1

Project:	Supplemental ASD	Surface Elevation:	1923.6 ft
Project No.:	26411007.15	Drilling Method:	Geoprobe Direct-Push
Location:	Lewis and Clark Station, Sidney, MT	Sampling Method:	Geoprobe
Coordinates:	N 2,248,244.4 ft E 3,583,085.3 ft	Completion Depth:	17.5 ft
Datum:	NAVD88		



Date Boring Started: 4/6/20 9:50 am
 Date Boring Completed: 4/6/20 10:30 am
 Logged By: DJZ
 Drilling Contractor: AET
 Drill Rig:

Remarks: Temp well screen 1.5-11.5' bgs.
 Sand collapsed on screen.

Additional data may have been collected in the field which is not included on this log.

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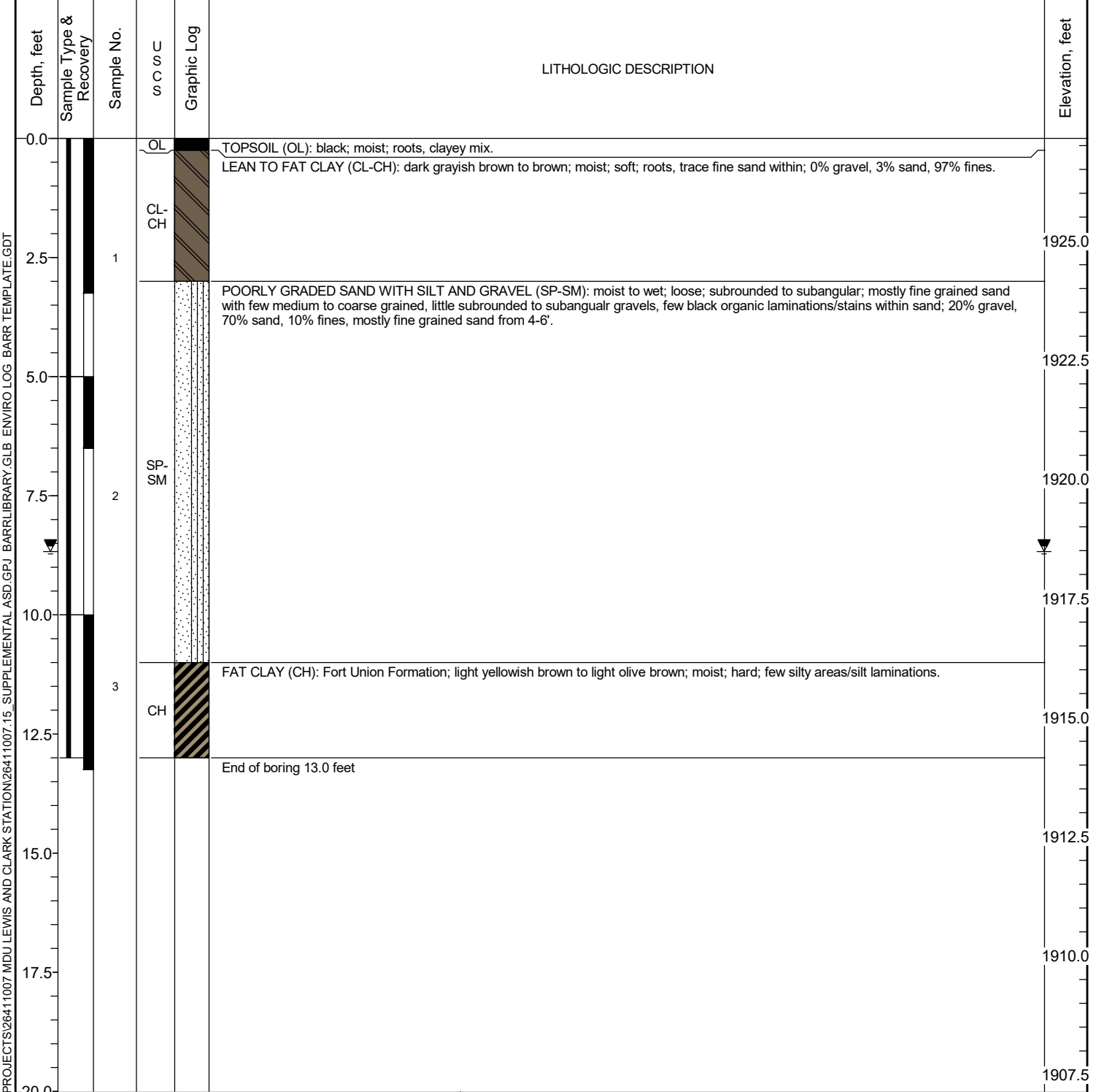
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LOG OF BORING T-16

DRAFT
 SHEET 1 OF 1

Project: Supplemental ASD
 Project No.: 26411007.15
 Location: Lewis and Clark Station, Sidney, MT
 Coordinates: N 2,247,812.4 ft E 3,583,130.0 ft
 Datum: NAVD88

Surface Elevation: 1927.2 ft
 Drilling Method: Geoprobe Direct-Push
 Sampling Method: Geoprobe
 Completion Depth: 13.0 ft



Date Boring Started: 4/6/20 11:20 am
 Date Boring Completed: 4/6/20 12:10 pm
 Logged By: DJZ
 Drilling Contractor: AET
 Drill Rig:

Remarks: Refusal at 13' bgs, attempted second boring from offset location. Both pushes refused at 13' bgs.
 Temp well screen 8-13' bgs, expendable point used.
 Sand collapsed on screen.

Additional data may have been collected in the field which is not included on this log.

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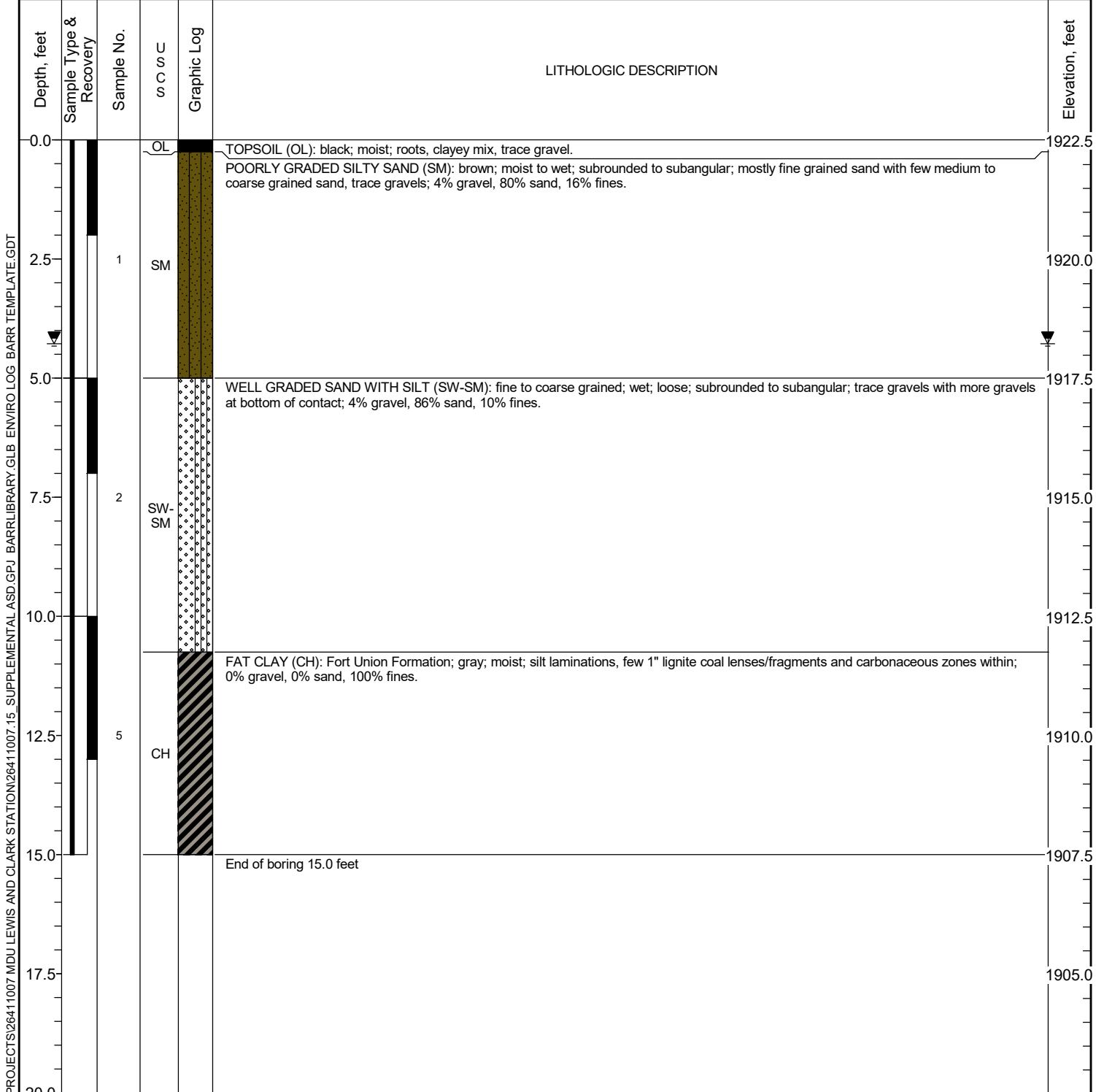


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LOG OF BORING T-17

DRAFT
 SHEET 1 OF 1

Project:	Supplemental ASD	Surface Elevation:	1922.5 ft
Project No.:	26411007.15	Drilling Method:	Geoprobe Direct-Push
Location:	Lewis and Clark Station, Sidney, MT	Sampling Method:	Geoprobe
Coordinates:	N 2,248,336.3 ft E 3,583,522.5 ft	Completion Depth:	15.0 ft
Datum:	NAVD88		



Date Boring Started: 4/6/20 2:50 pm
 Date Boring Completed: 4/6/20 3:30 pm
 Logged By: DJZ
 Drilling Contractor: AET
 Drill Rig:

Remarks: Temp well screen 5-10' bgs, expendable point used. Sand collapsed on screen.

 Additional data may have been collected in the field which is not included on this log.

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LOG OF BORING T-18

DRAFT
 SHEET 1 OF 1

Project:	Supplemental ASD	Surface Elevation:	1923.1 ft
Project No.:	26411007.15	Drilling Method:	Geoprobe Direct-Push
Location:	Lewis and Clark Station, Sidney, MT	Sampling Method:	Geoprobe
Coordinates:	N 2,247,982.1 ft E 3,583,479.1 ft	Completion Depth:	14.5 ft
Datum:	NAVD88		

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Depth, feet	Sample Type & Recovery	Sample No.	SSCS	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
0.0					FILL; SANDY LEAN CLAY (CL): black to very dark brown; moist; subrounded to subangular; roots, fine to coarse sand and trace gravels within, trace fragments of black coal within; 5% gravel, 30% sand, 65% fines.	1922.5
2.5		1	CL			1920.0
5.0					WELL GRADED SAND WITH SILT AND GRAVEL (SW-SM): fine to coarse grained; wet to saturated; loose; subrounded to subangular; little gravels; 15% gravel, 75% sand, 10% fines, some areas near top of interval are poorly graded, less fines at 11-12.5'.	1917.5
7.5		2	SW-SM			1915.0
10.0						1912.5
12.5		3	CH		FAT CLAY (CH): Fort Union Formation; gray; moist; hard to dense; thin silt laminations within; 0% gravel, 0% sand, 100% fines, 1" lignite coal lense at 14'.	1910.0
15.0					End of boring 14.5 feet	1907.5
17.5						1905.0
20.0						

Date Boring Started: 4/6/20 1:10 pm
 Date Boring Completed: 4/6/20 1:55 pm
 Logged By: DJZ
 Drilling Contractor: AET
 Drill Rig:

Remarks: No recovery & refusal at 10-14.5' bgs, attempted second boring from offset location which hit refusal at 14.5' bgs.
 Temp well screen 3.5-13.5' bgs, expendable point used.
 Sand collapsed on screen.

Additional data may have been collected in the field which is not included on this log.



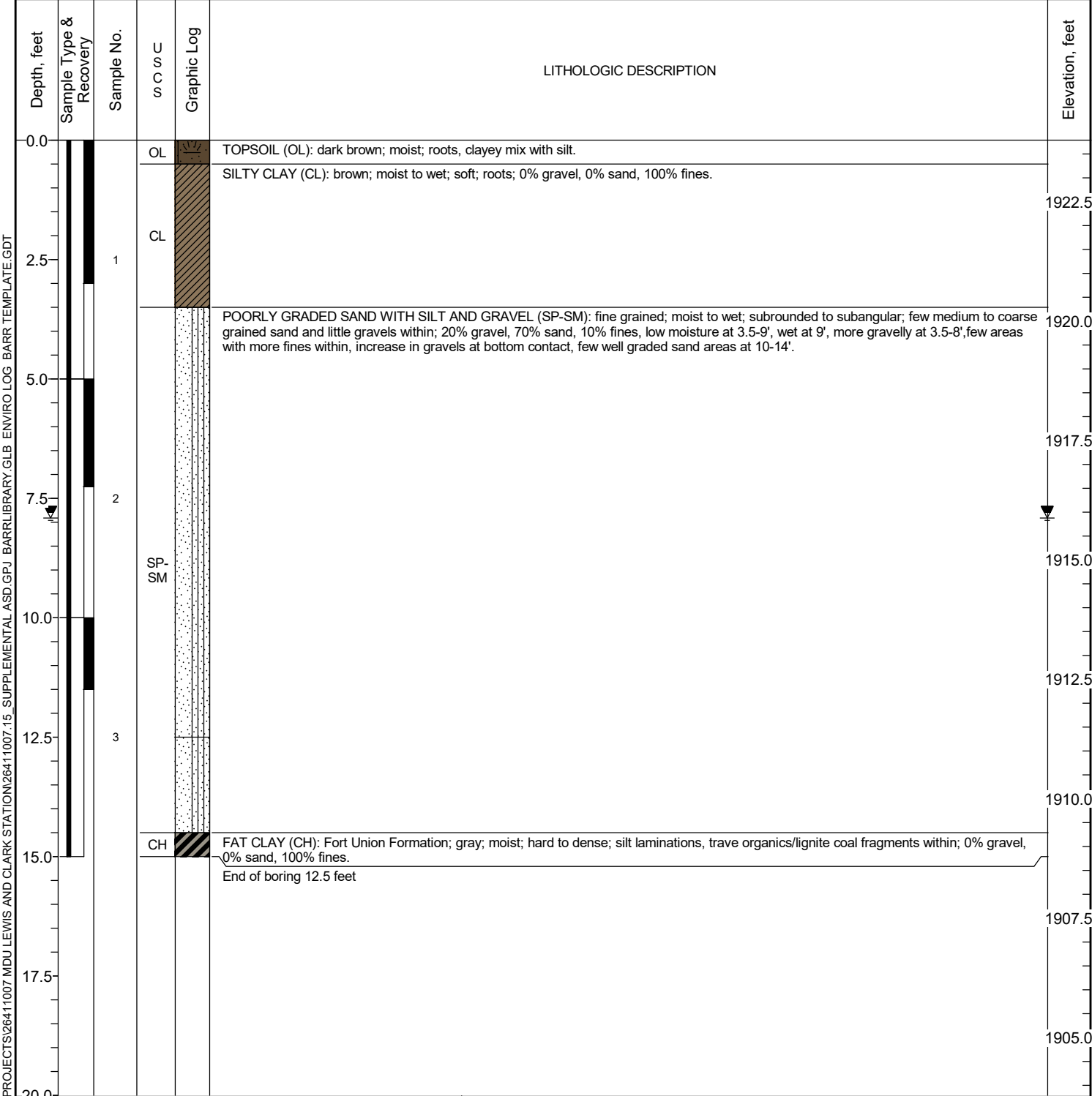
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LOG OF BORING T-19

DRAFT
 SHEET 1 OF 1

Project: Supplemental ASD
 Project No.: 26411007.15
 Location: Lewis and Clark Station, Sidney, MT
 Coordinates: N 2,246,894.0 ft E 3,583,802.3 ft
 Datum: NAVD88

Surface Elevation: 1923.8 ft
 Drilling Method: Geoprobe Direct-Push
 Sampling Method: Geoprobe
 Completion Depth: 12.5 ft



Date Boring Started: 4/6/20 5:20 pm
 Date Boring Completed: 4/6/20 6:00 pm
 Logged By: DJZ
 Drilling Contractor: AET
 Drill Rig:

Remarks: No recovery 5-10' bgs, completed second boring from offset location.
 Temp well screen 9-14' bgs, expendable point used.
 Sand collapsed on screen.

Additional data may have been collected in the field which is not included on this log.

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LOG OF BORING T-20

DRAFT
 SHEET 1 OF 1

Project: Supplemental ASD
 Project No.: 26411007.15
 Location: Lewis and Clark Station, Sidney, MT
 Coordinates: N 2,248,692.1 ft E 3,583,864.1 ft
 Datum: NAVD88

Surface Elevation: 1920.7 ft
 Drilling Method: Geoprobe Direct-Push
 Sampling Method: Geoprobe
 Completion Depth: 15.0 ft

Depth, feet	Sample Type & Recovery	Sample No.	U S C S	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
0.0			OL		TOPSOIL (OL): dark grayish brown; moist; roots, clayey mix.	1920.0
2.5		1	CL		SANDY LEAN CLAY (CL): fine to coarse grained; brown; moist; subrounded to subangular; trace gravels within; 5% gravel, 20% sand, 75% fines.	1917.5
5.0			CL-SC		POORLY GRADED SAND AND CLAY (CL-SC): fine grained; brown; moist; subrounded to subangular; few medium to coarse grained sand, few gravels; 10% gravel, 45% sand, 45% fines.	1915.0
7.5		2	CH		FAT CLAY (CH): light yellowish brown; moist; hard to dense; occasional brown and gray mottles, few black organic lenses/stains; 0% gravel, 0% sand, 100% fines.	1912.5
10.0		3	ML		SANDY SILT (ML): light olive yellow; wet to saturated; very fine grained sand within; 0% gravel, 40% sand, 60% fines, near liquid limit, sand and silt ratio varies with depth.	1910.0
12.5		4				1907.5
15.0					End of boring 15.0 feet	1905.0
17.5						1902.5
20.0						

Date Boring Started: 4/7/20 10:00 am
 Date Boring Completed: 4/7/20 10:30 am
 Logged By: DJZ
 Drilling Contractor: AET
 Drill Rig:

Remarks: Refusal at 15' bgs.
 Temp well screen 5-15' bgs.

Additional data may have been collected in the field which is not included on this log.

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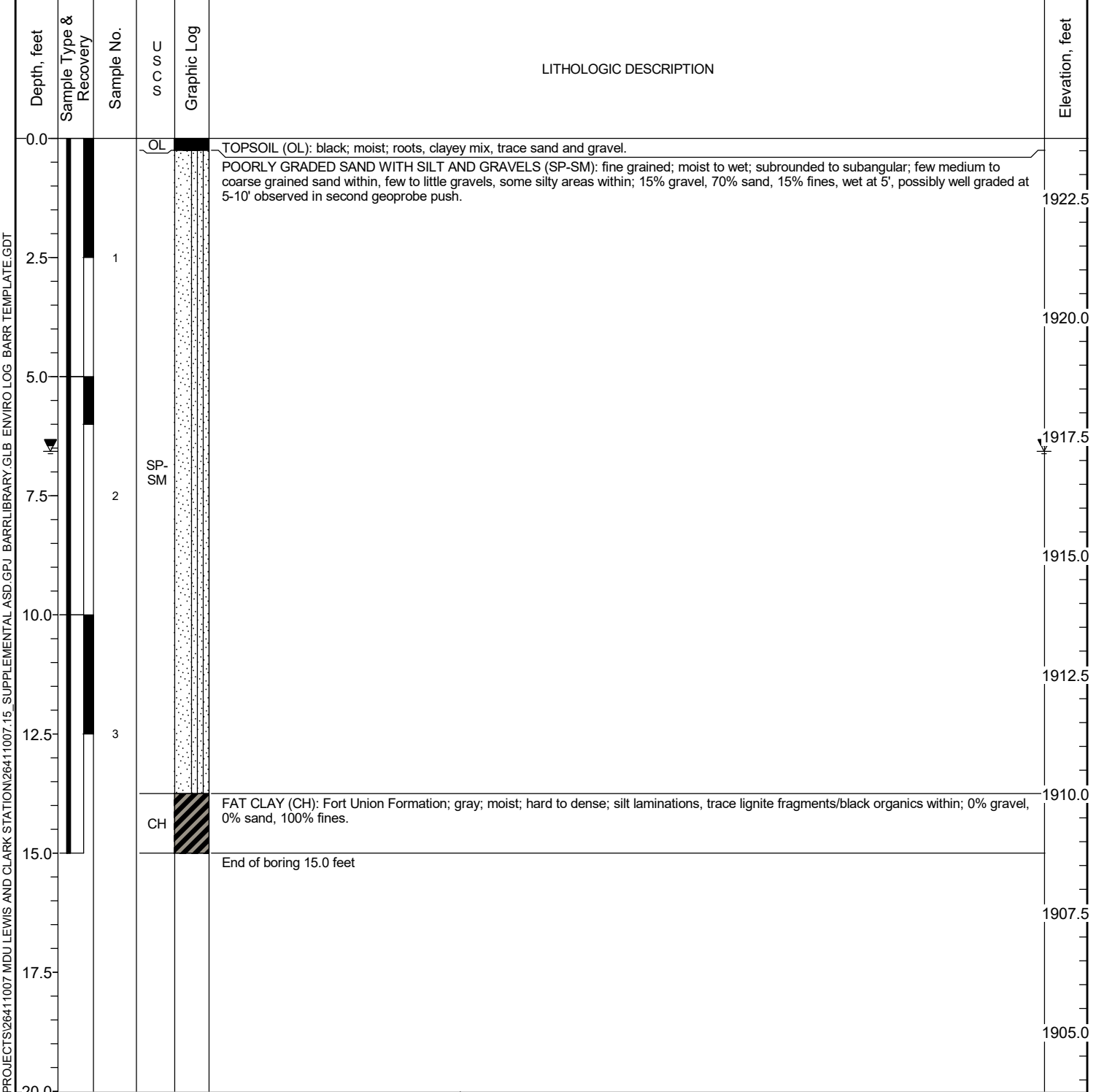


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LOG OF BORING T-21

DRAFT
 SHEET 1 OF 1

Project: Supplemental ASD Surface Elevation: 1923.8 ft
 Project No.: 26411007.15 Drilling Method: Geoprobe Direct-Push
 Location: Lewis and Clark Station, Sidney, MT Sampling Method: Geoprobe
 Coordinates: N 2,248,182.0 ft E 3,584,028.4 ft
 Datum: NAVD88 Completion Depth: 15.0 ft



Date Boring Started: 4/6/20 3:55 pm
 Date Boring Completed: 4/6/20 4:45 pm
 Logged By: DJZ
 Drilling Contractor: AET
 Drill Rig:

Remarks: Temp well screen 4-14' bgs, expendable point used.
 Second boring completed for additional sample recovery.

Additional data may have been collected in the field which is not included on this log.

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LOG OF BORING T-22

DRAFT
 SHEET 1 OF 1

Project: Supplemental ASD
 Project No.: 26411007.15
 Location: Lewis and Clark Station, Sidney, MT
 Coordinates: N 2,248,814.6 ft E 3,584,890.5 ft
 Datum: NAVD88

Surface Elevation: 1912.6 ft
 Drilling Method: Geoprobe Direct-Push
 Sampling Method: Geoprobe
 Completion Depth: 20.0 ft

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Depth, feet	Sample Type & Recovery	Sample No.	USCS	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
0					FILL; SANDY LEAN CLAY (CL): very dark gray to dark brown; moist; sand and gravel at surface - mixed within clay fill below surface; 10% gravel, 40% sand, 50% fines.	
1		1	CL			1910
5					FAT CLAY (CH): moist to wet; dense; hard and softer areas within, black organics and roots within; 0% gravel, 0% sand, 100% fines.	
2		2			8-9'; olive brown; more silty and saturated.	1905
10					9-12.5'; same as 3.5-8' but harder, soft at 12.5'; high plasticity.	
3		3	CH		12.5-14.5'; gray/dark gray to black; black organic/peat area with roots and shell fragments.	1900
15					14.5-15.5'; fine sand within the fat clay.	
4		4			15.5-20'; dark gray; wet, soft; high plasticity.	1895
20					End of boring 20.0 feet	

Date Boring Started: 4/7/20 11:35 am
 Date Boring Completed: 4/6/20 10:05 am
 Logged By: DJZ
 Drilling Contractor: AET
 Drill Rig:

Remarks: Temp well screen 3.5-18.5' bgs.

 Additional data may have been collected in the field which is not included on this log.



Barr Engineering Company
 234 West Century Avenue
 Bismarck, ND 58503
 Telephone: 701-255-5460

LOG OF BORING T-23

DRAFT
 SHEET 1 OF 1

Project: Supplemental ASD
 Project No.: 26411007.15
 Location: Lewis and Clark Station, Sidney, MT
 Coordinates: N 2,248,816.0 ft E 3,585,392.7 ft
 Datum: NAVD88

Surface Elevation: 1917.9 ft
 Drilling Method: Geoprobe Direct-Push
 Sampling Method: Geoprobe
 Completion Depth: 15.0 ft

\\EDI-CAD\CAD\GINT\PROJECTS\26411007 MDU LEWIS AND CLARK STATION\26411007.15_SUPPLEMENTAL ASD.GPJ_BARR\LIBRARY\GLB_ENVIRO LOG_BARR TEMPLATE.GDT

Depth, feet	Sample Type & Recovery	Sample No.	USCS	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
0.0			OL		TOPSOIL (OL): dark brown; moist; roots, clay with fine sand within.	1917.5
2.5		1	CL		SANDY LEAN CLAY (CL): very fine to fine grained; brown; moist; subangular to subrounded; trace medium to coarse sand, trace gravels; 4% gravel, 21% sand, 75% fines.	1915.0
5.0					SANDY SILT (ML): pale olive to light yellowish brown; moist to wet; 0% gravel, 40% sand, 60% fines. 4.5-5.5'; dry/low moisture with areas of rusty oxidation stains throughout.	1912.5
7.5		2			6.5-8'; wet to saturated; gray mottles.	1910.0
10.0			ML		9.5-13.5'; areas of lean clay and silt laminations, trace siltstone fragments, dense/hard drilling.	1907.5
12.5		3				1905.0
15.0			CH		FAT CLAY (CH): olive yellow to light yellowish brown; moist; very hard to dense; mottled, with black organics or manganese oxidation stains; 0% gravel, 0% sand, 100% fines.	1902.5
15.0					End of boring 15.0 feet	1902.5
17.5						1900.0
20.0						

Date Boring Started: 4/7/20 1:10 pm
 Date Boring Completed: 4/7/20 1:30 pm
 Logged By: DJZ
 Drilling Contractor: AET
 Drill Rig:

Remarks: Refusal at 15' bgs with very tough drilling from 10-15' bgs.
 Temp well screen 5-15' bgs.
 Borehole dry after temp well installed.

Additional data may have been collected in the field which is not included on this log.

Appendix B

Analytical Results for Hypothesis No. 1

Appendix B Analytical Results for Hypothesis No. 1



Date: 1/30/2020

CLIENT: Barr Engineering
Project: 26411007
Lab Order: S1912224

CASE NARRATIVE
Report ID: S1912224002
(Replaces S1912224001)

Samples SB-2, T-1, T-13 and T-2 were received on December 12, 2019.

All samples were received and analyzed within the EPA recommended holding times, except those noted below in this case narrative. Samples were analyzed using the methods outlined in the following references:

- "Standard Methods For The Examination of Water and Wastewater", approved method versions
Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, 3rd Edition
40 CFR Parts 136 and 141
40 CFR Part 50, Appendices B, J, L, and O
Methods indicated in the Methods Update Rule published in the Federal Register Friday, May 18, 2012
ASTM approved and recognized standards

All Quality Control parameters met the acceptance criteria defined by EPA and Pace Analytical (Formerly Inter-Mountain Laboratories) except as indicated in this case narrative.

Qualifiers by sample

- S1912224-001 - SPLP/Lithium - Holding times for preparation or analysis exceeded
S1912224-001 - SPLP/Selenium - Holding times for preparation or analysis exceeded
S1912224-001 - Total Metals-3050/6010/Lithium - Holding times for preparation or analysis exceeded
S1912224-001 - Total Metals-3050/6010/Selenium - Holding times for preparation or analysis exceeded
S1912224-002 - SPLP/Lithium - Holding times for preparation or analysis exceeded
S1912224-002 - SPLP/Selenium - Holding times for preparation or analysis exceeded
S1912224-002 - Total Metals-3050/6010/Lithium - Holding times for preparation or analysis exceeded
S1912224-002 - Total Metals-3050/6010/Selenium - Holding times for preparation or analysis exceeded
S1912224-003 - SPLP/Lithium - Holding times for preparation or analysis exceeded
S1912224-003 - SPLP/Selenium - Holding times for preparation or analysis exceeded
S1912224-003 - Total Metals-3050/6010/Lithium - Holding times for preparation or analysis exceeded
S1912224-003 - Total Metals-3050/6010/Selenium - Holding times for preparation or analysis exceeded
S1912224-004 - SPLP/Lithium - Holding times for preparation or analysis exceeded
S1912224-004 - SPLP/Selenium - Holding times for preparation or analysis exceeded
S1912224-004 - Total Metals-3050/6010/Lithium - Holding times for preparation or analysis exceeded
S1912224-004 - Total Metals-3050/6010/Selenium - Holding times for preparation or analysis exceeded
S1912224-005 - SPLP/Lithium - Holding times for preparation or analysis exceeded
S1912224-005 - SPLP/Selenium - Holding times for preparation or analysis exceeded
S1912224-005 - Total Metals-3050/6010/Lithium - Holding times for preparation or analysis exceeded
S1912224-005 - Total Metals-3050/6010/Selenium - Holding times for preparation or analysis exceeded
S1912224-006 - SPLP/Lithium - Holding times for preparation or analysis exceeded
S1912224-006 - SPLP/Selenium - Holding times for preparation or analysis exceeded
S1912224-006 - Total Metals-3050/6010/Lithium - Holding times for preparation or analysis exceeded
S1912224-006 - Total Metals-3050/6010/Selenium - Holding times for preparation or analysis exceeded

Reviewed by: Karen A Secor

Karen Secor, Soil Lab Supervisor



Date: 8/7/2020

CLIENT: Barr Engineering
Project: Sediment Saturated Paste Extracts
Lab Order: S2007298

CASE NARRATIVE
Report ID: S2007298001

Samples T-14 (10-13), T-14 (5-7), T-14 (7-10), T-15 (10-14.25), T-15 (5-10), T-16 (11-13), T-17 (10.75-15), T-17 (5-10.75), T-18 (10-12.5), T-18 (12.5-14.5), T-18 (5-10), T-19 (10-14.5), T-19 (3.5-5), T-19 (5-10), T-20 (12.5-15), T-20 (3.5-5.5), T-20 (8.25-12.5), T-21 (13.75-15), T-21 (5-13.75), T-22 (10-15), T-22 (15-20), T-22 (3.5-10), T-23 (10-13.5), T-23 (13.5-15) and T-23 (4.5-10) were received on July 21, 2020.

Samples T-15 (14.25-17.5), T-16 (3-11), T-20 (5.5-8.25) were originally received April 14, 2020 and samples were requested to be analyzed with the current received samples.

Samples were analyzed using the methods outlined in the following references:

- U.S.E.P.A. 600/2-78-054 "Field and Laboratory Methods Applicable to Overburden and Mining Soils", 1978
- American Society of Agronomy, Number 9, Part 2, 1982
- USDA Handbook 60 "Diagnosis and Improvement of Saline and Alkali Soils", 1969
- Wyoming Department of Environmental Quality, Land Quality Division, Guideline No. 1, 1984
- New Mexico Overburden and Soils Inventory and Handling Guideline, March 1987
- State of Utah, Division of Oil, Gas, and Mining: Guidelines for Management of Topsoil and Overburden for Underground and Surface Coal Mining, April 1988
- Montana Department of State Lands, Reclamation Division: Soil, Overburden, and Regraded Spoil Guidelines, December 1994
- State of Nevada Modified Sobek Procedure
- Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW846, 3rd Edition

All Quality Control parameters met the acceptance criteria defined by EPA and Pace Analytical (Formerly Inter-Mountain Laboratories) except as indicated in this case narrative.

Qualifiers by sample

- SATPASTE QC - Saturated Paste Metals by ICP/Boron - Spike Recovery outside accepted recovery limits
- SATPASTE QC - Saturated Paste Metals by ICP/Selenium - Spike Recovery outside accepted recovery limits

Karen A Secor



Sample Analysis Report

CLIENT: Barr Engineering
Bismark, ND

Date Reported: 8/7/2020
Report ID: S2007298001

Project: Sediment Saturated Paste Extracts
Lab ID: S2007298-001
Client Sample ID: T-14 (5-7)
Depths: 5 - 7 Feet

Work Order: S2007298
Collection Date:
Date Received: 7/21/2020
Sampler:
Matrix: Sediment
COC: 50061

Analyses	Result	RL	Qual	Units	Date Analyzed/Init	Method
Saturated Paste Metals						
Boron	0.2	0.1		ppm	08/04/2020 17:22 DG	EPA 200.7
Lithium	0.03	0.01		ppm	08/04/2020 17:22 DG	EPA 200.7
Selenium	ND	0.05		ppm	08/04/2020 17:22 DG	EPA 200.7

These results apply only to the samples tested.

RL - Reporting Limit

- Qualifiers:**
- B Analyte detected in the associated Method Blank
 - D Report limit raised due to dilution
 - G Analyzed at IML Gillette laboratory
 - J Analyte detected below quantitation limits
 - M Value exceeds Monthly Ave or MCL or is less than LCL
 - O Outside the Range of Dilutions
 - U Analyte below method detection limit

- C Calculated Value
- E Value above quantitation range
- H Holding times for preparation or analysis exceeded
- L Analyzed by another laboratory
- ND Not Detected at the Reporting Limit
- S Spike Recovery outside accepted recovery limits
- X Matrix Effect

Reviewed by: Karen A Secor
Karen Secor, Soil Lab Supervisor



Sample Analysis Report

CLIENT: Barr Engineering
Bismark, ND

Date Reported: 8/7/2020
Report ID: S2007298001

Project: Sediment Saturated Paste Extracts
Lab ID: S2007298-002
Client Sample ID: T-14 (7-10)
Depths: 7 - 10 Feet

Work Order: S2007298
Collection Date:
Date Received: 7/21/2020
Sampler:
Matrix: Sediment
COC: 50061

Analyses	Result	RL	Qual	Units	Date Analyzed/Init	Method
Saturated Paste Metals						
Boron	0.3	0.1		ppm	08/04/2020 17:24 DG	EPA 200.7
Lithium	0.04	0.01		ppm	08/04/2020 17:24 DG	EPA 200.7
Selenium	ND	0.05		ppm	08/04/2020 17:24 DG	EPA 200.7

These results apply only to the samples tested.

RL - Reporting Limit

- Qualifiers:**
- B Analyte detected in the associated Method Blank
 - D Report limit raised due to dilution
 - G Analyzed at IML Gillette laboratory
 - J Analyte detected below quantitation limits
 - M Value exceeds Monthly Ave or MCL or is less than LCL
 - O Outside the Range of Dilutions
 - U Analyte below method detection limit

- C Calculated Value
- E Value above quantitation range
- H Holding times for preparation or analysis exceeded
- L Analyzed by another laboratory
- ND Not Detected at the Reporting Limit
- S Spike Recovery outside accepted recovery limits
- X Matrix Effect

Reviewed by: Karen A Secor
Karen Secor, Soil Lab Supervisor



Sample Analysis Report

CLIENT: Barr Engineering
Bismark, ND

Date Reported: 8/7/2020
Report ID: S2007298001

Work Order: S2007298

Collection Date:

Date Received: 7/21/2020

Sampler:

Matrix: Sediment

COC: 50061

Project: Sediment Saturated Paste Extracts
Lab ID: S2007298-003
Client Sample ID: T-14 (10-13)
Depths: 10 - 13 Feet

Analyses	Result	RL	Qual	Units	Date Analyzed/Init	Method
Saturated Paste Metals						
Boron	0.3	0.1		ppm	08/04/2020 17:27 DG	EPA 200.7
Lithium	0.03	0.01		ppm	08/04/2020 17:27 DG	EPA 200.7
Selenium	ND	0.05		ppm	08/04/2020 17:27 DG	EPA 200.7

These results apply only to the samples tested.

RL - Reporting Limit

- Qualifiers:**
- B Analyte detected in the associated Method Blank
 - D Report limit raised due to dilution
 - G Analyzed at IML Gillette laboratory
 - J Analyte detected below quantitation limits
 - M Value exceeds Monthly Ave or MCL or is less than LCL
 - O Outside the Range of Dilutions
 - U Analyte below method detection limit

- C Calculated Value
- E Value above quantitation range
- H Holding times for preparation or analysis exceeded
- L Analyzed by another laboratory
- ND Not Detected at the Reporting Limit
- S Spike Recovery outside accepted recovery limits
- X Matrix Effect

Reviewed by: Karen A Secor
Karen Secor, Soil Lab Supervisor



Sample Analysis Report

CLIENT: Barr Engineering
Bismark, ND

Date Reported: 8/7/2020
Report ID: S2007298001

Work Order: S2007298

Collection Date:

Date Received: 7/21/2020

Sampler:

Matrix: Sediment

COC: 50061

Project: Sediment Saturated Paste Extracts
Lab ID: S2007298-004
Client Sample ID: T-15 (5-10)
Depths: 5 - 10 Feet

Analyses	Result	RL	Qual	Units	Date Analyzed/Init	Method
Saturated Paste Metals						
Boron	0.5	0.1		ppm	08/04/2020 17:29 DG	EPA 200.7
Lithium	0.03	0.01		ppm	08/04/2020 17:29 DG	EPA 200.7
Selenium	ND	0.05		ppm	08/04/2020 17:29 DG	EPA 200.7

These results apply only to the samples tested.

RL - Reporting Limit

- Qualifiers:**
- B Analyte detected in the associated Method Blank
 - D Report limit raised due to dilution
 - G Analyzed at IML Gillette laboratory
 - J Analyte detected below quantitation limits
 - M Value exceeds Monthly Ave or MCL or is less than LCL
 - O Outside the Range of Dilutions
 - U Analyte below method detection limit

- C Calculated Value
- E Value above quantitation range
- H Holding times for preparation or analysis exceeded
- L Analyzed by another laboratory
- ND Not Detected at the Reporting Limit
- S Spike Recovery outside accepted recovery limits
- X Matrix Effect

Reviewed by: Karen A Secor
Karen Secor, Soil Lab Supervisor



Sample Analysis Report

CLIENT: Barr Engineering
Bismark, ND

Date Reported: 8/7/2020
Report ID: S2007298001

Work Order: S2007298
Collection Date:

Project: Sediment Saturated Paste Extracts
Lab ID: S2007298-005
Client Sample ID: T-15 (10-14.25)
Depths: 10 - 14.25 Feet

Date Received: 7/21/2020
Sampler:
Matrix: Sediment
COC: 50061

Analyses	Result	RL	Qual	Units	Date Analyzed/Init	Method
Saturated Paste Metals						
Boron	0.6	0.1		ppm	08/04/2020 17:31 DG	EPA 200.7
Lithium	0.02	0.01		ppm	08/04/2020 17:31 DG	EPA 200.7
Selenium	ND	0.05		ppm	08/04/2020 17:31 DG	EPA 200.7

These results apply only to the samples tested.

RL - Reporting Limit

- Qualifiers:**
- B Analyte detected in the associated Method Blank
 - D Report limit raised due to dilution
 - G Analyzed at IML Gillette laboratory
 - J Analyte detected below quantitation limits
 - M Value exceeds Monthly Ave or MCL or is less than LCL
 - O Outside the Range of Dilutions
 - U Analyte below method detection limit

- C Calculated Value
- E Value above quantitation range
- H Holding times for preparation or analysis exceeded
- L Analyzed by another laboratory
- ND Not Detected at the Reporting Limit
- S Spike Recovery outside accepted recovery limits
- X Matrix Effect

Reviewed by: Karen A Secor
Karen Secor, Soil Lab Supervisor



Sample Analysis Report

CLIENT: Barr Engineering
Bismark, ND

Date Reported: 8/7/2020
Report ID: S2007298001

Work Order: S2007298

Collection Date:

Date Received: 7/21/2020

Sampler:

Matrix: Sediment

COC: 50061

Project: Sediment Saturated Paste Extracts
Lab ID: S2007298-006
Client Sample ID: T-16 (11-13)
Depths: 11 - 13 Feet

Analyses	Result	RL	Qual	Units	Date Analyzed/Init	Method
Saturated Paste Metals						
Boron	0.3	0.1		ppm	08/04/2020 17:33 DG	EPA 200.7
Lithium	0.02	0.01		ppm	08/04/2020 17:33 DG	EPA 200.7
Selenium	ND	0.05		ppm	08/04/2020 17:33 DG	EPA 200.7

These results apply only to the samples tested.

RL - Reporting Limit

- Qualifiers:**
- B Analyte detected in the associated Method Blank
 - D Report limit raised due to dilution
 - G Analyzed at IML Gillette laboratory
 - J Analyte detected below quantitation limits
 - M Value exceeds Monthly Ave or MCL or is less than LCL
 - O Outside the Range of Dilutions
 - U Analyte below method detection limit

- C Calculated Value
- E Value above quantitation range
- H Holding times for preparation or analysis exceeded
- L Analyzed by another laboratory
- ND Not Detected at the Reporting Limit
- S Spike Recovery outside accepted recovery limits
- X Matrix Effect

Reviewed by: Karen A Secor
Karen Secor, Soil Lab Supervisor



Sample Analysis Report

CLIENT: Barr Engineering
Bismark, ND

Date Reported: 8/7/2020
Report ID: S2007298001

Work Order: S2007298

Collection Date:

Date Received: 7/21/2020

Sampler:

Matrix: Sediment

COC: 50061

Project: Sediment Saturated Paste Extracts
Lab ID: S2007298-007
Client Sample ID: T-17 (5-10.75)
Depths: 5 - 10.75 Feet

Analyses	Result	RL	Qual	Units	Date Analyzed/Init	Method
Saturated Paste Metals						
Boron	0.4	0.1		ppm	08/04/2020 17:36 DG	EPA 200.7
Lithium	0.02	0.01		ppm	08/04/2020 17:36 DG	EPA 200.7
Selenium	ND	0.05		ppm	08/04/2020 17:36 DG	EPA 200.7

These results apply only to the samples tested.

RL - Reporting Limit

- Qualifiers:**
- B Analyte detected in the associated Method Blank
 - D Report limit raised due to dilution
 - G Analyzed at IML Gillette laboratory
 - J Analyte detected below quantitation limits
 - M Value exceeds Monthly Ave or MCL or is less than LCL
 - O Outside the Range of Dilutions
 - U Analyte below method detection limit

- C Calculated Value
- E Value above quantitation range
- H Holding times for preparation or analysis exceeded
- L Analyzed by another laboratory
- ND Not Detected at the Reporting Limit
- S Spike Recovery outside accepted recovery limits
- X Matrix Effect

Reviewed by: Karen A Secor
Karen Secor, Soil Lab Supervisor



Sample Analysis Report

CLIENT: Barr Engineering
Bismark, ND

Date Reported: 8/7/2020
Report ID: S2007298001

Work Order: S2007298
Collection Date:

Project: Sediment Saturated Paste Extracts
Lab ID: S2007298-008
Client Sample ID: T-17 (10.75-15)
Depths: 10.75 - 15 Feet

Date Received: 7/21/2020
Sampler:
Matrix: Sediment
COC: 50061

Analyses	Result	RL	Qual	Units	Date Analyzed/Init	Method
Saturated Paste Metals						
Boron	0.3	0.1		ppm	08/06/2020 16:15 DG	EPA 200.7
Lithium	0.07	0.01		ppm	08/06/2020 16:15 DG	EPA 200.7
Selenium	ND	0.05		ppm	08/06/2020 16:15 DG	EPA 200.7

These results apply only to the samples tested.

RL - Reporting Limit

- Qualifiers:**
- B Analyte detected in the associated Method Blank
 - D Report limit raised due to dilution
 - G Analyzed at IML Gillette laboratory
 - J Analyte detected below quantitation limits
 - M Value exceeds Monthly Ave or MCL or is less than LCL
 - O Outside the Range of Dilutions
 - U Analyte below method detection limit

- C Calculated Value
- E Value above quantitation range
- H Holding times for preparation or analysis exceeded
- L Analyzed by another laboratory
- ND Not Detected at the Reporting Limit
- S Spike Recovery outside accepted recovery limits
- X Matrix Effect

Reviewed by: Karen A Secor
Karen Secor, Soil Lab Supervisor



Sample Analysis Report

CLIENT: Barr Engineering
Bismark, ND

Date Reported: 8/7/2020
Report ID: S2007298001

Project: Sediment Saturated Paste Extracts
Lab ID: S2007298-009
Client Sample ID: T-18 (5-10)
Depths: 5 - 10 Feet

Work Order: S2007298
Collection Date:
Date Received: 7/21/2020
Sampler:
Matrix: Sediment
COC: 50061

Analyses	Result	RL	Qual	Units	Date Analyzed/Init	Method
Saturated Paste Metals						
Boron	0.5	0.1		ppm	08/04/2020 17:45 DG	EPA 200.7
Lithium	0.03	0.01		ppm	08/04/2020 17:45 DG	EPA 200.7
Selenium	ND	0.05		ppm	08/04/2020 17:45 DG	EPA 200.7

These results apply only to the samples tested.

RL - Reporting Limit

- Qualifiers:**
- B Analyte detected in the associated Method Blank
 - D Report limit raised due to dilution
 - G Analyzed at IML Gillette laboratory
 - J Analyte detected below quantitation limits
 - M Value exceeds Monthly Ave or MCL or is less than LCL
 - O Outside the Range of Dilutions
 - U Analyte below method detection limit

- C Calculated Value
- E Value above quantitation range
- H Holding times for preparation or analysis exceeded
- L Analyzed by another laboratory
- ND Not Detected at the Reporting Limit
- S Spike Recovery outside accepted recovery limits
- X Matrix Effect

Reviewed by: Karen A Secor
Karen Secor, Soil Lab Supervisor



Sample Analysis Report

CLIENT: Barr Engineering
Bismark, ND

Date Reported: 8/7/2020
Report ID: S2007298001

Work Order: S2007298

Collection Date:

Date Received: 7/21/2020

Sampler:

Matrix: Sediment

COC: 50061

Project: Sediment Saturated Paste Extracts
Lab ID: S2007298-010
Client Sample ID: T-18 (10-12.5)
Depths: 10 - 12.5 Feet

Analyses	Result	RL	Qual	Units	Date Analyzed/Init	Method
Saturated Paste Metals						
Boron	0.2	0.1		ppm	08/04/2020 17:47 DG	EPA 200.7
Lithium	0.02	0.01		ppm	08/04/2020 17:47 DG	EPA 200.7
Selenium	ND	0.05		ppm	08/04/2020 17:47 DG	EPA 200.7

These results apply only to the samples tested.

RL - Reporting Limit

- Qualifiers:**
- B Analyte detected in the associated Method Blank
 - D Report limit raised due to dilution
 - G Analyzed at IML Gillette laboratory
 - J Analyte detected below quantitation limits
 - M Value exceeds Monthly Ave or MCL or is less than LCL
 - O Outside the Range of Dilutions
 - U Analyte below method detection limit

- C Calculated Value
- E Value above quantitation range
- H Holding times for preparation or analysis exceeded
- L Analyzed by another laboratory
- ND Not Detected at the Reporting Limit
- S Spike Recovery outside accepted recovery limits
- X Matrix Effect

Reviewed by: Karen A Secor
Karen Secor, Soil Lab Supervisor



Sample Analysis Report

CLIENT: Barr Engineering
Bismark, ND

Date Reported: 8/7/2020
Report ID: S2007298001

Work Order: S2007298

Collection Date:

Date Received: 7/21/2020

Sampler:

Matrix: Sediment

COC: 50062

Project: Sediment Saturated Paste Extracts
Lab ID: S2007298-011
Client Sample ID: T-18 (12.5-14.5)
Depths: 12.5 - 14.5 Feet

Analyses	Result	RL	Qual	Units	Date Analyzed/Init	Method
Saturated Paste Metals						
Boron	1.2	0.1		ppm	08/04/2020 17:49 DG	EPA 200.7
Lithium	0.14	0.01		ppm	08/04/2020 17:49 DG	EPA 200.7
Selenium	ND	0.05		ppm	08/04/2020 17:49 DG	EPA 200.7

These results apply only to the samples tested.

RL - Reporting Limit

- Qualifiers:**
- B Analyte detected in the associated Method Blank
 - D Report limit raised due to dilution
 - G Analyzed at IML Gillette laboratory
 - J Analyte detected below quantitation limits
 - M Value exceeds Monthly Ave or MCL or is less than LCL
 - O Outside the Range of Dilutions
 - U Analyte below method detection limit

- C Calculated Value
- E Value above quantitation range
- H Holding times for preparation or analysis exceeded
- L Analyzed by another laboratory
- ND Not Detected at the Reporting Limit
- S Spike Recovery outside accepted recovery limits
- X Matrix Effect

Reviewed by: Karen A Secor
Karen Secor, Soil Lab Supervisor



Sample Analysis Report

CLIENT: Barr Engineering
Bismark, ND

Date Reported: 8/7/2020
Report ID: S2007298001

Work Order: S2007298

Collection Date:

Date Received: 7/21/2020

Sampler:

Matrix: Sediment

COC: 50062

Project: Sediment Saturated Paste Extracts
Lab ID: S2007298-012
Client Sample ID: T-19 (3.5-5)
Depths: 3.5 - 5 Feet

Analyses	Result	RL	Qual	Units	Date Analyzed/Init	Method
Saturated Paste Metals						
Boron	0.6	0.1		ppm	08/04/2020 17:51 DG	EPA 200.7
Lithium	0.06	0.01		ppm	08/04/2020 17:51 DG	EPA 200.7
Selenium	ND	0.05		ppm	08/04/2020 17:51 DG	EPA 200.7

These results apply only to the samples tested.

RL - Reporting Limit

- Qualifiers:**
- B Analyte detected in the associated Method Blank
 - D Report limit raised due to dilution
 - G Analyzed at IML Gillette laboratory
 - J Analyte detected below quantitation limits
 - M Value exceeds Monthly Ave or MCL or is less than LCL
 - O Outside the Range of Dilutions
 - U Analyte below method detection limit

- C Calculated Value
- E Value above quantitation range
- H Holding times for preparation or analysis exceeded
- L Analyzed by another laboratory
- ND Not Detected at the Reporting Limit
- S Spike Recovery outside accepted recovery limits
- X Matrix Effect

Reviewed by: Karen A Secor
Karen Secor, Soil Lab Supervisor



Sample Analysis Report

CLIENT: Barr Engineering
Bismark, ND

Date Reported: 8/7/2020
Report ID: S2007298001

Project: Sediment Saturated Paste Extracts
Lab ID: S2007298-013
Client Sample ID: T-19 (5-10)
Depths: 5 - 10 Feet

Work Order: S2007298
Collection Date:
Date Received: 7/21/2020
Sampler:
Matrix: Sediment
COC: 50062

Analyses	Result	RL	Qual	Units	Date Analyzed/Init	Method
Saturated Paste Metals						
Boron	0.2	0.1		ppm	08/04/2020 17:54 DG	EPA 200.7
Lithium	0.02	0.01		ppm	08/04/2020 17:54 DG	EPA 200.7
Selenium	ND	0.05		ppm	08/04/2020 17:54 DG	EPA 200.7

These results apply only to the samples tested.

RL - Reporting Limit

- Qualifiers:**
- B Analyte detected in the associated Method Blank
 - D Report limit raised due to dilution
 - G Analyzed at IML Gillette laboratory
 - J Analyte detected below quantitation limits
 - M Value exceeds Monthly Ave or MCL or is less than LCL
 - O Outside the Range of Dilutions
 - U Analyte below method detection limit

- C Calculated Value
- E Value above quantitation range
- H Holding times for preparation or analysis exceeded
- L Analyzed by another laboratory
- ND Not Detected at the Reporting Limit
- S Spike Recovery outside accepted recovery limits
- X Matrix Effect

Reviewed by: Karen A Secor
Karen Secor, Soil Lab Supervisor



Sample Analysis Report

CLIENT: Barr Engineering
Bismark, ND

Date Reported: 8/7/2020
Report ID: S2007298001

Work Order: S2007298
Collection Date:

Project: Sediment Saturated Paste Extracts
Lab ID: S2007298-014
Client Sample ID: T-19 (10-14.5)
Depths: 10 - 14.5 Feet

Date Received: 7/21/2020
Sampler:
Matrix: Sediment
COC: 50062

Analyses	Result	RL	Qual	Units	Date Analyzed/Init	Method
Saturated Paste Metals						
Boron	0.4	0.1		ppm	08/04/2020 17:56 DG	EPA 200.7
Lithium	0.02	0.01		ppm	08/04/2020 17:56 DG	EPA 200.7
Selenium	ND	0.05		ppm	08/04/2020 17:56 DG	EPA 200.7

These results apply only to the samples tested.

RL - Reporting Limit

- Qualifiers:**
- B Analyte detected in the associated Method Blank
 - D Report limit raised due to dilution
 - G Analyzed at IML Gillette laboratory
 - J Analyte detected below quantitation limits
 - M Value exceeds Monthly Ave or MCL or is less than LCL
 - O Outside the Range of Dilutions
 - U Analyte below method detection limit

- C Calculated Value
- E Value above quantitation range
- H Holding times for preparation or analysis exceeded
- L Analyzed by another laboratory
- ND Not Detected at the Reporting Limit
- S Spike Recovery outside accepted recovery limits
- X Matrix Effect

Reviewed by: Karen A Secor
Karen Secor, Soil Lab Supervisor



Sample Analysis Report

CLIENT: Barr Engineering
Bismark, ND

Date Reported: 8/7/2020
Report ID: S2007298001

Work Order: S2007298
Collection Date:

Project: Sediment Saturated Paste Extracts
Lab ID: S2007298-015
Client Sample ID: T-20 (3.5-5.5)
Depths: 3.5 - 5.5 Feet

Date Received: 7/21/2020
Sampler:
Matrix: Sediment
COC: 50062

Analyses	Result	RL	Qual	Units	Date Analyzed/Init	Method
Saturated Paste Metals						
Boron	0.6	0.1		ppm	08/04/2020 17:58 DG	EPA 200.7
Lithium	0.04	0.01		ppm	08/04/2020 17:58 DG	EPA 200.7
Selenium	ND	0.05		ppm	08/04/2020 17:58 DG	EPA 200.7

These results apply only to the samples tested.

RL - Reporting Limit

- Qualifiers:**
- B Analyte detected in the associated Method Blank
 - D Report limit raised due to dilution
 - G Analyzed at IML Gillette laboratory
 - J Analyte detected below quantitation limits
 - M Value exceeds Monthly Ave or MCL or is less than LCL
 - O Outside the Range of Dilutions
 - U Analyte below method detection limit

- C Calculated Value
- E Value above quantitation range
- H Holding times for preparation or analysis exceeded
- L Analyzed by another laboratory
- ND Not Detected at the Reporting Limit
- S Spike Recovery outside accepted recovery limits
- X Matrix Effect

Reviewed by: Karen A Secor
Karen Secor, Soil Lab Supervisor



Sample Analysis Report

CLIENT: Barr Engineering
Bismark, ND

Date Reported: 8/7/2020
Report ID: S2007298001

Work Order: S2007298

Collection Date:

Date Received: 7/21/2020

Sampler:

Matrix: Sediment

COC: 50062

Project: Sediment Saturated Paste Extracts
Lab ID: S2007298-016
Client Sample ID: T-20 (8.25-12.5)
Depths: 8.25 - 12.5 Feet

Analyses	Result	RL	Qual	Units	Date Analyzed/Init	Method
Saturated Paste Metals						
Boron	0.2	0.1		ppm	08/04/2020 18:00 DG	EPA 200.7
Lithium	0.01	0.01		ppm	08/04/2020 18:00 DG	EPA 200.7
Selenium	ND	0.05		ppm	08/04/2020 18:00 DG	EPA 200.7

These results apply only to the samples tested.

RL - Reporting Limit

- Qualifiers:**
- B Analyte detected in the associated Method Blank
 - D Report limit raised due to dilution
 - G Analyzed at IML Gillette laboratory
 - J Analyte detected below quantitation limits
 - M Value exceeds Monthly Ave or MCL or is less than LCL
 - O Outside the Range of Dilutions
 - U Analyte below method detection limit

- C Calculated Value
- E Value above quantitation range
- H Holding times for preparation or analysis exceeded
- L Analyzed by another laboratory
- ND Not Detected at the Reporting Limit
- S Spike Recovery outside accepted recovery limits
- X Matrix Effect

Reviewed by: Karen A Secor
Karen Secor, Soil Lab Supervisor



Sample Analysis Report

CLIENT: Barr Engineering
Bismark, ND

Date Reported: 8/7/2020
Report ID: S2007298001

Work Order: S2007298

Collection Date:

Date Received: 7/21/2020

Sampler:

Matrix: Sediment

COC: 50062

Project: Sediment Saturated Paste Extracts
Lab ID: S2007298-017
Client Sample ID: T-20 (12.5-15)
Depths: 12.5 - 15 Feet

Analyses	Result	RL	Qual	Units	Date Analyzed/Init	Method
Saturated Paste Metals						
Boron	0.3	0.1		ppm	08/04/2020 18:03 DG	EPA 200.7
Lithium	0.02	0.01		ppm	08/04/2020 18:03 DG	EPA 200.7
Selenium	ND	0.05		ppm	08/04/2020 18:03 DG	EPA 200.7

These results apply only to the samples tested.

RL - Reporting Limit

- Qualifiers:**
- B Analyte detected in the associated Method Blank
 - D Report limit raised due to dilution
 - G Analyzed at IML Gillette laboratory
 - J Analyte detected below quantitation limits
 - M Value exceeds Monthly Ave or MCL or is less than LCL
 - O Outside the Range of Dilutions
 - U Analyte below method detection limit

- C Calculated Value
- E Value above quantitation range
- H Holding times for preparation or analysis exceeded
- L Analyzed by another laboratory
- ND Not Detected at the Reporting Limit
- S Spike Recovery outside accepted recovery limits
- X Matrix Effect

Reviewed by: Karen A Secor
Karen Secor, Soil Lab Supervisor



Sample Analysis Report

CLIENT: Barr Engineering
Bismark, ND

Date Reported: 8/7/2020
Report ID: S2007298001

Work Order: S2007298

Collection Date:

Date Received: 7/21/2020

Sampler:

Matrix: Sediment

COC: 50062

Project: Sediment Saturated Paste Extracts
Lab ID: S2007298-018
Client Sample ID: T-21 (5-13.75)
Depths: 5 - 13.75 Feet

Analyses	Result	RL	Qual	Units	Date Analyzed/Init	Method
Saturated Paste Metals						
Boron	0.3	0.1		ppm	08/06/2020 16:20 DG	EPA 200.7
Lithium	0.05	0.01		ppm	08/06/2020 16:20 DG	EPA 200.7
Selenium	ND	0.05		ppm	08/06/2020 16:20 DG	EPA 200.7

These results apply only to the samples tested.

RL - Reporting Limit

- Qualifiers:**
- B Analyte detected in the associated Method Blank
 - D Report limit raised due to dilution
 - G Analyzed at IML Gillette laboratory
 - J Analyte detected below quantitation limits
 - M Value exceeds Monthly Ave or MCL or is less than LCL
 - O Outside the Range of Dilutions
 - U Analyte below method detection limit

- C Calculated Value
- E Value above quantitation range
- H Holding times for preparation or analysis exceeded
- L Analyzed by another laboratory
- ND Not Detected at the Reporting Limit
- S Spike Recovery outside accepted recovery limits
- X Matrix Effect

Reviewed by: Karen A Secor
Karen Secor, Soil Lab Supervisor



Sample Analysis Report

CLIENT: Barr Engineering
Bismark, ND

Date Reported: 8/7/2020
Report ID: S2007298001

Work Order: S2007298

Collection Date:

Date Received: 7/21/2020

Sampler:

Matrix: Sediment

COC: 50062

Project: Sediment Saturated Paste Extracts
Lab ID: S2007298-019
Client Sample ID: T-21 (13.75-15)
Depths: 13.75 - 15 Feet

Analyses	Result	RL	Qual	Units	Date Analyzed/Init	Method
Saturated Paste Metals						
Boron	0.4	0.1		ppm	08/04/2020 18:12 DG	EPA 200.7
Lithium	0.08	0.01		ppm	08/04/2020 18:12 DG	EPA 200.7
Selenium	ND	0.05		ppm	08/04/2020 18:12 DG	EPA 200.7

These results apply only to the samples tested.

RL - Reporting Limit

- Qualifiers:**
- B Analyte detected in the associated Method Blank
 - D Report limit raised due to dilution
 - G Analyzed at IML Gillette laboratory
 - J Analyte detected below quantitation limits
 - M Value exceeds Monthly Ave or MCL or is less than LCL
 - O Outside the Range of Dilutions
 - U Analyte below method detection limit

- C Calculated Value
- E Value above quantitation range
- H Holding times for preparation or analysis exceeded
- L Analyzed by another laboratory
- ND Not Detected at the Reporting Limit
- S Spike Recovery outside accepted recovery limits
- X Matrix Effect

Reviewed by: Karen A Secor
Karen Secor, Soil Lab Supervisor



Sample Analysis Report

CLIENT: Barr Engineering
Bismark, ND

Date Reported: 8/7/2020
Report ID: S2007298001

Project: Sediment Saturated Paste Extracts
Lab ID: S2007298-020
Client Sample ID: T-22 (3.5-10)
Depths: 3.5 - 10 Feet

Work Order: S2007298
Collection Date:
Date Received: 7/21/2020
Sampler:
Matrix: Sediment
COC: 50062

Analyses	Result	RL	Qual	Units	Date Analyzed/Init	Method
Saturated Paste Metals						
Boron	0.3	0.1		ppm	08/04/2020 18:14 DG	EPA 200.7
Lithium	0.03	0.01		ppm	08/04/2020 18:14 DG	EPA 200.7
Selenium	0.14	0.05		ppm	08/04/2020 18:14 DG	EPA 200.7

These results apply only to the samples tested.

RL - Reporting Limit

- Qualifiers:**
- B Analyte detected in the associated Method Blank
 - D Report limit raised due to dilution
 - G Analyzed at IML Gillette laboratory
 - J Analyte detected below quantitation limits
 - M Value exceeds Monthly Ave or MCL or is less than LCL
 - O Outside the Range of Dilutions
 - U Analyte below method detection limit

- C Calculated Value
- E Value above quantitation range
- H Holding times for preparation or analysis exceeded
- L Analyzed by another laboratory
- ND Not Detected at the Reporting Limit
- S Spike Recovery outside accepted recovery limits
- X Matrix Effect

Reviewed by: Karen A Secor
Karen Secor, Soil Lab Supervisor



Sample Analysis Report

CLIENT: Barr Engineering
Bismark, ND

Date Reported: 8/7/2020
Report ID: S2007298001

Work Order: S2007298
Collection Date:

Project: Sediment Saturated Paste Extracts
Lab ID: S2007298-021
Client Sample ID: T-22 (10-15)
Depths: 10 - 15 Feet

Date Received: 7/21/2020
Sampler:
Matrix: Sediment
COC: 50063

Analyses	Result	RL	Qual	Units	Date Analyzed/Init	Method
Saturated Paste Metals						
Boron	0.6	0.1		ppm	08/04/2020 18:16 DG	EPA 200.7
Lithium	0.10	0.01		ppm	08/04/2020 18:16 DG	EPA 200.7
Selenium	ND	0.05		ppm	08/04/2020 18:16 DG	EPA 200.7

These results apply only to the samples tested.

RL - Reporting Limit

- Qualifiers:**
- B Analyte detected in the associated Method Blank
 - D Report limit raised due to dilution
 - G Analyzed at IML Gillette laboratory
 - J Analyte detected below quantitation limits
 - M Value exceeds Monthly Ave or MCL or is less than LCL
 - O Outside the Range of Dilutions
 - U Analyte below method detection limit

- C Calculated Value
- E Value above quantitation range
- H Holding times for preparation or analysis exceeded
- L Analyzed by another laboratory
- ND Not Detected at the Reporting Limit
- S Spike Recovery outside accepted recovery limits
- X Matrix Effect

Reviewed by: Karen A Secor
Karen Secor, Soil Lab Supervisor



Sample Analysis Report

CLIENT: Barr Engineering
Bismark, ND

Date Reported: 8/7/2020
Report ID: S2007298001

Work Order: S2007298
Collection Date:

Project: Sediment Saturated Paste Extracts
Lab ID: S2007298-022
Client Sample ID: T-22 (15-20)
Depths: 15 - 20 Feet

Date Received: 7/21/2020
Sampler:
Matrix: Sediment
COC: 50063

Table with 7 columns: Analyses, Result, RL, Qual, Units, Date Analyzed/Init, Method. Rows include Boron, Lithium, and Selenium under the category Saturated Paste Metals.

These results apply only to the samples tested.

RL - Reporting Limit

- Qualifiers: B Analyte detected in the associated Method Blank
D Report limit raised due to dilution
G Analyzed at IML Gillette laboratory
J Analyte detected below quantitation limits
M Value exceeds Monthly Ave or MCL or is less than LCL
O Outside the Range of Dilutions
U Analyte below method detection limit

- C Calculated Value
E Value above quantitation range
H Holding times for preparation or analysis exceeded
L Analyzed by another laboratory
ND Not Detected at the Reporting Limit
S Spike Recovery outside accepted recovery limits
X Matrix Effect

Reviewed by: Karen A Secor
Karen Secor, Soil Lab Supervisor



Sample Analysis Report

CLIENT: Barr Engineering
Bismark, ND

Date Reported: 8/7/2020
Report ID: S2007298001

Work Order: S2007298

Collection Date:

Date Received: 7/21/2020

Sampler:

Matrix: Sediment

COC: 50063

Project: Sediment Saturated Paste Extracts
Lab ID: S2007298-023
Client Sample ID: T-23 (4.5-10)
Depths: 4.5 - 10 Feet

Analyses	Result	RL	Qual	Units	Date Analyzed/Init	Method
Saturated Paste Metals						
Boron	0.4	0.1		ppm	08/04/2020 18:21 DG	EPA 200.7
Lithium	0.03	0.01		ppm	08/04/2020 18:21 DG	EPA 200.7
Selenium	ND	0.05		ppm	08/04/2020 18:21 DG	EPA 200.7

These results apply only to the samples tested.

RL - Reporting Limit

- Qualifiers:**
- B Analyte detected in the associated Method Blank
 - D Report limit raised due to dilution
 - G Analyzed at IML Gillette laboratory
 - J Analyte detected below quantitation limits
 - M Value exceeds Monthly Ave or MCL or is less than LCL
 - O Outside the Range of Dilutions
 - U Analyte below method detection limit

- C Calculated Value
- E Value above quantitation range
- H Holding times for preparation or analysis exceeded
- L Analyzed by another laboratory
- ND Not Detected at the Reporting Limit
- S Spike Recovery outside accepted recovery limits
- X Matrix Effect

Reviewed by: Karen A Secor
Karen Secor, Soil Lab Supervisor



Sample Analysis Report

CLIENT: Barr Engineering
Bismark, ND

Date Reported: 8/7/2020
Report ID: S2007298001

Work Order: S2007298

Collection Date:

Date Received: 7/21/2020

Sampler:

Matrix: Sediment

COC: 50063

Project: Sediment Saturated Paste Extracts
Lab ID: S2007298-024
Client Sample ID: T-23 (10-13.5)
Depths: 10 - 13.5 Feet

Analyses	Result	RL	Qual	Units	Date Analyzed/Init	Method
Saturated Paste Metals						
Boron	0.4	0.1		ppm	08/04/2020 18:23 DG	EPA 200.7
Lithium	0.02	0.01		ppm	08/04/2020 18:23 DG	EPA 200.7
Selenium	ND	0.05		ppm	08/04/2020 18:23 DG	EPA 200.7

These results apply only to the samples tested.

RL - Reporting Limit

- Qualifiers:**
- B Analyte detected in the associated Method Blank
 - D Report limit raised due to dilution
 - G Analyzed at IML Gillette laboratory
 - J Analyte detected below quantitation limits
 - M Value exceeds Monthly Ave or MCL or is less than LCL
 - O Outside the Range of Dilutions
 - U Analyte below method detection limit

- C Calculated Value
- E Value above quantitation range
- H Holding times for preparation or analysis exceeded
- L Analyzed by another laboratory
- ND Not Detected at the Reporting Limit
- S Spike Recovery outside accepted recovery limits
- X Matrix Effect

Reviewed by: Karen A Secor
Karen Secor, Soil Lab Supervisor



Sample Analysis Report

CLIENT: Barr Engineering
Bismark, ND

Date Reported: 8/7/2020
Report ID: S2007298001

Work Order: S2007298

Collection Date:

Date Received: 7/21/2020

Sampler:

Matrix: Sediment

COC: 50063

Project: Sediment Saturated Paste Extracts
Lab ID: S2007298-025
Client Sample ID: T-23 (13.5-15)
Depths: 13.5 - 15 Feet

Analyses	Result	RL	Qual	Units	Date Analyzed/Init	Method
Saturated Paste Metals						
Boron	0.3	0.1		ppm	08/04/2020 18:25 DG	EPA 200.7
Lithium	0.02	0.01		ppm	08/04/2020 18:25 DG	EPA 200.7
Selenium	ND	0.05		ppm	08/04/2020 18:25 DG	EPA 200.7

These results apply only to the samples tested.

RL - Reporting Limit

- Qualifiers:**
- B Analyte detected in the associated Method Blank
 - D Report limit raised due to dilution
 - G Analyzed at IML Gillette laboratory
 - J Analyte detected below quantitation limits
 - M Value exceeds Monthly Ave or MCL or is less than LCL
 - O Outside the Range of Dilutions
 - U Analyte below method detection limit

- C Calculated Value
- E Value above quantitation range
- H Holding times for preparation or analysis exceeded
- L Analyzed by another laboratory
- ND Not Detected at the Reporting Limit
- S Spike Recovery outside accepted recovery limits
- X Matrix Effect

Reviewed by: Karen A Secor
Karen Secor, Soil Lab Supervisor



Sample Analysis Report

CLIENT: Barr Engineering
Bismark, ND

Date Reported: 8/7/2020
Report ID: S2007298001

Work Order: S2007298

Collection Date:

Date Received: 7/21/2020

Sampler:

Matrix: Sediment

COC: 50063

Project: Sediment Saturated Paste Extracts
Lab ID: S2007298-026
Client Sample ID: T-15 (14.25-17.5)
Depths: 14.25 - 17.5 Feet

Analyses	Result	RL	Qual	Units	Date Analyzed/Init	Method
Saturated Paste Metals						
Boron	0.1	0.1		ppm	08/06/2020 16:24 DG	EPA 200.7
Lithium	0.04	0.01		ppm	08/06/2020 16:24 DG	EPA 200.7
Selenium	ND	0.05		ppm	08/06/2020 16:24 DG	EPA 200.7

These results apply only to the samples tested.

RL - Reporting Limit

- Qualifiers:**
- B Analyte detected in the associated Method Blank
 - D Report limit raised due to dilution
 - G Analyzed at IML Gillette laboratory
 - J Analyte detected below quantitation limits
 - M Value exceeds Monthly Ave or MCL or is less than LCL
 - O Outside the Range of Dilutions
 - U Analyte below method detection limit

- C Calculated Value
- E Value above quantitation range
- H Holding times for preparation or analysis exceeded
- L Analyzed by another laboratory
- ND Not Detected at the Reporting Limit
- S Spike Recovery outside accepted recovery limits
- X Matrix Effect

Reviewed by: Karen A Secor
Karen Secor, Soil Lab Supervisor



Sample Analysis Report

CLIENT: Barr Engineering
Bismark, ND

Date Reported: 8/7/2020
Report ID: S2007298001

Work Order: S2007298

Collection Date:

Date Received: 7/21/2020

Sampler:

Matrix: Sediment

COC: 50063

Project: Sediment Saturated Paste Extracts
Lab ID: S2007298-027
Client Sample ID: T-16 (3-11)
Depths: 3 - 11 Feet

Analyses	Result	RL	Qual	Units	Date Analyzed/Init	Method
Saturated Paste Metals						
Boron	0.2	0.1		ppm	08/06/2020 16:31 DG	EPA 200.7
Lithium	0.03	0.01		ppm	08/06/2020 16:31 DG	EPA 200.7
Selenium	ND	0.05		ppm	08/06/2020 16:31 DG	EPA 200.7

These results apply only to the samples tested.

RL - Reporting Limit

- Qualifiers:**
- B Analyte detected in the associated Method Blank
 - D Report limit raised due to dilution
 - G Analyzed at IML Gillette laboratory
 - J Analyte detected below quantitation limits
 - M Value exceeds Monthly Ave or MCL or is less than LCL
 - O Outside the Range of Dilutions
 - U Analyte below method detection limit

- C Calculated Value
- E Value above quantitation range
- H Holding times for preparation or analysis exceeded
- L Analyzed by another laboratory
- ND Not Detected at the Reporting Limit
- S Spike Recovery outside accepted recovery limits
- X Matrix Effect

Reviewed by: Karen A Secor
Karen Secor, Soil Lab Supervisor



Sample Analysis Report

CLIENT: Barr Engineering
Bismark, ND

Date Reported: 8/7/2020
Report ID: S2007298001

Work Order: S2007298

Collection Date:

Date Received: 7/21/2020

Sampler:

Matrix: Sediment

COC: 50063

Project: Sediment Saturated Paste Extracts
Lab ID: S2007298-028
Client Sample ID: T-20 (5.5-8.25)
Depths: 5.5 - 8.25 Feet

Analyses	Result	RL	Qual	Units	Date Analyzed/Init	Method
Saturated Paste Metals						
Boron	0.2	0.1		ppm	08/06/2020 16:34 DG	EPA 200.7
Lithium	0.02	0.01		ppm	08/06/2020 16:34 DG	EPA 200.7
Selenium	0.09	0.05		ppm	08/06/2020 16:34 DG	EPA 200.7

These results apply only to the samples tested.

RL - Reporting Limit

- Qualifiers:**
- B Analyte detected in the associated Method Blank
 - D Report limit raised due to dilution
 - G Analyzed at IML Gillette laboratory
 - J Analyte detected below quantitation limits
 - M Value exceeds Monthly Ave or MCL or is less than LCL
 - O Outside the Range of Dilutions
 - U Analyte below method detection limit

- C Calculated Value
- E Value above quantitation range
- H Holding times for preparation or analysis exceeded
- L Analyzed by another laboratory
- ND Not Detected at the Reporting Limit
- S Spike Recovery outside accepted recovery limits
- X Matrix Effect

Reviewed by: Karen A Secor
Karen Secor, Soil Lab Supervisor



ANALYTICAL QC SUMMARY REPORT

CLIENT: Barr Engineering

Date: 8/7/2020

Work Order: S2007298

Report ID: S2007298001

Project: Sediment Saturated Paste Extracts

Saturated Paste Metals by ICP

Sample Type **MBLK**

Units: ppm

SATPASTE BLK (08/06/20 16:43)		RunNo: 181357						
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual	
Boron	ND	0.1						
Lithium	ND	0.01						
Selenium	ND	0.05						

Saturated Paste Metals by ICP

Sample Type **LCS**

Units: ppm

SATPASTE QC (08/04/20 18:28)		RunNo: 181260						
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual	
Boron	0.2	0.1	0.31		74.7	80 - 120	S	
Lithium	0.07	0.01	0.07		103	80 - 120		
Selenium	0.07	0.05	0.11		65.2	80 - 120	S	

QC-2 (08/06/20 16:40)		RunNo: 181357						
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual	
Boron	0.2	0.1	0.31		76.5	80 - 120	S	
Lithium	0.07	0.01	0.07		98.2	80 - 120		
Selenium	0.12	0.05	0.11		106	80 - 120		

Saturated Paste Metals by ICP

Sample Type **DUP**

Units: ppm

S2007298-008AD (08/06/20 16:18)		RunNo: 181357						
Analyte	Result	RL	Ref Samp	%RPD	%REC	% RPD Limits	Qual	
Boron	0.2	0.1	0.3	1.55		20		
Lithium	0.07	0.01	0.07	1.20		20		
Selenium	0.08	0.05	ND			20	R	

S2007298-018AD (08/06/20 16:22)		RunNo: 181357						
Analyte	Result	RL	Ref Samp	%RPD	%REC	% RPD Limits	Qual	
Boron	0.3	0.1	0.3	3.28		20		
Lithium	0.05	0.01	0.05	0.167		20		
Selenium	ND	0.05	ND			20		

S2007298-028AD (08/06/20 16:36)		RunNo: 181357						
Analyte	Result	RL	Ref Samp	%RPD	%REC	% RPD Limits	Qual	
Boron	0.2	0.1	0.2	7.47		20		
Lithium	0.02	0.01	0.02	0.0234		20		
Selenium	ND	0.05	0.09			20		

- Qualifiers:**
- B Analyte detected in the associated Method Blank
 - E Value above quantitation range
 - H Holding times for preparation or analysis exceeded
 - L Analyzed by another laboratory
 - O Outside the Range of Dilutions
 - S Spike Recovery outside accepted recovery limits

- D Report limit raised due to dilution
- G Analyzed at IML Gillette laboratory
- J Analyte detected below quantitation limits
- ND Not Detected at the Reporting Limit
- R RPD outside accepted recovery limits
- X Matrix Effect

Chain of Custody for Air Canisters

BARR Ann Arbor Duluth Jefferson City KS MO WI
 Bismarck Hibbing Minneapolis MI ND Other: MT
 MN SD

Analysis Requested:
 TO-14 TO-15 TO-15SIM
 3C Other

COC Number: **No 50061**
 COC 1 of 3

REPORT TO	INVOICE TO
Company: <u>BARR ENGINEERING</u>	Company:
Address: <u>234 W. CENTURY</u>	Address:
Name: <u>SCOTT KOROM</u>	Name: <u>SAME</u>
email: <u>SKOROM@barr.com</u>	email:
Copy to: <u>datamgt@barr.com</u>	P.O.:
Project Name:	Barr Project No.:

Lab Deliverable Contents:
 (check all that apply)
 Sample Data with QC
 TIC Library Search
 Sample Chromatograms
 Individual Canister Certification Data
 EDD:
 EQUIS EQUIS-LITE
 TIC results in EDD
 Other: _____

Matrix Code:
 AA = Ambient Air (Indoor/Outdoor)
 SV = Soil Vapor/Landfill Gas/SVE
 Other: _____
SEDIMENT 3 = SD

Location	Canister		Flow Controller Serial #	Vacuum		Collection Date (mm/dd/yyyy)	Collection Time		Total Time	Matrix Code	PID Reading (ppm/ppb)	Sample Comments
	Serial #	Size		Initial	Final		Start (hh:mm)	Stop (hh:mm)				
1. <u>T-14 (5-7')</u>	<u>52007298</u>	<u>001</u>				<u>4/2020</u>				<u>SD</u>		<u>SEE ATTACHED LETTER FOR DETAILS</u>
2. <u>T-14 (7-10')</u>			<u>002</u>							<u>SD</u>		
3. <u>T-14 (10-13')</u>			<u>003</u>							<u>SD</u>		
4. <u>T-15 (5-10')</u>			<u>004</u>							<u>SD</u>		
5. <u>T-15 (10-14.25')</u>			<u>005</u>							<u>SD</u>		
6. <u>T-16 (11-13')</u>			<u>006</u>							<u>SD</u>		
7. <u>T-17 (5-10.75')</u>			<u>007</u>							<u>SD</u>		
8. <u>T-17 (10.75-15')</u>			<u>008</u>							<u>SD</u>		
9. <u>T-18 (5-10')</u>			<u>009</u>							<u>SD</u>		
10. <u>T-18 (10-12.5')</u>			<u>010</u>							<u>SD</u>		

BARR USE ONLY		Relinquished by: <u>SCOTT KOROM</u>	Date: <u>7/17/20</u>	Time:	Received by: <u>KAREN SECN</u>	Date: <u>7/20/20</u>	Time: <u>1030</u>
Sampled by:	Barr Proj. Manager: <u>JEREMY GACNIK</u>	Relinquished by:	Date:	Time:	Received by:	Date:	Time:
Barr DQ Manager:	Lab Name:	Samples Shipped VIA: <input type="checkbox"/> Courier <input checked="" type="checkbox"/> Federal Express <input type="checkbox"/> Sampler <input type="checkbox"/> Other: _____	Air Bill Number:		Requested Due Date: <input type="checkbox"/> Standard Turn Around Time <input type="checkbox"/> Rush _____ (mm/dd/yyyy)		
Lab Location:	Lab WO:	Custody Seal Intact? <input type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> None					

Distribution - White-Original: Accompanies Shipment to Laboratory; Yellow Copy: Include in Field Documents; Pink Copy: Send to Data Management Administrators.

Chain of Custody for Air Canisters

Sample Origination State:

- Ann Arbor Duluth Jefferson City
 Bismarck Hibbing Minneapolis

- KS MO WI
 MI ND Other: MT
 MN SD

- Analysis Requested:
 TO-14 TO-15 TO-15SIM
 3C Other

COC Number: **No 50062**
 COC 2 of 3

- Lab Deliverable Contents:
 (check all that apply)
 Sample Data with QC
 TIC Library Search
 Sample Chromatograms
 Individual Canister Certification Data
 EDD:
 EQUiS EQUiS-LITE
 TIC results in EDD
 Other: _____

Matrix Code:
 AA = Ambient Air (Indoor/Outdoor)
 SV = Soil Vapor/Landfill Gas/SVE
 Other: SD = SEDIMENTS

REPORT TO	INVOICE TO
Company: <u>BARR</u>	Company:
Address: <u>234 W. CENTURY</u>	Address:
Name: <u>SA SCOTT KOROM</u>	Name: <u>SCOTT KOROM</u>
email: <u>SKOROM@BARR.COM</u>	email:
Copy to: <u>datamgt@barr.com</u>	P.O.:
Project Name:	Barr Project No:

Location	Canister		Flow Controller Serial #	Vacuum		Collection Date (mm/dd/yyyy)	Collection Time		Total Time	Matrix Code	PID Reading (ppm/ppb)	Sample Comments
	Serial #	Size		Initial	Final		Start (hh:mm)	Stop (hh:mm)				
<u>2.11 T-18 (12.5-14.5')</u>	<u>520</u>	<u>07298</u>	<u>011</u>			<u>04/2020</u>				<u>SD</u>		<u>SEE ATTACHED LETTER</u>
<u>2.12 T-19 (3.5-5')</u>			<u>012</u>							<u>SD</u>		
<u>3.13 T-19 (5-10')</u>			<u>013</u>							<u>SD</u>		
<u>4.14 T-19 (10-14.5')</u>			<u>014</u>							<u>SD</u>		
<u>5.15 T-20 (3.5-5.5')</u>			<u>015</u>							<u>SD</u>		
<u>6.16 T-20 (8.25-12.5')</u>			<u>016</u>							<u>SD</u>		
<u>7.17 T-20 (12.5-15')</u>			<u>017</u>							<u>SD</u>		
<u>8.18 T-21 (5-13.75')</u>			<u>018</u>							<u>SD</u>		
<u>8.19 T-21 (13.75-15')</u>			<u>019</u>							<u>SD</u>		
<u>10.20 T-22 (3.5-10')</u>			<u>020</u>							<u>SD</u>		

BARR USE ONLY		Relinquished by:	Date	Time	Received by:	Date	Time
Sampled by:		<u>SCOTT KOROM</u>	<u>7/7/20</u>		<u>Karen</u>	<u>7/6/20</u>	<u>1030</u>
Barr Proj. Manager:	<u>J. GACHIR</u>	Relinquished by:	Date	Time	Received by:	Date	Time
Barr DQ Manager:		Samples Shipped VIA:	<input type="checkbox"/> Courier <input type="checkbox"/> Federal Express <input type="checkbox"/> Sampler		Air Bill Number:		Requested Due Date: <input type="checkbox"/> Standard Turn Around Time <input type="checkbox"/> Rush _____ (mm/dd/yyyy)
Lab Name:		Other: _____					
Lab Location:		Lab WO:	Custody Seal Intact ? <input type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> None				

Distribution - White-Original: Accompanies Shipment to Laboratory; Yellow Copy: Include in Field Documents; Pink Copy: Send to Data Management Administrators.

Chain of Custody for Air Canisters

Sample Origination State:

- Ann Arbor
 Bismarck
 Duluth
 Hibbing
 Jefferson City
 Minneapolis

- KS MO WI
 MI ND Other: MT
 MN SD

- Analysis Requested:
 TO-14 TO-15 TO-15SIM
 3C Other

COC Number: **No 50063**
 COC 3 of 3

- Lab Deliverable Contents:
 (check all that apply)
 Sample Data with QC
 TIC Library Search
 Sample Chromatograms
 Individual Canister Certification Data
 EDD:
 EQUiS EQUiS-LITE
 TIC results in EDD
 Other: _____

Matrix Code:
 AA = Ambient Air (Indoor/Outdoor)
 SV = Soil Vapor/Landfill Gas/SVE
 Other: SD = SEDIMENTS

REPORT TO	INVOICE TO
Company: <u>BARR</u>	Company:
Address: <u>234 W. CENTURY</u>	Address: <u>SAME</u>
Name: <u>SCOTT KORDON</u>	Name:
email: <u>SKORDON@BARR.COM</u>	email:
Copy to: <u>datamgt@barr.com</u>	P.O.:
Project Name:	Barr Project No.:

Location	Canister		Flow Controller Serial #	Vacuum		Collection Date (mm/dd/yyyy)	Collection Time		Total Time	Matrix Code	PID Reading (ppm/ppb)	Sample Comments
	Serial #	Size		Initial	Final		Start (hh:mm)	Stop (hh:mm)				
<u>2.21 T-22(10-15')</u>	<u>520072</u>	<u>98-021</u>			<u>04/20/20</u>					<u>SD</u>		<u>SEE ATTACHED LETTER</u>
<u>2.22 T-22(15-20')</u>			<u>022</u>							<u>SD</u>		
<u>2.23 T-23(4.5-10')</u>			<u>023</u>							<u>SD</u>		
<u>2.24 T-23(10-13.5')</u>			<u>024</u>							<u>SD</u>		
<u>2.25 T-23(13.5-15')</u>			<u>025</u>							<u>SD</u>		<u>SCOTT KORDON</u> <u>701-335-3125</u>
6.												
7.												
8.												
9.												
10.												

BARR USE ONLY		Relinquished by: <u>SCOTT KORDON</u>	Date: <u>3/17/20</u>	Time: _____	Received by: <u>Karen Sea</u>	Date: <u>7/20/20</u>	Time: <u>1030</u>
Sampled by:		Relinquished by:	Date:	Time:	Received by:	Date:	Time:
Barr Proj. Manager: <u>J. CASNIK</u>		Samples Shipped VIA: <input type="checkbox"/> Courier <input type="checkbox"/> Federal Express <input type="checkbox"/> Sampler	Air Bill Number:		Requested Due Date:		
Barr DQ Manager:		<input type="checkbox"/> Other: _____			<input type="checkbox"/> Standard Turn Around Time		
Lab Name:		Lab WO:	Custody Seal Intact ? <input type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> None		<input type="checkbox"/> Rush _____ (mm/dd/yyyy)		

Distribution - White-Original: Accompanies Shipment to Laboratory; Yellow Copy: Include in Field Documents; Pink Copy: Send to Data Management Administrators.



Sample Analysis Report

CLIENT: Barr Engineering
Bismark, ND

Date Reported: 1/30/2020
Report ID: S1912224002
(Replaces S1912224001)

Work Order: S1912224
Collection Date: 1/31/2019 10:00:00 AM

Project: 2641 1007
Lab ID: S1912224-001
Client Sample ID: SB-2
Depths: 2 - 5 Feet

Date Received: 12/12/2019
Sampler:
Matrix: Soil
COC: 58192

Analyses	Result	RL	Qual	Units	Date Analyzed/Init	Method
Total Metals-3050/6010						
Lithium	11.5	0.2	H	mg/Kg	01/27/2020 1835 DG	EPA 6010C
Selenium	ND	1.3	H	mg/Kg	01/27/2020 1835 DG	EPA 6010C
SPLP						
Lithium	ND	0.01	H	mg/L	01/09/2020 1249 DG	EPA 200.7
Selenium	ND	0.2	H	mg/L	01/09/2020 1249 DG	EPA 200.7

These results apply only to the samples tested.

- Qualifiers:**
- B Analyte detected in the associated Method Blank
 - E Value above quantitation range
 - H Holding times for preparation or analysis exceeded
 - L Analyzed by another laboratory
 - ND Not Detected at the Reporting Limit
 - S Spike Recovery outside accepted recovery limits
 - X Matrix Effect

RL - Reporting Limit

- C Calculated Value
- G Analyzed at IML Gillette laboratory
- J Analyte detected below quantitation limits
- M Value exceeds Monthly Ave or MCL or is less than LCL
- O Outside the Range of Dilutions
- U Analysis reported under the reporting limit

Reviewed by: Karen A Secor
Karen Secor, Soil Lab Supervisor



Sample Analysis Report

CLIENT: Barr Engineering
Bismark, ND

Date Reported: 1/30/2020
Report ID: S1912224002
(Replaces S1912224001)

Work Order: S1912224
Collection Date: 1/31/2019 10:05:00 AM

Project: 2641 1007
Lab ID: S1912224-002
Client Sample ID: SB-2
Depths: 10 - 20 Feet

Date Received: 12/12/2019
Sampler:
Matrix: Soil
COC: 58192

Table with 8 columns: Analyses, Result, RL, Qual, Units, Date Analyzed/Init, Method. Rows include Total Metals-3050/6010 (Lithium, Selenium) and SPLP (Lithium, Selenium).

These results apply only to the samples tested.

- Qualifiers: B Analyte detected in the associated Method Blank
E Value above quantitation range
H Holding times for preparation or analysis exceeded
L Analyzed by another laboratory
ND Not Detected at the Reporting Limit
S Spike Recovery outside accepted recovery limits
X Matrix Effect

RL - Reporting Limit

- C Calculated Value
G Analyzed at IML Gillette laboratory
J Analyte detected below quantitation limits
M Value exceeds Monthly Ave or MCL or is less than LCL
O Outside the Range of Dilutions
U Analysis reported under the reporting limit

Reviewed by: Karen A Secor
Karen Secor, Soil Lab Supervisor



Sample Analysis Report

CLIENT: Barr Engineering
Bismark, ND

Date Reported: 1/30/2020
Report ID: S1912224002
(Replaces S1912224001)

Work Order: S1912224
Collection Date: 1/31/2019 3:20:00 PM

Project: 2641 1007
Lab ID: S1912224-003
Client Sample ID: T-1
Depths: 19 - 23 Feet

Date Received: 12/12/2019
Sampler:
Matrix: Soil
COC: 58192

Analyses	Result	RL	Qual	Units	Date Analyzed/Init	Method
Total Metals-3050/6010						
Lithium	4.0	0.2	H	mg/Kg	01/27/2020 1839 DG	EPA 6010C
Selenium	ND	1.3	H	mg/Kg	01/27/2020 1839 DG	EPA 6010C
SPLP						
Lithium	ND	0.01	H	mg/L	01/09/2020 1254 DG	EPA 200.7
Selenium	ND	0.2	H	mg/L	01/09/2020 1254 DG	EPA 200.7

These results apply only to the samples tested.

- Qualifiers:**
- B Analyte detected in the associated Method Blank
 - E Value above quantitation range
 - H Holding times for preparation or analysis exceeded
 - L Analyzed by another laboratory
 - ND Not Detected at the Reporting Limit
 - S Spike Recovery outside accepted recovery limits
 - X Matrix Effect

RL - Reporting Limit

- C Calculated Value
- G Analyzed at IML Gillette laboratory
- J Analyte detected below quantitation limits
- M Value exceeds Monthly Ave or MCL or is less than LCL
- O Outside the Range of Dilutions
- U Analysis reported under the reporting limit

Reviewed by: Karen A Secor
Karen Secor, Soil Lab Supervisor



Sample Analysis Report

CLIENT: Barr Engineering
Bismark, ND

Date Reported: 1/30/2020
Report ID: S1912224002
(Replaces S1912224001)

Work Order: S1912224
Collection Date: 2/1/2019 12:15:00 PM

Project: 2641 1007
Lab ID: S1912224-004
Client Sample ID: T-2
Depths: 23.5 - 30 Feet

Date Received: 12/12/2019
Sampler:
Matrix: Soil
COC: 58192

Analyses	Result	RL	Qual	Units	Date Analyzed/Init	Method
Total Metals-3050/6010						
Lithium	18.1	0.2	H	mg/Kg	01/27/2020 1844 DG	EPA 6010C
Selenium	ND	1.3	H	mg/Kg	01/27/2020 1844 DG	EPA 6010C
SPLP						
Lithium	0.02	0.01	H	mg/L	01/09/2020 1256 DG	EPA 200.7
Selenium	ND	0.2	H	mg/L	01/09/2020 1256 DG	EPA 200.7

These results apply only to the samples tested.

- Qualifiers:**
- B Analyte detected in the associated Method Blank
 - E Value above quantitation range
 - H Holding times for preparation or analysis exceeded
 - L Analyzed by another laboratory
 - ND Not Detected at the Reporting Limit
 - S Spike Recovery outside accepted recovery limits
 - X Matrix Effect

RL - Reporting Limit

- C Calculated Value
- G Analyzed at IML Gillette laboratory
- J Analyte detected below quantitation limits
- M Value exceeds Monthly Ave or MCL or is less than LCL
- O Outside the Range of Dilutions
- U Analysis reported under the reporting limit

Reviewed by: Karen A Secor
Karen Secor, Soil Lab Supervisor



Sample Analysis Report

CLIENT: Barr Engineering
Bismark, ND

Date Reported: 1/30/2020
Report ID: S1912224002
(Replaces S1912224001)

Work Order: S1912224
Collection Date: 1/30/2019 9:20:00 AM

Project: 2641 1007
Lab ID: S1912224-005
Client Sample ID: T-13
Depths: 3.5 - 10 Feet

Date Received: 12/12/2019
Sampler:
Matrix: Soil
COC: 58192

Analyses	Result	RL	Qual	Units	Date Analyzed/Init	Method
Total Metals-3050/6010						
Lithium	16.2	0.2	H	mg/Kg	01/27/2020 1856 DG	EPA 6010C
Selenium	ND	1.3	H	mg/Kg	01/27/2020 1856 DG	EPA 6010C
SPLP						
Lithium	ND	0.01	H	mg/L	01/09/2020 1305 DG	EPA 200.7
Selenium	ND	0.2	H	mg/L	01/09/2020 1305 DG	EPA 200.7

These results apply only to the samples tested.

- Qualifiers:**
- B Analyte detected in the associated Method Blank
 - E Value above quantitation range
 - H Holding times for preparation or analysis exceeded
 - L Analyzed by another laboratory
 - ND Not Detected at the Reporting Limit
 - S Spike Recovery outside accepted recovery limits
 - X Matrix Effect

RL - Reporting Limit

- C Calculated Value
- G Analyzed at IML Gillette laboratory
- J Analyte detected below quantitation limits
- M Value exceeds Monthly Ave or MCL or is less than LCL
- O Outside the Range of Dilutions
- U Analysis reported under the reporting limit

Reviewed by: Karen A Secor
Karen Secor, Soil Lab Supervisor



Sample Analysis Report

CLIENT: Barr Engineering
Bismark, ND

Date Reported: 1/30/2020
Report ID: S1912224002
(Replaces S1912224001)

Work Order: S1912224
Collection Date: 1/30/2019 10:10:00 AM

Project: 2641 1007
Lab ID: S1912224-006
Client Sample ID: T-13
Depths: 15 - 20 Feet

Date Received: 12/12/2019
Sampler:
Matrix: Soil
COC: 58192

Analyses	Result	RL	Qual	Units	Date Analyzed/Init	Method
Total Metals-3050/6010						
Lithium	22.7	0.2	H	mg/Kg	01/27/2020 1902 DG	EPA 6010C
Selenium	ND	1.3	H	mg/Kg	01/27/2020 1902 DG	EPA 6010C
SPLP						
Lithium	0.02	0.01	H	mg/L	01/09/2020 1307 DG	EPA 200.7
Selenium	ND	0.2	H	mg/L	01/09/2020 1307 DG	EPA 200.7

These results apply only to the samples tested.

- Qualifiers:**
- B Analyte detected in the associated Method Blank
 - E Value above quantitation range
 - H Holding times for preparation or analysis exceeded
 - L Analyzed by another laboratory
 - ND Not Detected at the Reporting Limit
 - S Spike Recovery outside accepted recovery limits
 - X Matrix Effect

RL - Reporting Limit

- C Calculated Value
- G Analyzed at IML Gillette laboratory
- J Analyte detected below quantitation limits
- M Value exceeds Monthly Ave or MCL or is less than LCL
- O Outside the Range of Dilutions
- U Analysis reported under the reporting limit

Reviewed by: Karen A Secor
Karen Secor, Soil Lab Supervisor

**ANALYTICAL QC SUMMARY REPORT**

CLIENT: Barr Engineering
Work Order: S1912224
Project: 26411007

Date: 1/30/2020
Report ID: S1912224002
 (Replaces S1912224001)

EPA 1312	Sample Type	MBLK	Units: mg/L				
SPLP BLK (01/09/20 13:09)	RunNo: 175360						
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual

Lithium	ND	0.01					
Selenium	ND	0.2					

EPA 1312	Sample Type	DUP	Units: mg/L				
S1912224-004AD (01/09/20 12:58)	RunNo: 175360						
Analyte	Result	RL	Ref Samp	%RPD	%REC	% RPD Limits	Qual

Lithium	0.03	0.01	0.02	54.8		20	HR
Selenium	ND	0.2	ND			20	H

Total (3050) Metals by ICP - 6010C	Sample Type	MBLK	Units: mg/Kg				
MB-17055 (01/27/20 17:49)	RunNo: 175797		PrepDate: 01/24/20 14:09		BatchID 17055		
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual

Lithium	ND	0.2					
Selenium	ND	1.3					

Total (3050) Metals by ICP - 6010C	Sample Type	LCS	Units: mg/Kg				
LCS-17055 (01/27/20 17:56)	RunNo: 175797		PrepDate: 01/24/20 14:09		BatchID 17055		
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual

Lithium	121	0.2	125		97.1	80 - 120	
Selenium	86.9	1.3	100		86.9	80 - 120	

Total (3050) Metals by ICP - 6010C	Sample Type	MS	Units: mg/Kg				
S1912224-004AS (01/27/20 18:51)	RunNo: 175797		PrepDate: 01/24/20 7:55		BatchID 17055		
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual

Lithium	136	0.2	125	18.1	94.0	75 - 125	H
Selenium	90.5	1.3	100	ND	90.5	75 - 125	H

Total (3050) Metals by ICP - 6010C	Sample Type	MSD	Units: mg/Kg				
S1912224-004AMSD (01/27/20 18:53)	RunNo: 175797		PrepDate: 01/24/20 7:55		BatchID 17055		
Analyte	Result	RL	Conc	%RPD	%REC	% RPD Limits	Qual

Lithium	132	0.2	136	2.55	91.3	20	H
Selenium	88.8	1.3	90.5	1.88	88.8	20	H

Total (3050) Metals by ICP - 6010C	Sample Type	DUP	Units: mg/Kg				
S1912224-003AD (01/27/20 18:42)	RunNo: 175797		PrepDate: 01/24/20 7:55		BatchID 17055		
Analyte	Result	RL	Ref Samp	%RPD	%REC	% RPD Limits	Qual

Lithium	4.1	0.2	4.0	0.415		20	H
Selenium	ND	1.3	ND			20	H

Qualifiers:	B Analyte detected in the associated Method Blank	E Value above quantitation range
	G Analyzed at IML Gillette laboratory	H Holding times for preparation or analysis exceeded
	J Analyte detected below quantitation limits	L Analyzed by another laboratory
	ND Not Detected at the Reporting Limit	O Outside the Range of Dilutions
	R RPD outside accepted recovery limits	S Spike Recovery outside accepted recovery limits
	X Matrix Effect	

Barr Engineering Co. Chain of Custody

Sample Origination State:

- Ann Arbor Duluth Hibbing Minneapolis
 Bismarck Grand Rapids Jefferson City Salt Lake City

- KS MO UT
 MI ND WI
 MN SD Other: **MT**

REPORT TO		INVOICE TO					Analysis Requested		COC Number: 58192				
Company: Barr Engineering Co		Company: Barr Engineering Co					Water		COC <u>1</u> of <u>1</u>				
Address: Bismarck ND		Address: Bismarck ND					Soil		Matrix Code: A				
Name: Scott Korom		Name: Scott Korom					%		Preservative Code:				
email: skorom@barr.com		email: skorom@barr.com					Total Number Of Containers		GW = Groundwater A = None				
Copy to: datamgt@barr.com		P.O.					Perform MS/MSD Y / N		SW = Surface Water B = HCl				
Project Name: Confidential Li/Se		Barr Project No: 26411007					Gallon Bag		WW = Waste Water C = HNO ₃				
Location	Sample Depth			Collection Date (mm/dd/yyyy)	Collection Time (hh:mm)	Matrix Code	Perform MS/MSD	Total Number Of Containers	Water	Soil	% Solids	Preservative Code	
	Start	Stop	Unit (m./ft. or in.)										
1. SB-2 (2-5')	2	5	ft	01/31/2019	1000	S	N	1				Analyze Lithium/Selenium per attached letter	
2. SB-2 (10-20')	10	20	ft	01/31/2019	1005	S	N	1					
3. T-1 (19-23')	19	23	ft	01/31/2019	1520	S	N	1					
4. T-2 (23.5-30')	23.5	30	ft	02/01/2019	1215	S	N	1					Send Level 2 QC Report
5. T-13 (3.5-10')	3.5	10	ft	01/30/2019	0920	S	N	1					
6. T-13 (15-20')	15	20	ft	01/30/2019	1010	S	N	1					
7.												Contact Scott Korom w/questions 701-221-5420	
8.													
9.													
10.													

BARR USE ONLY

Sampled by: **DJZ**

Barr Proj. Manager: **SFK**

Barr DQ Manager: **TAD**

Lab Name: **Pace**

Lab Location: **Sheridan WY**

Relinquished by: **[Signature]** On Ice? Y N Date: **02-0-19** Time: **1700**

Received by: **[Signature]** Date: **12/1/19** Time:

Samples Shipped VIA: Courier Federal Express Sampler

Air Bill Number: **7772-0595-1120**

Requested Due Date: Standard Turn Around Time Rush (mm/dd/yyyy)

Lab WO: _____ Temperature on Receipt (°C): _____ Custody Seal Intact? Y N None

Distribution - White-Original: Accompanies Shipment to Laboratory; Yellow Copy: Include in Field Documents; Pink Copy: Send to Data Management Administrators.



Date: 8/26/2020

CLIENT: Barr Engineering
Project: 26411007.15
Lab Order: S2008131

CASE NARRATIVE
Report ID: S2008131001

Samples COAL PILE COAL 2, SB-2 20.5-21, T-17 10.75-15, T-18 12.5-14.5, T-2 22.5-23.5, T-22 10-15, T-3 30-32.5, T-5 10-15 and T-6 19.5-20 were received on August 6, 2020.

Samples were analyzed using the methods outlined in the following references:

- U.S.E.P.A. 600/2-78-054 "Field and Laboratory Methods Applicable to Overburden and Mining Soils", 1978
- American Society of Agronomy, Number 9, Part 2, 1982
- USDA Handbook 60 "Diagnosis and Improvement of Saline and Alkali Soils", 1969
- Wyoming Department of Environmental Quality, Land Quality Division, Guideline No. 1, 1984
- New Mexico Overburden and Soils Inventory and Handling Guideline, March 1987
- State of Utah, Division of Oil, Gas, and Mining: Guidelines for Management of Topsoil and Overburden for Underground and Surface Coal Mining, April 1988
- Montana Department of State Lands, Reclamation Division: Soil, Overburden, and Regraded Spoil Guidelines, December 1994
- State of Nevada Modified Sobek Procedure
- Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW846, 3rd Edition

All Quality Control parameters met the acceptance criteria defined by EPA and Pace Analytical (Formerly Inter-Mountain Laboratories) except as indicated in this case narrative.

Qualifiers by sample

SATPASTE QC - Saturated Paste Metals by ICP/Boron - Spike Recovery outside accepted recovery limits

Please note that during sample preparation for total metals analysis, a standard was used which did not contain lithium. This was not discovered until the samples were analyzed on August 25. Therefore, there is no spike QC data for lithium, but all QC for boron and selenium are present and acceptable.

Karen A Secor



Sample Analysis Report

CLIENT: Barr Engineering
Bismark, ND

Date Reported: 8/26/2020
Report ID: S2008131001

Project: 26411007.15
Lab ID: S2008131-001
Client Sample ID: SB-2 20.5-21
Depths: 20.5 - 21 Feet

Work Order: S2008131
Collection Date:
Date Received: 8/6/2020
Sampler:
Matrix: Solid
COC: 58270

Analyses	Result	RL	Qual	Units	Date Analyzed/Init	Method
Saturated Paste Metals						
Boron	9.4	0.1		ppm	08/20/2020 16:17 DG	EPA 200.7
Lithium	0.11	0.01		ppm	08/20/2020 16:17 DG	EPA 200.7
Selenium	ND	0.05		ppm	08/20/2020 16:17 DG	EPA 200.7
Total Metals-3050/6010						
Boron	59	5		mg/Kg	08/25/2020 15:46 DG	EPA 6010C
Lithium	1.8	0.2		mg/Kg	08/25/2020 15:46 DG	EPA 6010C
Selenium	ND	1.3		mg/Kg	08/25/2020 15:46 DG	EPA 6010C

These results apply only to the samples tested.

RL - Reporting Limit

- Qualifiers:**
- B Analyte detected in the associated Method Blank
 - D Report limit raised due to dilution
 - G Analyzed at IML Gillette laboratory
 - J Analyte detected below quantitation limits
 - M Value exceeds Monthly Ave or MCL or is less than LCL
 - O Outside the Range of Dilutions
 - U Analyte below method detection limit

- C Calculated Value
- E Value above quantitation range
- H Holding times for preparation or analysis exceeded
- L Analyzed by another laboratory
- ND Not Detected at the Reporting Limit
- S Spike Recovery outside accepted recovery limits
- X Matrix Effect

Reviewed by: Karen A Secor
Karen Secor, Soil Lab Supervisor



Sample Analysis Report

CLIENT: Barr Engineering
Bismark, ND

Date Reported: 8/26/2020
Report ID: S2008131001

Project: 26411007.15
Lab ID: S2008131-002
Client Sample ID: T-2 22.5-23.5
Depths: 22.5 - 23.5 Feet

Work Order: S2008131
Collection Date:
Date Received: 8/6/2020
Sampler:
Matrix: Solid
COC: 58270

Analyses	Result	RL	Qual	Units	Date Analyzed/Init	Method
Saturated Paste Metals						
Boron	3.2	0.1		ppm	08/20/2020 16:19 DG	EPA 200.7
Lithium	0.07	0.01		ppm	08/20/2020 16:19 DG	EPA 200.7
Selenium	0.13	0.05		ppm	08/20/2020 16:19 DG	EPA 200.7
Total Metals-3050/6010						
Boron	42	5		mg/Kg	08/25/2020 15:50 DG	EPA 6010C
Lithium	5.0	0.2		mg/Kg	08/25/2020 15:50 DG	EPA 6010C
Selenium	2.9	1.3		mg/Kg	08/25/2020 15:50 DG	EPA 6010C

These results apply only to the samples tested.

RL - Reporting Limit

- Qualifiers:**
- B Analyte detected in the associated Method Blank
 - D Report limit raised due to dilution
 - G Analyzed at IML Gillette laboratory
 - J Analyte detected below quantitation limits
 - M Value exceeds Monthly Ave or MCL or is less than LCL
 - O Outside the Range of Dilutions
 - U Analyte below method detection limit

- C Calculated Value
- E Value above quantitation range
- H Holding times for preparation or analysis exceeded
- L Analyzed by another laboratory
- ND Not Detected at the Reporting Limit
- S Spike Recovery outside accepted recovery limits
- X Matrix Effect

Reviewed by: Karen A Secor
Karen Secor, Soil Lab Supervisor



Sample Analysis Report

CLIENT: Barr Engineering
Bismark, ND

Date Reported: 8/26/2020
Report ID: S2008131001

Work Order: S2008131
Collection Date:

Project: 26411007.15
Lab ID: S2008131-003
Client Sample ID: T-3 30-32.5
Depths: 30 - 32.5 Feet

Date Received: 8/6/2020
Sampler:
Matrix: Solid
COC: 58270

Table with 8 columns: Analyses, Result, RL, Qual, Units, Date Analyzed/Init, Method. Rows include Saturated Paste Metals (Boron, Lithium, Selenium) and Total Metals-3050/6010 (Boron, Lithium, Selenium).

These results apply only to the samples tested.

RL - Reporting Limit

- Qualifiers: B Analyte detected in the associated Method Blank
D Report limit raised due to dilution
G Analyzed at IML Gillette laboratory
J Analyte detected below quantitation limits
M Value exceeds Monthly Ave or MCL or is less than LCL
O Outside the Range of Dilutions
U Analyte below method detection limit

- C Calculated Value
E Value above quantitation range
H Holding times for preparation or analysis exceeded
L Analyzed by another laboratory
ND Not Detected at the Reporting Limit
S Spike Recovery outside accepted recovery limits
X Matrix Effect

Reviewed by: Karen A Secor
Karen Secor, Soil Lab Supervisor



Sample Analysis Report

CLIENT: Barr Engineering
Bismark, ND

Date Reported: 8/26/2020
Report ID: S2008131001

Project: 2641 1007.15
Lab ID: S2008131-004
Client Sample ID: T-5 10-15
Depths: 10 - 15 Feet

Work Order: S2008131
Collection Date:
Date Received: 8/6/2020
Sampler:
Matrix: Solid
COC: 58270

Analyses	Result	RL	Qual	Units	Date Analyzed/Init	Method
Saturated Paste Metals						
Boron	0.8	0.1		ppm	08/20/2020 16:24 DG	EPA 200.7
Lithium	0.09	0.01		ppm	08/20/2020 16:24 DG	EPA 200.7
Selenium	0.06	0.05		ppm	08/20/2020 16:24 DG	EPA 200.7
Total Metals-3050/6010						
Boron	33	5		mg/Kg	08/25/2020 16:02 DG	EPA 6010C
Lithium	15.9	0.2		mg/Kg	08/25/2020 16:02 DG	EPA 6010C
Selenium	ND	1.3		mg/Kg	08/25/2020 16:02 DG	EPA 6010C

These results apply only to the samples tested.

RL - Reporting Limit

- Qualifiers:**
- B Analyte detected in the associated Method Blank
 - D Report limit raised due to dilution
 - G Analyzed at IML Gillette laboratory
 - J Analyte detected below quantitation limits
 - M Value exceeds Monthly Ave or MCL or is less than LCL
 - O Outside the Range of Dilutions
 - U Analyte below method detection limit

- C Calculated Value
- E Value above quantitation range
- H Holding times for preparation or analysis exceeded
- L Analyzed by another laboratory
- ND Not Detected at the Reporting Limit
- S Spike Recovery outside accepted recovery limits
- X Matrix Effect

Reviewed by: Karen A Secor
Karen Secor, Soil Lab Supervisor



Sample Analysis Report

CLIENT: Barr Engineering
Bismark, ND

Date Reported: 8/26/2020
Report ID: S2008131001

Project: 2641 1007.15
Lab ID: S2008131-005
Client Sample ID: T-6 19.5-20
Depths: 19.5 - 20 Feet

Work Order: S2008131
Collection Date:
Date Received: 8/6/2020
Sampler:
Matrix: Solid
COC: 58270

Analyses	Result	RL	Qual	Units	Date Analyzed/Init	Method
Saturated Paste Metals						
Boron	0.6	0.1		ppm	08/20/2020 16:26 DG	EPA 200.7
Lithium	0.08	0.01		ppm	08/20/2020 16:26 DG	EPA 200.7
Selenium	0.09	0.05		ppm	08/20/2020 16:26 DG	EPA 200.7
Total Metals-3050/6010						
Boron	25	5		mg/Kg	08/25/2020 16:04 DG	EPA 6010C
Lithium	18.8	0.2		mg/Kg	08/25/2020 16:04 DG	EPA 6010C
Selenium	ND	1.3		mg/Kg	08/25/2020 16:04 DG	EPA 6010C

These results apply only to the samples tested.

RL - Reporting Limit

- Qualifiers:**
- B Analyte detected in the associated Method Blank
 - D Report limit raised due to dilution
 - G Analyzed at IML Gillette laboratory
 - J Analyte detected below quantitation limits
 - M Value exceeds Monthly Ave or MCL or is less than LCL
 - O Outside the Range of Dilutions
 - U Analyte below method detection limit

- C Calculated Value
- E Value above quantitation range
- H Holding times for preparation or analysis exceeded
- L Analyzed by another laboratory
- ND Not Detected at the Reporting Limit
- S Spike Recovery outside accepted recovery limits
- X Matrix Effect

Reviewed by: Karen A Secor
Karen Secor, Soil Lab Supervisor



Sample Analysis Report

CLIENT: Barr Engineering
Bismark, ND

Date Reported: 8/26/2020
Report ID: S2008131001

Work Order: S2008131
Collection Date:

Project: 26411007.15
Lab ID: S2008131-006
Client Sample ID: T-17 10.75-15
Depths: 10.75 - 15 Feet

Date Received: 8/6/2020
Sampler:
Matrix: Solid
COC: 58270

Table with 8 columns: Analyses, Result, RL, Qual, Units, Date Analyzed/Init, Method. Rows include Saturated Paste Metals (Boron, Lithium, Selenium) and Total Metals-3050/6010 (Boron, Lithium, Selenium).

These results apply only to the samples tested.

RL - Reporting Limit

- Qualifiers: B Analyte detected in the associated Method Blank
D Report limit raised due to dilution
G Analyzed at IML Gillette laboratory
J Analyte detected below quantitation limits
M Value exceeds Monthly Ave or MCL or is less than LCL
O Outside the Range of Dilutions
U Analyte below method detection limit

- C Calculated Value
E Value above quantitation range
H Holding times for preparation or analysis exceeded
L Analyzed by another laboratory
ND Not Detected at the Reporting Limit
S Spike Recovery outside accepted recovery limits
X Matrix Effect

Reviewed by: Karen A Secor
Karen Secor, Soil Lab Supervisor



Sample Analysis Report

CLIENT: Barr Engineering
Bismark, ND

Date Reported: 8/26/2020
Report ID: S2008131001

Project: 2641 1007.15
Lab ID: S2008131-007
Client Sample ID: T-18 12.5-14.5
Depths: 12.5 - 14.5 Feet

Work Order: S2008131
Collection Date:
Date Received: 8/6/2020
Sampler:
Matrix: Solid
COC: 58270

Analyses	Result	RL	Qual	Units	Date Analyzed/Init	Method
Saturated Paste Metals						
Boron	3.3	0.1		ppm	08/20/2020 16:32 DG	EPA 200.7
Lithium	0.09	0.01		ppm	08/20/2020 16:32 DG	EPA 200.7
Selenium	0.07	0.05		ppm	08/20/2020 16:32 DG	EPA 200.7
Total Metals-3050/6010						
Boron	47	5		mg/Kg	08/25/2020 16:08 DG	EPA 6010C
Lithium	12.6	0.2		mg/Kg	08/25/2020 16:08 DG	EPA 6010C
Selenium	ND	1.3		mg/Kg	08/25/2020 16:08 DG	EPA 6010C

These results apply only to the samples tested.

RL - Reporting Limit

- Qualifiers:**
- B Analyte detected in the associated Method Blank
 - D Report limit raised due to dilution
 - G Analyzed at IML Gillette laboratory
 - J Analyte detected below quantitation limits
 - M Value exceeds Monthly Ave or MCL or is less than LCL
 - O Outside the Range of Dilutions
 - U Analyte below method detection limit

- C Calculated Value
- E Value above quantitation range
- H Holding times for preparation or analysis exceeded
- L Analyzed by another laboratory
- ND Not Detected at the Reporting Limit
- S Spike Recovery outside accepted recovery limits
- X Matrix Effect

Reviewed by: Karen A Secor
Karen Secor, Soil Lab Supervisor



Sample Analysis Report

CLIENT: Barr Engineering
Bismark, ND

Date Reported: 8/26/2020
Report ID: S2008131001

Project: 26411007.15
Lab ID: S2008131-008
Client Sample ID: T-22 10-15
Depths: 10 - 15 Feet

Work Order: S2008131
Collection Date:
Date Received: 8/6/2020
Sampler:
Matrix: Solid
COC: 58270

Analyses	Result	RL	Qual	Units	Date Analyzed/Init	Method
Saturated Paste Metals						
Boron	0.9	0.1		ppm	08/20/2020 16:35 DG	EPA 200.7
Lithium	0.06	0.01		ppm	08/20/2020 16:35 DG	EPA 200.7
Selenium	ND	0.05		ppm	08/20/2020 16:35 DG	EPA 200.7
Total Metals-3050/6010						
Boron	34	5		mg/Kg	08/25/2020 16:10 DG	EPA 6010C
Lithium	12.4	0.2		mg/Kg	08/25/2020 16:10 DG	EPA 6010C
Selenium	ND	1.3		mg/Kg	08/25/2020 16:10 DG	EPA 6010C

These results apply only to the samples tested.

RL - Reporting Limit

- Qualifiers:**
- B Analyte detected in the associated Method Blank
 - D Report limit raised due to dilution
 - G Analyzed at IML Gillette laboratory
 - J Analyte detected below quantitation limits
 - M Value exceeds Monthly Ave or MCL or is less than LCL
 - O Outside the Range of Dilutions
 - U Analyte below method detection limit

- C Calculated Value
- E Value above quantitation range
- H Holding times for preparation or analysis exceeded
- L Analyzed by another laboratory
- ND Not Detected at the Reporting Limit
- S Spike Recovery outside accepted recovery limits
- X Matrix Effect

Reviewed by: Karen A Secor
Karen Secor, Soil Lab Supervisor



Sample Analysis Report

CLIENT: Barr Engineering
Bismark, ND

Date Reported: 8/26/2020
Report ID: S2008131001

Work Order: S2008131

Collection Date:

Date Received: 8/6/2020

Sampler:

Matrix: Solid

COC: 58270

Project: 26411007.15
Lab ID: S2008131-009
Client Sample ID: COAL PILE COAL 2
Depths: 0 - 0 Feet

Table with 8 columns: Analyses, Result, RL, Qual, Units, Date Analyzed/Init, Method. Rows include Saturated Paste Metals (Boron, Lithium, Selenium) and Total Metals-3050/6010 (Boron, Lithium, Selenium).

These results apply only to the samples tested.

RL - Reporting Limit

- Qualifiers: B Analyte detected in the associated Method Blank
D Report limit raised due to dilution
G Analyzed at IML Gillette laboratory
J Analyte detected below quantitation limits
M Value exceeds Monthly Ave or MCL or is less than LCL
O Outside the Range of Dilutions
U Analyte below method detection limit

- C Calculated Value
E Value above quantitation range
H Holding times for preparation or analysis exceeded
L Analyzed by another laboratory
ND Not Detected at the Reporting Limit
S Spike Recovery outside accepted recovery limits
X Matrix Effect

Reviewed by: Karen A Secor
Karen Secor, Soil Lab Supervisor



ANALYTICAL QC SUMMARY REPORT

CLIENT: Barr Engineering

Date: 8/26/2020

Work Order: S2008131

Report ID: S2008131001

Project:

Saturated Paste Metals by ICP

Sample Type **MBLK**

Units: ppm

SATPASTE BLK (08/20/20 16:46)		RunNo: 181804						
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual	
Boron	ND	0.1						
Lithium	ND	0.01						
Selenium	ND	0.05						

Saturated Paste Metals by ICP

Sample Type **LCS**

Units: ppm

SATPASTE QC (08/20/20 16:44)		RunNo: 181804						
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual	
Boron	0.4	0.1	0.31		124	80 - 120	S	
Lithium	0.08	0.01	0.07		116	80 - 120		
Selenium	0.10	0.05	0.11		86.7	80 - 120		

Saturated Paste Metals by ICP

Sample Type **DUP**

Units: ppm

S2008131-005AD (08/20/20 16:28)		RunNo: 181804						
Analyte	Result	RL	Ref Samp	%RPD	%REC	% RPD Limits	Qual	
Boron	0.6	0.1	0.6	7.17		20		
Lithium	0.08	0.01	0.08	5.44		20		
Selenium	0.07	0.05	0.09	24.9		20	R	

- Qualifiers:**
- B Analyte detected in the associated Method Blank
 - E Value above quantitation range
 - H Holding times for preparation or analysis exceeded
 - L Analyzed by another laboratory
 - O Outside the Range of Dilutions
 - S Spike Recovery outside accepted recovery limits

- D Report limit raised due to dilution
- G Analyzed at IML Gillette laboratory
- J Analyte detected below quantitation limits
- ND Not Detected at the Reporting Limit
- R RPD outside accepted recovery limits
- X Matrix Effect



ANALYTICAL QC SUMMARY REPORT

CLIENT: Barr Engineering
Work Order: S2008131
Project:

Date: 8/26/2020
Report ID: S2008131001

Total (3050) Metals by ICP - 6010C

Sample Type **MBLK**

Units: mg/Kg

MB-17637 (08/25/20 14:57)	RunNo: 181916	PrepDate: 08/20/20 17:23	BatchID 17637				
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Boron	ND	5					
Lithium	ND	0.2					
Selenium	ND	1.3					

Total (3050) Metals by ICP - 6010C

Sample Type **LCS**

Units: mg/Kg

LCS-17637 (08/25/20 14:59)	RunNo: 181916	PrepDate: 08/20/20 17:23	BatchID 17637				
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Boron	47	5	50		93.9	80 - 120	
Selenium	48.8	1.3	50		97.6	80 - 120	

Total (3050) Metals by ICP - 6010C

Sample Type **MS**

Units: mg/Kg

S2008131-009AS (08/25/20 16:17)	RunNo: 181916	PrepDate: 08/20/20 7:45	BatchID 17637				
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Boron	108	5	50	63	91.2	75 - 125	
Selenium	41.2	1.3	50	ND	82.4	75 - 125	

Total (3050) Metals by ICP - 6010C

Sample Type **MSD**

Units: mg/Kg

S2008131-009AMSD (08/25/20 16:26)	RunNo: 181916	PrepDate: 08/20/20 7:45	BatchID 17637				
Analyte	Result	RL	Conc	%RPD	%REC	% RPD Limits	Qual
Boron	105	5	108	2.88	85.0	20	
Selenium	40.0	1.3	41.2	2.96	80.0	20	

Total (3050) Metals by ICP - 6010C

Sample Type **DUP**

Units: mg/Kg

S2008131-001AD (08/25/20 15:48)	RunNo: 181916	PrepDate: 08/20/20 7:45	BatchID 17637				
Analyte	Result	RL	Ref Samp	%RPD	%REC	% RPD Limits	Qual
Boron	61	5	59	3.10		20	
Lithium	1.7	0.2	1.8	6.08		20	
Selenium	1.5	1.3	ND			20	R

S2008131-008AD (08/25/20 16:13)	RunNo: 181916	PrepDate: 08/20/20 7:45	BatchID 17637				
Analyte	Result	RL	Ref Samp	%RPD	%REC	% RPD Limits	Qual
Boron	36	5	34	4.95		20	
Lithium	12.9	0.2	12.4	3.79		20	
Selenium	ND	1.3	ND			20	

Qualifiers:

- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- H Holding times for preparation or analysis exceeded
- L Analyzed by another laboratory
- O Outside the Range of Dilutions
- S Spike Recovery outside accepted recovery limits

- D Report limit raised due to dilution
- G Analyzed at IML Gillette laboratory
- J Analyte detected below quantitation limits
- ND Not Detected at the Reporting Limit
- R RPD outside accepted recovery limits
- X Matrix Effect

Barr Engineering Co. Chain of Custody

Sample Origination State:

- Ann Arbor Duluth Hibbing Minneapolis
 Bismarck Grand Rapids Jefferson City Salt Lake City

- KS MO UT
 MI ND WI
 MN SD Other: MT

Analysis Requested

Water Soil

Perform MS/MSD Y / N
Total Number of Containers

SATURATED PASTE
TOTAL METALS (B, H, S, Se)

COC Number: **58270**

COC / of /

Matrix Code: Preservative Code:

- | | |
|---------------------|---|
| GW = Groundwater | A = None |
| SW = Surface Water | B = HCl |
| WW = Waste Water | C = HNO ₃ |
| DW = Drinking Water | D = H ₂ SO ₄ |
| S = Soil/Solid | E = NaOH |
| SD = Sediment | F = MeOH |
| O = Other | G = NaHSO ₄ |
| | H = Na ₂ S ₂ O ₃ |
| | I = Ascorbic Acid |
| | J = NH ₄ Cl |
| | K = Zn Acetate |
| | O = Other |

REPORT TO	INVOICE TO
Company: <u>BARR ENGINEERING</u>	Company:
Address: <u>234 W. CENTURY</u>	Address:
Name: <u>SCOTT KOROM</u>	Name: <u>SAME</u>
email: <u>skorom@barr.com</u>	email:
Copy to: <u>datamgt@barr.com</u>	P.O.:
Project Name: <u>[REDACTED]</u>	Barr Project No: <u>26411007.15</u>

Location	Sample Depth			Collection Date (mm/dd/yyyy)	Collection Time (hh:mm)	Matrix Code	Perform MS/MSD	Y	N	Total Number of Containers	Analysis Requested	% Solids
	Start	Stop	Unit (m./ft. or in.)									
1. <u>SB-2 20.5-21'</u>				<u>IN BARR RECORDS</u>	<u>IN BARR RECORDS</u>	<u>SD</u>					<u>52008131-001</u>	
2. <u>T-2 22.5-23.5'</u>				↓	↓							<u>002</u>
3. <u>T-3 30-32.5'</u>				↓	↓							<u>003</u>
4. <u>T-5 10-15'</u>				↓	↓							<u>004</u>
5. <u>T-6 19.5-20'</u>				↓	↓							<u>005</u>
6. <u>T-17 10.75-15'</u>				↓	↓							<u>006</u>
7. <u>T-18 12.5'-14.5'</u>				↓	↓							<u>007</u>
8. <u>T-22 10-15'</u>				↓	↓							<u>008</u>
9. <u>COAL PILE COAL 2</u>				↓	↓							<u>009</u>
10.												

Preservative Code

Field Filtered Y/N

SEE ATTACHED LETTER FOR DETAILS

CONTACT SCOTT KOROM W/ QUESTIONS 701-335-3125

BARR USE ONLY

Sampled by: DJZ

Barr Proj. Manager: JJG3

Barr DQ Manager: TAO

Lab Name: PACE

Lab Location: Sheridan WY

Relinquished by: <u>Donk Zandy</u>	On Ice? <input type="radio"/> Y <input checked="" type="radio"/> N	Date: <u>8-4-20</u>	Time: <u>1300</u>	Received by: <u>Fedex</u>	Date:	Time:
Relinquished by: <u>Fedex</u>	On Ice? <input type="radio"/> Y <input checked="" type="radio"/> N	Date:	Time:	Received by: <u>Karen A Sec</u>	Date: <u>8/6/20</u>	Time: <u>1030</u>
Samples Shipped VIA: <input type="checkbox"/> Courier <input checked="" type="checkbox"/> Federal Express <input type="checkbox"/> Sampler	Air Bill Number: <u>771172168518</u>			Requested Due Date: <input checked="" type="checkbox"/> Standard Turn Around Time <input type="checkbox"/> Rush _____ (mm/dd/yyyy)		
Lab WO:	Temperature on Receipt (°C):	Custody Seal Intact? <input type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> None				

Distribution - White-Original: Accompanies Shipment to Laboratory; Yellow Copy: Include in Field Documents; Pink Copy: Send to Data Management Administrators.

H:\RLG\STDFORMS\Chain Of Custody Form 2015 RLG Rev. 01/02/18