2018 Annual Groundwater Monitoring and Corrective Action Report

Scrubber Pond and Temporary Storage Area

Lewis & Clark Station
Sidney, Montana

Prepared for
Montana Dakota Utilities

January 2019

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234 West Century Avenue
Bismarck, ND 58503
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Lewis & Clark Station
Sidney, Montana

January 2019

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Acronyms

Acronym	Description
CCR	Coal Combustion Residuals
CFR	Code of Federal Regulations
FGD	Flue-Gas Desulfurization
GCL	Geosynthetic Clay Liner
HDPE	High-Density Polyethylene
MDU	Montana Dakota Utilities Company
SSI	Statistically Significant Increase
TDS	Total Dissolved Solids
TSP	Temporary Storage Pad

1.0 Introduction

Montana-Dakota Utilities Co. (MDU) owns and operates Lewis & Clark Station, a coal-fired generation unit near Sidney, Montana (Figure 1). Two coal combustion residuals (CCR) surface impoundments and a CCR pile, as defined by 40 CFR 257.53, are situated at the property. The surface impoundments are named the East and West Scrubber Ponds. The Scrubber Ponds are used to 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 dry prior to loading and hauling for disposal.

Closure by removal of CCR began at the TSP in 2018, which included removing all CCR and CCR-contaminated sediments from the TSP for disposal in an off-site landfill. Samples were collected from the base and sides of the excavation to verify that all CCR and CCR-contaminated sediments were removed. Although removal actions have been completed, demonstration that groundwater quality requirements of §257.102(c) are ongoing.

A retrofit of the Scrubber Ponds was conducted in 2018 with an alternative composite liner system that covers all surrounding earth that otherwise would likely be in contact with CCR. The new liner system is an alternative composite liner, consisting of two layers of geosynthetic clay liner (GCL) overlain by a 60-mil high-density polyethylene (HDPE) geomembrane. The alternative composite liner is equivalent to the composite liner design requirements of §257.70(c) and §257.70(b)(1) through (4). The location of the Scrubber Ponds after the retrofit is shown on Figure 1.

The locations of the Scrubber Ponds and TSP are shown on Figure 1. The groundwater monitoring system is a multiunit groundwater monitoring system, as allowed in §257.91(d). This 2018 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 (Site).

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 2017 Annual Groundwater Monitoring and Corrective Action Report, Scrubber Pond and Temporary Storage Area (Barr, 2018) documented the results of the baseline groundwater monitoring. The evaluation of groundwater monitoring data for statistically significant increases over background levels for the constituents listed in appendix III from the CCR Rule began on October 17, 2017 and continued in 2018.

Assessment monitoring was triggered because a statistically significant increase (SSI) over background levels was detected in detection monitoring for one or more of the constituents listed in appendix III to the CCR Rule (§257.95(a)) resulting from the fall 2017 monitoring event. The groundwater monitoring and corrective action program for the Scrubber Ponds and TSP has been in assessment monitoring for 2018. Additional information concerning the transition to assessment monitoring is provided in Section 2.0.

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 the following Table 1.

Table 1 CCR Rule Requirements

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 2.3 Monitoring and Analytical Results
§257.90(e)(4)	Discuss any transition between monitoring programs	Section 2.3 Transition to Assessment Monitoring
§257.90(e)(5)	Other information specified in §257.90 through §257.98	Other information not required in this report

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 2018. The groundwater monitoring system is described in Section 2.1, transition to assessment monitoring is described in Section 2.2, monitoring and analytical results are described in Section 2.3, key actions completed and problems encountered are described in Section 2.4, and key activities planned for 2019 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 background (or upgradient) and downgradient monitoring wells in the groundwater monitoring system, including the 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 for the CCR unit monitoring wells are included in Groundwater Monitoring System Certification, Lewis & Clark Station (Barr, 2018).

2.1.2 Changes to Monitoring System

The Groundwater Monitoring System Certification, Lewis & Clark Station (Barr, 2018) documents the removal of monitoring well MW 102 from the monitoring well system and the addition of monitoring well MW 120 into the monitoring well system. Monitoring well MW 102 was removed from the system and abandoned due to location conflicts with construction at the CCR units conducted in 2018. New monitoring well MW 120 was constructed to replace MW 102.

2.2 Transition to Assessment Monitoring

SSIs over background for the following parameters were determined as a result of the October 2017 detection monitoring event:

- Total dissolved solids (TDS): monitoring wells MW 111, MW 117, and MW 118
- Fluoride: monitoring wells MW 111 and MW 118
- Boron, calcium, chloride, pH, and sulfate: monitoring wells MW 111 and MW 118

The monitoring program transitioned from detection monitoring to assessment monitoring in 2018 and notification was provided on MDU's publicly accessible CCR Rule website.

2.3 Monitoring and Analytical Results

Groundwater samples were collected and analyzed in 2018 for the constituents listed in appendices III and IV (Part 257) under the assessment monitoring program.

- A total of seven samples were collected from the CCR groundwater monitoring system and were analyzed for the constituents listed in appendices III and IV during the initial assessment

monitoring event (May 29 and 30, and June 13 and 14, 2018) consistent with the requirements of §257.95(b). Additional groundwater and surface water samples, not required by the CCR Rule, were also collected from monitoring wells and surface water bodies that are not part of the CCR groundwater monitoring system.

- A total of seven samples were collected from the monitoring well system and were analyzed for the constituents listed in appendices III and IV, except for radium during the resample assessment monitoring event (August 21 and 22, and August 28, 2018) consistent with the requirements of §257.95(d)(1). Additional groundwater samples, not required by the CCR Rule, were also collected from monitoring wells not part of the monitoring well system.
- Monitoring wells MW 117 and MW 120, in which radium was detected in response to §257.95 (b) (the initial assessment monitoring event), were sampled for radium on October 30, 2018.

Sampling dates are reported on the field data sheets and analytical laboratory reports in Appendix A.

2.4 Key Actions Completed/Problems Encountered

The following key actions were completed for the groundwater monitoring program through 2018:

- Decommissioned monitoring well MW 102 and installed monitoring well MW 120
- Assessment monitoring was conducted throughout 2018

Monitoring well MW 117 required rehabilitation. The riser pipe at this monitoring well was inadvertently unscrewed during groundwater sampling, which allowed sand pack material to enter the monitoring well. The sand was evacuated from the monitoring well and no issues have been reported since then.

An obstruction was reported within monitoring well MW 110. Subsequently, the monitoring well was inspected with a water-resistant camera. No obstructions or damage within the monitoring well was observed and the monitoring well was later sampled with no issue.

No other problems were encountered.

2.5 Key Activities for Upcoming Year

The following key groundwater monitoring program activities are planned for 2019:

- Continue the groundwater monitoring program in accordance with the CCR rule
- Evaluate analytical results from monitoring events for SSIs according to the Statistical Method Selection Certification (Barr, 2017)

3.0 References

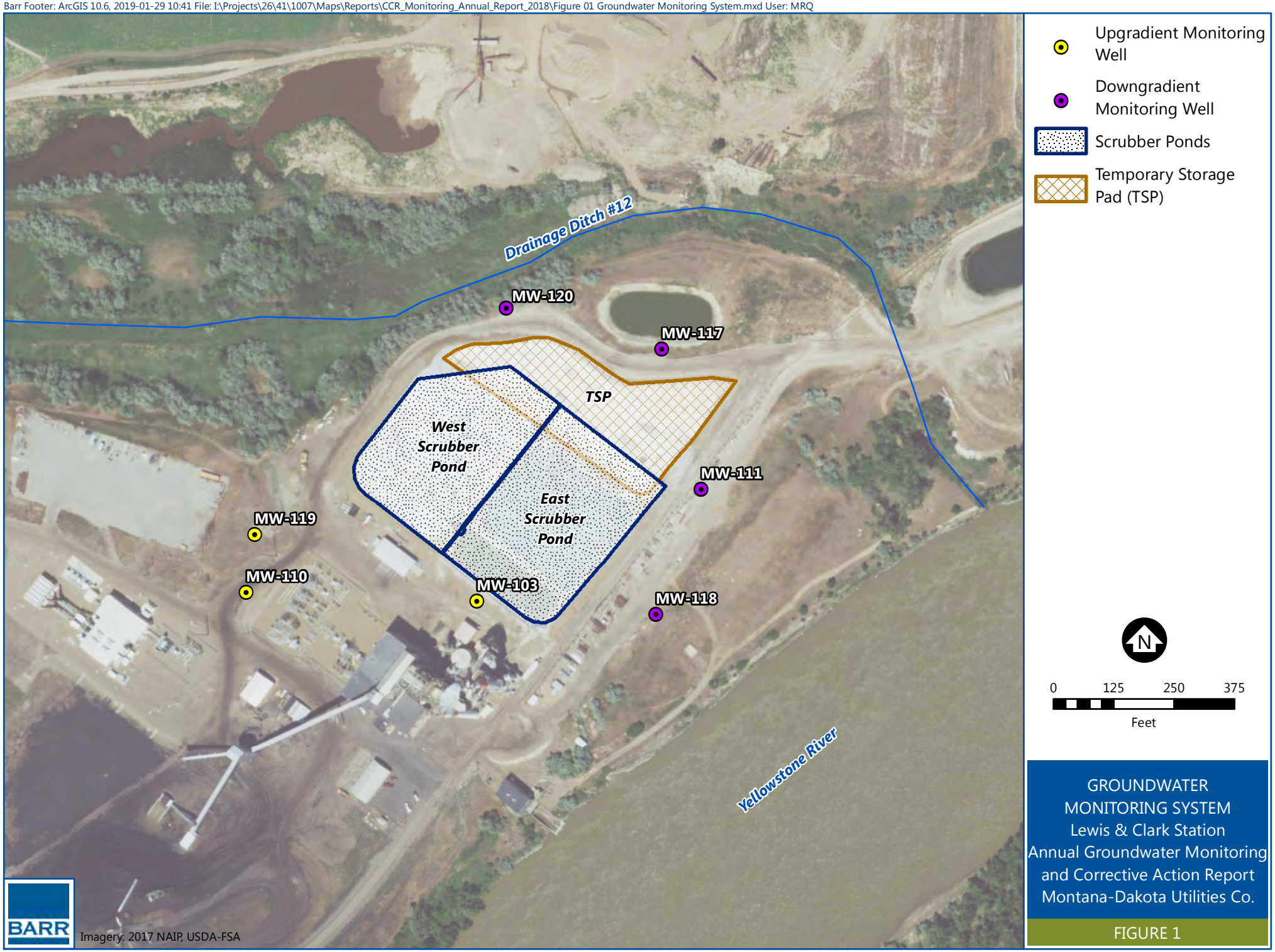
Barr, 2018. 2017 Annual Groundwater Monitoring and Corrective Action Report, Scrubber Pond and Temporary Storage Area, Prepared for Montana Dakota Utilities Company. January 2018.

Barr, 2018. 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.

Figures

Barr Footer: ArcGIS 10.6, 2019-01-29 10:41 File: I:\Projects\26\41\1007\Maps\Reports\CCR_Monitoring_Annual_Report_2018\Figure 01 Groundwater Monitoring System.mxd User: MRQ



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.
1126 North Front St. ~ New Ulm, MN 56073 ~ 800-782-3557 ~ Fax 507-359-2890
2 North German 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
MEMBER ACIL

August 15, 2018 – Amended Field Letter

Montana Dakota Utilities
Attn: Samantha Marshall
5181 Southgate Dr.
Billings, MT 59102

RE: Groundwater Sampling Event - 2018 at MDU Lewis & Clark Site

Dear Ms. Marshall:

Per email dated 26 July 2018 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. At well MW108 only a partial sample was collected due to insufficient recharge of the well to collect the full bottle set.

Per email dated 8 Aug 2018 from Terri Olson, Barr Engineering, it was noted that there still existed some confusion regarding the samples used as duplicate samples. Duplicate samples were collected from wells MW106 and MW118.

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

Sincerely,

Claudette Carroll for

Jeremy Meyer
MVTL Field Services

15 Aug 18

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.

MVTL Laboratories Inc.
FIELD DATA REPORT

WO# 82-1191

MDU Lewis and Clark
CCR Sampling
Attn: Samantha Marshall
5181 Southgate Dr.
Billings, MT 59102

WELL 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	
MW101	30-May-18	13:31	30-May-18	14:16	9.01	9.51	4500.0*	Bladder	14.88	1266	7.39	2.21	clear
MW105	30-May-18	15:57	30-May-18	17:27	8.80	NR	9000.0	Bladder	11.77	1644	7.32	8.09	clear
MW106	30-May-18	18:03	30-May-18	18:58	9.51	9.65	5500.0*	Bladder	13.80	2669	7.42	2.26	clear
MW107	30-May-18	11:10	30-May-18	12:55	4.30	5.98	10500.0	Bladder	9.85	1378	7.36	143.00	slightly turbid
MW108	31-May-18	7:27	31-May-18	11:19	16.82	NR	3700.0	Bladder	14.25	5368	6.83	160.00	slightly turbid
MW109	30-May-18	14:52	30-May-18	15:27	10.37	10.48	3500.0	Bladder	14.66	1669	7.32	2.47	clear
MW116	31-May-18	8:11	31-May-18	10:26	10.72	NR	13500.0	Bladder	12.14	2469	7.40	19.20	clear
MW210	NA	NA	29-May-18	12:16	9.15	NA	NA	Na	NA	NA	NA	NA	Water Level Only

NR= Not Recorded on Field Sheet NA = Not Applicable

MVTL Laboratories Inc.
FIELD DATA REPORT

MDU Lewis and Clark
CCR Sampling

Attn: Samantha Marshall
5181 Southgate Dr.
Billings, MT 59102

WO# 82-1193 82-1392
82-1191

WELL 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	29-May-18	14:04	29-May-18	14:54	10.50	10.54	5000.0	Bladder	12.78	1476	7.33	3.57	clear
MW110	13-Jun-18	12:12	13-Jun-18	15:12	8.80	9.01	18000.0	Bladder	15.61	1031	7.33	4.78	clear
MW119	29-May-18	12:08	29-May-18	12:58	8.83	8.90	5000.0	Bladder	10.63	1118	7.34	1.88	clear
MW111	29-May-18	16:19	29-May-18	17:29	7.91	7.95	7000.0	Bladder	12.71	2997	7.24	1.15	clear
MW117	13 jue 18	16:14	14-Jun-18	6:17	5.85	below pump	4000.0	Bladder	9.85	8475	7.24	4.41	clear
MW118	30-May-18	7:40	30-May-18	8:35	8.61	8.59	5500.0	Bladder	12.77	1574	7.45	2.61	clear
MW120	29-May-18	18:34	29-May-18	19:14	15.26	15.93	4000.0	Bladder	9.89	3761	6.88	1.41	clear
West Scrubber	NA	NA	30-May-18	11:05	NA	NA	NA	Grab	NA	NA	NA	NA	Dry
Sewage Lagoon	NA	NA	31-May-18	8:35	NA	NA	NA	Grab	20.29	3552	7.89	35.90	slightly turbid
SP1	NA	NA	30-May-18	10:35	NA	NA	NA	Grab	17.73	789	7.87	174.00	slightly turbid
SP2	NA	NA	30-May-18	10:56	NA	NA	NA	Grab	17.77	793	7.78	399.00	turbid

NR= Not Recorded on Field Sheet NA = Not Applicable

MVTL

2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

Field Datasheet

Groundwater Assessment

Company: MDU Lewis and Clark

Event: Spring 2018

Sample ID: 103

Sampling Personal: Darren Wiesmann

Weather Conditions: Temp: 71 °F Wind: South @ 5 Precip: Sunny / Partly Cloudy / Cloudy

Well Information

Well Locked?	Yes	(No)	
Well Labeled?	(Yes)	No	
Casing Straight?	(Yes)	No	
Grout Seal Intact?	Yes	No	(Not Visible)
Repairs Necessary:	—		
Casing Diameter:	2"		
Water Level Before Purge:	10.50	ft	
Depth to Top of Pump:	18.44	ft	
Water Level After Sample:	10.54	ft	
Measurement Method:	Electric Water Level Indicator		

Sampling Information

Purging Method:	Bladder
Sampling Method:	Bladder
Dedicated Equip?:	Yes (No)
Duplicate Sample?:	Yes (No)
Duplicate Sample ID:	—

Control Settings		
Purge:	5	sec.
Recover:	55	sec.
PSI:	–	

Purge Date:	29May18	Time Purging Began:	1404 am/(pm)
Well Purged Dry?	Yes (No)	Time Purged Dry:	— am/pm
Sample Date:	29May18	Time of Sampling:	1454 am/(pm)

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

Field Measurements

Stabilization (3 consecutive)		Temp (°C)	Spec. Cond.	pH	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Water Level (ft)	Pumping Rate	mL Removed	Description: Clarity, Color, Odor, Ect.
SEQ #	Time		±5%	±0.1	±10%	±20 mV	±10%	0.25 ft	ml/min		Clear, Slightly Turbid, Turbid
1	1409	14.39	4225	7.31	0.27	76.4	37.5	10.56	100	500	Slightly Turbid
2	1414	13.01	2163	7.33	0.21	77.8	27.7	10.55	100	1500	ST
3	1439	13.23	1527	7.33	0.24	73.6	4.62	10.55	100	1500	clear
4	1444	13.32	1512	7.33	0.20	74.1	3.53	10.55	100	500	clear
5	1449	12.94	1492	7.35	0.19	75.3	3.73	10.55	100	500	clear
6	1454	12.78	1476	7.33	0.19	77.3	3.57	10.55	100	500	clear
7											
8											
9											
10											

Stabilized: (Yes) No

Total Volume Removed: 5000 mL

Comments:

MVTL

2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

Field Datasheet

Groundwater Assessment

Company: MDU Lewis and Clark

Event: Spring 2018

Sample ID: MW 110

Sampling Personal: Darren Niesvacs

Weather Conditions: Temp: 70 °F Wind: Light @ Precip: Sunny / Partly Cloudy / Cloudy

Well Information

Well Locked?	Yes	~~No~~	
Well Labeled?	~~Yes~~	No	
Casing Straight?	~~Yes~~	No	
Grout Seal Intact?	~~Yes~~	No	Not Visible
Repairs Necessary:	—		
Casing Diameter:	2"		
Water Level Before Purge:	9.04	ft	
Depth to Top of Pump:		ft	
Water Level After Sample:		ft	
Measurement Method:	Electric Water Level Indicator		

Sampling Information

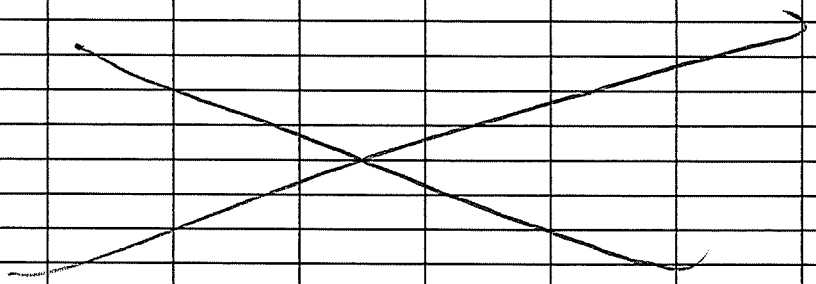
Purging Method:	Bladder			
Sampling Method:	Bladder			
Dedicated Equip?:	Yes	No		
Duplicate Sample?:	Yes	No		
Duplicate Sample ID:				
Purge Date:			Time Purging Began:	am/pm
Well Purged Dry?	Yes	No	Time Purged Dry:	am/pm
Sample Date:	29May18		Time of Sampling:	1400 am/~~pm~~

Control Settings	
Purge:	sec.
Recover:	sec.
PSI:	

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

Field Measurements

Stabilization (3 consecutive) SEQ #	Time	Temp (°C)	Spec. Cond.	pH	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Water Level (ft)	Pumping Rate	mL Removed	Description: Clarity, Color, Odor, Ect.
			±5%	±0.1	±10%	±20 mV	±10%	0.25 ft	ml/min		Clear, Slightly Turbid, Turbid
1											
2											
3											
4											
5											
6											
7											
8											
9											
10											



Stabilized: Yes No

Total Volume Removed: _____ mL

Comments: Went to put pump down the well and there is an obstruction around 9.10 just below water level. Bounced the pump to try to get by, but it won't go past.

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

Field Datasheet

Groundwater Assessment

Company: MDU Lewis and Clark
Event: Spring 2018
Sample ID: 119
Sampling Personal: Darren Aitsman

Weather Conditions: Temp: 66 °F Wind: Light @ Precip: Sunny / (Partly Cloudy) / Cloudy

Well Information

Well Locked?	Yes	(No)	
Well Labeled?	(Yes)	No	
Casing Straight?	(Yes)	No	
Grout Seal Intact?	(Yes)	No	Not Visible
Repairs Necessary:	—		
Casing Diameter:	2"		
Water Level Before Purge:	8.83 ft		
Depth to Top of Pump:	14.34 ft		
Water Level After Sample:	8.90 ft		
Measurement Method:	Electric Water Level Indicator		

Sampling Information

Purging Method:	Bladder		
Sampling Method:	Bladder		
Dedicated Equip?:	Yes (No)		
Duplicate Sample?:	Yes (No)		
Duplicate Sample ID:	—		

Control Settings		
Purge:	5	sec.
Recover:	55	sec.
PSI:	—	

Purge Date:	29May18	Time Purging Began:	1208 am/(pm)
Well Purged Dry?	Yes (No)	Time Purged Dry:	~~am/pm~~
Sample Date:	29May18	Time of Sampling:	1258 am/(pm)

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

Field Measurements

Stabilization (3 consecutive) SEQ #	Time	Temp (°C)	Spec. Cond. ±5%	pH ±0.1	DO (mg/L) ±10%	ORP (mV) ±20 mV	Turbidity (NTU) ±10%	Water Level (ft) 0.25 ft	Pumping Rate ml/min	mL Removed	Description: Clarity, Color, Odor, Ect. Clear, Slightly Turbid, Turbid
1	1213	11.98	1116	7.33	1.78	95.3	4.57	8.90	~~500~~ 100	500	clear
2	1228	11.01	1111	7.34	0.74	81.6	4.80	8.90	100	1500	clear
3	1233	10.79	1112	7.34	0.78	80.4	5.40	8.90	100	500	clear
4	1243	10.86	1116	7.34	0.89	78.4	3.48	8.90	100	1000	clear
5	1248	10.80	1119	7.33	0.94	77.5	2.04	8.90	100	500	clear
6	1253	10.86	1119	7.34	0.93	77.3	1.93	8.90	100	500	clear
7	1258	10.63	1118	7.34	0.98	76.6	1.88	8.90	100	500	clear
8											
9											
10											

Stabilized: (Yes) No

Total Volume Removed: 5000 mL

Comments: *29May18 DUP (4)

MVTL

2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

Field Datasheet

Groundwater Assessment

Company: MDU Lewis and Clark

Event: Spring 2018

Sample ID: 111

Sampling Personal: Darren Niesvaag

Weather Conditions: Temp: 75 °F Wind: Light @ Precip: Sunny / ~~Partly Cloudy~~ / Cloudy

Well Information

Well Locked?	Yes	(No)	
Well Labeled?	~~Yes~~	No	
Casing Straight?	~~Yes~~	No	
Grout Seal Intact?	~~Yes~~	No	Not Visible
Repairs Necessary:			

Casing Diameter:	2"
Water Level Before Purge:	7.91 ft
Depth to Top of Pump:	14.76 ft
Water Level After Sample:	7.95 ft
Measurement Method:	Electric Water Level Indicator

Sampling Information

Purging Method:	Bladder		
Sampling Method:	Bladder		
Dedicated Equip?:	Yes	(No)	
Duplicate Sample?:	Yes	(No)	
Duplicate Sample ID:	—		

Control Settings		
Purge:	5	sec.
Recover:	55	sec.
PSI:	-	

Purge Date:	29May18	Time Purging Began:	1619 am/~~pm~~
Well Purged Dry?	Yes (No)	Time Purged Dry:	~~am/pm~~
Sample Date:	29May18	Time of Sampling:	1729 am/~~pm~~

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

Field Measurements

Stabilization (3 consecutive) SEQ #	Time	Temp (°C)	Spec. Cond. ±5%	pH ±0.1	DO (mg/L) ±10%	ORP (mV) ±20 mV	Turbidity (NTU) ±10%	Water Level (ft) 0.25 ft	Pumping Rate ml/min	mL Removed	Description: Clarity, Color, Odor, Ect. Clear, Slightly Turbid, Turbid
1	1624	13.42	3930	7.04	0.34	78.6	5.73	7.98	100	500	Clear
2	1639	12.95	3750	7.07	0.30	74.0	14.3	7.94	100	1500	Clear
3	1649	12.80	3457	7.12	0.68	73.6	7.62	7.95	100	1000	Clear
4	1704	12.31	3129	7.21	1.70	73.8	4.81	7.94	100	1500	Clear
5	1714	12.38	3048	7.23	2.40	74.0	3.29	7.95	100	1000	Clear
6	1719	12.19	3013	7.24	2.74	74.3	1.24	7.95	100	500	Clear
7	1724	12.56	2995	7.25	2.81	74.3	1.15	7.95	100	500	Clear
8	1729	12.71	2997	7.24	2.91	74.4	1.15	7.95	100	500	Clear
9											
10											

Stabilized: (Yes) No

Total Volume Removed: 7000 mL

Comments:

MVTL

2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

Field Datasheet

Groundwater Assessment

Company: MDU Lewis and Clark

Event: Spring 2018

Sample ID: 117

Sampling Personal: Darren Nitschke

Weather Conditions: Temp: 75 °F Wind: Light @ Precip: Sunny / Partly Cloudy / Cloudy

Well Information

Well Locked?	Yes	No	
Well Labeled?	Yes	No	
Casing Straight?	Yes	No	
Grout Seal Intact?	Yes	No	Not Visible
Repairs Necessary:	—		
Casing Diameter:	2"		
Water Level Before Purge:			ft
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 Equip?:	Yes	No		
Duplicate Sample?:	Yes	No		
Duplicate Sample ID:				
Purge Date:			Time Purging Began:	am/pm
Well Purged Dry?	Yes	No	Time Purged Dry:	am/pm
Sample Date:	29 May 18		Time of Sampling:	1610 am/pm

Control Settings	
Purge:	sec.
Recover:	sec.
PSI:	

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

Field Measurements

Stabilization (3 consecutive)		Temp (°C)	Spec. Cond.	pH	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Water Level (ft)	Pumping Rate	mL Removed	Description: Clarity, Color, Odor, Ect.
SEQ #	Time		±5%	±0.1	±10%	±20 mV	±10%	0.25 ft	ml/min		Clear, Slightly Turbid, Turbid
1											
2											
3											
4											
5											
6											
7											
8											
9											
10											

Stabilized: Yes No

Total Volume Removed: _____ mL

Comments: when trying to get the cap off a section of pipe came up about a 2ft section. The cap was on really tight, replaced cap. The sand around the pipe fell into the well and plugged it.

MVTL

2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

Field Datasheet

Groundwater Assessment

Company: MDU Lewis and Clark

Event: Spring 2018

Sample ID: 118

Sampling Personal: Darren Nisswandt

Weather Conditions: Temp: 62 °F Wind: North @ 6 Precip: Sunny / Partly Cloudy / ~~Cloudy~~

Well Information

Well Locked?	Yes	~~No~~	
Well Labeled?	~~Yes~~	No	
Casing Straight?	~~Yes~~	No	
Grout Seal Intact?	~~Yes~~	No	Not Visible
Repairs Necessary:			
Casing Diameter:	2"		
Water Level Before Purge:	8.61 ft		
Depth to Top of Pump:	9.80 ft		
Water Level After Sample:	8.59 ft		
Measurement Method:	Electric Water Level Indicator		

Sampling Information

Purging Method:	Bladder		
Sampling Method:	Bladder		
Dedicated Equip?:	Yes	~~No~~	
Duplicate Sample?:	~~Yes~~	No	
Duplicate Sample ID:	Dup 1		

Control Settings		
Purge:	5	sec.
Recover:	55	sec.
PSI:	—	

Purge Date:	30 May 18	Time Purging Began:	0740 ~~am~~/pm
Well Purged Dry?	Yes ~~No~~	Time Purged Dry:	~~am/pm~~
Sample Date:	30 May 18	Time of Sampling:	0835 am/pm

Bottle List:	1L Raw	500mL Nitric	500mL Nitric (filtered)	250 Sulfuric
	2	2	~~2~~ - 1L Nitric	2

Field Measurements

Stabilization (3 consecutive)		Temp (°C)	Spec. Cond.	pH	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Water Level (ft)	Pumping Rate	mL Removed	Description: Clarity, Color, Odor, Ect.
SEQ #	Time		±5%	±0.1	±10%	±20 mV	±10%	0.25 ft	ml/min		Clear, Slightly Turbid, Turbid
1	0745	13.90	1571	7.38	6.71	64.2	300	8.59	100	500	Turbid
2	0815	12.91	1571	7.44	4.78	61.4	6.92	8.58	100	3000	clear
3	0825	13.05	1572	7.45	4.65	60.9	2.89	8.58	100	1000	clear
4	0830	12.65	1570	7.45	4.62	60.6	2.76	8.58	100	500	clear
5	0835	12.77	1574	7.45	4.66	60.5	2.61	8.58	100	500	clear
6											
7											
8											
9											
10											

Stabilized: Yes No

Total Volume Removed: 5500 mL

Comments:

MVTL

2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

Field Datasheet

Groundwater Assessment

Company: MDU Lewis and Clark

Event: Spring 2018

Sample ID: 120

Sampling Personal: Darren Nissman

Weather Conditions: Temp: 75 °F Wind: Light @ Precip: Sunny / Partly Cloudy / Cloudy

Well Information

Well Locked?	Yes	No	
Well Labeled?	Yes	No	
Casing Straight?	Yes	No	
Grout Seal Intact?	Yes	No	Not Visible
Repairs Necessary:			

Casing Diameter:	2"	
Water Level Before Purge:	15.26	ft
Depth of well	18.85	
Depth to Top of Pump:	16.60	ft
Water Level After Sample:	15.93	ft
Measurement Method:	Electric Water Level Indicator	

Sampling Information

Purging Method:	Bladder
Sampling Method:	Bladder
Dedicated Equip?:	Yes (No)
Duplicate Sample?:	Yes (No)
Duplicate Sample ID:	—

Control Settings		
Purge:	5	sec.
Recover:	55	sec.
PSI:		

Purge Date:	29May18	Time Purging Began:	1834 am/pm
Well Purged Dry?	Yes (No)	Time Purged Dry:	am/pm
Sample Date:	29May18	Time of Sampling:	1914 am/pm

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

Field Measurements

Stabilization (3 consecutive)		Temp (°C)	Spec. Cond.	pH	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Water Level (ft)	Pumping Rate	mL Removed	Description: Clarity, Color, Odor, Ect.
SEQ #	Time		±5%	±0.1	±10%	±20 mV	±10%	0.25 ft	ml/min		Clear, Slightly Turbid, Turbid
1	1839	11.64	3821	6.91	0.56	92.3	13.2	15.41	100	500	Clear
2	1849	10.55	3703	6.90	0.46	80.4	5.84	15.52	100	1000	Clear
3	1859	10.33	3699	6.89	0.29	79.1	2.79	15.60	100	1000	Clear
4	1904	10.42	3695	6.88	0.32	78.5	1.33	15.62	100	500	Clear
5	1909	10.31	3718	6.88	0.36	77.9	1.40	15.65	100	500	Clear
6	1914	9.89	3761	6.88	0.40	77.6	1.41	15.66	100	500	Clear
7											
8											
9											
10											

Stabilized: (Yes) No

Total Volume Removed: 4000 mL

Comments:

MVTL
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Phone: (701) 258-9720

Field Datasheet

Groundwater Assessment

Company: MDU Lewis and Clark
Event: Spring 2018
Sample ID: 101
Sampling Personal: Darcia Nieswiadomy

Weather Conditions: Temp: 74 °F Wind: Light @ Precip: (Sunny) / Partly Cloudy / Cloudy

Well Information

Well Locked?	Yes	(No)	
Well Labeled?	(Yes)	No	
Casing Straight?	(Yes)	No	
Grout Seal Intact?	Yes	No	(Not Visible)
Repairs Necessary:	—		
Casing Diameter:	2"		
Water Level Before Purge:	9.01 ft		
Depth to Top of Pump:	9.51 ft		
Water Level After Sample:	9.51 Top ft		
Measurement Method:	Electric Water Level Indicator		

Sampling Information

Purging Method:	Bladder		
Sampling Method:	Bladder		
Dedicated Equip?:	Yes	(No)	
Duplicate Sample?:	Yes	(No)	
Duplicate Sample ID:	—		

Control Settings		
Purge:	5	sec.
Recover:	55	sec.
PSI:		

Purge Date:	30 May 18	Time Purging Began:	1331 am/(pm)
Well Purged Dry?	Yes	(No)	Time Purged Dry: — am/pm
Sample Date:	30 May 18	Time of Sampling:	1416 am/(pm)

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

Field Measurements

Stabilization (3 consecutive) SEQ #	Time	Temp (°C)	Spec. Cond. ±5%	pH ±0.1	DO (mg/L) ±10%	ORP (mV) ±20 mV	Turbidity (NTU) ±10%	Water Level (ft) 0.25 ft	Pumping Rate ml/min	mL Removed	Description: Clarity, Color, Odor, Ect. Clear, Slightly Turbid, Turbid
1	1336	14.69	1310	7.44	4.36	51.4	11.6	9.41	100	500	clear
2	1351	15.57	1270	7.40	3.63	51.4	12.4	9.51 Tp	100	1500	clear
3	1401	14.80	1268	7.40	4.27	52.2	2.81	9.51	100	1000	clear
4	1406	14.96	1267	7.40	4.18	52.6	2.19	9.51	100	500	clear
5	1411	14.53	1268	7.40	4.18	52.8	2.05	9.51	100	500	clear
6	1416	14.88	1266	7.39	4.08	53.0	2.21	9.51	100	500	clear
7											
8											
9											
10											

Stabilized: (Yes) No

Total Volume Removed: 3500 mL

Comments:

MVTL

2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

Field Datasheet

Groundwater Assessment

Company: MDU Lewis and Clark

Event: Spring 2018

Sample ID: 105

Sampling Personal: Darren Nerswang

Weather Conditions: Temp: 80 °F Wind: Light @ Precip: Sunny / Partly Cloudy / Cloudy

Well Information

Well Locked?	Yes	~~No~~	
Well Labeled?	~~Yes~~	No	
Casing Straight?	~~Yes~~	No	
Grout Seal Intact?	Yes	No	~~Not Visible~~
Repairs Necessary:			

Casing Diameter:	2"
Water Level Before Purge:	8.80 ft
Depth to Top of Pump:	16.20 ft
Water Level After Sample:	ft
Measurement Method:	Electric Water Level Indicator

Sampling Information

Purging Method:	Bladder		
Sampling Method:	Bladder		
Dedicated Equip?:	Yes	~~No~~	
Duplicate Sample?:	Yes	~~No~~	
Duplicate Sample ID:			

Control Settings		
Purge:	5	sec.
Recover:	55	sec.
PSI:		

Purge Date:	30 may 18	Time Purging Began:	1557 ~~am~~/pm
Well Purged Dry?	Yes ~~No~~	Time Purged Dry:	~~am/pm~~
Sample Date:	30 May 18	Time of Sampling:	1727 ~~am~~/pm

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

Field Measurements

Stabilization (3 consecutive)		Temp (°C)	Spec. Cond.	pH	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Water Level (ft)	Pumping Rate	mL Removed	Description: Clarity, Color, Odor, Ect.
SEQ #	Time		±5%	±0.1	±10%	±20 mV	±10%	0.25 ft	ml/min		Clear, Slightly Turbid, Turbid
1	1602	13.20	8425	7.22	0.73	56.8	5.53	8.86	100	500	Turbid
2	1632	12.23	2031	7.32	0.86	49.9	15.5	8.85	100	3000	clear
3	1647	12.02	1757	7.32	1.00	49.3	14.9	8.89	100	1500	clear
4	1657	12.40	1714	7.32	0.91	49.0	16.1	8.85	100	1000	clear
5	1702	12.55	1694	7.32	1.00	49.0	10.2	8.85	100	500	clear
6	1717	11.61	1642	7.32	1.01	49.0	8.52	8.85	100	1500	clear
7	1722	11.62	1647	7.32	1.00	48.9	8.26	8.85	100	500	clear
8	1727	11.77	1644	7.32	1.00	48.3	8.09	8.85	100	500	clear
9											
10											

Stabilized: Yes No

Total Volume Removed: 9000 mL

Comments:

MVTL

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Phone: (701) 258-9720

Field Datasheet

Groundwater Assessment

Company: MDU Lewis and Clark

Event: Spring 2018

Sample ID: 106

Sampling Personal: Darren Kriesmann

Weather Conditions: Temp: 80 °F Wind: Light @ Precip: **Sunny / Partly Cloudy / Cloudy**

Well Information

Well Locked?	Yes	No	
Well Labeled?	Yes	No	
Casing Straight?	Yes	No	
Grout Seal Intact?	Yes	No	Not Visible
Repairs Necessary:			

Casing Diameter:	2"
Water Level Before Purge:	9.51 ft
Depth to Top of Pump:	10.90 ft
Water Level After Sample:	9.65 ft
Measurement Method:	Electric Water Level Indicator

Sampling Information

Purging Method:	Bladder
Sampling Method:	Bladder
Dedicated Equip?:	Yes / No
Duplicate Sample?:	Yes / No
Duplicate Sample ID:	Dup 2

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

Purge Date:	30May18	Time Purging Began:	1803 am/pm
Well Purged Dry?	Yes / No	Time Purged Dry:	am/pm
Sample Date:	30May18	Time of Sampling:	1858 am/pm

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

Field Measurements

Stabilization (3 consecutive) SEQ #	Time	Temp (°C)	Spec. Cond. ±5%	pH ±0.1	DO (mg/L) ±10%	ORP (mV) ±20 mV	Turbidity (NTU) ±10%	Water Level (ft) 0.25 ft	Pumping Rate ml/min	mL Removed	Description: Clarity, Color, Odor, Ect. Clear, Slightly Turbid, Turbid
1	1808	15.01	3140	7.38	3.32	31.7	22.5	9.64	100	500	clear
2	1823	14.26	2681	7.43	5.38	47.6	8.56	9.62	100	1500	clear
3	1838	14.09	2675	7.43	5.49	49.0	3.57	9.66	100	1500	clear
4	1843	14.29	2674	7.43	5.45	49.2	2.75	9.67	100	500	clear
5	1848	14.46	2669	7.42	5.55	49.3	2.47	9.66	100	500	clear
6	1853	13.94	2667	7.42	5.62	49.9	2.34	9.66	100	500	clear
7	1858	13.80	2669	7.42	5.53	50.2	2.26	9.65	100	500	clear
8											
9											
10											

Stabilized: Yes / No

Total Volume Removed: 5000 mL

Comments:

MVTL

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Phone: (701) 258-9720

Field Datasheet

Groundwater Assessment

Company: MDU Lewis and Clark

Event: Spring 2018

Sample ID: MW107

Sampling Personal: Darren Nesvaag

Weather Conditions: Temp: 68 °F Wind: Light@ Precip: Sunny / Partly Cloudy / Cloudy

Well Information

Well Locked?	Yes	(No)	
Well Labeled?	(Yes)	No	
Casing Straight?	(Yes)	No	
Grout Seal Intact?	(Yes)	No	Not Visible
Repairs Necessary:	—		

Casing Diameter:	2"
Water Level Before Purge:	4.30 ft
Depth to Top of Pump:	13.65 ft
Water Level After Sample:	5.98 ft
Measurement Method:	Electric Water Level Indicator

Sampling Information

Purging Method:	Bladder
Sampling Method:	Bladder
Dedicated Equip?:	Yes (No)
Duplicate Sample?:	Yes (No)
Duplicate Sample ID:	—

Control Settings		
Purge:	5	sec.
Recover:	55	sec.
PSI:	—	

Purge Date:	30May18	Time Purging Began:	1110 (am/pm)
Well Purged Dry?	Yes (No)	Time Purged Dry:	— am/pm
Sample Date:	30May18	Time of Sampling:	1255 am/pm

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

Field Measurements

Stabilization (3 consecutive) SEQ #	Time	Temp (°C)	Spec. Cond. ±5%	pH ±0.1	DO (mg/L) ±10%	ORP (mV) ±20 mV	Turbidity (NTU) ±10%	Water Level (ft) 0.25 ft	Pumping Rate ml/min	mL Removed	Description: Clarity, Color, Odor, Ect. Clear, Slightly Turbid, Turbid
1	1115	8.45	1382	*~~8.07~~ 7.32	1.57	-29.1	71000	5.00	100	500	Turbid, Tan
2	1145	7.73	1387	7.36	0.17	-9.3	485	5.63	100	3000	Turbid, tan
3	1215	7.62	1385	7.36	0.16	-5.5	219	6.05	100	3000	Turbid
4	1245	9.88	1377	7.36	0.10	-12.7	136	5.98	100	3000	slightly turbid
5	1250	9.85	1378	7.36	0.09	-12.3	141	5.98	100	500	ST
6	1255	9.85	1378	7.36	0.09	-12.2	143	5.98	100	500	ST
7											
8											
9											
10											

Stabilized: (Yes) No

Total Volume Removed: 10500 mL

Comments: * 30may18 only

The turbidity sabilized out at seq 4-6.

MVTL

2616 E. Broadway Ave, Bismarck, ND

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Field Datasheet

Groundwater Assessment

Company: MDU Lewis and Clark

Event: Spring 2018

Sample ID: 108

Sampling Personal: Darren Nieswaag

Weather Conditions: Temp: 62 °F Wind: North @ 10 Precip: Sunny / Partly Cloudy / (Cloudy)

Well Information

Well Locked?	Yes	(No)	
Well Labeled?	(Yes)	No	
Casing Straight?	(Yes)	No	
Grout Seal Intact?	Yes	No	Not Visible
Repairs Necessary:			

Casing Diameter:	2"
Water Level Before Purge:	16.82 ft
Depth to Top of Pump:	18.18 ft
Water Level After Sample:	ft
Measurement Method:	Electric Water Level Indicator

Sampling Information

Purging Method:	Bladder		
Sampling Method:	Bladder		
Dedicated Equip?:	Yes	(No)	
Duplicate Sample?:	Yes	(No)	
Duplicate Sample ID:			

Control Settings		
Purge:	5	sec.
Recover:	55	sec.
PSI:		

Purge Date:	31May18	Time Purging Began:	0727 (am)/pm
Well Purged Dry?	(Yes) No	Time Purged Dry:	0802 (am)/pm
Sample Date:	31May18	Time of Sampling:	1119 (am)/pm

Bottle List: 1L Raw ~~500mL Nitric~~ ~~500mL Nitric (filtered)~~ 250 Sulfuric

Field Measurements

Stabilization (3 consecutive) SEQ #	Time	Temp (°C)	Spec. Cond. ±5%	pH ±0.1	DO (mg/L) ±10%	ORP (mV) ±20 mV	Turbidity (NTU) ±10%	Water Level (ft) 0.25 ft	Pumping Rate ml/min	mL Removed	Description: Clarity, Color, Odor, Ect. Clear, Slightly Turbid, Turbid
1	0732	10.50	5397	6.70	3.39	54.7	40.6	17.38	100	500	Ok Slightly turbid
2	0787	10.38	5391	6.73	3.12	47.2	31.5	17.79	100	1500	ST
3	0802	10.91	5369	6.72	2.16	47.8	24.4	18.18 Top	100	1500	Turbid
4											
5											
6											
7											
8											
9	1117	Purged line for 2 min before sampling								200	
10	1119	14.25	5368	6.83	6.46	39.4	1.60	18.18	100		Slightly turbid

Stabilized: Yes (No)

Total Volume Removed: 3700 mL

Comments:

MVTL

2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

Field Datasheet

Groundwater Assessment

Company: MDU Lewis and Clark

Event: Spring 2018

Sample ID: 109

Sampling Personal: Darren A. Teswaag

Weather Conditions: Temp: 78 °F Wind: N @ 4 Precip: **Sunny / Partly Cloudy / Cloudy**

Well Information

Well Locked?	Yes	No	
Well Labeled?	Yes	No	
Casing Straight?	Yes	No	
Grout Seal Intact?	Yes	No	Not Visible
Repairs Necessary:			
Casing Diameter:	2"		
Water Level Before Purge:	10.37	ft	
Depth to Top of Pump:	14.10	ft	
Water Level After Sample:	10.48	ft	
Measurement Method:	Electric Water Level Indicator		

Sampling Information

Purging Method:	Bladder		
Sampling Method:	Bladder		
Dedicated Equip?:	Yes	No	
Duplicate Sample?:	Yes	No	
Duplicate Sample ID:	—		
Purge Date:	30 May 18	Time Purging Began:	1452 am/pm
Well Purged Dry?	Yes	No	Time Purged Dry: am/pm
Sample Date:	30 May 18	Time of Sampling:	1527 am/pm

Control Settings		
Purge:	5	sec.
Recover:	55	sec.
PSI:	25	

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

Field Measurements

Stabilization (3 consecutive) SEQ #	Time	Temp (°C)	Spec. Cond. ±5%	pH ±0.1	DO (mg/L) ±10%	ORP (mV) ±20 mV	Turbidity (NTU) ±10%	Water Level (ft) 0.25 ft	Pumping Rate ml/min	mL Removed	Description: Clarity, Color, Odor, Ect. Clear, Slightly Turbid, Turbid
1	1457	14.58	1688	7.33	0.45	57.3	9.69	10.45	100	500	clear
2	1512	15.39	1675	7.32	0.14	55.7	3.97	~~10.55~~ 10.46	100	1500	clear
3	1517	15.01	1677	7.32	0.12	55.9	2.66	10.46	100	500	clear
4	1522	15.24	1681	7.33	0.11	55.9	2.49	10.47	100	500	clear
5	1527	14.66	1669	7.32	0.10	56.6	2.47	10.47	100	500	clear
6											
7											
8											
9											
10											

Stabilized: Yes No

Total Volume Removed: 3500 mL

Comments: * 30 May 18 DW

MVTL

2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

Field Datasheet

Groundwater Assessment

Company: MDU Lewis and Clark

Event: Spring 2018

Sample ID: 116

Sampling Personal: Darren Niemaas

Weather Conditions: Temp: 61 °F Wind: North @ 10 Precip: Sunny / Partly Cloudy / (Cloudy)

Well Information

Well Locked?	(Yes)	No	Lock was rusted had to cut
Well Labeled?	(Yes)	No	
Casing Straight?	(Yes)	No	
Grout Seal Intact?	(Yes)	No	Not Visible
Repairs Necessary:	—		

Casing Diameter:	2"
Water Level Before Purge:	~~7.72~~ 10.72 ft
Depth to Top of Pump:	26.77 ft
Water Level After Sample:	ft
Measurement Method:	Electric Water Level Indicator

Sampling Information

Purging Method:	Bladder
Sampling Method:	Bladder
Dedicated Equip?:	Yes (No)
Duplicate Sample?:	Yes (No)
Duplicate Sample ID:	—

Control Settings	
Purge:	5 sec.
Recover:	55 sec.
PSI:	

Purge Date:	31May18	Time Purging Began:	0811 (am)/pm
Well Purged Dry?	Yes (No)	Time Purged Dry:	am/pm
Sample Date:	31May18	Time of Sampling:	1026 (am)/pm

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

Field Measurements

Stabilization (3 consecutive) SEQ #	Time	Temp (°C)	Spec. Cond. ±5%	pH ±0.1	DO (mg/L) ±10%	ORP (mV) ±20 mV	Turbidity (NTU) ±10%	Water Level (ft) 0.25 ft	Pumping Rate ml/min	mL Removed	Description: Clarity, Color, Odor, Ect. Clear, Slightly Turbid, Turbid
1	0816	12.60	2343	7.31	6.53	14.6	348	9.41	100	500	Turbid
2	0846	11.74	2480	7.38	0.17	35.0	107	9.36	100	3000	Slight turbid
3	0916	12.06	2475	7.39	0.10	34.0	47.9	9.32	100	3000	Clear
4	0931	12.00	2470	7.39	0.09	33.6	48.0	9.30	100	1500	Clear
5	1001	12.62	2471	7.40	0.08	33.6	21.4	9.20	100	3000	clear
6	1016	12.31	2472	7.40	0.08	34.0	20.9	9.18	100	1500	clear
7	1021	12.16	2471	7.40	0.08	33.9	19.2	9.18	100	500	clear
8	1026	12.14	2469	7.40	0.08	33.9	19.2	9.18	100	500	clear
9											
10											

Stabilized: (Yes) No

Total Volume Removed: 13,500 mL

Comments: #31May18 DW

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

Field Datasheet

Water Level

Sampling Personnel: Darren Nieswaag

Company: **MDU Lewis and Clark**

Well ID	Date	31May18 0N@ Time	Gauge Reading	Comments
East Scrubber Pond Gauge	31May18	~~3.78~~ 1109	3.78	
West Scrubber Pond Gauge	31May18	1105	0.5	
Stream behind Sewage Lagoon	31May18	1103	3.0	

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

Field Datasheet

Water Level

Sampling Personnel: Darren Nieswaag

Company: MDU Lewis and Clark

Well ID	Date	Time	Depth to Water	Comments
MW101	29May18	1146	9.00	
MW105	29May18	1150	8.78	
MW106	29May18	1153	9.53	
MW107	29May18	1143	4.31	
MW108	29May18	1157	16.87	
MW116	29May18	1203	10.57	
mw210	29May18	1216	9.15	

Field Datasheet

Surface Water

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

Company: **MDU Lewis and Clark**

Event: **Spring 2018**

Sample ID: West Scrubber Pond

Sampling Personal: Darren Nagaus

Weather Conditions: Temp: 67 °F Wind: North @ 10 Precip: **Sunny / Partly Cloudy / Cloudy**

Site Description

Source: ~~Pond~~ **Stream** **Other:**

Latitude:	47.67972
Longitude:	-104.15724
Gauge Reading:	0.5

Sampling Information

Sampling Method:	**Grab**		
Sample Date:	30 May 18	Time of Sampling:	1105 am/pm
Bottle List:	~~1 Liter~~ Raw: 501 ~~mL Nitric~~	250 ~~mL Sulfuric~~	~~4 1L Nitric~~

Field Measurements

Time	Temp (°C)	Spec. Cond.	pH	DO (mg/L)	ORP (mV)	Turbidity (NTU)			Description: Clarity, Color, Odor, Ect.

Comments: There was only rain water that collected by the guage. The rest of the pond was dry. There wasn't a repersentative sample to collect.

Field Datasheet

Surface Water

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

Company: **MDU Lewis and Clark**

Event: **Spring 2018**

Sample ID: Sewage Lagoon

Sampling Personal: Darren Niesvaag

Weather Conditions: Temp: 60 °F Wind: Light Precip: **Sunny / Partly Cloudy / Cloudy**

Site Description

Source:	**Pond**	**Stream**	**Other:**

Latitude:	47.68098
Longitude:	-104.15514
Gauge Reading:	—

Sampling Information

Sampling Method:	**Grab**		
Sample Date:	31May18	Time of Sampling:	0835 am/pm

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

500mL N Filtered

Field Measurements

Time	Temp (°C)	Spec. Cond.	pH	DO (mg/L)	ORP (mV)	Turbidity (NTU)			Description: Clarity, Color, Odor, Ect.
0835	20.29	3552	7.89	1.73	40.6	35.9			Slightly Turbid

Comments:

Field Datasheet

Surface Water

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

Company: **MDU Lewis and Clark**

Event: **Spring 2018**

Sample ID: SP1

Sampling Personal: Darren Nieswaag

Weather Conditions: Temp: 66 °F Wind: Light Precip: **Sunny / Partly Cloudy / Cloudy**

Site Description

Source:	**Pond**	**Stream**	**Other:**

Latitude:	47.68088
Longitude:	-104.16268
Gauge Reading:	

Sampling Information

Sampling Method:	**Grab**		
Sample Date:	30 May 18	Time of Sampling:	1035 ~~am/pm~~

Bottle List:	1 Liter Raw		4 - 1L Nitric
	~~500~~ mL Nitric	250 mL Sulfuric	

500 mL Nitric Filtered

Field Measurements

Time	Temp (°C)	Spec. Cond.	pH	DO (mg/L)	ORP (mV)	Turbidity (NTU)			Description: Clarity, Color, Odor, Ect.
1035	17.73	789	7.87	6.78	61.6	174			slightly turbid

Comments:

Field Datasheet

Surface Water

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

Company: **MDU Lewis and Clark**

Event: **Spring 2018**

Sample ID: SP2

Sampling Personal: Darren Nesvaag

Weather Conditions: Temp: 66 °F Wind: Light Precip: **Sunny / Partly Cloudy / Cloudy**

Site Description

Source:	**Pond**	~~**Stream**~~	**Other:**

Latitude:	47.68104
Longitude:	-104.15755
Gauge Reading:	

Sampling Information

Sampling Method:	**Grab**		
Sample Date:	30May18	Time of Sampling:	1056 ~~am~~/pm

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

500mL N Filtered

Field Measurements

Time	Temp (°C)	Spec. Cond.	pH	DO (mg/L)	ORP (mV)	Turbidity (NTU)			Description: Clarity, Color, Odor, Ect.
1056	17.77	793	7.78	7.91	61.7	399			Turbid

Comments:

MVTL Calibration Worksheet

Site: MDU Lewis and Clark

Technician: Darren Nissen

Instrument (Circle One): #1 650 MDS 08F100203 | #2 650 MDS 04H14736 | ~~#3 556 MPS 12E102056~~

Pre Site Calibration

Date: 29May18 **Time:** 0545

pH	Temp °C	Pre Cal	Post Cal	Post Cal Range	mv	mv Range +/- 50
Buffer 7	21.00	6.99	7.00	6.95-7.05	35.3	0 +/- 50
Buffer 10	21.04	10.04	10.00	9.95-10.05	215.4	-180 +/- 50
Buffer 4	21.16	3.95	4.00	4.95-5.05	142.1	180 +/- 50

Conductivity						Check
Buffer 1413	21.04	1411	1413	±10%	Buffer 5000	4948

ORP				
231 mV @ 25C	21.32	232.8	231.0	±10 mV

DO					Barometric Pressure (mm Hg)
	20.15	8.21	8.38	mg/L	703.1 on site

Post Site Check

Time: 1930

pH	Temp °C	Reading
Buffer 7	26.01	7.04

Conductivity		
Buffer 5000	25.68	4969

Date: 30May18 **Time:** 0630

pH	Temp °C	Pre Cal	Post Cal	Post Cal Range	mv	mv Range +/- 50
Buffer 7	21.24	6.98	7.00	6.95-7.05	-36.2	0 +/- 50
Buffer 10	21.36	9.98	10.00	9.95-10.05	-214.1	-180 +/- 50
Buffer 4	21.24	4.05	4.00	4.95-5.05	136.6	180 +/- 50

Conductivity						Check
Buffer 1413	21.19	1391	1414	±10%	Buffer 5000	4947

ORP				
231 mV @ 25C	7.34	253.2	231.0	±10 mV

DO					Barometric Pressure (mm Hg)
	21.07	8.19	8.21	mg/L	701.3

Time: 1925

pH	Temp °C	Reading
Buffer 7	28.82	7.05

Conductivity		
Buffer 5000	27.77	4984

MVTL Calibration Worksheet

Site: MDU Lewis and Clark

Technician: Darren Niemwagg

Instrument (Circle One): #1 650 MDS 08F100203 | #2 650 MDS 04H14736 | #3 556 MPS 12E102056

Pre Site Calibration

Date: 31May18 **Time:** 0630

pH	Temp °C	Pre Cal	Post Cal	Post Cal Range	mv	mv Range +/- 50
Buffer 7	21.23	6.96	7.00	6.95-7.05	-35.6	0 +/- 50
Buffer 10	21.30	10.06	10.01	9.95-10.05	-215.8	-180 +/- 50
Buffer 4	21.31	4.05	4.00	4.95-5.05	139.9	180 +/- 50

Conductivity						Check
Buffer 1413	21.13	1426	1413	±10%	Buffer 5000	4965

ORP				
231 mV @ 25C	6.70	230.2	231.0	±10 mV

DO					Barometric Pressure (mm Hg)
	20.72	7.82	8.30	mg/L	702.6

Post Site Check

Time: 1130

pH	Temp °C	Reading
Buffer 7	19.30	7.03

Conductivity		
Buffer 5000	19.21	4911

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						Check
Buffer 1413				±10%	Buffer 5000	

ORP				
231 mV @ 25C				±10 mV

DO					Barometric Pressure (mm Hg)
				mg/L	

Time:

pH	Temp °C	Reading
Buffer 7		

Conductivity		
Buffer 5000		

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CASE NARRATIVE – AMENDED 8 AUG 18 (Sample ID MW111, Field Data)

MVTL Lab Reference No/SDG: 201882-1191
Client: Montana Dakota Utilities
Location: MDU Lewis & Clark
Project Identification: CCR Spring 2018
MVTL Laboratory Identifications: 18-W1400 through 18-W1417

MDU Sample Identification	MVTL Laboratory #
Dup 1	18-W1400
Field Blank (FB)	18-W1401
MW103	18-W1402
MW110	No sample
MW119	18-W1403
MW111	18-W1404
MW117	No sample
MW118	18-W1405
MW120	18-W1406
Dup 2	18-W1407
MW101	18-W1408
MW105	18-W1409
MW106	18-W1410
MW107	18-W1411
MW108	18-W1412
MW109	18-W1413
MW116	18-W1414
West Scrubber Pond	No sample
Sewage Lagoon	18-W1415
SP1	18-W1416
SP2	18-W1417

I. RECEIPT

- All samples were received at the laboratory on 31 May 2018 at 1608.
- Samples were collected and hand delivered by MVTL Field Service personnel to the laboratory.
- Samples were received on ice and evidence of cooling had begun.
  - Temperature of samples upon receipt was 1.0°C.
- All samples were properly preserved unless noted here and/or flagged on the individual analytical laboratory report.
- No other exceptions on sample receipt were encountered on this sample set unless noted here.

II. HOLDING TIMES

- With the exception of laboratory pH, all holding times were met for both preparation and analysis unless noted here.

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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CASE NARRATIVE – AMENDED 8 AUG 18 (Sample ID MW111, Field Data)

MVTL Lab Reference No/SDG:	**201882-1191**
Client:	**Montana Dakota Utilities**
Location:	**MDU Lewis & Clark**
Project Identification:	**CCR Spring 2018**
MVTL Laboratory Identifications:	**18-W1400 through 18-W1417**

III. METHODS

- Approved methodology was followed for all sample analyses.

IV. ANALYSIS

- All acceptance criteria was met for calibration, method blanks, laboratory control samples, laboratory fortified matrix/matrix duplicates unless noted here and/or flagged on the individual analytical laboratory report.
    - For some metals, the reported results were elevated due to instrument performance at the lower limit of quantitation (LLOQ).

V. REPORT

- Per email dated 26 Jul 18 from Terri Olson with Barr Engineering, the case narrative was amended to correct the sample identification for MW111. In addition, the field summary sheet and field letter were amended to correct errors.

All laboratory data has been approved by MVTL Laboratories.

SIGNED: Claudette Carroll **DATE:** 8 Aug 18

Claudette Carroll - MVTL Bismarck Laboratory Manager

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.

Claudette Carroll

From: Terri A. Olson <TOlson@barr.com>
Sent: Wednesday, August 08, 2018 1:36 PM
To: Claudette Carroll; Marshall, Samantha
Cc: Justin Soberaski
Subject: RE: 201882-1191 questions

Follow Up Flag: Follow up
Flag Status: Flagged

Hi Claudette,

Couple of items:

- I believe we will need a new EDD since the one well was listed as MW11 instead of MW111.
- The revised field report states that the duplicate was from MW106 instead of MW118 (see below). This is incorrect.

  insufficient recharge of the well to collect the full bottle set. A duplicate sample was also collected from well MW106, not MW118 which as stated in the Letter dated June 15, 2018.

  The previous narrative had stated this:
  so sampling could be conducted at a later date. Duplicate samples were collected from wells MW116 and 118. Samples collected were placed on ice and transported to MVTL

  My understanding is that there were two field duplicates – MW118 and either MW106 or MW116. Wanted to verify so the question sent previously was this: Field report states that duplicate samples were collected from wells MW116 and MW118; however, the raw data shows MW106 not MW116. Which is correct?

Let me know if you have questions.

Thank-you,

Terri A. Olson
Senior Data Quality Specialist
Minneapolis, MN office: 952.842.3578
TOlson@barr.com
www.barr.com

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From: Claudette Carroll <ccarroll@mvtl.com>
Sent: Wednesday, August 8, 2018 1:15 PM
To: Marshall, Samantha <Samantha.Marshall@mdu.com>
Cc: Terri A. Olson <TOlson@barr.com>; Justin Soberaski <JSoberaski@barr.com>
Subject: RE: 201882-1191 questions

Hi Sam,

Per Terri's email below, please find the amended data packages for this work order. EDDs are not being sent, since no data results were changed. Let me know if you have any questions.

Have a good rest of your day!

Claudette

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Providing Analytical Excellence Since 1951

ccarroll@mvtl.com
701-258-9720
2616 E. Broadway Ave/Bismarck, ND 58501

From: Terri A. Olson [mailto:TOlson@barr.com]
Sent: Thursday, July 26, 2018 9:51 AM
To: Claudette Carroll <ccarroll@mvtl.com>
Subject: Re: 201882-1191 questions

Hi Claudette,

Below are my questions/comments on report 201882-1191.

- Looks like metals were crossed off for MW108 but no information on raw data sheet or in field report narrative as to why.
- MW101 had total volume removed reported as 3,500 mL, should be 4,500 mL per raw data.
- MW106 had total volume removed reported as 5,000 mL, should be 5,500 mL per raw data.
- Field report states that duplicate samples were collected from wells MW116 and MW118; however, the raw data shows MW106 not MW116. Which is correct?
- Report lists MW11 but this should be MW111.

Thank-you,

Terri A. Olson
Senior Data Quality Specialist
Minneapolis, MN office: 952.842.3578
TOlson@barr.com
www.barr.com

resourceful. naturally. BARR

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Quality Control Report

Lab IDs: 18-W1400 to 18-W1417 **Project:** MDU Lewis & Clark CCR **Work Order:** 201882-1191

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	104	80-120	0.400	18W1408q	< 0.001	0.4046	101	75-125	0.4046	0.4202	105	3.8	20	-	-	< 0.001
				0.100	18W1417q	< 0.001	0.1020	102	75-125	0.1020	0.1044	104	2.3	20	-	-	
Arsenic - Total mg/l	0.1000	98 Ā	80-120	0.400	18W1408q	< 0.002	0.4094	102	75-125	0.4094	0.4368	109	6.5	20	-	-	< 0.002
				0.100	18W1417q	0.0052	0.1094	104	75-125	0.1094	0.1070	102	2.2	20	-	-	
Barium - Total mg/l	0.1000	99	80-120	0.400	18W1408q	0.0286	0.4312	101	75-125	0.4312	0.4498	105	4.2	20	-	-	< 0.002
				0.100	18W1417q	0.0983	0.2012	103	75-125	0.2012	0.2016	103	0.2	20	-	-	
Beryllium - Total mg/l	0.1000	98	80-120	0.400	18W1408q	< 0.0005	0.3582	90	75-125	0.3582	0.3530	88	1.5	20	-	-	< 0.0005
				0.100	18W1417q	< 0.0005	0.1056	106	75-125	0.1056	0.1066	107	0.9	20	-	-	
Boron - Total mg/l	0.40	110	80-120	4.00	18-W1406	2.87	6.92	101	75-125	6.92	7.14	107	3.1	20	-	-	< 0.1
	0.40	110	80-120	0.400	18-W1408	0.35	0.78	108	75-125	0.78	0.79	110	1.3	20	-	-	< 0.1
				0.400	18-W1411	0.19	0.57	95	75-125	0.57	0.57	95	0.0	20	-	-	< 0.1
															-	-	< 0.1
Cadmium - Total mg/l	0.1000	101	80-120	0.400	18W1408q	< 0.0005	0.4078	102	75-125	0.4078	0.4108	103	0.7	20	-	-	< 0.0005
				0.100	18W1417q	< 0.0005	0.1045	104	75-125	0.1045	0.1079	108	3.2	20	-	-	
Calcium - Total mg/l	20.0	106	80-120	100	18W1403q	92.2	182	90	75-125	182	181	89	0.6	20	-	-	< 1
	20.0	108	80-120	100	18W1408q	107	193	86	75-125	193	201	94	4.1	20	-	-	< 1
	20.0	110	80-120	100	18D2123q	87.8	186	98	75-125	186	185	97	0.5	20	-	-	< 1
	20.0	110	80-120	500	18W1281q	304	830	105	75-125	830	825	104	0.6	20	-	-	< 1
	20.0	110	80-120	100	18W1416q	55.0	150	95	75-125	150	151	96	0.7	20	-	-	< 1
	20.0	108	80-120												-	-	< 1
															-	-	< 1
															-	-	< 1
															-	-	< 1
															-	-	< 1
Chloride mg/l	30.0	98	80-120	30.0	18-W1382	37.2	68.5	104	80-120	68.5	68.6	105	0.1	20	-	-	< 1
	30.0	99	80-120	30.0	18-W1405	25.7	55.7	100	80-120	55.7	57.3	105	2.8	20	-	-	< 1
	30.0	96	80-120												-	-	< 1
	30.0	97	80-120												-	-	< 1
Chromium - Total mg/l	0.1000	97	80-120	0.400	18W1408q	< 0.002	0.3972	99	75-125	0.3972	0.4094	102	3.0	20	-	-	< 0.002
				0.100	18W1417q	0.0047	0.1109	106	75-125	0.1109	0.1105	106	0.4	20	-	-	

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Quality Control Report

Lab IDs: 18-W1400 to 18-W1417 **Project:** MDU Lewis & Clark CCR **Work Order:** 201882-1191

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
Cobalt - Total mg/l	0.1000	100	80-120	0.400 0.100	18W1408q 18W1417q	< 0.002 < 0.002	0.4028 0.1080	101 108	75-125 75-125	0.4028 0.1080	0.4060 0.1070	102 107	0.8 0.9	20 20	- -	- -	< 0.002
Fluoride mg/l	0.50 0.50	106 102	90-110 90-110	0.500 0.500 0.500 0.500	18-W1391 18-W1405 18-W1408 18-W1419	0.37 1.12 0.37 0.53	0.90 1.57 0.92 1.08	106 90 110 110	80-120 80-120 80-120 80-120	0.90 1.57 0.92 1.08	0.91 1.63 0.93 1.09	108 102 112 112	1.1 3.7 1.1 0.9	20 20 20 20	- - - -	- - - -	< 0.1 < 0.1 < 0.1 < 0.1
Lead - Total mg/l	0.1000	98	80-120	0.400 0.100	18W1408q 18W1417q	< 0.0005 0.0025	0.3792 0.1008	95 98	75-125 75-125	0.3792 0.1008	0.3972 0.0996	99 97	4.6 1.2	20 20	- -	- -	< 0.0005
Lithium - Total mg/l	0.40 0.40	108 108	80-120 80-120	0.400 0.400	18-W1408 18-W1417	< 0.1 < 0.1	0.45 0.40	112 100	75-125 75-125	0.45 0.40	0.46 0.41	115 102	2.2 2.5	20 20	- - - -	- - - -	< 0.1 < 0.1 < 0.1 < 0.1
Mercury - Total mg/l	0.0020 0.0020	90 105	85-115 85-115	0.002 0.002 0.002 0.002	18-W1390 18-W1404 18-W1410 18-W1417	< 0.0002 < 0.0002 < 0.0002 < 0.0002	0.0019 0.0020 0.0019 0.0022	95 100 95 110	70-130 70-130 70-130 70-130	0.0019 0.0020 0.0019 0.0022	0.0019 0.0017 0.0019 0.0022	95 85 95 110	0.0 16.2 0.0 0.0	20 20 20 20	- - - -	- - - -	< 0.0002 < 0.0002
Molybdenum - Total mg/l	0.1000	104	80-120	0.400 0.100	18W1408q 18W1417q	< 0.005 < 0.005	0.4090 0.1124	102 112	75-125 75-125	0.4090 0.1124	0.4276 0.1130	107 113	4.4 0.5	20 20	- -	- -	< 0.002
pH units	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	7.6 8.0 8.3 7.6	7.6 8.0 8.3 7.6	- - - -	0.0 0.0 0.0 0.0	20 20 20 20	- - - -	- - - -	- - - -
Selenium - Total mg/l	0.1000	96	80-120	0.400 0.100	18W1408q 18W1417q	< 0.005 < 0.005	0.4008 0.0986	100 99	75-125 75-125	0.4008 0.0986	0.4294 0.1034	107 103	6.9 4.8	20 20	- -	- -	< 0.005

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Quality Control Report

Lab IDs: 18-W1400 to 18-W1417 **Project:** MDU Lewis & Clark CCR **Work Order:** 201882-1191

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
Sulfate mg/l	100	94	80-120	100	18-W1393	< 5	105	105	80-120	105	103	103	1.9	20	-	-	< 5
	100	107	80-120	200	18-W1408	336	558	111	80-120	558	560	112	0.4	20	-	-	< 5
	100	108	80-120	100	18-W1401	< 5	107	107	80-120	107	106	106	0.9	20	-	-	< 5
	100	112	80-120	200	18-W1417	182	384	101	80-120	384	387	102	0.8	20	-	-	< 5
Thallium - Total mg/l	0.1000	98	80-120	0.400	18W1408q	< 0.0005	0.3812	95	75-125	0.3812	0.3996	100	4.7	20	-	-	< 0.0005
				0.100	18W1417q	< 0.0005	0.0990	99	75-125	0.0990	0.0982	98	0.8	20	-	-	
Total Dissolved Solids mg/l	-	-	-	-	-	-	-	-	-	512	516	-	0.8	20	-	-	< 10

Approved by: C. Carlo
28 Jun 18

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CERTIFICATE of ANALYSIS - CCR

Samantha Marshall
Montana Dakota Utilities
5181 Southgate Dr
Billings MT 59102

Report Date: 28 Jun 18
Lab Number: 18-W1400
Work Order #: 82-1191
Account #: 002800
Date Sampled: 30 May 18
Date Received: 31 May 18 16:08
Sampled By: MVTL Field Services

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

Temp at Receipt: 1.0C

Event and Year: Spring 2018

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
pH	* 8.0	units	0.1	SM4500 H+ B	1 Jun 18 18:00	SVS
Fluoride	1.12	mg/l	0.10	SM4500-F-C	5 Jun 18 18:00	SVS
Sulfate	466	mg/l	5.00	ASTM D516-07	7 Jun 18 14:26	EMS
Chloride	25.9	mg/l	1.0	SM4500-Cl-E	31 May 18 16:43	RAG
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	5 Jun 18 12:32	EV
Total Dissolved Solids	1090	mg/l	10	I1750-85	1 Jun 18 8:55	SVS
Calcium - Total	76.3	mg/l	1.0	6010D	12 Jun 18 14:20	SZ
Lithium - Total	< 0.1	mg/l	0.10	6010D	13 Jun 18 9:10	SZ
Boron - Total	1.62	mg/l	0.10	6010D	14 Jun 18 14:14	SZ
Antimony - Total	< 0.001	mg/l	0.0010	6020B	12 Jun 18 11:39	BT
Arsenic - Total	< 0.002	mg/l	0.0020	6020B	12 Jun 18 11:39	BT
Barium - Total	0.0248	mg/l	0.0020	6020B	12 Jun 18 11:39	BT
Beryllium - Total	< 0.0005	mg/l	0.0005	6020B	12 Jun 18 11:39	BT
Cadmium - Total	< 0.0005	mg/l	0.0005	6020B	12 Jun 18 11:39	BT
Chromium - Total	0.0023	mg/l	0.0020	6020B	12 Jun 18 11:39	BT
Cobalt - Total	< 0.002	mg/l	0.0020	6020B	12 Jun 18 11:39	BT
Lead - Total	< 0.0005	mg/l	0.0005	6020B	12 Jun 18 11:39	BT
Molybdenum - Total	0.0390	mg/l	0.0020	6020B	12 Jun 18 11:39	BT
Selenium - Total	0.0590	mg/l	0.0050	6020B	12 Jun 18 11:39	BT
Thallium - Total	< 0.0005	mg/l	0.0005	6020B	12 Jun 18 11:39	BT

* Holding time exceeded

Approved by: Claudette K. Carroll cc 28 Jun 18

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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CERTIFICATE of ANALYSIS - CCR

Samantha Marshall
Montana Dakota Utilities
5181 Southgate Dr
Billings MT 59102

Report Date: 28 Jun 18
Lab Number: 18-W1401
Work Order #: 82-1191
Account #: 002800
Date Sampled: 30 May 18
Date Received: 31 May 18 16:08
Sampled By: MVTL Field Services

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

Temp at Receipt: 1.0C

Event and Year: Spring 2018

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
pH	* 6.8	units	0.1	SM4500 H+ B	1 Jun 18 18:00	SVS
Fluoride	< 0.1	mg/l	0.10	SM4500-F-C	5 Jun 18 18:00	SVS
Sulfate	< 5	mg/l	5.00	ASTM D516-07	15 Jun 18 9:16	EMS
Chloride	< 1	mg/l	1.0	SM4500-Cl-E	31 May 18 16:43	RAG
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	5 Jun 18 12:32	EV
Total Dissolved Solids	< 10	mg/l	10	I1750-85	1 Jun 18 8:55	SVS
Calcium - Total	< 1	mg/l	1.0	6010D	12 Jun 18 14:20	SZ
Lithium - Total	< 0.1	mg/l	0.10	6010D	13 Jun 18 9:10	SZ
Boron - Total	< 0.1	mg/l	0.10	6010D	14 Jun 18 14:14	SZ
Antimony - Total	< 0.001	mg/l	0.0010	6020B	12 Jun 18 11:39	BT
Arsenic - Total	< 0.002	mg/l	0.0020	6020B	12 Jun 18 11:39	BT
Barium - Total	< 0.002	mg/l	0.0020	6020B	12 Jun 18 11:39	BT
Beryllium - Total	< 0.0005	mg/l	0.0005	6020B	12 Jun 18 11:39	BT
Cadmium - Total	< 0.0005	mg/l	0.0005	6020B	12 Jun 18 11:39	BT
Chromium - Total	< 0.002	mg/l	0.0020	6020B	12 Jun 18 11:39	BT
Cobalt - Total	< 0.002	mg/l	0.0020	6020B	12 Jun 18 11:39	BT
Lead - Total	< 0.0005	mg/l	0.0005	6020B	12 Jun 18 11:39	BT
Molybdenum - Total	< 0.005 ^	mg/l	0.0020	6020B	12 Jun 18 11:39	BT
Selenium - Total	< 0.005	mg/l	0.0050	6020B	12 Jun 18 11:39	BT
Thallium - Total	< 0.0005	mg/l	0.0005	6020B	12 Jun 18 11:39	BT

* Holding time exceeded

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

Approved by: Claudette K. Carroll 28 Jun 18

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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CERTIFICATE of ANALYSIS - CCR

Samantha Marshall
Montana Dakota Utilities
5181 Southgate Dr
Billings MT 59102

Report Date: 28 Jun 18
Lab Number: 18-W1402
Work Order #: 82-1191
Account #: 002800
Date Sampled: 29 May 18 14:54
Date Received: 31 May 18 16:08
Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark
Sample Description: MW103

Temp at Receipt: 1.0C

Event and Year: Spring 2018

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	7.33	units	NA	SM 4500 H+ B	29 May 18 14:54	DJN
pH	* 8.0	units	0.1	SM4500 H+ B	1 Jun 18 18:00	SVS
Temperature - Field	12.8	Degrees C	NA	SM 2550B	29 May 18 14:54	DJN
Conductivity - Field	1476	umhos/cm	1	EPA 120.1	29 May 18 14:54	DJN
Fluoride	0.79	mg/l	0.10	SM4500-F-C	5 Jun 18 18:00	SVS
Sulfate	386	mg/l	5.00	ASTM D516-07	7 Jun 18 14:26	EMS
Chloride	28.2	mg/l	1.0	SM4500-Cl-E	31 May 18 16:43	RAG
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	5 Jun 18 12:32	EV
Total Dissolved Solids	1040	mg/l	10	I1750-85	1 Jun 18 8:55	SVS
Calcium - Total	84.8	mg/l	1.0	6010D	12 Jun 18 14:20	SZ
Lithium - Total	< 0.1	mg/l	0.10	6010D	13 Jun 18 9:10	SZ
Boron - Total	1.32	mg/l	0.10	6010D	14 Jun 18 14:14	SZ
Antimony - Total	0.0076	mg/l	0.0010	6020B	12 Jun 18 11:39	BT
Arsenic - Total	0.0028	mg/l	0.0020	6020B	12 Jun 18 11:39	BT
Barium - Total	0.0373	mg/l	0.0020	6020B	12 Jun 18 11:39	BT
Beryllium - Total	< 0.0005	mg/l	0.0005	6020B	12 Jun 18 11:39	BT
Cadmium - Total	< 0.0005	mg/l	0.0005	6020B	12 Jun 18 11:39	BT
Chromium - Total	< 0.002	mg/l	0.0020	6020B	12 Jun 18 11:39	BT
Cobalt - Total	0.0073	mg/l	0.0020	6020B	12 Jun 18 11:39	BT
Lead - Total	< 0.0005	mg/l	0.0005	6020B	12 Jun 18 11:39	BT
Molybdenum - Total	0.0267	mg/l	0.0020	6020B	12 Jun 18 11:39	BT
Selenium - Total	0.0446	mg/l	0.0050	6020B	12 Jun 18 11:39	BT
Thallium - Total	< 0.0005	mg/l	0.0005	6020B	12 Jun 18 11:39	BT

* Holding time exceeded

CC

Approved by: Claudette K. Carrep 28Jun18

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

Samantha Marshall
Montana Dakota Utilities
5181 Southgate Dr
Billings MT 59102

Report Date: 28 Jun 18
Lab Number: 18-W1403
Work Order #: 82-1191
Account #: 002800
Date Sampled: 29 May 18 12:58
Date Received: 31 May 18 16:08
Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark
Sample Description: MW119

Temp at Receipt: 1.0C

Event and Year: Spring 2018

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	7.34	units	NA	SM 4500 H+ B	29 May 18 12:58	DJN
pH	* 8.0	units	0.1	SM4500 H+ B	1 Jun 18 18:00	SVS
Temperature - Field	10.6	Degrees C	NA	SM 2550B	29 May 18 12:58	DJN
Conductivity - Field	1118	umhos/cm	1	EPA 120.1	29 May 18 12:58	DJN
Fluoride	0.43	mg/l	0.10	SM4500-F-C	5 Jun 18 18:00	SVS
Sulfate	193	mg/l	5.00	ASTM D516-07	7 Jun 18 14:26	EMS
Chloride	26.5	mg/l	1.0	SM4500-Cl-E	31 May 18 16:43	RAG
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	5 Jun 18 12:32	EV
Total Dissolved Solids	714	mg/l	10	I1750-85	1 Jun 18 8:55	SVS
Calcium - Total	92.2	mg/l	1.0	6010D	12 Jun 18 14:20	SZ
Lithium - Total	< 0.1	mg/l	0.10	6010D	13 Jun 18 9:10	SZ
Boron - Total	0.22	mg/l	0.10	6010D	14 Jun 18 14:14	SZ
Antimony - Total	< 0.001	mg/l	0.0010	6020B	12 Jun 18 11:39	BT
Arsenic - Total	< 0.002	mg/l	0.0020	6020B	12 Jun 18 11:39	BT
Barium - Total	0.0324	mg/l	0.0020	6020B	12 Jun 18 11:39	BT
Beryllium - Total	< 0.0005	mg/l	0.0005	6020B	12 Jun 18 11:39	BT
Cadmium - Total	< 0.0005	mg/l	0.0005	6020B	12 Jun 18 11:39	BT
Chromium - Total	< 0.002	mg/l	0.0020	6020B	12 Jun 18 11:39	BT
Cobalt - Total	< 0.002	mg/l	0.0020	6020B	12 Jun 18 11:39	BT
Lead - Total	< 0.0005	mg/l	0.0005	6020B	12 Jun 18 11:39	BT
Molybdenum - Total	< 0.005 ^	mg/l	0.0020	6020B	12 Jun 18 11:39	BT
Selenium - Total	< 0.005	mg/l	0.0050	6020B	12 Jun 18 11:39	BT
Thallium - Total	< 0.0005	mg/l	0.0005	6020B	12 Jun 18 11:39	BT

* Holding time exceeded

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

Approved by: Claudette K Carroll 28 Jun 18

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

Samantha Marshall
Montana Dakota Utilities
5181 Southgate Dr
Billings MT 59102

Report Date: 28 Jun 18
Lab Number: 18-W1404
Work Order #: 82-1191
Account #: 002800
Date Sampled: 29 May 18 17:29
Date Received: 31 May 18 16:08
Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark
Sample Description: MW111

Temp at Receipt: 1.0C

Event and Year: Spring 2018

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	7.24	units	NA	SM 4500 H+ B	29 May 18 17:29	DJN
pH	* 7.9	units	0.1	SM4500 H+ B	1 Jun 18 18:00	SVS
Temperature - Field	12.7	Degrees C	NA	SM 2550B	29 May 18 17:29	DJN
Conductivity - Field	2997	umhos/cm	1	EPA 120.1	29 May 18 17:29	DJN
Fluoride	2.10	mg/l	0.10	SM4500-F-C	5 Jun 18 18:00	SVS
Sulfate	1890	mg/l	5.00	ASTM D516-07	7 Jun 18 15:54	EMS
Chloride	32.7	mg/l	1.0	SM4500-Cl-E	31 May 18 16:43	RAG
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	5 Jun 18 12:32	EV
Total Dissolved Solids	2730	mg/l	10	I1750-85	1 Jun 18 8:55	SVS
Calcium - Total	150	mg/l	1.0	6010D	12 Jun 18 15:20	SZ
Lithium - Total	0.15	mg/l	0.10	6010D	13 Jun 18 9:10	SZ
Boron - Total	6.06	mg/l	0.10	6010D	14 Jun 18 14:14	SZ
Antimony - Total	< 0.001	mg/l	0.0010	6020B	12 Jun 18 11:39	BT
Arsenic - Total	< 0.002	mg/l	0.0020	6020B	12 Jun 18 11:39	BT
Barium - Total	0.0170	mg/l	0.0020	6020B	12 Jun 18 11:39	BT
Beryllium - Total	< 0.0005	mg/l	0.0005	6020B	12 Jun 18 11:39	BT
Cadmium - Total	< 0.0005	mg/l	0.0005	6020B	12 Jun 18 11:39	BT
Chromium - Total	< 0.002	mg/l	0.0020	6020B	12 Jun 18 11:39	BT
Cobalt - Total	< 0.002	mg/l	0.0020	6020B	12 Jun 18 11:39	BT
Lead - Total	< 0.0005	mg/l	0.0005	6020B	12 Jun 18 11:39	BT
Molybdenum - Total	0.0616	mg/l	0.0020	6020B	12 Jun 18 11:39	BT
Selenium - Total	0.0596	mg/l	0.0050	6020B	12 Jun 18 11:39	BT
Thallium - Total	< 0.0005	mg/l	0.0005	6020B	12 Jun 18 11:39	BT

* Holding time exceeded

Approved by: Claudette K Carrep CC 28 Jun 18

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

Samantha Marshall
Montana Dakota Utilities
5181 Southgate Dr
Billings MT 59102

Report Date: 28 Jun 18
Lab Number: 18-W1405
Work Order #: 82-1191
Account #: 002800
Date Sampled: 30 May 18 8:35
Date Received: 31 May 18 16:08
Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark
Sample Description: MW118

Temp at Receipt: 1.0C

Event and Year: Spring 2018

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	7.45	units	NA	SM 4500 H+ B	30 May 18 8:35	DJN
pH	* 8.1	units	0.1	SM4500 H+ B	1 Jun 18 18:00	SVS
Temperature - Field	12.8	Degrees C	NA	SM 2550B	30 May 18 8:35	DJN
Conductivity - Field	1574	umhos/cm	1	EPA 120.1	30 May 18 8:35	DJN
Fluoride	1.12	mg/l	0.10	SM4500-F-C	5 Jun 18 18:00	SVS
Sulfate	551	mg/l	5.00	ASTM D516-07	7 Jun 18 15:54	EMS
Chloride	25.7	mg/l	1.0	SM4500-Cl-E	31 May 18 17:20	RAG
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	6 Jun 18 11:27	EV
Total Dissolved Solids	1100	mg/l	10	I1750-85	1 Jun 18 8:55	SVS
Calcium - Total	78.0	mg/l	1.0	6010D	12 Jun 18 15:20	SZ
Lithium - Total	< 0.1	mg/l	0.10	6010D	13 Jun 18 9:10	SZ
Boron - Total	1.63	mg/l	0.10	6010D	14 Jun 18 14:14	SZ
Antimony - Total	< 0.001	mg/l	0.0010	6020B	12 Jun 18 11:39	BT
Arsenic - Total	0.0021	mg/l	0.0020	6020B	12 Jun 18 11:39	BT
Barium - Total	0.0236	mg/l	0.0020	6020B	12 Jun 18 11:39	BT
Beryllium - Total	< 0.0005	mg/l	0.0005	6020B	12 Jun 18 11:39	BT
Cadmium - Total	< 0.0005	mg/l	0.0005	6020B	12 Jun 18 11:39	BT
Chromium - Total	0.0024	mg/l	0.0020	6020B	12 Jun 18 11:39	BT
Cobalt - Total	< 0.002	mg/l	0.0020	6020B	12 Jun 18 11:39	BT
Lead - Total	< 0.0005	mg/l	0.0005	6020B	12 Jun 18 11:39	BT
Molybdenum - Total	0.0397	mg/l	0.0020	6020B	12 Jun 18 11:39	BT
Selenium - Total	0.0577	mg/l	0.0050	6020B	12 Jun 18 11:39	BT
Thallium - Total	< 0.0005	mg/l	0.0005	6020B	12 Jun 18 11:39	BT

* Holding time exceeded

Approved by: Claudette K. Carroll 28 Jun 18

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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1201 Lincoln Hwy. ~ Nevada, IA 50201 ~ 800-362-0855 ~ Fax 515-382-3885
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CERTIFICATE of ANALYSIS - CCR

Samantha Marshall
Montana Dakota Utilities
5181 Southgate Dr
Billings MT 59102

Report Date: 28 Jun 18
Lab Number: 18-W1406
Work Order #: 82-1191
Account #: 002800
Date Sampled: 29 May 18 19:14
Date Received: 31 May 18 16:08
Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark
Sample Description: MW120

Temp at Receipt: 1.0C

Event and Year: Spring 2018

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	6.88	units	NA	SM 4500 H+ B	29 May 18 19:14	DJN
pH	* 7.7	units	0.1	SM4500 H+ B	1 Jun 18 18:00	SVS
Temperature - Field	9.89	Degrees C	NA	SM 2550B	29 May 18 19:14	DJN
Conductivity - Field	3761	umhos/cm	1	EPA 120.1	29 May 18 19:14	DJN
Fluoride	0.42	mg/l	0.10	SM4500-F-C	5 Jun 18 18:00	SVS
Sulfate	2450	mg/l	5.00	ASTM D516-07	7 Jun 18 15:54	EMS
Chloride	31.5	mg/l	1.0	SM4500-Cl-E	31 May 18 17:20	RAG
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	6 Jun 18 11:27	EV
Total Dissolved Solids	3560	mg/l	10	I1750-85	1 Jun 18 8:55	SVS
Calcium - Total	293	mg/l	1.0	6010D	12 Jun 18 15:20	SZ
Lithium - Total	< 0.1	mg/l	0.10	6010D	13 Jun 18 9:10	SZ
Boron - Total	2.87	mg/l	0.10	6010D	14 Jun 18 14:14	SZ
Antimony - Total	< 0.001	mg/l	0.0010	6020B	12 Jun 18 11:39	BT
Arsenic - Total	< 0.002	mg/l	0.0020	6020B	12 Jun 18 11:39	BT
Barium - Total	0.0422	mg/l	0.0020	6020B	12 Jun 18 11:39	BT
Beryllium - Total	< 0.0005	mg/l	0.0005	6020B	12 Jun 18 11:39	BT
Cadmium - Total	< 0.0005	mg/l	0.0005	6020B	12 Jun 18 11:39	BT
Chromium - Total	< 0.002	mg/l	0.0020	6020B	12 Jun 18 11:39	BT
Cobalt - Total	< 0.002	mg/l	0.0020	6020B	12 Jun 18 11:39	BT
Lead - Total	< 0.0005	mg/l	0.0005	6020B	12 Jun 18 11:39	BT
Molybdenum - Total	< 0.005 ^	mg/l	0.0020	6020B	12 Jun 18 11:39	BT
Selenium - Total	< 0.005	mg/l	0.0050	6020B	12 Jun 18 11:39	BT
Thallium - Total	< 0.0005	mg/l	0.0005	6020B	12 Jun 18 11:39	BT

* Holding time exceeded

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

Approved by: Claudette K Carrep 28 Jun 18

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

CERTIFICATE of ANALYSIS - CCR

Samantha Marshall
Montana Dakota Utilities
5181 Southgate Dr
Billings MT 59102

Report Date: 28 Jun 18
Lab Number: 18-W1407
Work Order #: 82-1191
Account #: 002800
Date Sampled: 30 May 18
Date Received: 31 May 18 16:08
Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark
Sample Description: Dup2

Temp at Receipt: 1.0C

Event and Year: Spring 2018

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
pH	* 8.0	units	0.1	SM4500 H+ B	1 Jun 18 18:00	SVS
Fluoride	2.04	mg/l	0.10	SM4500-F-C	5 Jun 18 18:00	SVS
Sulfate	1400	mg/l	5.00	ASTM D516-07	7 Jun 18 15:54	EMS
Chloride	32.8	mg/l	1.0	SM4500-Cl-E	31 May 18 17:20	RAG
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	6 Jun 18 11:27	EV
Total Dissolved Solids	2330	mg/l	10	I1750-85	1 Jun 18 8:55	SVS
Calcium - Total	130	mg/l	1.0	6010D	12 Jun 18 15:20	SZ
Lithium - Total	0.14	mg/l	0.10	6010D	13 Jun 18 9:10	SZ
Boron - Total	5.16	mg/l	0.10	6010D	14 Jun 18 14:14	SZ
Antimony - Total	< 0.001	mg/l	0.0010	6020B	12 Jun 18 11:39	BT
Arsenic - Total	< 0.002	mg/l	0.0020	6020B	12 Jun 18 11:39	BT
Barium - Total	0.0332	mg/l	0.0020	6020B	12 Jun 18 11:39	BT
Beryllium - Total	< 0.0005	mg/l	0.0005	6020B	12 Jun 18 11:39	BT
Cadmium - Total	< 0.0005	mg/l	0.0005	6020B	12 Jun 18 11:39	BT
Chromium - Total	< 0.002	mg/l	0.0020	6020B	12 Jun 18 11:39	BT
Cobalt - Total	< 0.002	mg/l	0.0020	6020B	12 Jun 18 11:39	BT
Lead - Total	< 0.0005	mg/l	0.0005	6020B	12 Jun 18 11:39	BT
Molybdenum - Total	0.0592	mg/l	0.0020	6020B	12 Jun 18 11:39	BT
Selenium - Total	0.0721	mg/l	0.0050	6020B	12 Jun 18 11:39	BT
Thallium - Total	< 0.0005	mg/l	0.0005	6020B	12 Jun 18 11:39	BT

* Holding time exceeded

CC

Approved by: Claudette K. Carroll 28 Jun 18

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

Samantha Marshall
Montana Dakota Utilities
5181 Southgate Dr
Billings MT 59102

Report Date: 28 Jun 18
Lab Number: 18-W1408
Work Order #: 82-1191
Account #: 002800
Date Sampled: 30 May 18 14:16
Date Received: 31 May 18 16:08
Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark
Sample Description: MW101

Temp at Receipt: 1.0C

Event and Year: Spring 2018

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	7.39	units	NA	SM 4500 H+ B	30 May 18 14:16	DJN
pH	* 7.8	units	0.1	SM4500 H+ B	6 Jun 18 17:00	SVS
Temperature - Field	14.9	Degrees C	NA	SM 2550B	30 May 18 14:16	DJN
Conductivity - Field	1266	umhos/cm	1	EPA 120.1	30 May 18 14:16	DJN
Fluoride	0.37	mg/l	0.10	SM4500-F-C	6 Jun 18 17:00	SVS
Sulfate	336	mg/l	5.00	ASTM D516-07	7 Jun 18 15:54	EMS
Chloride	24.9	mg/l	1.0	SM4500-Cl-E	31 May 18 17:20	RAG
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	6 Jun 18 11:27	EV
Total Dissolved Solids	832	mg/l	10	I1750-85	1 Jun 18 8:55	SVS
Calcium - Total	107	mg/l	1.0	6010D	12 Jun 18 15:20	SZ
Lithium - Total	< 0.1	mg/l	0.10	6010D	13 Jun 18 9:10	SZ
Boron - Total	0.35	mg/l	0.10	6010D	14 Jun 18 15:14	SZ
Antimony - Total	< 0.001	mg/l	0.0010	6020B	12 Jun 18 11:39	BT
Arsenic - Total	< 0.002	mg/l	0.0020	6020B	12 Jun 18 11:39	BT
Barium - Total	0.0286	mg/l	0.0020	6020B	12 Jun 18 11:39	BT
Beryllium - Total	< 0.0005	mg/l	0.0005	6020B	12 Jun 18 11:39	BT
Cadmium - Total	< 0.0005	mg/l	0.0005	6020B	12 Jun 18 11:39	BT
Chromium - Total	< 0.002	mg/l	0.0020	6020B	12 Jun 18 11:39	BT
Cobalt - Total	< 0.002	mg/l	0.0020	6020B	12 Jun 18 11:39	BT
Lead - Total	< 0.0005	mg/l	0.0005	6020B	12 Jun 18 11:39	BT
Molybdenum - Total	< 0.005 ^	mg/l	0.0020	6020B	12 Jun 18 11:39	BT
Selenium - Total	< 0.005	mg/l	0.0050	6020B	12 Jun 18 11:39	BT
Thallium - Total	< 0.0005	mg/l	0.0005	6020B	12 Jun 18 11:39	BT

* Holding time exceeded

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

Approved by: Claudette K Carroll 28 Jun 18

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

Samantha Marshall
Montana Dakota Utilities
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Billings MT 59102

Report Date: 28 Jun 18
Lab Number: 18-W1409
Work Order #: 82-1191
Account #: 002800
Date Sampled: 30 May 18 17:27
Date Received: 31 May 18 16:08
Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark
Sample Description: MW105

Temp at Receipt: 1.0C

Event and Year: Spring 2018

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	7.32	units	NA	SM 4500 H+ B	30 May 18 17:27	DJN
pH	* 7.7	units	0.1	SM4500 H+ B	6 Jun 18 17:00	SVS
Temperature - Field	11.8	Degrees C	NA	SM 2550B	30 May 18 17:27	DJN
Conductivity - Field	1644	umhos/cm	1	EPA 120.1	30 May 18 17:27	DJN
Fluoride	0.73	mg/l	0.10	SM4500-F-C	6 Jun 18 17:00	SVS
Sulfate	686	mg/l	5.00	ASTM D516-07	7 Jun 18 15:54	EMS
Chloride	26.0	mg/l	1.0	SM4500-Cl-E	31 May 18 17:20	RAG
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	6 Jun 18 11:27	EV
Total Dissolved Solids	1180	mg/l	10	I1750-85	1 Jun 18 8:55	SVS
Calcium - Total	96.0	mg/l	1.0	6010D	12 Jun 18 15:20	SZ
Lithium - Total	< 0.1	mg/l	0.10	6010D	13 Jun 18 9:10	SZ
Boron - Total	1.78	mg/l	0.10	6010D	14 Jun 18 15:14	SZ
Antimony - Total	0.0014	mg/l	0.0010	6020B	12 Jun 18 11:39	BT
Arsenic - Total	0.0021	mg/l	0.0020	6020B	12 Jun 18 11:39	BT
Barium - Total	0.0235	mg/l	0.0020	6020B	12 Jun 18 11:39	BT
Beryllium - Total	< 0.0005	mg/l	0.0005	6020B	12 Jun 18 11:39	BT
Cadmium - Total	< 0.0005	mg/l	0.0005	6020B	12 Jun 18 11:39	BT
Chromium - Total	< 0.002	mg/l	0.0020	6020B	12 Jun 18 11:39	BT
Cobalt - Total	< 0.002	mg/l	0.0020	6020B	12 Jun 18 11:39	BT
Lead - Total	< 0.0005	mg/l	0.0005	6020B	12 Jun 18 11:39	BT
Molybdenum - Total	0.0236	mg/l	0.0020	6020B	12 Jun 18 11:39	BT
Selenium - Total	0.0414	mg/l	0.0050	6020B	12 Jun 18 11:39	BT
Thallium - Total	< 0.0005	mg/l	0.0005	6020B	12 Jun 18 11:39	BT

* Holding time exceeded

CC
Approved by: Claudette K Carroll 28 Jun 18

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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CERTIFICATE of ANALYSIS - CCR

Samantha Marshall
Montana Dakota Utilities
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Billings MT 59102

Report Date: 28 Jun 18
Lab Number: 18-W1410
Work Order #: 82-1191
Account #: 002800
Date Sampled: 30 May 18 18:58
Date Received: 31 May 18 16:08
Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark
Sample Description: MW106

Temp at Receipt: 1.0C

Event and Year: Spring 2018

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	7.42	units	NA	SM 4500 H+ B	30 May 18 18:58	DJN
pH	* 7.7	units	0.1	SM4500 H+ B	6 Jun 18 17:00	SVS
Temperature - Field	13.8	Degrees C	NA	SM 2550B	30 May 18 18:58	DJN
Conductivity - Field	2669	umhos/cm	1	EPA 120.1	30 May 18 18:58	DJN
Fluoride	1.87	mg/l	0.10	SM4500-F-C	6 Jun 18 17:00	SVS
Sulfate	1450	mg/l	5.00	ASTM D516-07	7 Jun 18 15:54	EMS
Chloride	33.1	mg/l	1.0	SM4500-Cl-E	31 May 18 17:20	RAG
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	6 Jun 18 11:27	EV
Total Dissolved Solids	2270	mg/l	10	I1750-85	1 Jun 18 8:55	SVS
Calcium - Total	129	mg/l	1.0	6010D	12 Jun 18 15:20	SZ
Lithium - Total	0.14	mg/l	0.10	6010D	13 Jun 18 10:10	SZ
Boron - Total	4.92	mg/l	0.10	6010D	14 Jun 18 15:14	SZ
Antimony - Total	< 0.001	mg/l	0.0010	6020B	12 Jun 18 11:39	BT
Arsenic - Total	< 0.002	mg/l	0.0020	6020B	12 Jun 18 11:39	BT
Barium - Total	0.0294	mg/l	0.0020	6020B	12 Jun 18 11:39	BT
Beryllium - Total	< 0.0005	mg/l	0.0005	6020B	12 Jun 18 11:39	BT
Cadmium - Total	< 0.0005	mg/l	0.0005	6020B	12 Jun 18 11:39	BT
Chromium - Total	< 0.002	mg/l	0.0020	6020B	12 Jun 18 11:39	BT
Cobalt - Total	< 0.002	mg/l	0.0020	6020B	12 Jun 18 11:39	BT
Lead - Total	< 0.0005	mg/l	0.0005	6020B	12 Jun 18 11:39	BT
Molybdenum - Total	0.0576	mg/l	0.0020	6020B	12 Jun 18 11:39	BT
Selenium - Total	0.0734	mg/l	0.0050	6020B	12 Jun 18 11:39	BT
Thallium - Total	< 0.0005	mg/l	0.0005	6020B	12 Jun 18 11:39	BT

* Holding time exceeded

Approved by: Claudette K. Carroll 28 Jun 18

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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www.mvtl.com
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CERTIFICATE of ANALYSIS - CCR

Samantha Marshall
Montana Dakota Utilities
5181 Southgate Dr
Billings MT 59102

Report Date: 28 Jun 18
Lab Number: 18-W1411
Work Order #: 82-1191
Account #: 002800
Date Sampled: 30 May 18 12:55
Date Received: 31 May 18 16:08
Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark
Sample Description: MW107

Temp at Receipt: 1.0C

Event and Year: Spring 2018

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	7.36	units	NA	SM 4500 H+ B	30 May 18 12:55	DJN
pH	* 7.8	units	0.1	SM4500 H+ B	6 Jun 18 17:00	SVS
Temperature - Field	9.85	Degrees C	NA	SM 2550B	30 May 18 12:55	DJN
Conductivity - Field	1378	umhos/cm	1	EPA 120.1	30 May 18 12:55	DJN
Fluoride	0.75	mg/l	0.10	SM4500-F-C	6 Jun 18 17:00	SVS
Sulfate	377	mg/l	5.00	ASTM D516-07	7 Jun 18 15:54	EMS
Chloride	17.5	mg/l	1.0	SM4500-Cl-E	31 May 18 17:20	RAG
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	6 Jun 18 11:27	EV
Total Dissolved Solids	887	mg/l	10	I1750-85	1 Jun 18 8:55	SVS
Calcium - Total	62.6	mg/l	1.0	6010D	12 Jun 18 15:20	SZ
Lithium - Total	< 0.1	mg/l	0.10	6010D	13 Jun 18 10:10	SZ
Boron - Total	0.19	mg/l	0.10	6010D	14 Jun 18 15:14	SZ
Antimony - Total	< 0.001	mg/l	0.0010	6020B	12 Jun 18 11:39	BT
Arsenic - Total	0.0449	mg/l	0.0020	6020B	12 Jun 18 11:39	BT
Barium - Total	0.0456	mg/l	0.0020	6020B	12 Jun 18 11:39	BT
Beryllium - Total	< 0.0005	mg/l	0.0005	6020B	12 Jun 18 11:39	BT
Cadmium - Total	< 0.0005	mg/l	0.0005	6020B	12 Jun 18 11:39	BT
Chromium - Total	0.0021	mg/l	0.0020	6020B	12 Jun 18 11:39	BT
Cobalt - Total	< 0.002	mg/l	0.0020	6020B	12 Jun 18 11:39	BT
Lead - Total	0.0015	mg/l	0.0005	6020B	12 Jun 18 11:39	BT
Molybdenum - Total	0.0081	mg/l	0.0020	6020B	12 Jun 18 11:39	BT
Selenium - Total	< 0.005	mg/l	0.0050	6020B	12 Jun 18 11:39	BT
Thallium - Total	< 0.0005	mg/l	0.0005	6020B	12 Jun 18 11:39	BT

* Holding time exceeded

Approved by: Claudette K. Carroll 28 Jun 18

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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www.mvtl.com

CERTIFICATE of ANALYSIS - CCR

Samantha Marshall
Montana Dakota Utilities
5181 Southgate Dr
Billings MT 59102

Report Date: 28 Jun 18
Lab Number: 18-W1412
Work Order #: 82-1191
Account #: 002800
Date Sampled: 31 May 18 11:19
Date Received: 31 May 18 16:08
Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark
Sample Description: MW108

Temp at Receipt: 1.0C

Event and Year: Spring 2018

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	6.83	units	NA	SM 4500 H+ B	31 May 18 11:19	DJN
pH	* 7.2	units	0.1	SM4500 H+ B	6 Jun 18 17:00	SVS
Temperature - Field	14.2	Degrees C	NA	SM 2550B	31 May 18 11:19	DJN
Conductivity - Field	5368	umhos/cm	1	EPA 120.1	31 May 18 11:19	DJN
Fluoride	0.41	mg/l	0.10	SM4500-F-C	6 Jun 18 17:00	SVS
Sulfate	4000	mg/l	5.00	ASTM D516-07	7 Jun 18 15:54	EMS
Chloride	39.7	mg/l	1.0	SM4500-Cl-E	31 May 18 17:20	RAG
Total Dissolved Solids	5520	mg/l	10	I1750-85	1 Jun 18 8:55	SVS

* Holding time exceeded

Approved by: Claudette K. Carroll CC 28 Jun 18

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

CERTIFICATE of ANALYSIS - CCR

Samantha Marshall
Montana Dakota Utilities
5181 Southgate Dr
Billings MT 59102

Report Date: 28 Jun 18
Lab Number: 18-W1413
Work Order #: 82-1191
Account #: 002800
Date Sampled: 30 May 18 15:27
Date Received: 31 May 18 16:08
Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark
Sample Description: MW109

Temp at Receipt: 1.0C

Event and Year: Spring 2018

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	7.32	units	NA	SM 4500 H+ B	30 May 18 15:27	DJN
pH	* 7.8	units	0.1	SM4500 H+ B	6 Jun 18 17:00	SVS
Temperature - Field	14.7	Degrees C	NA	SM 2550B	30 May 18 15:27	DJN
Conductivity - Field	1669	umhos/cm	1	EPA 120.1	30 May 18 15:27	DJN
Fluoride	0.75	mg/l	0.10	SM4500-F-C	6 Jun 18 17:00	SVS
Sulfate	670	mg/l	5.00	ASTM D516-07	7 Jun 18 15:54	EMS
Chloride	27.9	mg/l	1.0	SM4500-Cl-E	31 May 18 17:20	RAG
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	6 Jun 18 11:27	EV
Total Dissolved Solids	1210	mg/l	10	I1750-85	1 Jun 18 8:55	SVS
Calcium - Total	103	mg/l	1.0	6010D	12 Jun 18 15:20	SZ
Lithium - Total	< 0.1	mg/l	0.10	6010D	13 Jun 18 10:10	SZ
Boron - Total	1.76	mg/l	0.10	6010D	14 Jun 18 15:14	SZ
Antimony - Total	0.0064	mg/l	0.0010	6020B	12 Jun 18 11:39	BT
Arsenic - Total	0.0028	mg/l	0.0020	6020B	12 Jun 18 11:39	BT
Barium - Total	0.0276	mg/l	0.0020	6020B	12 Jun 18 11:39	BT
Beryllium - Total	< 0.0005	mg/l	0.0005	6020B	12 Jun 18 11:39	BT
Cadmium - Total	< 0.0005	mg/l	0.0005	6020B	12 Jun 18 11:39	BT
Chromium - Total	< 0.002	mg/l	0.0020	6020B	12 Jun 18 11:39	BT
Cobalt - Total	0.0071	mg/l	0.0020	6020B	12 Jun 18 11:39	BT
Lead - Total	< 0.0005	mg/l	0.0005	6020B	12 Jun 18 11:39	BT
Molybdenum - Total	0.0280	mg/l	0.0020	6020B	12 Jun 18 11:39	BT
Selenium - Total	0.0527	mg/l	0.0050	6020B	12 Jun 18 11:39	BT
Thallium - Total	< 0.0005	mg/l	0.0005	6020B	12 Jun 18 11:39	BT

* Holding time exceeded

Approved by: Claudette K Carroll RC 28 Jun 18

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

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CERTIFICATION: ND # ND-00016

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

CERTIFICATE of ANALYSIS - CCR

Samantha Marshall
Montana Dakota Utilities
5181 Southgate Dr
Billings MT 59102

Report Date: 28 Jun 18
Lab Number: 18-W1414
Work Order #: 82-1191
Account #: 002800
Date Sampled: 31 May 18 10:26
Date Received: 31 May 18 16:08
Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark
Sample Description: MW116

Temp at Receipt: 1.0C

Event and Year: Spring 2018

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	7.40	units	NA	SM 4500 H+ B	31 May 18 10:26	DJN
pH	* 7.8	units	0.1	SM4500 H+ B	6 Jun 18 17:00	SVS
Temperature - Field	12.1	Degrees C	NA	SM 2550B	31 May 18 10:26	DJN
Conductivity - Field	2469	umhos/cm	1	EPA 120.1	31 May 18 10:26	DJN
Fluoride	1.12	mg/l	0.10	SM4500-F-C	6 Jun 18 17:00	SVS
Sulfate	1260	mg/l	5.00	ASTM D516-07	15 Jun 18 9:16	EMS
Chloride	41.1	mg/l	1.0	SM4500-Cl-E	31 May 18 17:20	RAG
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	6 Jun 18 11:27	EV
Total Dissolved Solids	2110	mg/l	10	I1750-85	1 Jun 18 8:55	SVS
Calcium - Total	159	mg/l	1.0	6010D	12 Jun 18 15:20	SZ
Lithium - Total	< 0.1	mg/l	0.10	6010D	13 Jun 18 10:10	SZ
Boron - Total	2.58	mg/l	0.10	6010D	14 Jun 18 15:14	SZ
Antimony - Total	< 0.001	mg/l	0.0010	6020B	12 Jun 18 11:39	BT
Arsenic - Total	0.0021	mg/l	0.0020	6020B	12 Jun 18 11:39	BT
Barium - Total	0.0472	mg/l	0.0020	6020B	12 Jun 18 11:39	BT
Beryllium - Total	< 0.0005	mg/l	0.0005	6020B	12 Jun 18 11:39	BT
Cadmium - Total	< 0.0005	mg/l	0.0005	6020B	12 Jun 18 11:39	BT
Chromium - Total	< 0.002	mg/l	0.0020	6020B	12 Jun 18 11:39	BT
Cobalt - Total	0.0025	mg/l	0.0020	6020B	12 Jun 18 11:39	BT
Lead - Total	< 0.0005	mg/l	0.0005	6020B	12 Jun 18 11:39	BT
Molybdenum - Total	0.0181	mg/l	0.0020	6020B	12 Jun 18 11:39	BT
Selenium - Total	< 0.005	mg/l	0.0050	6020B	12 Jun 18 11:39	BT
Thallium - Total	< 0.0005	mg/l	0.0005	6020B	12 Jun 18 11:39	BT

* Holding time exceeded

Approved by: Claudette K Carroll 28 Jun 18

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

Samantha Marshall
Montana Dakota Utilities
5181 Southgate Dr
Billings MT 59102

Report Date: 28 Jun 18
Lab Number: 18-W1415
Work Order #: 82-1191
Account #: 002800
Date Sampled: 31 May 18 8:35
Date Received: 31 May 18 16:08
Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark
Sample Description: Sewage Lagoon

Temp at Receipt: 1.0C

Event and Year: Spring 2018

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	7.89	units	NA	SM 4500 H+ B	31 May 18 8:35	DJN
pH	* 8.0	units	0.1	SM4500 H+ B	6 Jun 18 17:00	SVS
Temperature - Field	20.3	Degrees C	NA	SM 2550B	31 May 18 8:35	DJN
Conductivity - Field	3552	umhos/cm	1	EPA 120.1	31 May 18 8:35	DJN
Fluoride	1.16	mg/l	0.10	SM4500-F-C	6 Jun 18 17:00	SVS
Sulfate	2140	mg/l	5.00	ASTM D516-07	15 Jun 18 9:16	EMS
Chloride	65.8	mg/l	1.0	SM4500-Cl-E	31 May 18 17:20	RAG
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	6 Jun 18 11:27	EV
Total Dissolved Solids	3610	mg/l	10	I1750-85	1 Jun 18 8:55	SVS
Calcium - Total	186	mg/l	1.0	6010D	19 Jun 18 14:00	BT
Lithium - Total	0.10	mg/l	0.10	6010D	13 Jun 18 10:10	SZ
Boron - Total	8.94	mg/l	0.10	6010D	14 Jun 18 15:14	SZ
Antimony - Total	0.0031	mg/l	0.0010	6020B	12 Jun 18 11:39	BT
Arsenic - Total	0.0117	mg/l	0.0020	6020B	12 Jun 18 11:39	BT
Barium - Total	0.1060	mg/l	0.0020	6020B	12 Jun 18 11:39	BT
Beryllium - Total	< 0.0005	mg/l	0.0005	6020B	12 Jun 18 11:39	BT
Cadmium - Total	< 0.0005	mg/l	0.0005	6020B	12 Jun 18 11:39	BT
Chromium - Total	< 0.002	mg/l	0.0020	6020B	12 Jun 18 11:39	BT
Cobalt - Total	< 0.002	mg/l	0.0020	6020B	12 Jun 18 11:39	BT
Lead - Total	0.0005	mg/l	0.0005	6020B	12 Jun 18 11:39	BT
Molybdenum - Total	0.0205	mg/l	0.0020	6020B	12 Jun 18 11:39	BT
Selenium - Total	0.0101	mg/l	0.0050	6020B	12 Jun 18 11:39	BT
Thallium - Total	< 0.0005	mg/l	0.0005	6020B	12 Jun 18 11:39	BT

* Holding time exceeded

Approved by: Claudette K. Carroll CC 28 Jun 18

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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CERTIFICATE of ANALYSIS - CCR

Samantha Marshall
Montana Dakota Utilities
5181 Southgate Dr
Billings MT 59102

Report Date: 28 Jun 18
Lab Number: 18-W1416
Work Order #: 82-1191
Account #: 002800
Date Sampled: 30 May 18 10:35
Date Received: 31 May 18 16:08
Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark
Sample Description: SP1

Temp at Receipt: 1.0C

Event and Year: Spring 2018

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	7.87	units	NA	SM 4500 H+ B	30 May 18 10:35	DJN
pH	* 8.1	units	0.1	SM4500 H+ B	6 Jun 18 17:00	SVS
Temperature - Field	17.7	Degrees C	NA	SM 2550B	30 May 18 10:35	DJN
Conductivity - Field	789	umhos/cm	1	EPA 120.1	30 May 18 10:35	DJN
Fluoride	0.30	mg/l	0.10	SM4500-F-C	6 Jun 18 17:00	SVS
Sulfate	176	mg/l	5.00	ASTM D516-07	15 Jun 18 9:16	EMS
Chloride	17.6	mg/l	1.0	SM4500-Cl-E	31 May 18 17:20	RAG
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	6 Jun 18 11:27	EV
Total Dissolved Solids	474	mg/l	10	I1750-85	1 Jun 18 8:55	SVS
Calcium - Total	55.0	mg/l	1.0	6010D	21 Jun 18 9:01	BT
Lithium - Total	< 0.1	mg/l	0.10	6010D	13 Jun 18 10:10	SZ
Boron - Total	0.15	mg/l	0.10	6010D	14 Jun 18 15:14	SZ
Antimony - Total	< 0.001	mg/l	0.0010	6020B	12 Jun 18 11:39	BT
Arsenic - Total	0.0054	mg/l	0.0020	6020B	12 Jun 18 11:39	BT
Barium - Total	0.1056	mg/l	0.0020	6020B	12 Jun 18 11:39	BT
Beryllium - Total	< 0.0005	mg/l	0.0005	6020B	12 Jun 18 11:39	BT
Cadmium - Total	< 0.0005	mg/l	0.0005	6020B	12 Jun 18 11:39	BT
Chromium - Total	0.0066	mg/l	0.0020	6020B	12 Jun 18 11:39	BT
Cobalt - Total	0.0024	mg/l	0.0020	6020B	12 Jun 18 11:39	BT
Lead - Total	0.0033	mg/l	0.0005	6020B	12 Jun 18 11:39	BT
Molybdenum - Total	< 0.005 ^	mg/l	0.0020	6020B	12 Jun 18 11:39	BT
Selenium - Total	< 0.005	mg/l	0.0050	6020B	12 Jun 18 11:39	BT
Thallium - Total	< 0.0005	mg/l	0.0005	6020B	12 Jun 18 11:39	BT

* Holding time exceeded

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

Approved by: Claudette K. Carroll CC 28 Jun 18

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

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CERTIFICATION: ND # ND-00016

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1201 Lincoln Hwy. ~ Nevada, IA 50201 ~ 800-362-0855 ~ Fax 515-382-3885
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CERTIFICATE of ANALYSIS - CCR

Samantha Marshall
Montana Dakota Utilities
5181 Southgate Dr
Billings MT 59102

Report Date: 28 Jun 18
Lab Number: 18-W1417
Work Order #: 82-1191
Account #: 002800
Date Sampled: 30 May 18 10:56
Date Received: 31 May 18 16:08
Sampled By: MVTL Field Services

PO #: 169917 OP Line 1

Temp at Receipt: 1.0C

Project Name: MDU Lewis & Clark

Sample Description: SP2

Event and Year: Spring 2018

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	7.78	units	NA	SM 4500 H+ B	30 May 18 10:56	DJN
pH	* 8.1	units	0.1	SM4500 H+ B	6 Jun 18 17:00	SVS
Temperature - Field	17.8	Degrees C	NA	SM 2550B	30 May 18 10:56	DJN
Conductivity - Field	793	umhos/cm	1	EPA 120.1	30 May 18 10:56	DJN
Fluoride	0.31	mg/l	0.10	SM4500-F-C	6 Jun 18 17:00	SVS
Sulfate	182	mg/l	5.00	ASTM D516-07	15 Jun 18 9:36	EMS
Chloride	18.2	mg/l	1.0	SM4500-Cl-E	31 May 18 17:20	RAG
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	6 Jun 18 11:27	EV
Total Dissolved Solids	512	mg/l	10	I1750-85	1 Jun 18 8:55	SVS
Calcium - Total	59.4	mg/l	1.0	6010D	21 Jun 18 9:01	BT
Lithium - Total	< 0.1	mg/l	0.10	6010D	13 Jun 18 10:10	SZ
Boron - Total	0.16	mg/l	0.10	6010D	14 Jun 18 15:14	SZ
Antimony - Total	< 0.001	mg/l	0.0010	6020B	12 Jun 18 11:39	BT
Arsenic - Total	0.0052	mg/l	0.0020	6020B	12 Jun 18 11:39	BT
Barium - Total	0.0983	mg/l	0.0020	6020B	12 Jun 18 11:39	BT
Beryllium - Total	< 0.0005	mg/l	0.0005	6020B	12 Jun 18 11:39	BT
Cadmium - Total	< 0.0005	mg/l	0.0005	6020B	12 Jun 18 11:39	BT
Chromium - Total	0.0047	mg/l	0.0020	6020B	12 Jun 18 11:39	BT
Cobalt - Total	< 0.002	mg/l	0.0020	6020B	12 Jun 18 11:39	BT
Lead - Total	0.0025	mg/l	0.0005	6020B	12 Jun 18 11:39	BT
Molybdenum - Total	< 0.005 ^	mg/l	0.0020	6020B	12 Jun 18 11:39	BT
Selenium - Total	< 0.005	mg/l	0.0050	6020B	12 Jun 18 11:39	BT
Thallium - Total	< 0.0005	mg/l	0.0005	6020B	12 Jun 18 11:39	BT

* Holding time exceeded

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

Approved by: Claudette K Carroll cc 28 Jun 18

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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MVTL **Laboratories, Inc.**
2616 E. Broadway
Bismarck, ND 58501
Phone (701) 258-9720

Chain of Custody Record

Project Name:	Event:	Work Order Number:
MDU Lewis and Clark	Spring 2018	82-1191

Report To:	MDU	Carbon Copy:	Name of Sampler(s):
Attn:	Samantha Marshall	Attn:	Darren Nieswaag
Address:	5181 Southgate Dr. Billings, MT 59102	Address:	
phone:	406-896-4227		
email:			

Sample Information					Bottle Type							Field Parameters			Analysis
Lab Number	Sample ID	Date	Time	Sample Type	1 liter	500mL Nitric	500mL Nitric (filtered)	250 mL Sulfuric				Temp (°C)	Spec. Cond.	pH	Analysis Required
W1400	Dup 1	30May18	NA	GW	X	X	X	X				NA	NA	NA	MDU L&C Spring 2018
W1401	Field Blank (FB)	~~29~~30May18	NA	GW	X	X	X	X				NA	NA	NA	
W1402	MW103	29May18	1454	GW	X	X	X	X				12.78	1476	7.33	
—	~~MW~~MW110	29May18	1400	GW	~~X~~	~~X~~	~~X~~	~~X~~				Obstruction			
W1403	MW119	29May18	1258	GW	X	X	X	X				10.63	1118	7.34	
W1404	MW111	29May18	1729	GW	X	X	X	X				12.71	2997	7.24	
—	MW117	29May18	1610	GW	~~X~~	~~X~~	~~X~~	~~X~~				Obstructed			
W1405	MW118	30May18	0835	GW	X	X	X	X				12.77	1574	7.45	
W1406	MW120	29May18	1914	GW	X	X	X	X				9.89	3761	6.88	

Comments: * 30May18 DN

Relinquished By:		Sample Condition:	
Name:	Date/Time	Location:	Temp (°C)
1 Darren Nieswaag	31May18 1608	~~Log In~~ Walk In #2	1.0 ~~TM805 TM562 / TM805~~
2			

Received by:	
Name:	Date/Time
	31 May 2018 1608

MVTL **Laboratories, Inc.**
2616 E. Broadway
Bismarck, ND 58501
Phone (701) 258-9720

Chain of Custody Record

Project Name:	Event:	Work Order Number:
MDU Lewis and Clark	Spring 2018	82-1191

Report To:	MDU	Carbon Copy:	Name of Sampler(s):
Attn:	Samantha Marshall	Attn:	Darren Nieswaag
Address:	5181 Southgate Dr. Billings, MT 59102	Address:	
phone:	406-896-4227		
email:			

Sample Information					Bottle Type							Field Parameters			Analysis
Lab Number	Sample ID	Date	Time	Sample Type	1 liter	500mL Nitric	500mL Nitric (filtered)	250 mL Sulfuric				Temp (°C)	Spec. Cond.	pH	Analysis Required
W1407	Dup2	30May18	NA	GW	X	X	X	X				NA	NA	NA	MDU L&C Spring 2018
W1408	MW101	30May18	1416	GW	X	X	X	X				14.88	1266	7.39	
W1409	MW105	30May18	1727	GW	X	X	X	X				11.77	1644	7.32	
W1410	MW106	30May18	1858	GW	X	X	X	X				13.80	2669	7.42	
W1411	MW107	30May18	1255	GW	X	X	X	X				9.85	1378	7.36	
W1412	MW108	31May18	1199	GW	X	~~X~~	~~X~~	X				14.25	5368	6.83	
W1413	MW109	30May18	1527	GW	X	X	X	X				14.66	1669	7.32	
W1414	MW116	31May18	1026	GW	X	X	X	X				12.14	2469	7.40	
*	~~MW210~~	—	—	~~GW~~	* ~~X~~	~~X~~	~~X~~	~~X~~				No Sample			

Comments: *30May18 ON (A) ●31May18 ON (A)

Relinquished By:		Sample Condition:	
Name:	Date/Time	Location:	Temp (°C)
1 Dan Nies	31May18 1608	Log In / Walk In #2	1.0 TM562 / TM805
2			

Received by:	
Name:	Date/Time
	31May 2018 1608

MVTL **Laboratories, Inc.**
2616 E. Broadway
Bismarck, ND 58501
Phone (701) 258-9720

Chain of Custody Record

Project Name:	Event:	Work Order Number:
MDU Lewis and Clark	Spring 2018	82-1191

Report To:	MDU	Carbon Copy:	Name of Sampler(s):
Attn:	Samantha Marshall	Attn:	Darren Nieswaag
Address:	5181 Southgate Dr. Billings, MT 59102	Address:	
phone:	406-896-4227		
email:			

Sample Information					Bottle Type							Field Parameters			Analysis
Lab Number	Sample ID	Date	Time	Sample Type	1 liter	500mL Nitric	500mL Nitric (filtered)	250 mL Sulfuric				Temp (°C)	Spec. Cond.	pH	Analysis Required
* ~	West Scrubber Pond	31May18	1105	SW	~~X~~	~~X~~	~~X~~	~~X~~				—	—	~	MDU L&C Spring 2018
W1415	Sewage Lagoon	31May18	0875	SW	X	X	X	X				20.29	3552	7.89	
W1416	SP1	30May18	1035	SW	X	X	X	X				17.73	789	7.87	
W1417	SP2	30May18	1056	SW	X	X	X	X				17.77	793	7.78	

Comments: * 31May18 on ice

Relinquished By:		Sample Condition:	
Name:	Date/Time	Location:	Temp (°C)
1 Dan Nies	31May18 1608	Log In Walk In #2	1.0 TM805 ~~TM502 / TM805~~
2			

Received by:	
Name:	Date/Time
Tera Kl	31 May 2018 1608

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MEMBER ACIL

CASE NARRATIVE

-MVTL Lab Reference No/SDG: 201882-1193
Client: Montana Dakota Utilities
Location: MDU Lewis & Clark
Project Identification: CCR Radiochem Spring 2018
MVTL Laboratory Identifications: 18-W1421 through 18-W1430

MDU Sample Identification	MVTL Laboratory #
Dup 1	18-W1421
Field Blank (FB)	18-W1422
MW103	18-W1423
MW110	No sample
MW119	18-W1424
MW111	18-W1425
MW117	No sample
MW118	18-W1426
MW120	18-W1427
Scrubber Pond	No sample
Sewage Lagoon	18-W1428
SP1	18-W1429
SP2	18-W1430

I. RECEIPT

- All samples were received at the laboratory on 31 May 2018 at 1608.
- Samples were collected and hand delivered by MVTL Field Service personnel to the laboratory.
- Samples were received on ice and evidence of cooling had begun.
  - Temperature of samples upon receipt was 1.0°C.
- No other exceptions on sample receipt were encountered on this sample set unless noted here.
- All samples requiring radiochemistry analysis were sent via courier to Inter-Mountain Labs (IML) for analysis there. Samples were received at IML on 5 Jun 18.
  - All samples were properly preserved unless noted on the individual analytical laboratory report or on the IML Case Narrative.

II. HOLDING TIMES

- All holding times were met for both preparation and analysis unless noted on the individual analytical laboratory report or on the IML Case Narrative.

III. METHODS

- Approved methodology was followed for all sample analyses.
  - Please refer to the IML Case Narrative for more information regarding methodology.

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MEMBER ACIL

CASE NARRATIVE

-MVTL Lab Reference No/SDG:	**201882-1193**
Client:	**Montana Dakota Utilities**
Location:	**MDU Lewis & Clark**
Project Identification:	**CCR Radiochem Spring 2018**
MVTL Laboratory Identifications:	**18-W1421 through 18-W1430**

IV. ANALYSIS

- All acceptance criteria was met for calibration, method blanks, laboratory control samples, laboratory fortified matrix/matrix duplicates unless noted on the individual analytical laboratory report or on the IML Case Narrative.

All laboratory data has been approved by MVTL Laboratories.

SIGNED: Claudette Carroll **DATE:** 13 JUL 18

Claudette Carroll - MVTL Bismarck Laboratory Manager

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Report Date: 13 Jul 18
Lab Number: 18-W1421
Work Order #: 82-1193
Account #: 002800
Date Sampled: 30 May 18
Date Received: 31 May 18 16:08
Sampled By: MVTL Field Services

Samantha Marshall
Montana Dakota Utilities
5181 Southgate Dr
Billings MT 59102

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

Temp at Receipt: 1.0C

Event and Year: Spring 2018

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
Radium 226	See Attached Report			21 Jun 18	OL
Radium 228	See Attached Report			3 Jul 18	OL

OL = Analysis performed by an Outside Laboratory.

Approved by: Claudette K Carrep CC 13 JUL 18

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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Report Date: 13 Jul 18
Lab Number: 18-W1422
Work Order #: 82-1193
Account #: 002800
Date Sampled: 30 May 18
Date Received: 31 May 18 16:08
Sampled By: MVTL Field Services

Samantha Marshall
Montana Dakota Utilities
5181 Southgate Dr
Billings MT 59102

Project Name: MDU Lewis & Clark
Sample Description: Field Blank (FB)

Temp at Receipt: 1.0C

Event and Year: Spring 2018

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
Radium 226	See Attached Report			21 Jun 18	OL
Radium 228	See Attached Report			3 Jul 18	OL

OL = Analysis performed by an Outside Laboratory.

Approved by: Claudette K Carrep CC 13JUL8

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

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Report Date: 13 Jul 18
Lab Number: 18-W1423
Work Order #: 82-1193
Account #: 002800
Date Sampled: 29 May 18 14:54
Date Received: 31 May 18 16:08
Sampled By: Client

Samantha Marshall
Montana Dakota Utilities
5181 Southgate Dr
Billings MT 59102

Project Name: MDU Lewis & Clark
Sample Description: MW103

Temp at Receipt: 1.0C

Event and Year: Spring 2018

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	7.33	units	NA	SM 4500 H+ B	29 May 18 14:54	DJN
Temperature - Field	12.8	Degrees C	NA	SM 2550B	29 May 18 14:54	DJN
Conductivity - Field	1476	umhos/cm	1	EPA 120.1	29 May 18 14:54	DJN
Radium 226	See Attached Report				21 Jun 18	OL
Radium 228	See Attached Report				3 Jul 18	OL

OL = Analysis performed by an Outside Laboratory.

Approved by: Claudette K. Carroll CC 13JUL18

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

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Report Date: 13 Jul 18
Lab Number: 18-W1424
Work Order #: 82-1193
Account #: 002800
Date Sampled: 29 May 18 12:58
Date Received: 31 May 18 16:08
Sampled By: MVTL Field Services

Samantha Marshall
Montana Dakota Utilities
5181 Southgate Dr
Billings MT 59102

Project Name: MDU Lewis & Clark
Sample Description: MW119

Temp at Receipt: 1.0C

Event and Year: Spring 2018

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	7.34	units	NA	SM 4500 H+ B	29 May 18 12:58	DJN
Temperature - Field	10.6	Degrees C	NA	SM 2550B	29 May 18 12:58	DJN
Conductivity - Field	1118	umhos/cm	1	EPA 120.1	29 May 18 12:58	DJN
Radium 226	See Attached Report				21 Jun 18	OL
Radium 228	See Attached Report				3 Jul 18	OL

OL = Analysis performed by an Outside Laboratory.

Approved by: Claudette K Carrep cc 13JUL18

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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Report Date: 13 Jul 18
Lab Number: 18-W1425
Work Order #: 82-1193
Account #: 002800
Date Sampled: 29 May 18 17:29
Date Received: 31 May 18 16:08
Sampled By: MVTL Field Services

Samantha Marshall
Montana Dakota Utilities
5181 Southgate Dr
Billings MT 59102

Project Name: MDU Lewis & Clark
Sample Description: MW111

Temp at Receipt: 1.0C

Event and Year: Spring 2018

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	7.24	units	NA	SM 4500 H+ B	29 May 18 17:29	DJN
Temperature - Field	12.7	Degrees C	NA	SM 2550B	29 May 18 17:29	DJN
Conductivity - Field	2997	umhos/cm	1	EPA 120.1	29 May 18 17:29	DJN
Radium 226	See Attached Report				21 Jun 18	OL
Radium 228	See Attached Report				3 Jul 18	OL

OL = Analysis performed by an Outside Laboratory.

Approved by: Claudette K Carrep cc 13 JUL 18

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

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

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Report Date: 13 Jul 18
Lab Number: 18-W1426
Work Order #: 82-1193
Account #: 002800
Date Sampled: 30 May 18 8:35
Date Received: 31 May 18 16:08
Sampled By: MVTL Field Services

Samantha Marshall
Montana Dakota Utilities
5181 Southgate Dr
Billings MT 59102

Project Name: MDU Lewis & Clark
Sample Description: MW118

Temp at Receipt: 1.0C

Event and Year: Spring 2018

	As Received Result		Method RL	Method Reference	Date Analyzed		Analyst
pH - Field	7.45	units	NA	SM 4500 H+ B	30 May 18	8:35	DJN
Temperature - Field	12.8	Degrees C	NA	SM 2550B	30 May 18	8:35	DJN
Conductivity - Field	1574	umhos/cm	1	EPA 120.1	30 May 18	8:35	DJN
Radium 226	See Attached Report				21 Jun 18		OL
Radium 228	See Attached Report				3 Jul 18		OL

OL = Analysis performed by an Outside Laboratory.

Approved by: Claudette K Carrep CC 13JUL18

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

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

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Report Date: 13 Jul 18
Lab Number: 18-W1427
Work Order #: 82-1193
Account #: 002800
Date Sampled: 29 May 18 19:14
Date Received: 31 May 18 16:08
Sampled By: MVTL Field Services

Samantha Marshall
Montana Dakota Utilities
5181 Southgate Dr
Billings MT 59102

Project Name: MDU Lewis & Clark
Sample Description: MW120

Temp at Receipt: 1.0C

Event and Year: Spring 2018

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	6.88	units	NA	SM 4500 H+ B	29 May 18 19:14	DJN
Temperature - Field	9.89	Degrees C	NA	SM 2550B	29 May 18 19:14	DJN
Conductivity - Field	3761	umhos/cm	1	EPA 120.1	29 May 18 19:14	DJN
Radium 226	See Attached Report				21 Jun 18	OL
Radium 228	See Attached Report				4 Jul 18	OL

OL = Analysis performed by an Outside Laboratory.

CC

Approved by: Claudette K Carrep 13JUL18

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

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www.mvtl.com

Report Date: 13 Jul 18
Lab Number: 18-W1428
Work Order #: 82-1193
Account #: 002800
Date Sampled: 31 May 18 8:35
Date Received: 31 May 18 16:08
Sampled By: MVTL Field Services

Samantha Marshall
Montana Dakota Utilities
5181 Southgate Dr
Billings MT 59102

Project Name: MDU Lewis & Clark
Sample Description: Sewage Lagoon

Temp at Receipt: 1.0C

Event and Year: Spring 2018

	As Received Result		Method RL	Method Reference	Date Analyzed		Analyst
pH - Field	7.89	units	NA	SM 4500 H+ B	31 May 18	8:35	DJN
Temperature - Field	20.3	Degrees C	NA	SM 2550B	31 May 18	8:35	DJN
Conductivity - Field	3552	umhos/cm	1	EPA 120.1	31 May 18	8:35	DJN
Radium 226	See Attached Report				21 Jun 18		OL
Radium 228	See Attached Report				4 Jul 18		OL

OL = Analysis performed by an Outside Laboratory.

cc

Approved by: Claudette K Carrep 13 JUL 18

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

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Report Date: 13 Jul 18
Lab Number: 18-W1429
Work Order #: 82-1193
Account #: 002800
Date Sampled: 30 May 18 10:35
Date Received: 31 May 18 16:08
Sampled By: MVTL Field Services

Samantha Marshall
Montana Dakota Utilities
5181 Southgate Dr
Billings MT 59102

Project Name: MDU Lewis & Clark
Sample Description: SP1

Temp at Receipt: 1.0C

Event and Year: Spring 2018

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	7.87	units	NA	SM 4500 H+ B	30 May 18 10:35	DJN
Temperature - Field	17.7	Degrees C	NA	SM 2550B	30 May 18 10:35	DJN
Conductivity - Field	789	umhos/cm	1	EPA 120.1	30 May 18 10:35	DJN
Radium 226	See Attached Report				21 Jun 18	OL
Radium 228	See Attached Report				4 Jul 18	OL

OL = Analysis performed by an Outside Laboratory.

Approved by: Claudette K Carroll CC 13 JUL 18

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

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Report Date: 13 Jul 18
Lab Number: 18-W1430
Work Order #: 82-1193
Account #: 002800
Date Sampled: 30 May 18 10:56
Date Received: 31 May 18 16:08
Sampled By: MVTL Field Services

Samantha Marshall
Montana Dakota Utilities
5181 Southgate Dr
Billings MT 59102

Project Name: MDU Lewis & Clark

PO #: 169917 OP Line 1

Sample Description: SP2

Temp at Receipt: 1.0C

Event and Year: Spring 2018

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	7.78	units	NA	SM 4500 H+ B	30 May 18 10:56	DJN
Temperature - Field	17.8	Degrees C	NA	SM 2550B	30 May 18 10:56	DJN
Conductivity - Field	793	umhos/cm	1	EPA 120.1	30 May 18 10:56	DJN
Radium 226	See Attached Report				21 Jun 18	OL
Radium 228	See Attached Report				4 Jul 18	OL

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Approved by: Claudette K Carroll 13 Jul 18

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

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Inter-Mountain Labs
1673 Terra Avenue, Sheridan, Wyoming 82801 ph: (307) 672-8945

Your Environmental Monitoring Partner

Date: 7/5/2018

CLIENT: MVTL Laboratories, Inc.
Project: 201882-1193
Lab Order: S1806044

CASE NARRATIVE

Report ID: S1806044001

Samples 18-W1421 Dup 1, 18-W1422 Field Blank (FB), 18-W1423 MW103, 18-W1424 MW119, 18-W1425 MW111, 18-W1426 MW118, 18-W1427 MW120, 18-W1428 Sewage Lagoon, 18-W1429 SP1 and 18-W1430 SP2 were received on June 5, 2018.

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 Inter-Mountain Laboratories except as indicated in this case narrative.

Qualifiers by sample

S1805521-001 - Radium 226 in Water -/Radium 226 - Spike Recovery outside accepted recovery limits

Reviewed by:

Wade Nieuwsma, Assistant Laboratory Manager

Inter-Mountain Labs
1673 Terra Avenue, Sheridan, Wyoming 82801 ph: (307) 672-8945

Your Environmental Monitoring Partner

Sample Analysis Report

Company:	MVTL Laboratories, Inc. 2616 E Broadway Ave. Bismarck, ND 58501	**Date Reported**	7/5/2018
		Report ID	S1806044001
ProjectName:	201882-1193	**WorkOrder:**	S1806044
Lab ID:	S1806044-001	**CollectionDate:**	5/30/2018
ClientSample ID:	18-W1421 Dup 1	**DateReceived:**	6/5/2018 11:50:00 AM
COC:	201882-1193	**FieldSampler:**	
PWS ID:		**Matrix:**	Water
Comments			

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Radionuclides - Total							
Radium 226	0.1	pCi/L		0.2	SM 7500 Ra-B	06/21/2018 1414	MB
Radium 226 Precision (±)	0.05	pCi/L			SM 7500 Ra-B	06/21/2018 1414	MB
Radium 228	-0.6	pCi/L		1	Ga-Tech	07/03/2018 812	WN
Radium 228 Precision (±)	1.3	pCi/L			Ga-Tech	07/03/2018 812	WN

These results apply only to the samples tested.

RL - Reporting Limit

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
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: _____
Wade Nieuwsma, Assistant Laboratory Manager

Sample Analysis Report

Company:	MVTL Laboratories, Inc. 2616 E Broadway Ave. Bismarck, ND 58501	**Date Reported**	7/5/2018
		Report ID	S1806044001
ProjectName:	201882-1193	**WorkOrder:**	S1806044
Lab ID:	S1806044-002	**CollectionDate:**	5/30/2018
ClientSample ID:	18-W1422 Field Blank (FB)	**DateReceived:**	6/5/2018 11:50:00 AM
COC:	201882-1193	**FieldSampler:**	
PWS ID:		**Matrix:**	Water
Comments			

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Radionuclides - Total							
Radium 226	0.1	pCi/L		0.2	SM 7500 Ra-B	06/21/2018 1414	MB
Radium 226 Precision (±)	0.04	pCi/L			SM 7500 Ra-B	06/21/2018 1414	MB
Radium 228	0.3	pCi/L		1	Ga-Tech	07/03/2018 1116	WN
Radium 228 Precision (±)	3.2	pCi/L			Ga-Tech	07/03/2018 1116	WN

These results apply only to the samples tested.

RL - Reporting Limit

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
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: _____
Wade Nieuwsma, Assistant Laboratory Manager

Sample Analysis Report

Company:	MVTL Laboratories, Inc. 2616 E Broadway Ave. Bismarck, ND 58501	**Date Reported**	7/5/2018
		Report ID	S1806044001
ProjectName:	201882-1193	**WorkOrder:**	S1806044
Lab ID:	S1806044-003	**CollectionDate:**	5/29/2018 2:54:00 PM
ClientSample ID:	18-W1423 MW103	**DateReceived:**	6/5/2018 11:50:00 AM
COC:	201882-1193	**FieldSampler:**	
PWS ID:		**Matrix:**	Water
Comments			

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Radionuclides - Total							
Radium 226	0.3	pCi/L		0.2	SM 7500 Ra-B	06/21/2018 1630	MB
Radium 226 Precision (±)	0.1	pCi/L			SM 7500 Ra-B	06/21/2018 1630	MB
Radium 228	0.9	pCi/L		1	Ga-Tech	07/03/2018 1420	WN
Radium 228 Precision (±)	1.7	pCi/L			Ga-Tech	07/03/2018 1420	WN

These results apply only to the samples tested.

RL - Reporting Limit

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
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: _____
Wade Nieuwsma, Assistant Laboratory Manager

Sample Analysis Report

Company:	MVTL Laboratories, Inc. 2616 E Broadway Ave. Bismarck, ND 58501	**Date Reported**	7/5/2018
		Report ID	S1806044001
ProjectName:	201882-1193	**WorkOrder:**	S1806044
Lab ID:	S1806044-004	**CollectionDate:**	5/29/2018 12:58:00 PM
ClientSample ID:	18-W1424 MW119	**DateReceived:**	6/5/2018 11:50:00 AM
COC:	201882-1193	**FieldSampler:**	
PWS ID:		**Matrix:**	Water
Comments			

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Radionuclides - Total							
Radium 226	0.1	pCi/L		0.2	SM 7500 Ra-B	06/21/2018 1630	MB
Radium 226 Precision (±)	0.04	pCi/L			SM 7500 Ra-B	06/21/2018 1630	MB
Radium 228	-1.4	pCi/L		1	Ga-Tech	07/03/2018 1723	WN
Radium 228 Precision (±)	1.9	pCi/L			Ga-Tech	07/03/2018 1723	WN

These results apply only to the samples tested.

RL - Reporting Limit

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
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: _____
Wade Nieuwsma, Assistant Laboratory Manager

Sample Analysis Report

Company: MVTL Laboratories, Inc.
2616 E Broadway Ave.
Bismarck, ND 58501

Date Reported 7/5/2018
Report ID S1806044001

ProjectName: 201882-1193
Lab ID: S1806044-005
ClientSample ID: 18-W1425 MW111
COC: 201882-1193
PWS ID:
Comments

WorkOrder: S1806044
CollectionDate: 5/29/2018 5:29:00 PM
DateReceived: 6/5/2018 11:50:00 AM
FieldSampler:
Matrix: Water

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Radionuclides - Total							
Radium 226	0.16	pCi/L		0.2	SM 7500 Ra-B	06/21/2018 1630	MB
Radium 226 Precision (±)	0.05	pCi/L			SM 7500 Ra-B	06/21/2018 1630	MB
Radium 228	0.1	pCi/L		1	Ga-Tech	07/03/2018 2025	WN
Radium 228 Precision (±)	1.6	pCi/L			Ga-Tech	07/03/2018 2025	WN

These results apply only to the samples tested.

RL - Reporting Limit

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
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: _____
Wade Nieuwsma, Assistant Laboratory Manager

Sample Analysis Report

Company:	MVTL Laboratories, Inc. 2616 E Broadway Ave. Bismarck, ND 58501	**Date Reported**	7/5/2018
		Report ID	S1806044001
ProjectName:	201882-1193	**WorkOrder:**	S1806044
Lab ID:	S1806044-006	**CollectionDate:**	5/30/2018 8:35:00 AM
ClientSample ID:	18-W1426 MW118	**DateReceived:**	6/5/2018 11:50:00 AM
COC:	201882-1193	**FieldSampler:**	
PWS ID:		**Matrix:**	Water
Comments			

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Radionuclides - Total							
Radium 226	0.16	pCi/L		0.2	SM 7500 Ra-B	06/21/2018 1630	MB
Radium 226 Precision (±)	0.1	pCi/L			SM 7500 Ra-B	06/21/2018 1630	MB
Radium 228	-0.7	pCi/L		1	Ga-Tech	07/03/2018 2328	WN
Radium 228 Precision (±)	1.7	pCi/L			Ga-Tech	07/03/2018 2328	WN

These results apply only to the samples tested.

RL - Reporting Limit

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
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: _____
Wade Nieuwsma, Assistant Laboratory Manager

Sample Analysis Report

Company:	MVTL Laboratories, Inc. 2616 E Broadway Ave. Bismarck, ND 58501	**Date Reported**	7/5/2018
		Report ID	S1806044001
ProjectName:	201882-1193	**WorkOrder:**	S1806044
Lab ID:	S1806044-007	**CollectionDate:**	5/29/2018 7:14:00 PM
ClientSample ID:	18-W1427 MW120	**DateReceived:**	6/5/2018 11:50:00 AM
COC:	201882-1193	**FieldSampler:**	
PWS ID:		**Matrix:**	Water
Comments			

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Radionuclides - Total							
Radium 226	0.2	pCi/L		0.2	SM 7500 Ra-B	06/21/2018 1631	MB
Radium 226 Precision (±)	0.1	pCi/L			SM 7500 Ra-B	06/21/2018 1631	MB
Radium 228	0.4	pCi/L		1	Ga-Tech	07/04/2018 230	WN
Radium 228 Precision (±)	1.5	pCi/L			Ga-Tech	07/04/2018 230	WN

These results apply only to the samples tested.

RL - Reporting Limit

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
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: _____
Wade Nieuwsma, Assistant Laboratory Manager

Sample Analysis Report

Company:	MVTL Laboratories, Inc. 2616 E Broadway Ave. Bismarck, ND 58501	**Date Reported**	7/5/2018
		Report ID	S1806044001
ProjectName:	201882-1193	**WorkOrder:**	S1806044
Lab ID:	S1806044-008	**CollectionDate:**	5/31/2018 8:35:00 AM
ClientSample ID:	18-W1428 Sewage Lagoon	**DateReceived:**	6/5/2018 11:50:00 AM
COC:	201882-1193	**FieldSampler:**	
PWS ID:		**Matrix:**	Water
Comments			

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Radionuclides - Total							
Radium 226	0.19	pCi/L		0.2	SM 7500 Ra-B	06/21/2018 1631	MB
Radium 226 Precision (±)	0.1	pCi/L			SM 7500 Ra-B	06/21/2018 1631	MB
Radium 228	-3.0	pCi/L		1	Ga-Tech	07/04/2018 533	WN
Radium 228 Precision (±)	1.4	pCi/L			Ga-Tech	07/04/2018 533	WN

These results apply only to the samples tested.

RL - Reporting Limit

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
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: _____
Wade Nieuwsma, Assistant Laboratory Manager

Sample Analysis Report

Company: MVTL Laboratories, Inc.
2616 E Broadway Ave.
Bismarck, ND 58501

Date Reported 7/5/2018
Report ID S1806044001

ProjectName: 201882-1193
Lab ID: S1806044-009
ClientSample ID: 18-W1429 SP1
COC: 201882-1193
PWS ID:
Comments

WorkOrder: S1806044
CollectionDate: 5/30/2018 10:35:00 AM
DateReceived: 6/5/2018 11:50:00 AM
FieldSampler:
Matrix: Water

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Radionuclides - Total							
Radium 226	0.15	pCi/L		0.2	SM 7500 Ra-B	06/21/2018 1631	MB
Radium 226 Precision (±)	0.05	pCi/L			SM 7500 Ra-B	06/21/2018 1631	MB
Radium 228	-4.6	pCi/L		1	Ga-Tech	07/04/2018 836	WN
Radium 228 Precision (±)	2.6	pCi/L			Ga-Tech	07/04/2018 836	WN

These results apply only to the samples tested.

RL - Reporting Limit

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
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: _____
Wade Nieuwsma, Assistant Laboratory Manager

Sample Analysis Report

Company:	MVTL Laboratories, Inc. 2616 E Broadway Ave. Bismarck, ND 58501	**Date Reported** **Report ID**	7/5/2018 S1806044001
ProjectName:	201882-1193	**WorkOrder:**	S1806044
Lab ID:	S1806044-010	**CollectionDate:**	5/30/2018 10:56:00 AM
ClientSample ID:	18-W1430 SP2	**DateReceived:**	6/5/2018 11:50:00 AM
COC:	201882-1193	**FieldSampler:**	
PWS ID:		**Matrix:**	Water
Comments			

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Radionuclides - Total							
Radium 226	0.18	pCi/L		0.2	SM 7500 Ra-B	06/21/2018 1631	MB
Radium 226 Precision (±)	0.1	pCi/L			SM 7500 Ra-B	06/21/2018 1631	MB
Radium 228	0.0	pCi/L		1	Ga-Tech	07/04/2018 1138	WN
Radium 228 Precision (±)	1.4	pCi/L			Ga-Tech	07/04/2018 1138	WN

These results apply only to the samples tested.

RL - Reporting Limit

Qualifiers:

B	Analyte detected in the associated Method Blank	C	Calculated Value
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	M	Value exceeds Monthly Ave or MCL or is less than LCL
ND	Not Detected at the Reporting Limit	O	Outside the Range of Dilutions
S	Spike Recovery outside accepted recovery limits	U	Analysis reported under the reporting limit
X	Matrix Effect		

Reviewed by: _____
Wade Nieuwsma, Assistant Laboratory Manager

Inter-Mountain Labs
1673 Terra Avenue, Sheridan, Wyoming 82801 ph: (307) 672-8945

Your Environmental Monitoring Partner

ANALYTICAL QC SUMMARY REPORT

CLIENT: MVTL Laboratories, Inc.
Work Order: S1806044
Project: 201882-1193

Date: 7/5/2018
Report ID: S1806044001

Radium 228 by Ga/Tech Sample Type **MBLK** Units: pCi/L

MB-512 (07/02/18 16:53)	RunNo: 158826	PrepDate: 06/12/18 14:00			BatchID 14748		
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Total Radium 228	ND	1					

Radium 228 by Ga/Tech Sample Type **LCS** Units: pCi/L

LCS-512 (07/02/18 19:57)	RunNo: 158826	PrepDate: 06/12/18 14:00			BatchID 14748		
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Total Radium 228	33	1	39		85.7	65.9 - 132	

Radium 228 by Ga/Tech Sample Type **MS** Units: pCi/L

MS-512 (07/03/18 02:04)	RunNo: 158826	PrepDate: 06/12/18 14:00			BatchID 14748		
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Total Radium 228	36	1	39	ND	92.0	50 - 139	

Radium 228 by Ga/Tech Sample Type **MSD** Units: pCi/L

MSD-512 (07/03/18 05:08)	RunNo: 158826	PrepDate: 06/12/18 14:00			BatchID 14748		
Analyte	Result	RL	Conc	%RPD	%REC	% RPD Limits	Qual
Total Radium 228	45	1	36	21.9	115	20	

Radium 226 in Water - Sample Type **MBLK** Units: pCi/L

MB-1869 (06/21/18 14:14)	RunNo: 158550	PrepDate: 06/06/18 0:00			BatchID 14701		
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Radium 226	ND	0.2					

Radium 226 in Water - Sample Type **LCS** Units: pCi/L

LCS-1869 (06/21/18 14:14)	RunNo: 158550	PrepDate: 06/06/18 0:00			BatchID 14701		
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Radium 226	6.4	0.2	6.95		91.8	67.1 - 122	

Radium 226 in Water - Sample Type **LCSD** Units: pCi/L

LCSD-1869 (06/21/18 14:14)	RunNo: 158550	PrepDate: 06/06/18 0:00			BatchID 14701		
Analyte	Result	RL	Conc	%RPD	%REC	% RPD Limits	Qual
Radium 226	6.6	0.2	6.4	3.39	95.0	20	

Radium 226 in Water - Sample Type **MS** Units: pCi/L

S1805521-001CMS (06/21/18 14:14)	RunNo: 158550	PrepDate: 06/06/18 0:00			BatchID 14701		
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Radium 226	250	0.2	6.95	232	252	65 - 131	S

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		

MVTL LABORATORIES, Inc.
2616 E Broadway Ave
Bismarck, ND 58501
Phone: (701) 258-97
Toll Free: (800) 279-6885 Fax: (701) 258-9724

Chain of Custody Record

201882-1193

Company Name and Address: MVTL 2616 E Broadway Bismarck, ND 58501	Account #:	Phone #: 701-258-9720
	Contact: Claudette	Fax #: For faxed report check box ☐
	Name of Sampler:	E-mail: ccarroll@mvtl.com For e-mail report check box ☐
Billing Address (indicate if different from above): PO Box 249 New Ulm, MN 56073	Quote Number	Date Submitted: 06/01/2018
	Project Name/Number:	Purchase Order #: BL6057

Sample Information						Bottle Type						Analysis
S1806044 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
001	18-W1421	Dup 1	GW	30-May-18	N/A							Ra226 & Ra228
002	18-W1422	Field Blank (FB)	GW	30-May-18	N/A							Ra226 & Ra228
003	18-W1423	MW103	GW	29-May-18	1454							Ra226 & Ra228
004	18-W1424	MW119	GW	29-May-18	1258							Ra226 & Ra228
005	18-W1425	MW111	GW	29-May-18	1729							Ra226 & Ra228
006	18-W1426	MW118	GW	30-May-18	0835							Ra226 & Ra228
007	18-W1427	MW120	GW	29-May-18	1914							Ra226 & Ra228
008	18-W1428	Sewage Lagoon	SW	31-May-18	0835							Ra226 & Ra228
009	18-W1429	SP1	SW	30-May-18	1035							Ra226 & Ra228
010	18-W1430	SP2	SW	30-May-18	1056							Ra226 & Ra228

Comments:

2 coolers

Transferred by:	Date:	Time:	Sample Condition:	Received by:	Date:		Temp:
N. Buchmann	06/01/2018	1700		Kathy Boyd	6.5.18	11:50	21.5
2.							21.1

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

Field Datasheet

Groundwater Assessment

Company: MDU Lewis and Clark
Event: Spring 2018
Sample ID: 103
Sampling Personal: Darren Wieswag

Weather Conditions: Temp: 71 °F Wind: South @ 5 Precip: Sunny / Partly Cloudy / Cloudy

Well Information

Well Locked?	Yes	(No)	
Well Labeled?	(Yes)	No	
Casing Straight?	(Yes)	No	
Grout Seal Intact?	Yes	No	(Not Visible)
Repairs Necessary:	—		
Casing Diameter:	2"		
Water Level Before Purge:	10.50	ft	
Depth to Top of Pump:	18.44	ft	
Water Level After Sample:	10.54	ft	
Measurement Method:	Electric Water Level Indicator		

Sampling Information

Purging Method:	Bladder
Sampling Method:	Bladder
Dedicated Equip?:	Yes (No)
Duplicate Sample?:	Yes (No)
Duplicate Sample ID:	—

Control Settings		
Purge:	5	sec.
Recover:	55	sec.
PSI:	—	

Purge Date:	29 May 18	Time Purging Began:	1404 am/(pm)
Well Purged Dry?	Yes (No)	Time Purged Dry:	— am/pm
Sample Date:	29 May 18	Time of Sampling:	1454 am/(pm)

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

Field Measurements

Stabilization (3 consecutive)		Temp (°C)	Spec. Cond.	pH	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Water Level (ft)	Pumping Rate	mL Removed	Description: Clarity, Color, Odor, Ect.
SEQ #	Time		±5%	±0.1	±10%	±20 mV	±10%	0.25 ft	ml/min		Clear, Slightly Turbid, Turbid
1	1409	14.39	4225	7.31	0.27	76.4	37.5	10.56	100	500	Slightly Turbid
2	1424	13.01	2163	7.33	0.21	77.8	27.7	10.55	100	1500	SF
3	1439	13.23	1527	7.33	0.24	73.6	4.62	10.55	100	1500	clear
4	1444	13.32	1512	7.33	0.20	74.1	3.53	10.55	100	500	clear
5	1449	12.94	1492	7.35	0.19	75.3	3.73	10.55	100	500	clear
6	1454	12.78	1476	7.33	0.19	77.3	3.57	10.55	100	500	clear
7											
8											
9											
10											

Stabilized: (Yes) No

Total Volume Removed: 5000 mL

Comments:

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

Field Datasheet

Groundwater Assessment

Company: MDU Lewis and Clark
Event: Spring 2018
Sample ID: MW 110
Sampling Personal: Darren Niesvacy

Weather Conditions: Temp: 70 °F Wind: Light @ Precip: Sunny / Partly Cloudy / Cloudy

Well Information

Well Locked?	Yes	~~No~~	
Well Labeled?	~~Yes~~	No	
Casing Straight?	~~Yes~~	No	
Grout Seal Intact?	~~Yes~~	No	Not Visible
Repairs Necessary:	—		
Casing Diameter:	2"		
Water Level Before Purge:	9.04 ft		
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 Equip?:	Yes	No		
Duplicate Sample?:	Yes	No		
Duplicate Sample ID:				
Purge Date:			Time Purging Began:	am/pm
Well Purged Dry?	Yes	No	Time Purged Dry:	am/pm
Sample Date:	29 May 18		Time of Sampling:	1400 am/pm

Control Settings	
Purge:	sec.
Recover:	sec.
PSI:	

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

Field Measurements

Stabilization (3 consecutive) SEQ #	Time	Temp (°C)	Spec. Cond.	pH	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Water Level (ft)	Pumping Rate	mL Removed	Description: Clarity, Color, Odor, Ect.
			±5%	±0.1	±10%	±20 mV	±10%	0.25 ft	ml/min		Clear, Slightly Turbid, Turbid
1											
2											
3											
4											
5											
6											
7											
8											
9											
10											

Stabilized: Yes No

Total Volume Removed: _____ mL

Comments: Went to put pump down the well and there is an obstruction around 9.10 just below water level. Bounced the pump to try to get by, but it won't go past.

MVTL

2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

Field Datasheet

Groundwater Assessment

Company: MDU Lewis and Clark

Event: Spring 2018

Sample ID: 119

Sampling Personal: Darren Nieswang

Weather Conditions: Temp: 66 °F Wind: Light @ Precip: Sunny / (Partly Cloudy) / Cloudy

Well Information

Well Locked?	Yes	(No)	
Well Labeled?	(Yes)	No	
Casing Straight?	(Yes)	No	
Grout Seal Intact?	(Yes)	No	Not Visible
Repairs Necessary:	—		
Casing Diameter:	2"		
Water Level Before Purge:	8.83 ft		
Depth to Top of Pump:	14.34 ft		
Water Level After Sample:	8.90 ft		
Measurement Method:	Electric Water Level Indicator		

Sampling Information

Purging Method:	Bladder		
Sampling Method:	Bladder		
Dedicated Equip?:	Yes	(No)	
Duplicate Sample?:	Yes	(No)	
Duplicate Sample ID:	—		

Control Settings		
Purge:	5	sec.
Recover:	55	sec.
PSI:	—	

Purge Date:	24May18	Time Purging Began:	1208 am/(pm)
Well Purged Dry?	Yes (No)	Time Purged Dry:	~~am/pm~~
Sample Date:	24May18	Time of Sampling:	1258 am/(pm)

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

Field Measurements

Stabilization (3 consecutive) SEQ #	Time	Temp (°C)	Spec. Cond. ±5%	pH ±0.1	DO (mg/L) ±10%	ORP (mV) ±20 mV	Turbidity (NTU) ±10%	Water Level (ft) 0.25 ft	Pumping Rate ml/min	mL Removed	Description: Clarity, Color, Odor, Ect. Clear, Slightly Turbid, Turbid
1	1213	11.98	1116	7.33	1.78	95.3	4.57	8.90	~~500~~ 100	500	clear
2	1238	11.01	1111	7.34	0.74	81.6	4.80	8.90	100	1500	clear
3	1233	10.79	1112	7.34	0.78	80.4	5.40	8.90	100	500	clear
4	1243	10.86	1116	7.34	0.89	78.4	3.48	8.90	100	1000	clear
5	1248	10.80	1119	7.33	0.94	77.5	2.04	8.90	100	500	clear
6	1253	10.86	1119	7.34	0.93	77.3	1.93	8.90	100	500	clear
7	1258	10.63	1118	7.34	0.98	76.6	1.88	8.90	100	500	clear
8											
9											
10											

Stabilized: (Yes) No

Total Volume Removed: 5000 mL

Comments: *24May18 QA(4)

MVTL

2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

Field Datasheet

Groundwater Assessment

Company: MDU Lewis and Clark

Event: Spring 2018

Sample ID: 111

Sampling Personal: Darren Nieswaag

Weather Conditions: Temp: 75 °F Wind: Light @ Precip: Sunny / ~~Partly Cloudy~~ / Cloudy

Well Information

Well Locked?	Yes	(No)	
Well Labeled?	~~Yes~~	No	
Casing Straight?	~~Yes~~	No	
Grout Seal Intact?	~~Yes~~	No	Not Visible
Repairs Necessary:			

Casing Diameter:	2"	
Water Level Before Purge:	7.91	ft
Depth to Top of Pump:	14.76	ft
Water Level After Sample:	7.95	ft
Measurement Method:	Electric Water Level Indicator	

Sampling Information

Purging Method:	Bladder
Sampling Method:	Bladder
Dedicated Equip?:	Yes (No)
Duplicate Sample?:	Yes (No)
Duplicate Sample ID:	—

Control Settings		
Purge:	5	sec.
Recover:	55	sec.
PSI:	—	

Purge Date:	29May18	Time Purging Began:	1619 am/~~pm~~
Well Purged Dry?	Yes (No)	Time Purged Dry:	—— ~~am/pm~~
Sample Date:	29May18	Time of Sampling:	1729 am/~~pm~~

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

Field Measurements

Stabilization (3 consecutive)		Temp (°C)	Spec. Cond.	pH	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Water Level (ft)	Pumping Rate	mL Removed	Description: Clarity, Color, Odor, Ect.
SEQ #	Time		±5%	±0.1	±10%	±20 mV	±10%	0.25 ft	ml/min		Clear, Slightly Turbid, Turbid
1	1624	13.42	3930	7.04	0.34	78.6	5.73	7.98	100	500	Clear
2	1639	12.95	3750	7.07	0.30	74.0	11.3	7.94	100	1500	Clear
3	1649	12.80	3457	7.12	0.68	73.6	7.62	7.95	100	1000	Clear
4	1704	12.31	3129	7.21	1.70	73.8	4.81	7.94	100	1500	Clear
5	1714	12.38	3048	7.23	2.40	74.0	3.29	7.95	100	1000	Clear
6	1719	12.19	3013	7.24	2.74	74.3	1.24	7.95	100	500	Clear
7	1724	12.56	2995	7.25	2.81	74.3	1.15	7.95	100	500	Clear
8	1729	12.71	2997	7.24	2.91	74.4	1.15	7.95	100	500	Clear
9											
10											

Stabilized: (Yes) No

Total Volume Removed: 7000 mL

Comments:

MVTL

2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

Field Datasheet

Groundwater Assessment

Company: MDU Lewis and Clark

Event: Spring 2018

Sample ID: 117

Sampling Personal: Darren Nitzmaag

Weather Conditions: Temp: 75 °F Wind: Light @ Precip: Sunny / Partly Cloudy / Cloudy

Well Information

Well Locked?	Yes	No	
Well Labeled?	Yes	No	
Casing Straight?	Yes	No	
Grout Seal Intact?	Yes	No	Not Visible
Repairs Necessary:			
Casing Diameter:	2"		
Water Level Before Purge:		ft	
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 Equip?:	Yes	No	
Duplicate Sample?:	Yes	No	
Duplicate Sample ID:			

Control Settings	
Purge:	sec.
Recover:	sec.
PSI:	

Purge Date:		Time Purging Began:	am/pm
Well Purged Dry?	Yes No	Time Purged Dry:	am/pm
Sample Date:	29 May 18	Time of Sampling:	1610 am/pm

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

Field Measurements

Stabilization (3 consecutive) SEQ #	Time	Temp (°C)	Spec. Cond.	pH	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Water Level (ft)	Pumping Rate	mL Removed	Description: Clarity, Color, Odor, Ect.
			±5%	±0.1	±10%	±20 mV	±10%	0.25 ft	ml/min		Clear, Slightly Turbid, Turbid
1											
2											
3											
4											
5											
6											
7											
8											
9											
10											

Stabilized: Yes No

Total Volume Removed: _____ mL

Comments: when trying to get the cap off a section of pipe came up about a 2ft section. The cap was on really tight, replaced cap. The sand around the pipe fell into the well and plugged it.

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

Field Datasheet

Groundwater Assessment

Company: MDU Lewis and Clark
Event: Spring 2018
Sample ID: 118
Sampling Personal: Darren Nissman

Weather Conditions: Temp: 62 °F Wind: North @ 6 Precip: Sunny / Partly Cloudy / Cloudy

Well Information

Well Locked?	Yes	~~No~~	
Well Labeled?	~~Yes~~	No	
Casing Straight?	~~Yes~~	No	
Grout Seal Intact?	~~Yes~~	No	Not Visible
Repairs Necessary:			

Casing Diameter:	2"	
Water Level Before Purge:	8.61	ft
Depth to Top of Pump:	9.80	ft
Water Level After Sample:	8.59	ft
Measurement Method:	Electric Water Level Indicator	

Sampling Information

Purging Method:	Bladder		
Sampling Method:	Bladder		
Dedicated Equip?:	Yes	~~No~~	
Duplicate Sample?:	~~Yes~~	No	
Duplicate Sample ID:	Dup 1		

Control Settings		
Purge:	5	sec.
Recover:	55	sec.
PSI:	—	

Purge Date:	30May18	Time Purging Began:	0740 ~~am/pm~~
Well Purged Dry?	Yes ~~No~~	Time Purged Dry:	~~am/pm~~
Sample Date:	30May18	Time of Sampling:	0835 am/pm

Bottle List:	1L Raw	500mL Nitric	500mL Nitric (filtered)	250 Sulfuric
	2	2	~~8~~ 2 - 1L Nitric	2

Field Measurements

Stabilization (3 consecutive) SEQ #	Time	Temp (°C)	Spec. Cond. ±5%	pH ±0.1	DO (mg/L) ±10%	ORP (mV) ±20 mV	Turbidity (NTU) ±10%	Water Level (ft) 0.25 ft	Pumping Rate ml/min	mL Removed	Description: Clarity, Color, Odor, Ect. Clear, Slightly Turbid, Turbid
1	0745	13.90	1571	7.38	6.71	64.2	300	8.59	100	500	Turbid
2	0815	12.91	1571	7.44	4.78	61.4	6.92	8.58	100	3000	clear
3	0825	13.05	1572	7.45	4.65	60.9	2.89	8.58	100	1000	clear
4	0830	12.65	1570	7.45	4.62	60.6	2.76	8.58	100	500	clear
5	0835	12.77	1574	7.45	4.66	60.5	2.61	8.58	100	500	clear
6											
7											
8											
9											
10											

Stabilized: Yes No

Total Volume Removed: 5500 mL

Comments:

MVTL

2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

Field Datasheet

Groundwater Assessment

Company: MDU Lewis and Clark

Event: Spring 2018

Sample ID: 120

Sampling Personal: Darren Nissuacy

Weather Conditions: Temp: 75 °F Wind: Light @ Precip: Sunny / Partly Cloudy / Cloudy

Well Information

Well Locked?	Yes	No	
Well Labeled?	Yes	No	
Casing Straight?	Yes	No	
Grout Seal Intact?	Yes	No	Not Visible
Repairs Necessary:			

Casing Diameter:	2"	
Water Level Before Purge:	15.26	ft
Depth of well	18.85	
Depth to Top of Pump:	16.60	ft
Water Level After Sample:	15.93	ft
Measurement Method:	Electric Water Level Indicator	

Sampling Information

Purging Method:	Bladder
Sampling Method:	Bladder
Dedicated Equip?:	Yes (No)
Duplicate Sample?:	Yes (No)
Duplicate Sample ID:	—

Control Settings		
Purge:	5	sec.
Recover:	55	sec.
PSI:		

Purge Date:	29May18	Time Purging Began:	1834 am/pm
Well Purged Dry?	Yes (No)	Time Purged Dry:	am/pm
Sample Date:	29May18	Time of Sampling:	1914 am/pm

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

Field Measurements

Stabilization (3 consecutive)		Temp (°C)	Spec. Cond.	pH	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Water Level (ft)	Pumping Rate	mL Removed	Description: Clarity, Color, Odor, Ect.
SEQ #	Time		±5%	±0.1	±10%	±20 mV	±10%	0.25 ft	ml/min		Clear, Slightly Turbid, Turbid
1	1839	11.64	3821	6.91	0.56	92.3	13.2	15.41	100	500	Clear
2	1849	10.55	3703	6.90	0.46	80.4	5.84	15.52	100	1000	Clear
3	1859	10.33	3699	6.89	0.29	79.1	2.79	15.60	100	1000	Clear
4	1904	10.42	3695	6.88	0.32	78.5	1.33	15.62	100	500	Clear
5	1909	10.31	3718	6.88	0.36	77.9	1.40	15.65	100	500	Clear
6	1914	9.89	3761	6.88	0.40	77.6	1.41	15.66	100	500	Clear
7											
8											
9											
10											

Stabilized: (Yes) No

Total Volume Removed: 4000 mL

Comments:

Field Datasheet

Surface Water

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

Company: **MDU Lewis and Clark**

Event: **Spring 2018**

Sample ID: Sewage Lagoon

Sampling Personal: Darrin Niswaag

Weather Conditions: Temp: 60 °F Wind: Light Precip: **Sunny / Partly Cloudy / Cloudy**

Site Description

Source:	**Pond**	**Stream**	**Other:**

Latitude:	47.68098
Longitude:	-104.15514
Gauge Reading:	—

Sampling Information

Sampling Method:	**Grab**		
Sample Date:	31 May 18	Time of Sampling:	0835 **am/pm**
Bottle List:	1 Liter Raw: 500 mL Nitric (500mL N Filtered)	250 mL Sulfuric	4 - 1L Nitric

Field Measurements

Time	Temp (°C)	Spec. Cond.	pH	DO (mg/L)	ORP (mV)	Turbidity (NTU)			**Description:** Clarity, Color, Odor, Ect.
0835	20.29	3552	7.89	1.73	40.6	35.9			Slightly Turbid

Comments:

Field Datasheet

Surface Water

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

Company: **MDU Lewis and Clark**

Event: **Spring 2018**

Sample ID: SP1

Sampling Personal: Darren Nitsvaag

Weather Conditions: Temp: 66 °F Wind: Light Precip: **Sunny / Partly Cloudy / Cloudy**

Site Description

Source:	**Pond**	**Stream**	**Other:**

Latitude:	47.68088
Longitude:	-104.16268
Gauge Reading:	

Sampling Information

Sampling Method:	**Grab**	
Sample Date:	7 May 18	Time of Sampling: 1035 am/pm

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

500 mL Nitric Filtered

Field Measurements

Time	Temp (°C)	Spec. Cond.	pH	DO (mg/L)	ORP (mV)	Turbidity (NTU)			Description: Clarity, Color, Odor, Ect.
1035	17.73	789	7.87	6.78	61.6	174			slightly turbid

Comments:

Field Datasheet

Surface Water

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

Company: **MDU Lewis and Clark**
Event: **Spring 2018**
Sample ID: SP2
Sampling Personal: Darren Nistaag

Weather Conditions: Temp: 66 °F Wind: Light Precip: **Sunny / Partly Cloudy / Cloudy**

Site Description

Source:	**Pond**	~~**Stream**~~	**Other:**
Latitude:	47.68104		
Longitude:	-104.15755		
Gauge Reading:			

Sampling Information

Sampling Method:	**Grab**		
Sample Date:	30May18	Time of Sampling:	1056 ~~am~~/pm
Bottle List:	1 Liter Raw: 500 mL Nitric; 250 mL Sulfuric		4 - 1L Nitric

500mL N Filtered

Field Measurements

Time	Temp (°C)	Spec. Cond.	pH	DO (mg/L)	ORP (mV)	Turbidity (NTU)			Description: Clarity, Color, Odor, Ect.
1056	17.77	793	7.78	7.91	61.7	399			Turbid

Comments:

MVTL **Laboratories, Inc.**
2616 E. Broadway
Bismarck, ND 58501
Phone (701) 258-9720

Chain of Custody Record

Project Name:	Event:	Work Order Number:
MDU Lewis and Clark	Spring 2018	82-1193

Report To:	MDU	Carbon Copy:	Name of Sampler(s):
Attn:	Samantha Marshall	Attn:	Darren Nieswaag
Address:	5181 Southgate Dr. Billings, MT 59102	Address:	
phone:	406-896-4227		
email:			

Sample Information						Bottle Type							Field Parameters			Analysis
Lab Number	Sample ID	Date	Time	Sample Type		1 liter Nitric							Temp (°C)	Spec. Cond.	pH	Analysis Required
W1421	Dup 1	30May18	NA	GW		4							NA	NA	NA	
W1422	Field Blank (FB)	30May18	NA	W		4							NA	NA	NA	
W1423	MW103	29May18	1454	GW		4							12.78	1476	7.33	
—	MW110	29May18	1400	GW		~~4~~							obstruction			
W1424	MW119	29May18	1258	GW		4							10.63	1118	7.34	
W1425	MW111	29May18	1729	GW		4							12.71	2997	7.24	Rad 226 & Rad 228
—	MW117	29May18	1610	GW		~~4~~							~~obstructed~~			
W1426	MW118	30May18	0835	GW		4							12.77	1574	7.45	
W1427	MW120	29May18	1914	GW		4							9.89	3761	6.88	

Comments: * 29May18 DNG

Relinquished By:		Sample Condition:	
Name:	Date/Time	Location:	Temp (°C)
1 Dan Nies	31May18 1608	(Log In) Walk In #2	1.0 TM805 ~~TM562 / TM805~~
2			

Received by:	
Name:	Date/Time
Tina Hoh	31 May 2018 1608

MVTL **Laboratories, Inc.**
2616 E. Broadway
Bismarck, ND 58501
Phone (701) 258-9720

Chain of Custody Record

Project Name:	Event:	Work Order Number:
MDU Lewis and Clark	Spring 2018	82-1193

Report To:	MDU	Carbon Copy:	Name of Sampler(s):
Attn:	Samantha Marshall	Attn:	Darren Wieswaag
Address:	5181 Southgate Dr. Billings, MT 59102	Address:	
phone:	406-896-4227		
email:			

Sample Information						Bottle Type							Field Parameters			Analysis
Lab Number	Sample ID	Date	Time	Sample Type		1 liter Nitric							Temp (°C)	Spec. Cond.	pH	Analysis Required
—	west Scrubber Pond	31May18	1105	SW		~~4~~							—	—	—	
W1428	Sewage Lagoon	31May18	0835	SW		4							20.29	3552	7.89	
W1429	SP1	30May18	1035	SW		4										
W1430	SP2	30May18	1056	SW		4			CC		SB	1	17.73	789	7.87	
								1	35	1K	SB	2	17.77	793	7.78	Rad 226 & Rad 228

Comments:

Relinquished By:		Sample Condition:	
Name:	Date/Time	Location:	Temp (°C)
1 Darren Wieswaag	31May18 1608	~~Log In~~ Walk In #2	1.0 TM805 ~~TM502 / TM805~~
2			

Received by:	
Name:	Date/Time
	31 May 2018 1608

MINNESOTA VALLEY TESTING LABORATORIES, INC.
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1201 Lincoln Hwy. ~ Nevada, IA 50201 ~ 800-362-0855 ~ Fax 515-382-3885
www.mvtl.com
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CASE NARRATIVE

-MVTL Lab Reference No/SDG: 201882-1392
Client: Montana Dakota Utilities
Location: MDU Lewis & Clark
Project Identification: Spring 2018 (Radiochem)
MVTL Laboratory Identifications: 18-W1647 through 18-W1648
Page 1 of 1

MDU Sample Identification	MVTL Laboratory #
110	18-W1647
117	18-W1648

I. RECEIPT

- All samples were received at the laboratory on 14 Jun 2018 at 1450.
- Samples were collected and hand delivered by MVTL Field Service personnel to the laboratory.
- Samples were received on ice and evidence of cooling had begun.
  - Temperature of samples upon receipt was 4.0°C.
- No other exceptions on sample receipt were encountered on this sample set unless noted here.
- All samples requiring radiochemistry analysis were sent via courier to Inter-Mountain Labs (IML) for analysis there. Samples were received at IML on 19 Jun 18.
  - All samples were properly preserved unless noted on the individual analytical laboratory report or on the IML Case Narrative.

II. HOLDING TIMES

- All holding times were met for both preparation and analysis unless noted on the individual analytical laboratory report or on the IML Case Narrative.

III. METHODS

- Approved methodology was followed for all sample analyses.
  - Please refer to the IML Case Narrative for more information regarding methodology.

IV. ANALYSIS

- All acceptance criteria was met for calibration, method blanks, laboratory control samples, laboratory fortified matrix/matrix duplicates unless noted on the individual analytical laboratory report or on the IML Case Narrative.

All laboratory data has been approved by MVTL Laboratories.

SIGNED: Claudette Carroll **DATE:** 19 JUL 18

Claudette Carroll - MVTL Bismarck Laboratory Manager

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

Report Date: 19 Jul 18
Lab Number: 18-W1647
Work Order #: 82-1392
Account #: 002800
Date Sampled: 13 Jun 18 15:12
Date Received: 14 Jun 18 14:50
Sampled By: MVTL Field Services

Samantha Marshall
Montana Dakota Utilities
5181 Southgate Dr
Billings MT 59102

Project Name: MDU Lewis & Clark
Sample Description: 110

Temp at Receipt: 4.0C

Event and Year: Spring 2018

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	7.33	units	NA	SM 4500 H+ B	13 Jun 18 15:12	
Temperature - Field	15.6	Degrees C	NA	SM 2550B	13 Jun 18 15:12	
Conductivity - Field	1031	umhos/cm	1	EPA 120.1	13 Jun 18 15:12	
Radium 226	See Attached Report				11 Jul 18	OL
Radium 228	See Attached Report				11 Jul 18	OL

OL = Analysis performed by an Outside Laboratory.

Approved by: Claudette K Carrep CC 19JUL18

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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Report Date: 19 Jul 18
Lab Number: 18-W1648
Work Order #: 82-1392
Account #: 002800
Date Sampled: 14 Jun 18 6:17
Date Received: 14 Jun 18 14:50
Sampled By: MVTL Field Services

Samantha Marshall
Montana Dakota Utilities
5181 Southgate Dr
Billings MT 59102

Project Name: MDU Lewis & Clark
Sample Description: 117

Temp at Receipt: 4.0C

Event and Year: Spring 2018

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	7.24	units	NA	SM 4500 H+ B	14 Jun 18 6:17	
Temperature - Field	9.85	Degrees C	NA	SM 2550B	14 Jun 18 6:17	
Conductivity - Field	8475	umhos/cm	1	EPA 120.1	14 Jun 18 6:17	
Radium 226	See Attached Report				11 Jul 18	OL
Radium 228	See Attached Report				11 Jul 18	OL

OL = Analysis performed by an Outside Laboratory.

CC

Approved by: Claudette K Carrol 19 JUL 18

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.

Inter-Mountain Labs
1673 Terra Avenue, Sheridan, Wyoming 82801 ph: (307) 672-8945

Your Environmental Monitoring Partner

Date: 7/13/2018

CLIENT: MVTL Laboratories, Inc.
Project: 201882-1392
Lab Order: S1806333

CASE NARRATIVE

Report ID: S1806333001

Samples 18-W16747 110 and 18-W16748 117 were received on June 19, 2018.

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 Inter-Mountain Laboratories except as indicated in this case narrative.

Reviewed by:
Wade Nieuwsma, Assistant Laboratory Manager

Inter-Mountain Labs
1673 Terra Avenue, Sheridan, Wyoming 82801 ph: (307) 672-8945

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Sample Analysis Report

Company:	MVTL Laboratories, Inc. 2616 E Broadway Ave. Bismarck, ND 58501	**Date Reported**	7/13/2018
		Report ID	S1806333001
ProjectName:	201882-1392	**WorkOrder:**	S1806333
Lab ID:	S1806333-001	**CollectionDate:**	6/13/2018 3:12:00 PM
ClientSample ID:	18-W16747 110	**DateReceived:**	6/19/2018 11:20:00 AM
COC:	201882-1382	**FieldSampler:**	
PWS ID:		**Matrix:**	Water
Comments			

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Radionuclides - Total							
Radium 226	0.2	pCi/L		0.2	SM 7500 Ra-B	07/11/2018 1502	MB
Radium 226 Precision (±)	0.1	pCi/L			SM 7500 Ra-B	07/11/2018 1502	MB
Radium 228	-0.2	pCi/L		1	Ga-Tech	07/11/2018 2007	MB
Radium 228 Precision (±)	1.9	pCi/L			Ga-Tech	07/11/2018 2007	MB

These results apply only to the samples tested.

RL - Reporting Limit

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
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: _____
Wade Nieuwsma, Assistant Laboratory Manager

Sample Analysis Report

Company:	MVTL Laboratories, Inc. 2616 E Broadway Ave. Bismarck, ND 58501	**Date Reported**	7/13/2018
		Report ID	S1806333001
ProjectName:	201882-1392	**WorkOrder:**	S1806333
Lab ID:	S1806333-002	**CollectionDate:**	6/14/2018 6:17:00 AM
ClientSample ID:	18-W16748 117	**DateReceived:**	6/19/2018 11:20:00 AM
COC:	201882-1382	**FieldSampler:**	
PWS ID:		**Matrix:**	Water
Comments			

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Radionuclides - Total							
Radium 226	0.9	pCi/L		0.2	SM 7500 Ra-B	07/11/2018 1502	MB
Radium 226 Precision (±)	0.2	pCi/L			SM 7500 Ra-B	07/11/2018 1502	MB
Radium 228	-0.4	pCi/L		1	Ga-Tech	07/11/2018 2310	MB
Radium 228 Precision (±)	1.3	pCi/L			Ga-Tech	07/11/2018 2310	MB

These results apply only to the samples tested.

RL - Reporting Limit

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
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: _____
Wade Nieuwsma, Assistant Laboratory Manager

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ANALYTICAL QC SUMMARY REPORT

CLIENT: MVTL Laboratories, Inc.
Work Order: S1806333
Project: 201882-1392

Date: 7/13/2018
Report ID: S1806333001

Radium 228 by Ga/Tech Sample Type **MBLK** Units: pCi/L

MB-514 (07/09/18 10:11)	RunNo: 159126	PrepDate: 06/28/18 0:00			BatchID 14759		
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Total Radium 228	ND	1					

Radium 228 by Ga/Tech Sample Type **LCS** Units: pCi/L

LCS-514 (07/09/18 13:14)	RunNo: 159126	PrepDate: 06/28/18 0:00			BatchID 14759		
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Total Radium 228	37	1	39		95.7	65.9 - 132	

Radium 228 by Ga/Tech Sample Type **MS** Units: pCi/L

MS-514 (07/09/18 19:20)	RunNo: 159126	PrepDate: 06/28/18 0:00			BatchID 14759		
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Total Radium 228	34	1	39	ND	87.8	50 - 139	

Radium 228 by Ga/Tech Sample Type **MSD** Units: pCi/L

MSD-514 (07/09/18 22:23)	RunNo: 159126	PrepDate: 06/28/18 0:00			BatchID 14759		
Analyte	Result	RL	Conc	%RPD	%REC	% RPD Limits	Qual
Total Radium 228	38	1	34	10.0	97.1	20	

Radium 226 in Water - Sample Type **MBLK** Units: pCi/L

MB-1874 (07/11/18 12:45)	RunNo: 159097	PrepDate: 06/25/18 0:00			BatchID 14771		
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Radium 226	ND	0.2					

Radium 226 in Water - Sample Type **LCS** Units: pCi/L

LCS-1874 (07/11/18 12:45)	RunNo: 159097	PrepDate: 06/25/18 0:00			BatchID 14771		
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Radium 226	7.0	0.2	6.95		100	67.1 - 122	

Radium 226 in Water - Sample Type **MS** Units: pCi/L

MS-1874 (07/11/18 12:45)	RunNo: 159097	PrepDate: 06/25/18 0:00			BatchID 14771		
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Radium 226	7.8	0.2	6.95	ND	111	65 - 131	

Radium 226 in Water - Sample Type **MSD** Units: pCi/L

MSD-1874 (07/11/18 12:45)	RunNo: 159097	PrepDate: 06/25/18 0:00			BatchID 14771		
Analyte	Result	RL	Conc	%RPD	%REC	% RPD Limits	Qual
Radium 226	7.4	0.2	7.8	4.35	107	20	

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		

MVTL LABORATORIES, Inc.
2616 E Broadway Ave
Bismarck, ND 58501
Phone: (701) 258-9720
Toll Free: (800) 279-6885 Fax: (701) 258-9724

Chain of Custody Record

201882-1392

Company Name and Address:	Account #:	Phone #:
		701-258-9720
MVTL	Contact:	Fax #:
2616 E Broadway	Claudette	For faxed report check box
Bismarck, ND 58501	Name of Sampler:	E-mail: ccarroll@mvtl.com
Billing Address (indicate if different from above):		For e-mail report check box
	Quote Number	Date Submitted:
PO Box 249		15-Jun-18
New Ulm, MN 56073	Project Name/Number:	Purchase Order #:
		BL6060

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
S1806333-001	18-W1647	110	GW	13-Jun-18	1512		4					Ra226 & Ra228
002	18-W1648	117	GW	14-Jun-18	0617		4					Ra226 & Ra228

Comments: All results must be reported as a numerical value.

Transferred by:	Date:	Time:	Sample Condition:	Received by:	Date:		Temp:
Nathan Buchmann	15-Jun-18	1700		Kathy Bop	6.19.18	11:20	18.0
2.							

MVTL

2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

Field Datasheet

Groundwater Assessment

Company:	MDU Lewis and Clark
Event:	Spring 2018
Sample ID:	110
Sampling Personal:	Jimmy Hoyer

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 Straight?	(Yes)	No	
Grout Seal Intact?	(Yes)	No	Not Visible
Repairs Necessary:			
Casing Diameter:	2"		
Water Level Before Purge:	8.80	ft	
Bottom:	16.92		
Depth to Top of Pump:	—	ft	
Water Level After Sample:	9.01	ft	
Measurement Method:	Electric Water Level Indicator		

Sampling Information

Purging Method:	Bladder
Sampling Method:	Bladder
Dedicated Equip?:	Yes (No)
Duplicate Sample?:	Yes (No)
Duplicate Sample ID:	—

Control Settings		
Purge:	5	sec.
Recover:	55	sec.
PSI:	15	

Purge Date:	13 Jun 18	Time Purging Began:	1212 am/(pm)
Well Purged Dry?	Yes (No)	Time Purged Dry:	— am/pm
Sample Date:	13 Jun 18	Time of Sampling:	1512 am/(pm)

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

Field Measurements

Stabilization (3 consecutive) SEQ #	Time	Temp (°C)	Spec. Cond. ±5%	pH ±0.1	DO (mg/L) ±10%	ORP (mV) ±20 mV	Turbidity (NTU) ±10%	Water Level (ft) 0.25 ft	Pumping Rate ml/min	mL Removed	Description: Clarity, Color, Odor, Ect. Clear, Slightly Turbid, Turbid
1	1217	16.41	1040	7.38	3.32	130.1	696.0	8.89	100.0	500.0	Turbid Tan
2	1247	17.47	1030	7.06	2.28	48.2	285.0	8.93	100.0	3000.0	Slightly Turbid
3	1317	14.88	1029	7.07	2.09	37.8	115.0	8.93	100.0	3000.0	Slightly Turbid
4	1347	14.84	1028	7.15	2.52	31.2	46.6	8.93	100.0	3000.0	Clear
5	1417	15.38	1029	7.15	2.23	24.7	25.1	8.94	100.0	3000.0	Clear
6	1437	15.58	1032	7.12	2.18	23.3	19.5	8.95	100.0	3000.0	Clear
7	1457	15.83	1030	7.31	2.91	69.3	5.01	8.97	100.0	3000.0	Clear
8	1502	15.93	1026	7.30	2.83	74.8	4.91	8.97	100.0	3000.0	Clear
9	1507	15.72	1027	7.29	2.94	68.6	4.76	8.98	100.0	3000.0	Clear
10	1512	15.61	1031	7.33	2.89	70.2	4.78	8.98	100.0	3000.0	Clear

Stabilized: (Yes) No

Total Volume Removed: 10,000.0 mL

Comments:

Slight obstruction able to get longer bladder pump past

MVTL

2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

Field Datasheet

Groundwater Assessment

Company: MDU Lewis and Clark

Event: Spring 2018

Sample ID: 117

Sampling Personal: Jenny Mayer

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 Straight?	(Yes)	No	
Grout Seal Intact?	(Yes)	No	Not Visible
Repairs Necessary:			

Casing Diameter:	2"	
Water Level Before Purge:	5.85	ft
	11.54	
Depth to Top of Pump:	~~11~~ 9.25	ft
Water Level After Sample:	Below Pump	ft
Measurement Method:	Electric Water Level Indicator	

Sampling Information

Purging Method:	Bladder		
Sampling Method:	Bladder		
Dedicated Equip?:	Yes	(No)	
Duplicate Sample?:	Yes	(No)	
Duplicate Sample ID:			

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

Purge Date:	13 June 18		Time Purging Began:	1614 am/pm
Well Purged Dry?	(Yes)	No	Time Purged Dry:	1649 am/pm
Sample Date:	14 June 18		Time of Sampling:	0617 am/pm

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

Field Measurements

Stabilization (3 consecutive)		Temp (°C)	Spec. Cond.	pH	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Water Level (ft)	Pumping Rate	mL Removed	Description: Clarity, Color, Odor, Ect.
SEQ #	Time		±5%	±0.1	±10%	±20 mV	±10%	0.25 ft	ml/min		Clear, Slightly Turbid, Turbid
1	1619	15.62	8794	7.13	9.64	168.4	617.0	5.93	100.0	500.0	Turbid Tan
2	1629	15.24	8366	7.14	9.96	187.4	22.8	7.20	100.0	1000.0	Clear
3	1639	12.87	8555	7.12	9.42	198.0	17.9	8.06	100.0	1000.0	Clear
4	1649	12.43	8540	7.17	10.49	203.4	18.5	Below Pump	100.0	1000.0	clear
5											
6	0612	Purged	well for	5 min	to clear	line		6.58	100.0	500.0	
7	0617	9.85	8475	7.24	10.42	226.2	4.41	—	—	—	Clear
8											
9											
10										recharge	

Stabilized: Yes (No)

Total Volume Removed: 4000.0 mL

Comments:

MVTL **Laboratories, Inc.**
2616 E. Broadway
Bismarck, ND 58501
Phone (701) 258-9720

Chain of Custody Record

Project Name:	Event:	Work Order Number:
MDU Lewis and Clark	Spring 2018	82-1392

Report To:	MDU	Carbon Copy:	Name of Sampler(s):
Attn:	Samantha Marshall	Attn:	
Address:	5181 Southgate Dr. Billings, MT 59102	Address:	
phone:	406-896-4227		
email:			

Sample Information						Bottle Type							Field Parameters			Analysis
Lab Number	Sample ID	Date	Time	Sample Type		1 liter Nitric							Temp (°C)	Spec. Cond.	pH	Analysis Required
W1647	110	13 Jun 18	1512	GW		4							15.61	1031	7.33	Rad 226 & Rad 228
W1648	117	14 Jun 18	0617	GW		4							9.85	8475	7.24	

Comments:

Relinquished By:		Sample Condition:	
Name:	Date/Time	Location:	Temp (°C)
1	14 Jun 18 1450	~~Log In~~ Walk In #2	4.C ~~TM562~~ / TM805
2			

Received by:	
Name:	Date/Time
	14 Jun 2018 1450

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CASE NARRATIVE

-MVTL Lab Reference No/SDG: **201882-1391**
Client: **Montana Dakota Utilities**
Location: **MDU Lewis & Clark**
Project Identification: **Spring 2018**
MVTL Laboratory Identifications: **18-W1645 through 18-W1646**

MDU Sample Identification	MVTL Laboratory #
110	18-W1645
117	18-W1646

I. RECEIPT

- All samples were received at the laboratory on 14 Jun 2018 at 1450.
- Samples were collected and hand delivered by MVTL Field Service personnel to the laboratory.
- Samples were received on ice and evidence of cooling had begun.
  - Temperature of samples upon receipt was 4.0°C.
- All samples were properly preserved unless noted here and/or flagged on the individual analytical laboratory report.
- No other exceptions on sample receipt were encountered on this sample set unless noted here.

II. HOLDING TIMES

- With the exception of laboratory pH, all holding times were met for both preparation and analysis unless noted here.

III. METHODS

- Approved methodology was followed for all sample analyses.

IV. ANALYSIS

- All acceptance criteria was met for calibration, method blanks, laboratory control samples, laboratory fortified matrix/matrix duplicates unless noted here and/or flagged on the individual analytical laboratory report.
  - For some metals, the reported results were elevated due to instrument performance at the lower limit of quantitation (LLOQ).
  - For some analytes, the reported results were elevated due to additional dilutions required to minimize the effects of sample matrix.
  - Recovery for one beryllium total matrix spike was outside of the acceptable limits. Recovery of the matrix spike duplicate was acceptable. RPD for the recoveries of the matrix spike/matrix spike duplicate was acceptable. No further action was taken.
  - The recoveries for one selenium dissolved 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. Data was accepted based on acceptable recovery of the LCS. No further action was taken.

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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CASE NARRATIVE

-MVTL Lab Reference No/SDG: **201882-1391**
Client: **Montana Dakota Utilities**
Location: **MDU Lewis & Clark**
Project Identification: **Spring 2018**
MVTL Laboratory Identifications: **18-W1645 through 18-W1646**

- The recoveries for one mercury dissolved 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. Data was accepted based on acceptable recovery of the LCS. No further action was taken.

All laboratory data has been approved by MVTL Laboratories.

SIGNED: Claudette Carroll **DATE:** 13 JUL 18

Claudette Carroll - MVTL Bismarck Laboratory Manager

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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Quality Control Report

Lab IDs: 18-W1645 to 18-W1646 **Project:** MDU Lewis & Clark **Work Order:** 201882-1391

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	0.0160	100	80-120	0.100 0.100	18W1626q 18-W1646	< 0.001 < 0.001	0.1056 0.1051	106 105	75-125 75-125	0.1056 0.1051	0.1006 0.0992	101 99	4.8 5.8	20 20	- -	- -	< 0.001
Antimony - Total mg/l	0.1000	109	80-120	0.100	18-W1646	< 0.001	0.1062	106	75-125	0.1062	0.1059	106	0.3	20	-	-	< 0.001
Arsenic - Dissolved mg/l	0.0160	102	80-120	0.100 0.100	18W1626q 18-W1646	< 0.002 < 0.002	0.1106 0.1072	111 107	75-125 75-125	0.1106 0.1072	0.1022 0.1044	102 104	7.9 2.6	20 20	- -	- -	< 0.002
Arsenic - Total mg/l	0.1000	105	80-120	0.100	18-W1646	< 0.002	0.1096	110	75-125	0.1096	0.1069	107	2.5	20	-	-	< 0.002
Barium - Dissolved mg/l	0.0160	100	80-120	0.100 0.100	18W1626q 18-W1646	0.0308 0.0137	0.1298 0.1129	99 99	75-125 75-125	0.1129	0.1098	96	2.8	20	- -	- -	< 0.002
Barium - Total mg/l	0.1000	106	80-120	0.100	18-W1646	0.0201	0.1272	107	75-125	0.1272	0.1268	107	0.3	20	-	-	< 0.002
Beryllium - Dissolved mg/l	0.0160	103	80-120	0.100 0.100	18W1626q 18-W1646	< 0.0005 < 0.0005	0.1155 0.1178	116 118	75-125 75-125	0.1155 0.1178	0.1162 0.1118	116 112	0.6 5.2	20 20	- -	- -	< 0.0005
Beryllium - Total mg/l	0.1000	108	80-120	0.100	18-W1646	< 0.0005	0.1278	128	75-125	0.1278	0.1231	123	3.7	20	-	-	< 0.0005
Boron - Dissolved mg/l	0.40 0.40	110 108	80-120 80-120	2.00	18-W1774	0.86	3.04	109	75-125	3.04	2.76	95	9.7	20	- - -	- - -	< 0.1 < 0.1 < 0.1
Boron - Total mg/l	0.40	110	80-120	0.400 0.400	18-D2232 18-W1732	3.34 0.57	3.75 0.98	102 102	75-125 75-125	3.75 0.98	3.82 0.96	120 98	1.8 2.1	20 20	- -	- -	< 0.1 < 0.1
Cadmium - Dissolved mg/l	0.0160	102	80-120	0.100 0.100	18W1626q 18-W1646	< 0.0005 < 0.0005	0.1083 0.1054	108 105	75-125 75-125	0.1083 0.1054	0.1078 0.1021	108 102	0.5 3.2	20 20	- -	- -	< 0.0005
Cadmium - Total mg/l	0.1000	107	80-120	0.100	18-W1646	< 0.0005	0.1039	104	75-125	0.1039	0.1052	105	1.2	20	-	-	< 0.0005
Calcium - Dissolved mg/l	20.0	108	80-120	500	18W1646q	409	895	97	75-125	895	910	100	1.7	20	- -	- -	< 1 < 1
Calcium - Total mg/l	20.0	106	80-120	100	18W1645q	87.0	174	87	75-125	174	174	87	0.0	20	- -	- -	< 1 < 1
Chloride mg/l	30.0 30.0	99 96	80-120 80-120	30.0	18-D2093	88.6	118	98	80-120	118	119	101	0.8	20	- -	- -	< 1 < 1

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Quality Control Report

Lab IDs: 18-W1645 to 18-W1646 **Project:** MDU Lewis & Clark **Work Order:** 201882-1391

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
Chromium - Dissolved mg/l	0.0160	104	80-120	0.100 0.100	18W1626q 18-W1646	< 0.002 < 0.002	0.1034 0.1108	103 111	75-125 75-125	0.1034 0.1108	0.0964 0.1056	96 106	7.0 4.8	20 20	- -	- -	< 0.002
Chromium - Total mg/l	0.1000	104	80-120	0.100	18-W1646	0.0074	0.1238	116	75-125	0.1238	0.1204	113	2.8	20	-	-	< 0.002
Cobalt - Dissolved mg/l	0.0160	106	80-120	0.100 0.100	18W1626q 18-W1646	< 0.002 < 0.002	0.1048 0.1066	105 107	75-125 75-125	0.1048 0.1066	0.1016 0.1006	102 101	3.1 5.8	20 20	- -	- -	< 0.002
Cobalt - Total mg/l	0.1000	107	80-120	0.100	18-W1646	< 0.005	0.1138	114	75-125	0.1138	0.1134	113	0.4	20	-	-	< 0.002
Fluoride mg/l	0.50 0.50	108 106	90-110 90-110	0.500 0.500	18-W1645 18-W1663	0.51 0.24	1.00 0.80	98 112	80-120 80-120	1.00 0.80	0.99 0.71	96 94	1.0 11.9	20 20	- -	- -	< 0.1 < 0.1
Lead - Dissolved mg/l	0.0160	101	80-120	0.100 0.100	18W1626q 18-W1646	< 0.0005 < 0.0005	0.0919 0.0912	92 91	75-125 75-125	0.0919 0.0912	0.1004 0.0874	100 87	8.8 4.3	20 20	- -	- -	< 0.0005
Lead - Total mg/l	0.1000	105	80-120	0.100	18-W1646	< 0.0005	0.0951	95	75-125	0.0951	0.0949	95	0.2	20	-	-	< 0.0005
Lithium - Dissolved mg/l	0.40	108	80-120	2.00	18-W1646	< 0.5	1.98	99	75-125	1.98	1.95	98	1.5	20	- - -	- - -	< 0.1 < 0.1 < 0.1
Lithium - Total mg/l	0.40 0.40 0.40	105 105 108	80-120 80-120 80-120	4.00 0.400	18-D2080 18-W1732	< 1 < 0.1	3.72 0.46	93 115	75-125 75-125	3.72 0.46	3.59 0.46	90 115	3.6 0.0	20 20	- - - -	- - - -	< 0.1 < 0.1 < 0.1 < 0.1
Magnesium - Dissolved mg/l	20.0	106	80-120	500	18W1646q	1160	1620	92	75-125	1620	1640	96	1.2	20	- -	- -	< 1 < 1
Magnesium - Total mg/l	20.0	104	80-120	100	18W1645q	54.0	143	89	75-125	143	143	89	0.0	20	- -	- -	< 1 < 1
Mercury - Dissolved mg/l	0.0020	100	85-115	0.002	18-W1696	< 0.0002	0.0012	60	70-130	0.0012	0.0012	60	0.0	20	-	-	< 0.0002
Mercury - Total mg/l	0.0020	100	85-115	0.002	18-W1646	< 0.0002	0.0018	90	70-130	0.0018	0.0018	90	0.0	20	-	-	< 0.0002
Molybdenum - Dissolved mg/l	0.0160	99	80-120	0.100 0.100	18W1626q 18-W1646	0.0034 0.0033	0.1080 0.1135	105 110	75-125 75-125	0.1080 0.1135	0.0986 0.1077	95 104	9.1 5.2	20 20	- -	- -	< 0.002
Molybdenum - Total mg/l	0.1000	110	80-120	0.100	18-W1646	0.0056	0.1225	117	75-125	0.1225	0.1227	117	0.2	20	-	-	< 0.002

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Quality Control Report

Lab IDs: 18-W1645 to 18-W1646 **Project:** MDU Lewis & Clark **Work Order:** 201882-1391

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 0.50	110 104	90-110 90-110	1.00	18-W1634	< 0.1	0.91	91	90-110	0.91	0.93	93	2.2	20	- -	- -	< 0.1 < 0.1
pH units	- -	- -	- -	- -	- -	- -	- -	- -	- -	5.9 7.5	5.9 7.6	- -	0.0 1.3	20 20	- -	- -	- -
Potassium - Dissolved mg/l	10.0	90	80-120	100	18W1646q	23.5	120	96	75-125	120	122	98	1.7	20	- -	- -	< 1 < 1
Potassium - Total mg/l	10.0	92	80-120	20.0	18W1645q	6.6	24.0	87	75-125	24.0	24.0	87	0.0	20	- -	- -	< 1 < 1
Selenium - Dissolved mg/l	0.0160	103	80-120	0.100 0.100	18W1626q 18-W1646	< 0.005 0.0393	0.1230 0.1708	123 132	75-125 75-125	0.1230 0.1708	0.1181 0.1664	118 127	4.1 2.6	20 20	- -	- -	< 0.005
Selenium - Total mg/l	0.1000	102	80-120	0.100	18-W1646	0.0403	0.1571	117	75-125	0.1571	0.1578	118	0.4	20	-	-	< 0.005
Sodium - Dissolved mg/l	20.0	104	80-120	500	18W1646q	580	1060	96	75-125	1060	1080	100	1.9	20	- -	- -	< 1 < 1
Sodium - Total mg/l	20.0	100	80-120	100	18W1645q	77.7	166	88	75-125	166	164	86	1.2	20	- -	- -	< 1 < 1
Sulfate mg/l	100	101	80-120	200	18-W1652	168	330	81	80-120	330	332	82	0.6	20	-	-	< 5
Thallium - Dissolved mg/l	0.0160	100	80-120	0.100 0.100	18W1626q 18-W1646	< 0.0005 < 0.0005	0.0922 0.0921	92 92	75-125 75-125	0.0922 0.0921	0.0978 0.0881	98 88	5.9 4.4	20 20	- -	- -	< 0.0005
Thallium - Total mg/l	0.1000	104	80-120	0.100	18-W1646	< 0.0005	0.0965	96	75-125	0.0965	0.0962	96	0.3	20	-	-	< 0.0005
Total Alkalinity mg/l CaCO3	410	97	90-110	410 410	18-W1669 18-W1670	425 499	798 876	91 92	80-120 80-120	798 876	803 876	92 92	0.6 0.0	20 20	93	80-120	< 20 < 20
Total Dissolved Solids mg/l	-	-	-	-	-	-	-	-	-	9870	10000	-	1.3	20	-	-	< 10
Total Suspended Solids mg/l	- -	- -	- -	- -	- -	- -	- -	- -	- -	13 26	14 26	- -	7.4 0.0	20 20	- -	- -	< 2

Approved by: C. Cantrell
13 JUL 18

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Report Date: 5 Jul 18
Lab Number: 18-W1645
Work Order #: 82-1391
Account #: 002800
Date Sampled: 13 Jun 18 15:12
Date Received: 14 Jun 18 14:50
Sampled By: MVTL Field Services

Samantha Marshall
Montana Dakota Utilities
5181 Southgate Dr
Billings MT 59102

Project Name: MDU Lewis & Clark
Sample Description: 110

Temp at Receipt: 4.0C

Event and Year: Spring 2018

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	14 Jun 18	SVS
pH	* 7.8	units	N/A	SM4500 H+ B	15 Jun 18 18:00	SVS
Total Suspended Solids	7	mg/l	2	I3765-85	15 Jun 18 15:43	SVS
pH - Field	7.33	units	NA	SM 4500 H+ B	13 Jun 18 15:12	
Temperature - Field	15.6	Degrees C	NA	SM 2550B	13 Jun 18 15:12	
Total Alkalinity	328	mg/l CaCO3	20	SM2320-B	19 Jun 18 17:00	SVS
Conductivity - Field	1031	umhos/cm	1	EPA 120.1	13 Jun 18 15:12	
Fluoride	0.51	mg/l	0.10	SM4500-F-C	18 Jun 18 17:00	SVS
Sulfate	222	mg/l	5.00	ASTM D516-07	21 Jun 18 11:58	EMS
Chloride	20.4	mg/l	1.0	SM4500-Cl-E	20 Jun 18 14:15	EMS
Nitrate-Nitrite as N	5.16	mg/l	0.10	EPA 353.2	22 Jun 18 12:06	EV
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	21 Jun 18 12:23	EV
Mercury - Dissolved	< 0.0002	mg/l	0.0002	EPA 245.1	21 Jun 18 12:23	EV
Total Dissolved Solids	667	mg/l	10	I1750-85	15 Jun 18 10:01	SVS
Calcium - Total	87.0	mg/l	1.0	6010D	25 Jun 18 13:39	BT
Magnesium - Total	54.0	mg/l	1.0	6010D	25 Jun 18 13:39	BT
Sodium - Total	77.7	mg/l	1.0	6010D	25 Jun 18 13:39	BT
Potassium - Total	6.6	mg/l	1.0	6010D	25 Jun 18 13:39	BT
Lithium - Total	< 0.1	mg/l	0.10	6010D	27 Jun 18 13:22	BT
Boron - Total	0.26	mg/l	0.10	6010D	3 Jul 18 13:00	BT
Calcium - Dissolved	82.4	mg/l	1.0	6010D	19 Jun 18 16:00	BT
Magnesium - Dissolved	51.4	mg/l	1.0	6010D	19 Jun 18 16:00	BT
Sodium - Dissolved	75.1	mg/l	1.0	6010D	19 Jun 18 16:00	BT
Potassium - Dissolved	5.3	mg/l	1.0	6010D	19 Jun 18 16:00	BT
Lithium - Dissolved	< 0.1	mg/l	0.10	6010D	27 Jun 18 13:22	BT
Boron - Dissolved	0.20	mg/l	0.10	6010D	3 Jul 18 12:00	BT
Antimony - Total	< 0.001	mg/l	0.0010	6020B	18 Jun 18 18:37	CC
Arsenic - Total	< 0.002	mg/l	0.0020	6020B	18 Jun 18 18:37	CC
Barium - Total	0.0345	mg/l	0.0020	6020B	18 Jun 18 18:37	CC
Beryllium - Total	< 0.0005	mg/l	0.0005	6020B	18 Jun 18 18:37	CC
Cadmium - Total	< 0.0005	mg/l	0.0005	6020B	18 Jun 18 18:37	CC
Chromium - Total	< 0.002	mg/l	0.0020	6020B	18 Jun 18 18:37	CC
Cobalt - Total	< 0.005 ^	mg/l	0.0020	6020B	18 Jun 18 18:37	CC
Lead - Total	0.0007	mg/l	0.0005	6020B	18 Jun 18 18:37	CC
Molybdenum - Total	0.0040	mg/l	0.0020	6020B	18 Jun 18 18:37	CC
Selenium - Total	< 0.01 ^	mg/l	0.0050	6020B	18 Jun 18 18:37	CC
Thallium - Total	< 0.0005	mg/l	0.0005	6020B	18 Jun 18 18:37	CC

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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Report Date: 5 Jul 18
Lab Number: 18-W1645
Work Order #: 82-1391
Account #: 002800
Date Sampled: 13 Jun 18 15:12
Date Received: 14 Jun 18 14:50
Sampled By: MVTL Field Services

Samantha Marshall
Montana Dakota Utilities
5181 Southgate Dr
Billings MT 59102

Project Name: MDU Lewis & Clark
Sample Description: 110

Temp at Receipt: 4.0C

Event and Year: Spring 2018

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Antimony - Dissolved	< 0.001	mg/l	0.0010	6020B	19 Jun 18 17:34	CC
Arsenic - Dissolved	< 0.002	mg/l	0.0020	6020B	19 Jun 18 17:34	CC
Barium - Dissolved	0.0265	mg/l	0.0020	6020B	19 Jun 18 17:34	CC
Beryllium - Dissolved	< 0.0005	mg/l	0.0005	6020B	19 Jun 18 17:34	CC
Cadmium - Dissolved	< 0.0005	mg/l	0.0005	6020B	19 Jun 18 17:34	CC
Chromium - Dissolved	< 0.002	mg/l	0.0020	6020B	19 Jun 18 17:34	CC
Cobalt - Dissolved	< 0.002	mg/l	0.0020	6020B	19 Jun 18 17:34	CC
Lead - Dissolved	< 0.0005	mg/l	0.0005	6020B	19 Jun 18 17:34	CC
Molybdenum - Dissolved	0.0031	mg/l	0.0020	6020B	19 Jun 18 17:34	CC
Selenium - Dissolved	< 0.005	mg/l	0.0050	6020B	19 Jun 18 17:34	CC
Thallium - Dissolved	< 0.0005	mg/l	0.0005	6020B	19 Jun 18 17:34	CC

* Holding time exceeded

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

Approved by: Claudette K Carroll 13JUL18

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

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

CERTIFICATION: ND # ND-00016

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Report Date: 5 Jul 18
Lab Number: 18-W1646
Work Order #: 82-1391
Account #: 002800
Date Sampled: 14 Jun 18 6:17
Date Received: 14 Jun 18 14:50
Sampled By: MVTL Field Services

Samantha Marshall
Montana Dakota Utilities
5181 Southgate Dr
Billings MT 59102

Project Name: MDU Lewis & Clark
Sample Description: 117

Temp at Receipt: 4.0C

Event and Year: Spring 2018

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	14 Jun 18	SVS
pH	* 7.6	units	N/A	SM4500 H+ B	15 Jun 18 18:00	SVS
Total Suspended Solids	26	mg/l	2	I3765-85	15 Jun 18 15:43	SVS
pH - Field	7.24	units	NA	SM 4500 H+ B	14 Jun 18 6:17	
Temperature - Field	9.85	Degrees C	NA	SM 2550B	14 Jun 18 6:17	
Total Alkalinity	396	mg/l CaCO3	20	SM2320-B	19 Jun 18 17:00	SVS
Conductivity - Field	8475	umhos/cm	1	EPA 120.1	14 Jun 18 6:17	
Fluoride	0.29	mg/l	0.10	SM4500-F-C	18 Jun 18 17:00	SVS
Sulfate	7560	mg/l	5.00	ASTM D516-07	21 Jun 18 11:58	EMS
Chloride	47.9	mg/l	1.0	SM4500-Cl-E	20 Jun 18 14:15	EMS
Nitrate-Nitrite as N	24.0	mg/l	0.10	EPA 353.2	22 Jun 18 12:06	EV
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	21 Jun 18 12:23	EV
Mercury - Dissolved	< 0.0002	mg/l	0.0002	EPA 245.1	21 Jun 18 12:23	EV
Total Dissolved Solids	9870	mg/l	10	I1750-85	15 Jun 18 10:01	SVS
Calcium - Total	413	mg/l	1.0	6010D	25 Jun 18 13:39	BT
Magnesium - Total	1220	mg/l	1.0	6010D	25 Jun 18 13:39	BT
Sodium - Total	600	mg/l	1.0	6010D	25 Jun 18 13:39	BT
Potassium - Total	29.2	mg/l	1.0	6010D	25 Jun 18 13:39	BT
Lithium - Total	< 0.5 @	mg/l	0.10	6010D	27 Jun 18 13:22	BT
Boron - Total	12.4	mg/l	0.10	6010D	3 Jul 18 13:00	BT
Calcium - Dissolved	409	mg/l	1.0	6010D	19 Jun 18 16:00	BT
Magnesium - Dissolved	1160	mg/l	1.0	6010D	19 Jun 18 16:00	BT
Sodium - Dissolved	580	mg/l	1.0	6010D	19 Jun 18 16:00	BT
Potassium - Dissolved	23.5	mg/l	1.0	6010D	19 Jun 18 16:00	BT
Lithium - Dissolved	< 0.5 @	mg/l	0.10	6010D	27 Jun 18 13:22	BT
Boron - Dissolved	11.1	mg/l	0.10	6010D	3 Jul 18 12:00	BT
Antimony - Total	< 0.001	mg/l	0.0010	6020B	18 Jun 18 18:37	CC
Arsenic - Total	< 0.002	mg/l	0.0020	6020B	18 Jun 18 18:37	CC
Barium - Total	0.0201	mg/l	0.0020	6020B	18 Jun 18 18:37	CC
Beryllium - Total	< 0.0005	mg/l	0.0005	6020B	18 Jun 18 18:37	CC
Cadmium - Total	< 0.0005	mg/l	0.0005	6020B	18 Jun 18 18:37	CC
Chromium - Total	0.0074	mg/l	0.0020	6020B	18 Jun 18 18:37	CC
Cobalt - Total	< 0.005 ^	mg/l	0.0020	6020B	18 Jun 18 18:37	CC
Lead - Total	< 0.0005	mg/l	0.0005	6020B	18 Jun 18 18:37	CC
Molybdenum - Total	0.0056	mg/l	0.0020	6020B	18 Jun 18 18:37	CC
Selenium - Total	0.0403	mg/l	0.0050	6020B	18 Jun 18 18:37	CC
Thallium - Total	< 0.0005	mg/l	0.0005	6020B	18 Jun 18 18:37	CC

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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Report Date: 5 Jul 18
Lab Number: 18-W1646
Work Order #: 82-1391
Account #: 002800
Date Sampled: 14 Jun 18 6:17
Date Received: 14 Jun 18 14:50
Sampled By: MVTL Field Services

Samantha Marshall
Montana Dakota Utilities
5181 Southgate Dr
Billings MT 59102

Project Name: MDU Lewis & Clark
Sample Description: 117

Temp at Receipt: 4.0C

Event and Year: Spring 2018

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Antimony - Dissolved	< 0.001	mg/l	0.0010	6020B	19 Jun 18 17:34	CC
Arsenic - Dissolved	< 0.002	mg/l	0.0020	6020B	19 Jun 18 17:34	CC
Barium - Dissolved	0.0137	mg/l	0.0020	6020B	19 Jun 18 17:34	CC
Beryllium - Dissolved	< 0.0005	mg/l	0.0005	6020B	19 Jun 18 17:34	CC
Cadmium - Dissolved	< 0.0005	mg/l	0.0005	6020B	19 Jun 18 17:34	CC
Chromium - Dissolved	< 0.002	mg/l	0.0020	6020B	19 Jun 18 17:34	CC
Cobalt - Dissolved	< 0.002	mg/l	0.0020	6020B	19 Jun 18 17:34	CC
Lead - Dissolved	< 0.0005	mg/l	0.0005	6020B	19 Jun 18 17:34	CC
Molybdenum - Dissolved	0.0033	mg/l	0.0020	6020B	19 Jun 18 17:34	CC
Selenium - Dissolved	0.0393	mg/l	0.0050	6020B	19 Jun 18 17:34	CC
Thallium - Dissolved	< 0.0005	mg/l	0.0005	6020B	19 Jun 18 17:34	CC

* Holding time exceeded

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

CC

Approved by: Claudette K Carroll 13JUL18

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.

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

Field Datasheet

Groundwater Assessment

Company:	MDU Lewis and Clark
Event:	Spring 2018
Sample ID:	110
Sampling Personal:	Jenny Mayer

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 Straight?	Yes	No	
Grout Seal Intact?	Yes	No	Not Visible
Repairs Necessary:			

Casing Diameter:	2"	
Water Level Before Purge:	8.80	ft
Bottom:	16.92	
Depth to Top of Pump:	—	ft
Water Level After Sample:	9.01	ft
Measurement Method:	Electric Water Level Indicator	

Sampling Information

Purging Method:	Bladder
Sampling Method:	Bladder
Dedicated Equip?:	Yes (No)
Duplicate Sample?:	Yes (No)
Duplicate Sample ID:	—

Control Settings		
Purge:	5	sec.
Recover:	55	sec.
PSI:	15	

Purge Date:	13 Jun 18	Time Purging Began:	1212 am/pm
Well Purged Dry?	Yes (No)	Time Purged Dry:	— am/pm
Sample Date:	13 Jun 18	Time of Sampling:	1512 am/(pm)

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

Field Measurements

Stabilization (3 consecutive)		Temp (°C)	Spec. Cond.	pH	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Water Level (ft)	Pumping Rate	mL Removed	Description: Clarity, Color, Odor, Ect.
SEQ #	Time		±5%	±0.1	±10%	±20 mV	±10%	0.25 ft	ml/min		Clear, Slightly Turbid, Turbid
1	1217	16.41	1040	7.38	3.32	130.1	696.0	8.89	100.0	500.0	Turbid Tan
2	1247	17.41	1030	7.08	2.28	48.2	285.0	8.93	100.0	3000.0	Slightly Turbid
3	1317	14.88	1029	7.07	2.09	37.8	115.0	8.93	100.0	3000.0	Slightly Turbid
4	1347	14.84	1028	7.15	2.52	31.2	46.6	8.93	100.0	3000.0	clear
5	1417	15.38	1029	7.15	2.23	24.7	25.1	8.94	100.0	3000.0	Clear
6	1437	15.58	1032	7.12	2.18	23.3	19.5	8.95	100.0	2000.0	clear
7	1457	15.83	1030	7.31	2.91	69.3	5.01	8.97	100.0	2000.0	clear
8	1502	15.93	1026	7.30	2.83	74.8	4.91	8.97	100.0	500.0	clear
9	1507	15.72	1027	7.29	2.94	68.6	4.76	8.98	100.0	500.0	clear
10	1512	15.61	1031	7.33	2.89	70.2	4.78	8.98	100.0	500.0	clear

Stabilized: (Yes) No

Total Volume Removed: 10,000.0 mL

Comments:

Slight obstruction
able to get longer bladder pump past

MVTL

2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

Field Datasheet

Groundwater Assessment

Company:	MDU Lewis and Clark
Event:	Spring 2018
Sample ID:	117
Sampling Personal:	Jenny Meyer

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 Straight?	~~Yes~~	No	
Grout Seal Intact?	~~Yes~~	No	Not Visible
Repairs Necessary:			

Casing Diameter:	2"	
Water Level Before Purge:	5.85	ft
	11.54	
Depth to Top of Pump:	~~11~~ 9.25	ft
Water Level After Sample:	Below Pump	ft
Measurement Method:	Electric Water Level Indicator	

Sampling Information

Purging Method:	Bladder
Sampling Method:	Bladder
Dedicated Equip?:	Yes ~~No~~
Duplicate Sample?:	Yes ~~No~~
Duplicate Sample ID:	

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

Purge Date:	13 June 18	Time Purging Began:	1614 ~~am~~/pm
Well Purged Dry?	~~Yes~~ No	Time Purged Dry:	1649 am/pm
Sample Date:	14 June 18	Time of Sampling:	0617 ~~am~~/pm

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

Field Measurements

Stabilization (3 consecutive)		Temp (°C)	Spec. Cond.	pH	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Water Level (ft)	Pumping Rate	mL Removed	Description: Clarity, Color, Odor, Ect.
SEQ #	Time		±5%	±0.1	±10%	±20 mV	±10%	0.25 ft	ml/min		Clear, Slightly Turbid, Turbid
1	1619	15.62	8794	7.13	9.64	168.4	617.0	5.93	100.0	500.0	Turbid Tan
2	1629	15.24	8366	7.14	9.96	187.4	22.8	7.20	100.0	1000.0	Clear
3	1639	12.87	8555	7.12	9.42	198.0	17.9	8.06	100.0	1000.0	Clear
4	1649	12.43	8540	7.17	10.49	203.4	18.5	Below Pump	100.0	1000.0	Clear
5											
6	0612	Purged	well for	5 min	to clear	1in		6.58	100.0	500.0	
7	0617	9.65	8475	7.24	10.42	226.2	4.41	—	—	—	Clear
8											
9											
10										Rinsate	

Stabilized: Yes ~~No~~

Total Volume Removed: 4000.0 mL

Comments:

MVTL **Laboratories, Inc.**
2616 E. Broadway
Bismarck, ND 58501
Phone (701) 258-9720

Chain of Custody Record

Project Name:	Event:	Work Order Number:
MDU Lewis and Clark	Spring 2018	82-1391

Report To:	MDU	Carbon Copy:	Name of Sampler(s):
Attn:	Samantha Marshall	Attn:	
Address:	5181 Southgate Dr. Billings, MT 59102	Address:	
phone:	406-896-4227		
email:			

Sample Information					Bottle Type							Field Parameters			Analysis
Lab Number	Sample ID	Date	Time	Sample Type		1 liter	500mL Nitric	500mL Nitric (filtered)	250 mL Sulfuric				Temp (°C)	Spec. Cond.	pH	Analysis Required
W1645	110	13 Jun 18	1512	GW		X	X	X	X				15.61	1031	7.33	MDU L&C Spring 2018
W1646	117	14 Jun 18	0617	GW		X	X	X	X				9.85	8475	7.24	

Comments:

Relinquished By:			Sample Condition:		Received by:	
	Name:	Date/Time	Location:	Temp (°C)	Name:	Date/Time
1		14 Jun 18 1450	~~Log In~~ Walk In #2	4.0 ~~TM562~~ / TM805		14 Jun 2018 1450
2						

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CASE NARRATIVE

-MVTL Lab Reference No/SDG: 201882-2163
Client: Montana Dakota Utilities
Location: MDU Lewis & Clark
Project Identification: August 2018
MVTL Laboratory Identifications: 18-W2741 through 18-W2749

MDU Sample Identification	MVTL Laboratory #
Dup 1	18-W2741
Field Blank (FB)	18-W2742
MW103	18-W2743
MW109	18-W2744
MW110	18-W2745
MW119	18-W2746
MW111	18-W2747
MW117	No sample
MW118	18-W2748
MW120	18-W2749

I. RECEIPT

- All samples were received at the laboratory on 23 Aug 2018 at 0800.
- Samples were collected and hand delivered by MVTL Field Service personnel to the laboratory.
- Samples were received on ice and evidence of cooling had begun.
    - Temperature of samples upon receipt was 2.3°C.
- All samples were properly preserved unless noted here and/or flagged on the individual analytical laboratory report.
- No other exceptions on sample receipt were encountered on this sample set unless noted here.
    - Bottles for sample 18-W2742 were labeled as EB-Field Blank (FB). COC lists correct sample identification.
    - MW117 will be collected at a later date due to an error at sampling.

II. HOLDING TIMES

- With the exception of laboratory pH, all holding times were met for both preparation and analysis unless noted here.

III. METHODS

- Approved methodology was followed for all sample analyses.

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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CASE NARRATIVE

-MVTL Lab Reference No/SDG: 201882-2163
Client: Montana Dakota Utilities
Location: MDU Lewis & Clark
Project Identification: August 2018
MVTL Laboratory Identifications: 18-W2741 through 18-W2749

IV. ANALYSIS

- All acceptance criteria was met for calibration, method blanks, laboratory control samples, laboratory fortified matrix/matrix duplicates unless noted here and/or flagged on the individual analytical laboratory report.
    - For some metals, the reported results were elevated due to instrument performance at the lower limit of quantitation (LLOQ).
    - Reporting limit for two alkalinity batches were elevated due to instrument performance of the method blank at the reporting limit.

All laboratory data has been approved by MVTL Laboratories.

SIGNED: Claudette Carroll **DATE:** 2 OCT 18

Claudette Carroll - MVTL Bismarck Laboratory Manager

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Quality Control Report

Lab IDs: 18-W2741 to 18-W2749 **Project:** MDU Lewis & Clark **Work Order:** 201882-2163

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	0.0160	106	80-120	0.100	18W2534q	< 0.001	0.1080	108	75-125	0.1080	0.1088	109	0.7	20	-	-	< 0.001
				0.100	18W2534sdq	< 0.001	0.1094	109	75-125	0.1094	0.1094	109	0.0	20	-	-	
				0.100	18W2736q	< 0.001	0.1101	110	75-125	0.1101	0.1112	111	1.0	20	-	-	
Antimony - Total mg/l	0.1000	119	80-120	0.400	18W2674q	< 0.001	0.4412	110	75-125	0.4412	0.4546	114	3.0	20	-	-	< 0.001
	0.1000	114	80-120	0.400	18W2704q	< 0.001	0.4292	107	75-125	0.4292	0.4260	106	0.7	20	-	-	< 0.001
				0.400	18W2738q	< 0.001	0.4266	107	75-125	0.4266	0.4256	106	0.2	20	-	-	
				0.400	18W2749q	< 0.001	0.4298	107	75-125	0.4298	0.4232	106	1.5	20	-	-	
				0.400	18W2753q	< 0.001	0.4354	109	75-125	0.4354	0.4178	104	4.1	20	-	-	
Arsenic - Dissolved mg/l	0.0160	101	80-120	0.100	18W2534q	< 0.002	0.1076	108	75-125	0.1076	0.1122	112	4.2	20	-	-	< 0.002
				0.100	18W2534sdq	< 0.002	0.1107	111	75-125	0.1107	0.1120	112	1.2	20	-	-	
				0.100	18W2736q	< 0.002	0.1138	114	75-125	0.1138	0.1106	111	2.9	20	-	-	
Arsenic - Total mg/l	0.1000	97	80-120	0.400	18W2674q	< 0.002	0.4088	102	75-125	0.4088	0.4186	105	2.4	20	-	-	< 0.002
	0.1000	93	80-120	0.400	18W2704q	0.0046	0.4036	100	75-125	0.4036	0.4148	103	2.7	20	-	-	< 0.002
				0.400	18W2738q	0.0069	0.4118	101	75-125	0.4118	0.3994	98	3.1	20	-	-	
				0.400	18W2749q	< 0.002	0.4042	101	75-125	0.4042	0.4020	100	0.5	20	-	-	
				0.400	18W2753q	0.0024	0.3970	99	75-125	0.3970	0.3866	96	2.7	20	-	-	
Barium - Dissolved mg/l	0.0160	101	80-120	0.100	18W2534q	0.0205	0.1282	108	75-125	0.1282	0.1284	108	0.2	20	-	-	< 0.002
				0.100	18W2534sdq	0.0046	0.1075	103	75-125	0.1075	0.1092	105	1.6	20	-	-	
				0.100	18W2736q	0.0145	0.1105	96	75-125	0.1105	0.1100	96	0.5	20	-	-	
Barium - Total mg/l	0.1000	98	80-120	0.400	18W2674q	0.0232	0.4272	101	75-125	0.4272	0.4216	100	1.3	20	-	-	< 0.002
	0.1000	98	80-120	0.400	18W2704q	0.0727	0.4806	102	75-125	0.4806	0.4888	104	1.7	20	-	-	< 0.002
				0.400	18W2738q	0.3019	0.6974	99	75-125	0.6974	0.7058	101	1.2	20	-	-	
				0.400	18W2749q	0.0451	0.4376	98	75-125	0.4376	0.4374	98	0.0	20	-	-	
				0.400	18W2753q	0.0501	0.4406	98	75-125	0.4406	0.4432	98	0.6	20	-	-	
Beryllium - Dissolved mg/l	0.0160	102	80-120	0.100	18-W2748	< 0.0005	0.1078	108	75-125	0.1078	0.1092	109	1.3	20	-	-	< 0.0005

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Quality Control Report

Lab IDs: 18-W2741 to 18-W2749 **Project:** MDU Lewis & Clark **Work Order:** 201882-2163

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 Known 疱d:疱 Limits	Method Blank
Beryllium - Total mg/l	0.1000	100	80-120	0.400	18W2674q	< 0.0005	0.4096	102	75-125	0.4096	0.4202	105	2.6	20	-	-	< 0.0005
	0.1000	100	80-120	0.400	18W2704q	< 0.0005	0.4132	103	75-125	0.4132	0.4192	105	1.4	20	-	-	< 0.0005
				0.400	18W2738q	< 0.0005	0.4108	103	75-125	0.4108	0.4052	101	1.4	20	-	-	
				0.400	18W2749q	< 0.0005	0.4096	102	75-125	0.4096	0.4078	102	0.4	20	-	-	
				0.400	18W2753q	< 0.0005	0.4108	103	75-125	0.4108		102	0.4	20	-	-	
Boron - Dissolved mg/l	0.40	105	80-120	0.400	18-W2733	0.16	0.55	98	75-125	0.55	0.55	98	0.0	20	-	-	< 0.1
	0.40	108	80-120	0.400	18-W2753	0.53	0.89	90	75-125	0.89	0.90	92	1.1	20	-	-	< 0.1
	0.40	110	80-120											-	-	-	
Boron - Total mg/l	0.40	105	80-120	0.400	18-D2985	2.39	2.89	125	75-125	2.89	2.89	125	0.0	20	-	-	< 0.1
	0.40	108	80-120	0.400	18-W2738	0.48	0.91	108	75-125	0.91	0.89	102	2.2	20	-	-	< 0.1
	0.40	110	80-120	2.00	18-W2749	6.61	8.50	94	75-125	8.50	8.57	98	0.8	20	-	-	< 0.1
	0.40	110	80-120	0.400	18-W2753	0.53	0.93	100	75-125	0.93	0.93	100	0.0	20	-	-	< 0.1
				0.400	18-W2761	0.45	0.87	105	75-125	0.87	0.83	95	4.7	20	-	-	< 0.1
															-	-	< 0.1
Cadmium - Dissolved mg/l	0.0160	105	80-120	0.100	18W2534q	< 0.0005	0.1052	105	75-125	0.1052	0.1044	104	0.8	20	-	-	< 0.0005
				0.100	18W2534sdq	< 0.0005	0.1086	109	75-125	0.1086	0.1106	111	1.8	20	-	-	
				0.100	ê	0.0024	0.1094	107	75-125	0.1094	0.1112	109	1.6	20	-	-	
Cadmium - Total mg/l	0.1000	114	80-120	0.400	18W2674q	< 0.0005	0.4306	108	75-125	0.4306	0.4482	112	4.0	20	-	-	< 0.0005
	0.1000	112	80-120	0.400	18W2704q	< 0.0005	0.4252	106	75-125	0.4252	0.4286	107	0.8	20	-	-	< 0.0005
				0.400	18W2738q	< 0.0005	0.4166	104	75-125	0.4166	0.4194	105	0.7	20	-	-	
				0.400	18W2749q	< 0.0005	0.4238	106	75-125	0.4238	0.4072	102	4.0	20	-	-	
				0.400	18W2753q	< 0.0005	□ÿ	107	75-125	0.4290	0.4190	105	2.4	20	-	-	
Calcium - Dissolved mg/l	20.0	112	80-120	100	18W2743q	90.3	186	96	75-125	186	188	98	1.1	20	-	-	< 1
															-	-	< 1

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Quality Control Report

Lab IDs: 18-W2741 to 18-W2749 **Project:** MDU Lewis & Clark **Work Order:** 201882-2163

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
Calcium - Total mg/l	20.0	114	80-120	100	18W2698q	48.4	148	100	75-125	148	149	101	0.7	20	-	-	< 1
	20.0	116	80-120	100	18W2745q	86.8	184	97	75-125	184	185	98	0.5	20	-	-	< 1
	20.0	112	80-120	100	18W2757q	74.9	172	97	75-125	172	172	97	0.0	20	-	-	< 1
	20.0	112	80-120												-	-	< 1
															-	-	< 1
															-	-	< 1
															-	-	□□ÿ
Chloride mg/l	30.0	92	80-120	30.0	18-W2698	1.6	31.0	98	80-120	31.0	30.9	98	0.3	20	-	-	< 1
	30.0	92	80-120												-	-	< 1
Chromium - Dissolved mg/l	0.0160	102	80-120	0.100	18W2534q	< 0.002	0.0966	97	75-125	0.0966	0.0980	98	1.4	20	-	-	< 0.002
				0.100	18W2534sdq	< 0.002	0.1005	100	75-125	0.1005	0.1006	101	0.1	20	-	-	
				0.100	18W2736q	< 0.002	0.0999	100	75-125	0.0999	0.0986	99	1.3	20	-	-	
Chromium - Total mg/l	0.1000	99	80-120	0.400	18W2674q	< 0.002	0.3876	97	75-125	0.3876	0.3966	99	2.3	20	-	-	< 0.002
	0.1000	94	80-120	0.400	18W2704q	0.0032	0.3944	98	75-125	0.3944	0.4008	99	1.6	20	-	-	< 0.002
				0.400	18W2738q	< 0.002	0.3856	96	75-125	0.3856	0.3814	95	1.1	20	-	-	
				0.400	18W2749q	< 0.002	0.3880	97	75-125	0.3880	0.3878	97	0.1	20	-	-	
				0.400	18W2753q	< 0.002	0.3836	96	75-125	0.3836	0.3766	94	1.8	20	-	-	
Cobalt - Dissolved mg/l	0.0160	104	80-120	0.100	18W2534q	< 0.002	0.0965	96	75-125	0.0965	0.0994	99	3.0	20	-	-	< 0.002
				0.100	18W2534sdq	< 0.002	0.1016	102	75-125	0.1016	0.1010	101	0.6	20	-	-	
				0.100	18W2736q	< 0.002	0.0994	99	75-125	0.0994	0.0994	99	0.0	.0	-	-	
Cobalt - Total mg/l	0.1000	100	80-120	0.400	18W2674q	< 0.002	0.3916	98	75-125	0.3916	0.3988	100	1.8	20	-	-	< 0.002
	0.1000	95	80-120	0.400	18W2704q	< 0.002	0.3998	100	75-125	0.3998	0.4014	100	0.4	20	-	-	< 0.002
				0.400	18W2738q	< 0.002	0.3860	96	75-125	0.3860	0.3824	96	0.9	20	-	-	
				0.400	18W2749q	0.0023	0.3928	98	75-125	0.3928	0.3876	96	1.3	20	-	-	
				0.400	18W2753q	< 0.002	0.3874	97	75-125	0.3874	0.3830	96	1.1	20	-	-	

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Quality Control Report

Lab IDs: 18-W2741 to 18-W2749 **Project:** MDU Lewis & Clark **Work Order:** 201882-2163

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	ÿ □	90-110	0.500	18-W2748	1.28	1.84	112	80-120	1.84	1.83	110	0.5	20	-	-	< 0.1
	0.50	102	90-110	0.500	18-W2743	0.75	1.22	94	80-120	1.22	1.21	92	0.8	20	-	-	< 0.1
	0.50	102	90-110	0.500	18-W2761	< 0.1	0.58	116	80-120	0.58	0.58	116	0.0	20	-	-	< 0.1
															-	-	< 0.1
Lead - Dissolved mg/l	0.0160	102	80-120	0.100	18W2534q	< 0.0005	0.0915	92	75-125	0.0915	0.0930	93	1.6	20	-	-	< 0.0005
				0.100	18W2534sdq	< 0.0005	0.0982	98	75-125	0.0982	0.0985	98	0.3	20	-	-	
				0.100	18W2736q	< 0.0005	0.0944	94	75-125	0.0944	0.0954	95	1.1	20	-	-	
Lead - Total mg/l	0.1000	102	80-120	0.400	18W2674q	< 0.0005	0.4028	101	75-125	0.4028	0.4018	100	0.2	20	-	-	< 0.0005
	0.1000	98	80-120	0.400	18W2704q	0.0016	0.3980	99	75-125	0.3980	0.3980	99	0.0	20	-	-	< 0.0005
				0.400	18W2738q	< 0.0005	0.3976	99	75-125	0.3976	0.4002	100	0.7	20	-	-	
				0.400	18W2749q	< 0.0005	0.3782	95	75-125	0.3782	0.3786	95	0.1	20	-	-	
				0.400	18W2753q	< 0.0005	0.3750	94	75-125	0.3750	0.3790	95	1.1	20	-	-	
Lithium - Dissolved mg/l	0.400	106	80-120	0.400	5	0.089	0.460	93	75-125	0.460	0.462	93	0.4	20	-	-	< 0.02
	0.400	106	80-120												-	-	
Lithium - Total mg/l	0.400	106	80-120	0.400	18-W2749	0.091	0.506	104	75-125	0.506	0.505	104	0.2	20	-	-	< 0.02
	0.400	106	80-120												-	-	< 0.02
															-	-	< 0.02
Magnesium - Dissolved mg/l	20.0	108	80-120	100	18W2743q	114	206	92	75-125	206	208	94	1.0	20	-	-	< 1
															-	-	< 1
Magnesium - Total mg/l	20.0	114	80-120	100	18W2698q	19.6	121	101	75-125	121	121	101	0.0	20	-	-	< 1
	20.0	114	80-120	100	18W2745q	53.1	152	99	75-125	152	151	98	0.7	20	-	-	< 1
	20.0	111	80-120	100	18W2757q	52.6	152	99	75-125	152	151	98	0.7	20	-	25	< 1
	20.0	110	80-120												-	-	< 1
															-	-	< 1
															-	-	< 1
															-	-	< 1
Mercury - Dissolved mg/l	0.0020	105	85-115	0.002	18-W2753	< 0.0002	0.0023	115	70-130	0.0023	0.0020	100	14.0	20	-	-	< 0.0002
				0.002	18-W2782	< 0.0002	0.0021	105	70-130	0.0021	0.0021	105	0.0	20	-	-	

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Quality Control Report

Lab IDs: 18-W2741 to 18-W2749 **Project:** MDU Lewis & Clark **Work Order:** 201882-2163

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
Mercury - Total mg/l	0.0020	110	85-115	0.100	18-M2220	< 0.01	0.1009	101	70-130	0.1009	0.1150	115	13.1	20	-	-	< 0.0002
	0.0020	105	85-115	0.002	18-W2746	< 0.0002	0.0020	100	70-130	0.0020	0.0022	110	9.5	20	-	-	< 0.0002
				0.002	18-W2650q	< 0.0002	0.0021	105	70-130	0.0021	0.0020	100	4.9	20	-	-	
Molybdenum - Dissolved mg/l	0.0160	104	80-120	0.100	18W2534q	< 0.002	0.1056	106	75-125	0.1056	0.1072	107	1.5	20	-	-	< 0.002
				0.100	18W2534sdq	< 0.002	0.1052	105	75-125	0.1052	0.1048	105	0.4	20	-	-	
				0.100	18W2736q	< 0.002	0.1064	106	75-125	0.1064	0.1062	106	0.2	20	-	-	
Molybdenum - Total mg/l	0.1000	116	80-120	0.400	18W2674q	< 0.002	0.4350	109	75-125	0.4350	0.4478	112	2.9	20	-	-	< 0.002
	0.1000	113	80-120	0.400	18W2704q	0.0031	0.4266	106	75-125	0.4266	0.4248	105	0.4	20	-	-	< 0.002
				0.400	18W2738q	0.0108	0.4332	106	75-125	0.4332	0.4262	104	1.6	20	-	-	
				0.400	18W2749q	0.0029	0.4386	109	75-125	0.4386	0.4324	107	1.4	20	-	-	
				0.400	18W2753q	0.0320	0.4662	109	75-125	0.4662	0.4536	105	2.7	20	-	-	
Nitrate-Nitrite as N mg/l	0.50	98	90-110	1.00	18-W2742	< 0.1	1.08	108	90-110	1.08	1.02	102	5.7	20	-	-	< 0.1
	0.50	102	90-110	1.00	18-W2754	< 0.1	0.99	99	90-110	0.99	1.04	104	4.9	20	-	-	< 0.1
pH units	-	-	-	-	-	-	-	-	-	8.7	8.7	-	0.0	20	-	-	-
	-	-	-	-	-	-	-	-	-	7.4	7.1	-	4.1	20	-	-	-
	-	-	-	-	-	-	-	-	-	7.3	7.3	-	0.0	20	-	-	-
Potassium - Dissolved mg/l	10.0	101	80-120	20.0	18W2743q	8.5	29.0	102	75-125	29.0	29.6	106	2.0	20	-	-	< 1
															-	-	< 1
Potassium - Total mg/l	10.0	108	80-120	20.0	18W2698q	3.6	24.4	104	75-125	24.4	24.3	104	0.4	20	-	-	< 1
	10.0	107	80-120	20.0	18W2745q	7.2	27.7	102	75-125	27.7	27.3	100	1.5	20	-	-	< 1
	10.0	104	80-120	20.0	18W2757q	9.5	29.5	100	75-125	29.5	29.5	100	0.0	20	-	-	< 1
	10.0	103	80-120												-	-	< 1
															-	-	< 1
															-	-	< 1
															-	-	< 1

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Quality Control Report

Lab IDs: 18-W2741 to 18-W2749 **Project:** MDU Lewis & Clark **Work Order:** 201882-2163

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 - Dissolved mg/l	0.0160	97	80-120	0.100	18W2534q	< 0.005	0.1140	114	75-125	0.1140	0.1186	119	4.0	20	-	-	< 0.005
	0.0160	108	80-120	0.100	18W2534sdq	< 0.005	0.1206	121	75-125	0.1206	0.1220	122	1.2	20	-	-	< 0.005
				0.100	18W2736q	< 0.005	0.1194	119	75-125	0.1194	0.1196	120	0.2	20	-	-	
				0.200	18-W2743	0.0523	0.2142	81	75-125	0.2142	0.2225	85	3.8	20	-	-	
Selenium - Total mg/l	0.1000	96	80-120	0.400	18W2674q	< 0.01	0.3880	97	75-125	0.3880	0.3990	100	2.8	20	-	-	< 0.005
	0.1000	94	80-120	0.400	18W2704q	< 0.01	0.4042	101	75-125	0.4042	0.3946	99	2.4	20	-	-	< 0.005
				0.400	18W2738q	< 0.01	0.3894	97	75-125	0.3894	0.3746	94	3.9	20	-	-	
				0.400	18-W2749	< 0.005	0.4360	109	75-125	0.4360	0.4238	106	2.8	20	-	-	
				0.400	18-W2753	< 0.005	0.4030	101	75-125	0.4030	0.4242	106	5.1	20	-	-	
Sodium - Dissolved mg/l	20.0	106	80-120	100	18W2743q	90.1	183	93	75-125	183	185	95	1.1	20	-	-	< 1
															-	-	< 1
Sodium - Total mg/l	20.0	111	80-120	100	18W2698q	134	225	91	75-125	225	227	93	0.9	20	-	-	< 1
	20.0	112	80-120	100	18W2745q	81.8	177	95	75-125	177	177	95	0.0	20	-	-	< 1
	20.0	110	80-120	100	18W2757q	22.0	122	100	75-125	122	122	100	0.0	20	-	-	< 1
	20.0	106	80-120												-	-	< 1
															-	-	< 1
															-	-	< 1
															-	-	< 1
Sulfate mg/l	100	108	80-120	100	18-W2698	32.4	141	109	80-120	141	141	109	0.0	20	-	-	< 5
	100	102	80-120	500	18-D2999	139	676	107	80-120	676	665	105	1.6	20	-	-	< 5
	100	102	80-120	100	18-W2757	90.9	177	86	80-120	177	177	86	0.0	20	-	-	< 5
Thallium - Dissolved mg/l	0.0160	102	80-120	0.100	18W2534q	< 0.0005	0.0932	93	75-125	0.0932	0.0942	94	1.1	20	-	-	< 0.0005
				0.100	18W2534sdq	< 0.0005	0.0998	100	75-125	0.0998	0.0999	100	0.1	20	-	-	
				0.100	18W2736q	< 0.0005	0.0969	97	75-125	0.0969	0.0978	98	0.9	20	-	-	

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Quality Control Report

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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 - Total mg/l	0.1000	99	80-120	0.400	18W2674q	< 0.0005	0.4046	101	75-125	0.4046	0.4042	101	0.1	20	-	-	< 0.0005
	0.1000	96	80-120	0.400	18W2704q	< 0.0005	0.4000	100	75-125	0.4000	0.4002	100	0.0	20	-	-	< 0.0005
				0.400	18W2738q	< 0.0005	0.3988	100	75-125	0.3988	0.3988	100	0.0	20	-	-	
				0.400	18W2749q	< 0.0005	0.3832	96	75-125	0.3832	0.3828	96	0.1	20	-	-	
				0.400	18W2753q	< 0.0005	0.3786	95	75-125	0.3786	0.3824	96	1.0	20	-	-	
Total Alkalinity mg/l CaCO3	410	100	90-110	410	18-D3008	768	1159	95	80-120	1159	1157	95	0.2	20	98	80-120	< 20
	410	94	90-110	410	18-D3015	1080	1471	95	80-120	1471	1468	95	0.2	20			< 20
	410	100	90-110	410	18-W2748	384	776	96	80-120	776	772	95	0.5	20			< 22
																	< 22
Total Dissolved Solids mg/l	-	-	-	-	-	-	-	-	-	8060	8070	-	0.1	20	-	-	< 10
Total Suspended Solids mg/l	-	-	-	-	-	-	-	-	-	2750	2750	-	0.0	20	-	-	< 2
	-	-	-	-	-	-	-	-	-	6	6	-	0.0	*	-	-	< 2
	-	-	-	-	-	-	-	-	-	4	4	-	0.0	*	-	-	

* Due to result < 10 mg/L, data reported based on acceptance criteria of an Absolute Difference of ± 3 mg/L.

Approved by: C. Canfield
20CT18

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Report Date: 2 Oct 18
Lab Number: 18-W2741
Work Order #: 82-2163
Account #: 002800
Date Sampled: 21 Aug 18
Date Received: 23 Aug 18 8:00
Sampled By: MVTL Field Services

Samantha Marshall
Montana Dakota Utilities
5181 Southgate Dr
Billings MT 59102

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

Temp at Receipt: 2.3C ROI

Event and Year: August 2018

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	23 Aug 18	SVS
pH	* 7.7	units	N/A	SM4500 H+ B	23 Aug 18 17:00	SVS
Total Suspended Solids	< 2	mg/l	2	I3765-85	23 Aug 18 16:12	SVS
Total Alkalinity	372	mg/l CaCO3	20	SM2320-B	23 Aug 18 17:00	SVS
Fluoride	0.50	mg/l	0.10	SM4500-F-C	29 Aug 18 17:00	SVS
Sulfate	199	mg/l	5.00	ASTM D516-07	23 Aug 18 11:42	EMS
Chloride	23.4	mg/l	1.0	SM4500-Cl-E	29 Aug 18 9:53	EV
Nitrate-Nitrite as N	7.50	mg/l	0.10	EPA 353.2	27 Aug 18 12:38	EV
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	30 Aug 18 12:27	EMS
Mercury - Dissolved	< 0.0002	mg/l	0.0002	EPA 245.1	30 Aug 18 13:28	EMS
Total Dissolved Solids	741	mg/l	10	I1750-85	27 Aug 18 9:25	SVS
Calcium - Total	96.2	mg/l	1.0	6010D	31 Aug 18 13:06	SZ
Magnesium - Total	59.4	mg/l	1.0	6010D	31 Aug 18 13:06	SZ
Sodium - Total	91.2	mg/l	1.0	6010D	31 Aug 18 13:06	SZ
Potassium - Total	8.5	mg/l	1.0	6010D	31 Aug 18 13:06	SZ
Lithium - Total	0.034	mg/l	0.020	6010D	18 Sep 18 13:25	SZ
Boron - Total	0.26	mg/l	0.10	6010D	6 Sep 18 9:57	SZ
Calcium - Dissolved	95.1	mg/l	1.0	6010D	10 Sep 18 9:34	BB
Magnesium - Dissolved	59.2	mg/l	1.0	6010D	10 Sep 18 9:34	BB
Sodium - Dissolved	91.6	mg/l	1.0	6010D	10 Sep 18 9:34	BB
Potassium - Dissolved	8.7	mg/l	1.0	6010D	10 Sep 18 9:34	BB
Lithium - Dissolved	0.026	mg/l	0.020	6010D	18 Sep 18 15:25	SZ
Boron - Dissolved	0.25	mg/l	0.10	6010D	6 Sep 18 12:57	SZ
Antimony - Total	< 0.001	mg/l	0.0010	6020B	31 Aug 18 11:56	BB
Arsenic - Total	< 0.002	mg/l	0.0020	6020B	31 Aug 18 11:56	BB
Barium - Total	0.0357	mg/l	0.0020	6020B	31 Aug 18 11:56	BB
Beryllium - Total	< 0.0005	mg/l	0.0005	6020B	31 Aug 18 11:56	BB
Cadmium - Total	< 0.0005	mg/l	0.0005	6020B	31 Aug 18 11:56	BB
Chromium - Total	< 0.002	mg/l	0.0020	6020B	31 Aug 18 11:56	BB
Cobalt - Total	< 0.002	mg/l	0.0020	6020B	31 Aug 18 11:56	BB
Lead - Total	< 0.0005	mg/l	0.0005	6020B	31 Aug 18 11:56	BB
Molybdenum - Total	0.0044	mg/l	0.0020	6020B	31 Aug 18 11:56	BB
Selenium - Total	< 0.01 ^	mg/l	0.0050	6020B	31 Aug 18 11:56	BB
Thallium - Total	< 0.0005	mg/l	0.0005	6020B	31 Aug 18 11:56	BB
Antimony - Dissolved	< 0.001	mg/l	0.0010	6020B	27 Aug 18 14:14	BB
Arsenic - Dissolved	< 0.002	mg/l	0.0020	6020B	27 Aug 18 14:14	BB
Barium - Dissolved	0.0300	mg/l	0.0020	6020B	27 Aug 18 14:14	BB

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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Date Received: 23 Aug 18 8:00
Sampled By: MVTL Field Services

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

Temp at Receipt: 2.3C ROI

Event and Year: August 2018

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Beryllium - Dissolved	< 0.0005	mg/l	0.0005	6020B	30 Aug 18 8:51	BB
Cadmium - Dissolved	< 0.0005	mg/l	0.0005	6020B	27 Aug 18 14:14	BB
Chromium - Dissolved	< 0.002	mg/l	0.0020	6020B	27 Aug 18 14:14	BB
Cobalt - Dissolved	< 0.002	mg/l	0.0020	6020B	27 Aug 18 14:14	BB
Lead - Dissolved	< 0.0005	mg/l	0.0005	6020B	27 Aug 18 14:14	BB
Molybdenum - Dissolved	0.0039	mg/l	0.0020	6020B	27 Aug 18 14:14	BB
Selenium - Dissolved	< 0.005	mg/l	0.0050	6020B	27 Aug 18 14:14	BB
Thallium - Dissolved	< 0.0005	mg/l	0.0005	6020B	27 Aug 18 14:14	BB

* Holding time exceeded

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

Approved by: Claudette K Carroll CC 20CT18

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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1201 Lincoln Hwy. ~ Nevada, IA 50201 ~ 800-362-0855 ~ Fax 515-382-3885
www.mvtl.com
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Report Date: 2 Oct 18
Lab Number: 18-W2742
Work Order #: 82-2163
Account #: 002800
Date Sampled: 22 Aug 18
Date Received: 23 Aug 18 8:00
Sampled By: MVTL Field Services

Samantha Marshall
Montana Dakota Utilities
5181 Southgate Dr
Billings MT 59102

Project Name: MDU Lewis & Clark
Sample Description: Field Blank (FB)

Temp at Receipt: 2.3C ROI

Event and Year: August 2018

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	23 Aug 18	SVS
pH	* 6.2	units	N/A	SM4500 H+ B	23 Aug 18 17:00	SVS
Total Suspended Solids	< 2	mg/l	2	I3765-85	23 Aug 18 16:12	SVS
Total Alkalinity	< 20	mg/l CaCO3	20	SM2320-B	23 Aug 18 17:00	SVS
Fluoride	< 0.1	mg/l	0.10	SM4500-F-C	29 Aug 18 17:00	SVS
Sulfate	< 5	mg/l	5.00	ASTM D516-07	23 Aug 18 11:42	EMS
Chloride	< 1	mg/l	1.0	SM4500-Cl-E	29 Aug 18 9:53	EV
Nitrate-Nitrite as N	< 0.1	mg/l	0.10	EPA 353.2	27 Aug 18 12:38	EV
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	30 Aug 18 12:27	EMS
Mercury - Dissolved	< 0.0002	mg/l	0.0002	EPA 245.1	30 Aug 18 13:28	EMS
Total Dissolved Solids	< 10	mg/l	10	I1750-85	27 Aug 18 9:25	SVS
Calcium - Total	< 1	mg/l	1.0	6010D	31 Aug 18 13:06	SZ
Magnesium - Total	< 1	mg/l	1.0	6010D	31 Aug 18 13:06	SZ
Sodium - Total	< 1	mg/l	1.0	6010D	31 Aug 18 13:06	SZ
Potassium - Total	< 1	mg/l	1.0	6010D	31 Aug 18 13:06	SZ
Lithium - Total	< 0.02	mg/l	0.020	6010D	18 Sep 18 13:25	SZ
Boron - Total	< 0.1	mg/l	0.10	6010D	6 Sep 18 9:57	SZ
Calcium - Dissolved	< 1	mg/l	1.0	6010D	10 Sep 18 9:34	BB
Magnesium - Dissolved	< 1	mg/l	1.0	6010D	10 Sep 18 9:34	BB
Sodium - Dissolved	< 1	mg/l	1.0	6010D	10 Sep 18 9:34	BB
Potassium - Dissolved	< 1	mg/l	1.0	6010D	10 Sep 18 9:34	BB
Lithium - Dissolved	< 0.02	mg/l	0.020	6010D	18 Sep 18 15:25	SZ
Boron - Dissolved	< 0.1	mg/l	0.10	6010D	6 Sep 18 13:57	SZ
Antimony - Total	< 0.001	mg/l	0.0010	6020B	31 Aug 18 11:56	BB
Arsenic - Total	< 0.002	mg/l	0.0020	6020B	31 Aug 18 11:56	BB
Barium - Total	< 0.002	mg/l	0.0020	6020B	31 Aug 18 11:56	BB
Beryllium - Total	< 0.0005	mg/l	0.0005	6020B	31 Aug 18 11:56	BB
Cadmium - Total	< 0.0005	mg/l	0.0005	6020B	31 Aug 18 11:56	BB
Chromium - Total	< 0.002	mg/l	0.0020	6020B	31 Aug 18 11:56	BB
Cobalt - Total	< 0.002	mg/l	0.0020	6020B	31 Aug 18 11:56	BB
Lead - Total	< 0.0005	mg/l	0.0005	6020B	31 Aug 18 11:56	BB
Molybdenum - Total	< 0.002	mg/l	0.0020	6020B	31 Aug 18 11:56	BB
Selenium - Total	< 0.01 ^	mg/l	0.0050	6020B	31 Aug 18 11:56	BB
Thallium - Total	< 0.0005	mg/l	0.0005	6020B	31 Aug 18 11:56	BB
Antimony - Dissolved	< 0.001	mg/l	0.0010	6020B	27 Aug 18 14:14	BB
Arsenic - Dissolved	< 0.002	mg/l	0.0020	6020B	27 Aug 18 14:14	BB
Barium - Dissolved	< 0.002	mg/l	0.0020	6020B	27 Aug 18 14:14	BB

RL = Method Reporting Limit

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CERTIFICATION: ND # ND-00016

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Report Date: 2 Oct 18
Lab Number: 18-W2742
Work Order #: 82-2163
Account #: 002800
Date Sampled: 22 Aug 18
Date Received: 23 Aug 18 8:00
Sampled By: MVTL Field Services

Samantha Marshall
Montana Dakota Utilities
5181 Southgate Dr
Billings MT 59102

Project Name: MDU Lewis & Clark
Sample Description: Field Blank (FB)

Temp at Receipt: 2.3C ROI

Event and Year: August 2018

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Beryllium - Dissolved	< 0.0005	mg/l	0.0005	6020B	30 Aug 18 8:51	BB
Cadmium - Dissolved	< 0.0005	mg/l	0.0005	6020B	27 Aug 18 14:14	BB
Chromium - Dissolved	< 0.002	mg/l	0.0020	6020B	27 Aug 18 14:14	BB
Cobalt - Dissolved	< 0.002	mg/l	0.0020	6020B	27 Aug 18 14:14	BB
Lead - Dissolved	< 0.0005	mg/l	0.0005	6020B	27 Aug 18 14:14	BB
Molybdenum - Dissolved	< 0.002	mg/l	0.0020	6020B	27 Aug 18 14:14	BB
Selenium - Dissolved	< 0.005	mg/l	0.0050	6020B	27 Aug 18 14:14	BB
Thallium - Dissolved	< 0.0005	mg/l	0.0005	6020B	27 Aug 18 14:14	BB

* Holding time exceeded

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

Approved by: Claudette K Carroll 20CT18

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

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

Report Date: 2 Oct 18
Lab Number: 18-W2743
Work Order #: 82-2163
Account #: 002800
Date Sampled: 21 Aug 18 17:08
Date Received: 23 Aug 18 8:00
Sampled By: MVTL Field Services

Samantha Marshall
Montana Dakota Utilities
5181 Southgate Dr
Billings MT 59102

Project Name: MDU Lewis & Clark
Sample Description: MW103

Temp at Receipt: 2.3C ROI

Event and Year: August 2018

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	23 Aug 18	SVS
pH	* 7.7	units	N/A	SM4500 H+ B	23 Aug 18 17:00	SVS
Total Suspended Solids	6	mg/l	2	I3765-85	23 Aug 18 16:12	SVS
pH - Field	7.25	units	NA	SM 4500 H+ B	21 Aug 18 17:08	JSM
Temperature - Field	14.6	Degrees C	NA	SM 2550B	21 Aug 18 17:08	JSM
Total Alkalinity	365	mg/l CaCO3	20	SM2320-B	23 Aug 18 17:00	SVS
Conductivity - Field	1437	umhos/cm	1	EPA 120.1	21 Aug 18 17:08	JSM
Fluoride	0.75	mg/l	0.10	SM4500-F-C	29 Aug 18 17:00	SVS
Sulfate	421	mg/l	5.00	ASTM D516-07	29 Aug 18 13:38	EV
Chloride	24.2	mg/l	1.0	SM4500-Cl-E	29 Aug 18 10:32	EV
Nitrate-Nitrite as N	5.40	mg/l	0.10	EPA 353.2	27 Aug 18 12:38	EV
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	30 Aug 18 12:27	EMS
Mercury - Dissolved	< 0.0002	mg/l	0.0002	EPA 245.1	30 Aug 18 13:28	EMS
Total Dissolved Solids	1010	mg/l	10	I1750-85	27 Aug 18 9:25	SVS
Calcium - Total	92.7	mg/l	1.0	6010D	31 Aug 18 13:06	SZ
Magnesium - Total	121	mg/l	1.0	6010D	31 Aug 18 13:06	SZ
Sodium - Total	93.4	mg/l	1.0	6010D	31 Aug 18 13:06	SZ
Potassium - Total	8.9	mg/l	1.0	6010D	31 Aug 18 13:06	SZ
Lithium - Total	0.047	mg/l	0.020	6010D	18 Sep 18 13:25	SZ
Boron - Total	1.38	mg/l	0.10	6010D	6 Sep 18 9:57	SZ
Calcium - Dissolved	90.3	mg/l	1.0	6010D	10 Sep 18 9:34	BB
Magnesium - Dissolved	114	mg/l	1.0	6010D	10 Sep 18 9:34	BB
Sodium - Dissolved	90.1	mg/l	1.0	6010D	10 Sep 18 9:34	BB
Potassium - Dissolved	8.5	mg/l	1.0	6010D	10 Sep 18 9:34	BB
Lithium - Dissolved	0.040	mg/l	0.020	6010D	18 Sep 18 15:25	SZ
Boron - Dissolved	1.34	mg/l	0.10	6010D	6 Sep 18 13:57	SZ
Antimony - Total	0.0053	mg/l	0.0010	6020B	31 Aug 18 11:56	BB
Arsenic - Total	0.0029	mg/l	0.0020	6020B	31 Aug 18 11:56	BB
Barium - Total	0.0269	mg/l	0.0020	6020B	31 Aug 18 11:56	BB
Beryllium - Total	< 0.0005	mg/l	0.0005	6020B	31 Aug 18 11:56	BB
Cadmium - Total	< 0.0005	mg/l	0.0005	6020B	31 Aug 18 11:56	BB
Chromium - Total	< 0.002	mg/l	0.0020	6020B	31 Aug 18 11:56	BB
Cobalt - Total	< 0.002	mg/l	0.0020	6020B	31 Aug 18 11:56	BB
Lead - Total	< 0.0005	mg/l	0.0005	6020B	31 Aug 18 11:56	BB
Molybdenum - Total	0.0251	mg/l	0.0020	6020B	31 Aug 18 11:56	BB
Selenium - Total	0.0499	mg/l	0.0050	6020B	31 Aug 18 11:56	BB
Thallium - Total	< 0.0005	mg/l	0.0005	6020B	31 Aug 18 11:56	BB

RL = Method Reporting Limit

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Report Date: 2 Oct 18
Lab Number: 18-W2743
Work Order #: 82-2163
Account #: 002800
Date Sampled: 21 Aug 18 17:08
Date Received: 23 Aug 18 8:00
Sampled By: MVTL Field Services

Samantha Marshall
Montana Dakota Utilities
5181 Southgate Dr
Billings MT 59102

Project Name: MDU Lewis & Clark
Sample Description: MW103

Temp at Receipt: 2.3C ROI

Event and Year: August 2018

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Antimony - Dissolved	0.0046	mg/l	0.0010	6020B	27 Aug 18 14:14	BB
Arsenic - Dissolved	0.0032	mg/l	0.0020	6020B	27 Aug 18 14:14	BB
Barium - Dissolved	0.0220	mg/l	0.0020	6020B	27 Aug 18 14:14	BB
Beryllium - Dissolved	< 0.0005	mg/l	0.0005	6020B	30 Aug 18 8:51	BB
Cadmium - Dissolved	< 0.0005	mg/l	0.0005	6020B	27 Aug 18 14:14	BB
Chromium - Dissolved	< 0.002	mg/l	0.0020	6020B	27 Aug 18 14:14	BB
Cobalt - Dissolved	< 0.002	mg/l	0.0020	6020B	27 Aug 18 14:14	BB
Lead - Dissolved	< 0.0005	mg/l	0.0005	6020B	27 Aug 18 14:14	BB
Molybdenum - Dissolved	0.0224	mg/l	0.0020	6020B	27 Aug 18 14:14	BB
Selenium - Dissolved	0.0523	mg/l	0.0050	6020B	2 Oct 18 11:31	CC
Thallium - Dissolved	< 0.0005	mg/l	0.0005	6020B	27 Aug 18 14:14	BB

* Holding time exceeded

Approved by: Claudette K Carrep CC 2OCT18

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

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Report Date: 2 Oct 18
Lab Number: 18-W2744
Work Order #: 82-2163
Account #: 002800
Date Sampled: 22 Aug 18 7:35
Date Received: 23 Aug 18 8:00
Sampled By: MVTL Field Services

Samantha Marshall
Montana Dakota Utilities
5181 Southgate Dr
Billings MT 59102

Project Name: MDU Lewis & Clark
Sample Description: MW109

Temp at Receipt: 2.3C ROI

Event and Year: August 2018

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	23 Aug 18	SVS
pH	* 7.7	units	N/A	SM4500 H+ B	23 Aug 18 17:00	SVS
Total Suspended Solids	11	mg/l	2	I3765-85	23 Aug 18 16:12	SVS
pH - Field	7.23	units	NA	SM 4500 H+ B	22 Aug 18 7:35	JSM
Temperature - Field	12.6	Degrees C	NA	SM 2550B	22 Aug 18 7:35	JSM
Total Alkalinity	368	mg/l CaCO3	20	SM2320-B	23 Aug 18 17:00	SVS
Conductivity - Field	1566	umhos/cm	1	EPA 120.1	22 Aug 18 7:35	JSM
Fluoride	0.85	mg/l	0.10	SM4500-F-C	29 Aug 18 17:00	SVS
Sulfate	522	mg/l	5.00	ASTM D516-07	29 Aug 18 13:38	EV
Chloride	25.0	mg/l	1.0	SM4500-Cl-E	29 Aug 18 10:32	EV
Nitrate-Nitrite as N	5.85	mg/l	0.10	EPA 353.2	27 Aug 18 12:38	EV
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	30 Aug 18 12:27	EMS
Mercury - Dissolved	< 0.0002	mg/l	0.0002	EPA 245.1	30 Aug 18 13:28	EMS
Total Dissolved Solids	1140	mg/l	10	I1750-85	27 Aug 18 9:25	SVS
Calcium - Total	103	mg/l	1.0	6010D	31 Aug 18 13:06	SZ
Magnesium - Total	150	mg/l	1.0	6010D	31 Aug 18 13:06	SZ
Sodium - Total	92.6	mg/l	1.0	6010D	31 Aug 18 13:06	SZ
Potassium - Total	9.2	mg/l	1.0	6010D	31 Aug 18 13:06	SZ
Lithium - Total	0.054	mg/l	0.020	6010D	18 Sep 18 13:25	SZ
Boron - Total	1.65	mg/l	0.10	6010D	6 Sep 18 9:57	SZ
Calcium - Dissolved	99.6	mg/l	1.0	6010D	10 Sep 18 9:34	BB
Magnesium - Dissolved	144	mg/l	1.0	6010D	10 Sep 18 9:34	BB
Sodium - Dissolved	88.3	mg/l	1.0	6010D	10 Sep 18 9:34	BB
Potassium - Dissolved	9.0	mg/l	1.0	6010D	10 Sep 18 9:34	BB
Lithium - Dissolved	0.046	mg/l	0.020	6010D	18 Sep 18 15:25	SZ
Boron - Dissolved	1.65	mg/l	0.10	6010D	6 Sep 18 13:57	SZ
Antimony - Total	0.0069	mg/l	0.0010	6020B	31 Aug 18 11:56	BB
Arsenic - Total	0.0027	mg/l	0.0020	6020B	31 Aug 18 11:56	BB
Barium - Total	0.0273	mg/l	0.0020	6020B	31 Aug 18 11:56	BB
Beryllium - Total	< 0.0005	mg/l	0.0005	6020B	31 Aug 18 11:56	BB
Cadmium - Total	< 0.0005	mg/l	0.0005	6020B	31 Aug 18 11:56	BB
Chromium - Total	< 0.002	mg/l	0.0020	6020B	31 Aug 18 11:56	BB
Cobalt - Total	0.0072	mg/l	0.0020	6020B	31 Aug 18 11:56	BB
Lead - Total	< 0.0005	mg/l	0.0005	6020B	31 Aug 18 11:56	BB
Molybdenum - Total	0.0285	mg/l	0.0020	6020B	31 Aug 18 11:56	BB
Selenium - Total	0.0528	mg/l	0.0050	6020B	31 Aug 18 11:56	BB
Thallium - Total	< 0.0005	mg/l	0.0005	6020B	31 Aug 18 11:56	BB

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CERTIFICATION: ND # ND-00016

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www.mvtl.com

Report Date: 2 Oct 18
Lab Number: 18-W2744
Work Order #: 82-2163
Account #: 002800
Date Sampled: 22 Aug 18 7:35
Date Received: 23 Aug 18 8:00
Sampled By: MVTL Field Services

Samantha Marshall
Montana Dakota Utilities
5181 Southgate Dr
Billings MT 59102

Project Name: MDU Lewis & Clark
Sample Description: MW109

Temp at Receipt: 2.3C ROI

Event and Year: August 2018

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Antimony - Dissolved	0.0052	mg/l	0.0010	6020B	27 Aug 18 14:14	BB
Arsenic - Dissolved	0.0028	mg/l	0.0020	6020B	27 Aug 18 14:14	BB
Barium - Dissolved	0.0197	mg/l	0.0020	6020B	27 Aug 18 14:14	BB
Beryllium - Dissolved	< 0.0005	mg/l	0.0005	6020B	30 Aug 18 8:51	BB
Cadmium - Dissolved	< 0.0005	mg/l	0.0005	6020B	27 Aug 18 14:14	BB
Chromium - Dissolved	< 0.002	mg/l	0.0020	6020B	27 Aug 18 14:14	BB
Cobalt - Dissolved	< 0.002	mg/l	0.0020	6020B	27 Aug 18 14:14	BB
Lead - Dissolved	< 0.0005	mg/l	0.0005	6020B	27 Aug 18 14:14	BB
Molybdenum - Dissolved	0.0246	mg/l	0.0020	6020B	27 Aug 18 14:14	BB
Selenium - Dissolved	0.0607	mg/l	0.0050	6020B	2 Oct 18 11:31	CC
Thallium - Dissolved	< 0.0005	mg/l	0.0005	6020B	27 Aug 18 14:14	BB

* Holding time exceeded

Approved by: Claudette K Carroll RC 2OCT18

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

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

CERTIFICATION: ND # ND-00016

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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
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Report Date: 2 Oct 18
Lab Number: 18-W2745
Work Order #: 82-2163
Account #: 002800
Date Sampled: 21 Aug 18 12:22
Date Received: 23 Aug 18 8:00
Sampled By: MVTL Field Services

Samantha Marshall
Montana Dakota Utilities
5181 Southgate Dr
Billings MT 59102

Project Name: MDU Lewis & Clark
Sample Description: MW110

Temp at Receipt: 2.3C ROI

Event and Year: August 2018

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	23 Aug 18	SVS
pH	* 7.7	units	N/A	SM4500 H+ B	23 Aug 18 17:00	SVS
Total Suspended Solids	2	mg/l	2	I3765-85	23 Aug 18 16:12	SVS
pH - Field	7.21	units	NA	SM 4500 H+ B	21 Aug 18 12:22	JSM
Temperature - Field	16.6	Degrees C	NA	SM 2550B	21 Aug 18 12:22	JSM
Total Alkalinity	350	mg/l CaCO3	20	SM2320-B	23 Aug 18 17:00	SVS
Conductivity - Field	1039	umhos/cm	1	EPA 120.1	21 Aug 18 12:22	JSM
Fluoride	0.52	mg/l	0.10	SM4500-F-C	29 Aug 18 17:00	SVS
Sulfate	186	mg/l	5.00	ASTM D516-07	29 Aug 18 14:02	EV
Chloride	18.6	mg/l	1.0	SM4500-Cl-E	29 Aug 18 10:32	EV
Nitrate-Nitrite as N	5.15	mg/l	0.10	EPA 353.2	27 Aug 18 12:38	EV
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	30 Aug 18 12:27	EMS
Mercury - Dissolved	< 0.0002	mg/l	0.0002	EPA 245.1	30 Aug 18 13:28	EMS
Total Dissolved Solids	663	mg/l	10	I1750-85	27 Aug 18 9:25	SVS
Calcium - Total	86.8	mg/l	1.0	6010D	31 Aug 18 13:06	SZ
Magnesium - Total	53.1	mg/l	1.0	6010D	31 Aug 18 13:06	SZ
Sodium - Total	81.8	mg/l	1.0	6010D	31 Aug 18 13:06	SZ
Potassium - Total	7.2	mg/l	1.0	6010D	31 Aug 18 13:06	SZ
Lithium - Total	0.030	mg/l	0.020	6010D	18 Sep 18 13:25	SZ
Boron - Total	0.22	mg/l	0.10	6010D	6 Sep 18 9:57	SZ
Calcium - Dissolved	85.8	mg/l	1.0	6010D	10 Sep 18 9:34	BB
Magnesium - Dissolved	52.6	mg/l	1.0	6010D	10 Sep 18 9:34	BB
Sodium - Dissolved	81.0	mg/l	1.0	6010D	10 Sep 18 9:34	BB
Potassium - Dissolved	7.3	mg/l	1.0	6010D	10 Sep 18 9:34	BB
Lithium - Dissolved	0.024	mg/l	0.020	6010D	18 Sep 18 15:25	SZ
Boron - Dissolved	0.22	mg/l	0.10	6010D	6 Sep 18 13:57	SZ
Antimony - Total	< 0.001	mg/l	0.0010	6020B	31 Aug 18 11:56	BB
Arsenic - Total	< 0.002	mg/l	0.0020	6020B	31 Aug 18 11:56	BB
Barium - Total	0.0312	mg/l	0.0020	6020B	31 Aug 18 11:56	BB
Beryllium - Total	< 0.0005	mg/l	0.0005	6020B	31 Aug 18 11:56	BB
Cadmium - Total	< 0.0005	mg/l	0.0005	6020B	31 Aug 18 11:56	BB
Chromium - Total	< 0.002	mg/l	0.0020	6020B	31 Aug 18 11:56	BB
Cobalt - Total	< 0.002	mg/l	0.0020	6020B	31 Aug 18 11:56	BB
Lead - Total	< 0.0005	mg/l	0.0005	6020B	31 Aug 18 11:56	BB
Molybdenum - Total	0.0037	mg/l	0.0020	6020B	31 Aug 18 11:56	BB
Selenium - Total	< 0.01 ^	mg/l	0.0050	6020B	31 Aug 18 11:56	BB
Thallium - Total	< 0.0005	mg/l	0.0005	6020B	31 Aug 18 11:56	BB

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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Report Date: 2 Oct 18
Lab Number: 18-W2745
Work Order #: 82-2163
Account #: 002800
Date Sampled: 21 Aug 18 12:22
Date Received: 23 Aug 18 8:00
Sampled By: MVTL Field Services

Samantha Marshall
Montana Dakota Utilities
5181 Southgate Dr
Billings MT 59102

Project Name: MDU Lewis & Clark
Sample Description: MW110

Temp at Receipt: 2.3C ROI

Event and Year: August 2018

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Antimony - Dissolved	< 0.001	mg/l	0.0010	6020B	27 Aug 18 14:14	BB
Arsenic - Dissolved	< 0.002	mg/l	0.0020	6020B	27 Aug 18 14:14	BB
Barium - Dissolved	0.0301	mg/l	0.0020	6020B	27 Aug 18 14:14	BB
Beryllium - Dissolved	< 0.0005	mg/l	0.0005	6020B	30 Aug 18 8:51	BB
Cadmium - Dissolved	< 0.0005	mg/l	0.0005	6020B	27 Aug 18 14:14	BB
Chromium - Dissolved	< 0.002	mg/l	0.0020	6020B	27 Aug 18 14:14	BB
Cobalt - Dissolved	< 0.002	mg/l	0.0020	6020B	27 Aug 18 14:14	BB
Lead - Dissolved	< 0.0005	mg/l	0.0005	6020B	27 Aug 18 14:14	BB
Molybdenum - Dissolved	0.0038	mg/l	0.0020	6020B	27 Aug 18 14:14	BB
Selenium - Dissolved	< 0.005	mg/l	0.0050	6020B	27 Aug 18 14:14	BB
Thallium - Dissolved	< 0.0005	mg/l	0.0005	6020B	27 Aug 18 14:14	BB

* Holding time exceeded

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

Approved by: Claudette K. Carroll CC 20CT18

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

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

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Samantha Marshall
Montana Dakota Utilities
5181 Southgate Dr
Billings MT 59102

Report Date: 2 Oct 18
Lab Number: 18-W2746
Work Order #: 82-2163
Account #: 002800
Date Sampled: 21 Aug 18 14:00
Date Received: 23 Aug 18 8:00
Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark
Sample Description: MW119

Temp at Receipt: 2.3C ROI

Event and Year: August 2018

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	23 Aug 18	SVS
pH	* 7.7	units	N/A	SM4500 H+ B	23 Aug 18 17:00	SVS
Total Suspended Solids	< 2	mg/l	2	I3765-85	23 Aug 18 16:12	SVS
pH - Field	7.20	units	NA	SM 4500 H+ B	21 Aug 18 14:00	JSM
Temperature - Field	16.4	Degrees C	NA	SM 2550B	21 Aug 18 14:00	JSM
Total Alkalinity	380	mg/l CaCO3	20	SM2320-B	23 Aug 18 17:00	SVS
Conductivity - Field	1155	umhos/cm	1	EPA 120.1	21 Aug 18 14:00	JSM
Fluoride	0.49	mg/l	0.10	SM4500-F-C	29 Aug 18 17:00	SVS
Sulfate	213	mg/l	5.00	ASTM D516-07	29 Aug 18 14:02	EV
Chloride	23.3	mg/l	1.0	SM4500-Cl-E	29 Aug 18 10:32	EV
Nitrate-Nitrite as N	7.70	mg/l	0.10	EPA 353.2	27 Aug 18 12:38	EV
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	30 Aug 18 12:27	EMS
Mercury - Dissolved	< 0.0002	mg/l	0.0002	EPA 245.1	30 Aug 18 13:28	EMS
Total Dissolved Solids	754	mg/l	10	I1750-85	27 Aug 18 9:25	SVS
Calcium - Total	97.0	mg/l	1.0	6010D	31 Aug 18 13:06	SZ
Magnesium - Total	59.9	mg/l	1.0	6010D	31 Aug 18 13:06	SZ
Sodium - Total	93.3	mg/l	1.0	6010D	31 Aug 18 13:06	SZ
Potassium - Total	8.6	mg/l	1.0	6010D	31 Aug 18 13:06	SZ
Lithium - Total	0.035	mg/l	0.020	6010D	18 Sep 18 13:25	SZ
Boron - Total	0.26	mg/l	0.10	6010D	6 Sep 18 9:57	SZ
Calcium - Dissolved	94.7	mg/l	1.0	6010D	10 Sep 18 9:34	BB
Magnesium - Dissolved	58.4	mg/l	1.0	6010D	10 Sep 18 9:34	BB
Sodium - Dissolved	90.2	mg/l	1.0	6010D	10 Sep 18 9:34	BB
Potassium - Dissolved	8.3	mg/l	1.0	6010D	10 Sep 18 9:34	BB
Lithium - Dissolved	0.026	mg/l	0.020	6010D	18 Sep 18 15:25	SZ
Boron - Dissolved	0.26	mg/l	0.10	6010D	6 Sep 18 13:57	SZ
Antimony - Total	< 0.001	mg/l	0.0010	6020B	31 Aug 18 16:36	BB
Arsenic - Total	< 0.002	mg/l	0.0020	6020B	31 Aug 18 16:36	BB
Barium - Total	0.0350	mg/l	0.0020	6020B	31 Aug 18 16:36	BB
Beryllium - Total	< 0.0005	mg/l	0.0005	6020B	31 Aug 18 16:36	BB
Cadmium - Total	0.0005	mg/l	0.0005	6020B	31 Aug 18 16:36	BB
Chromium - Total	< 0.002	mg/l	0.0020	6020B	31 Aug 18 16:36	BB
Cobalt - Total	< 0.002	mg/l	0.0020	6020B	31 Aug 18 16:36	BB
Lead - Total	< 0.0005	mg/l	0.0005	6020B	31 Aug 18 16:36	BB
Molybdenum - Total	0.0042	mg/l	0.0020	6020B	31 Aug 18 16:36	BB
Selenium - Total	< 0.005	mg/l	0.0050	6020B	4 Sep 18 10:46	BB
Thallium - Total	< 0.0005	mg/l	0.0005	6020B	31 Aug 18 16:36	BB

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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Report Date: 2 Oct 18
Lab Number: 18-W2746
Work Order #: 82-2163
Account #: 002800
Date Sampled: 21 Aug 18 14:00
Date Received: 23 Aug 18 8:00
Sampled By: MVTL Field Services

Samantha Marshall
Montana Dakota Utilities
5181 Southgate Dr
Billings MT 59102

Project Name: MDU Lewis & Clark
Sample Description: MW119

Temp at Receipt: 2.3C ROI

Event and Year: August 2018

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Antimony - Dissolved	< 0.001	mg/l	0.0010	6020B	27 Aug 18 14:14	BB
Arsenic - Dissolved	< 0.002	mg/l	0.0020	6020B	27 Aug 18 14:14	BB
Barium - Dissolved	0.0334	mg/l	0.0020	6020B	27 Aug 18 14:14	BB
Beryllium - Dissolved	< 0.0005	mg/l	0.0005	6020B	30 Aug 18 8:51	BB
Cadmium - Dissolved	< 0.0005	mg/l	0.0005	6020B	27 Aug 18 14:14	BB
Chromium - Dissolved	< 0.002	mg/l	0.0020	6020B	27 Aug 18 14:14	BB
Cobalt - Dissolved	< 0.002	mg/l	0.0020	6020B	27 Aug 18 14:14	BB
Lead - Dissolved	< 0.0005	mg/l	0.0005	6020B	27 Aug 18 14:14	BB
Molybdenum - Dissolved	0.0041	mg/l	0.0020	6020B	27 Aug 18 14:14	BB
Selenium - Dissolved	< 0.005	mg/l	0.0050	6020B	27 Aug 18 14:14	BB
Thallium - Dissolved	< 0.0005	mg/l	0.0005	6020B	27 Aug 18 14:14	BB

* Holding time exceeded

Approved by: Claudette K Carroll CC 20CT18

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

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Report Date: 2 Oct 18
Lab Number: 18-W2747
Work Order #: 82-2163
Account #: 002800
Date Sampled: 22 Aug 18 11:31
Date Received: 23 Aug 18 8:00
Sampled By: MVTL Field Services

Samantha Marshall
Montana Dakota Utilities
5181 Southgate Dr
Billings MT 59102

Project Name: MDU Lewis & Clark
Sample Description: MW111

Temp at Receipt: 2.3C ROI

Event and Year: August 2018

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	23 Aug 18	SVS
pH	* 7.6	units	N/A	SM4500 H+ B	23 Aug 18 17:00	SVS
Total Suspended Solids	3	mg/l	2	I3765-85	23 Aug 18 16:12	SVS
pH - Field	7.16	units	NA	SM 4500 H+ B	22 Aug 18 11:31	JSM
Temperature - Field	15.4	Degrees C	NA	SM 2550B	22 Aug 18 11:31	JSM
Total Alkalinity	419	mg/l CaCO3	20	SM2320-B	23 Aug 18 17:00	SVS
Conductivity - Field	3307	umhos/cm	1	EPA 120.1	22 Aug 18 11:31	JSM
Fluoride	2.28	mg/l	0.10	SM4500-F-C	29 Aug 18 17:00	SVS
Sulfate	1760	mg/l	5.00	ASTM D516-07	29 Aug 18 14:02	EV
Chloride	33.2	mg/l	1.0	SM4500-Cl-E	29 Aug 18 10:32	EV
Nitrate-Nitrite as N	9.25	mg/l	0.10	EPA 353.2	27 Aug 18 14:28	EV
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	30 Aug 18 13:28	EMS
Mercury - Dissolved	< 0.0002	mg/l	0.0002	EPA 245.1	30 Aug 18 13:28	EMS
Total Dissolved Solids	3200	mg/l	10	I1750-85	27 Aug 18 9:25	SVS
Calcium - Total	170	mg/l	1.0	6010D	31 Aug 18 14:06	SZ
Magnesium - Total	473	mg/l	1.0	6010D	31 Aug 18 14:06	SZ
Sodium - Total	138	mg/l	1.0	6010D	31 Aug 18 14:06	SZ
Potassium - Total	11.5	mg/l	1.0	6010D	31 Aug 18 14:06	SZ
Lithium - Total	0.174	mg/l	0.020	6010D	18 Sep 18 13:25	SZ
Boron - Total	7.28	mg/l	0.10	6010D	6 Sep 18 9:57	SZ
Calcium - Dissolved	164	mg/l	1.0	6010D	10 Sep 18 9:34	BB
Magnesium - Dissolved	454	mg/l	1.0	6010D	10 Sep 18 9:34	BB
Sodium - Dissolved	133	mg/l	1.0	6010D	10 Sep 18 9:34	BB
Potassium - Dissolved	11.3	mg/l	1.0	6010D	10 Sep 18 9:34	BB
Lithium - Dissolved	0.163	mg/l	0.020	6010D	18 Sep 18 15:25	SZ
Boron - Dissolved	7.16	mg/l	0.10	6010D	6 Sep 18 13:57	SZ
Antimony - Total	< 0.001	mg/l	0.0010	6020B	31 Aug 18 16:36	BB
Arsenic - Total	< 0.002	mg/l	0.0020	6020B	31 Aug 18 16:36	BB
Barium - Total	0.0234	mg/l	0.0020	6020B	31 Aug 18 16:36	BB
Beryllium - Total	< 0.0005	mg/l	0.0005	6020B	31 Aug 18 16:36	BB
Cadmium - Total	< 0.0005	mg/l	0.0005	6020B	31 Aug 18 16:36	BB
Chromium - Total	< 0.002	mg/l	0.0020	6020B	31 Aug 18 16:36	BB
Cobalt - Total	< 0.002	mg/l	0.0020	6020B	31 Aug 18 16:36	BB
Lead - Total	< 0.0005	mg/l	0.0005	6020B	31 Aug 18 16:36	BB
Molybdenum - Total	0.0821	mg/l	0.0020	6020B	31 Aug 18 16:36	BB
Selenium - Total	0.0720	mg/l	0.0050	6020B	4 Sep 18 10:46	BB
Thallium - Total	< 0.0005	mg/l	0.0005	6020B	31 Aug 18 16:36	BB

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CERTIFICATION: ND # ND-00016

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Report Date: 2 Oct 18
Lab Number: 18-W2747
Work Order #: 82-2163
Account #: 002800
Date Sampled: 22 Aug 18 11:31
Date Received: 23 Aug 18 8:00
Sampled By: MVTL Field Services

Samantha Marshall
Montana Dakota Utilities
5181 Southgate Dr
Billings MT 59102

Project Name: MDU Lewis & Clark
Sample Description: MW111

Temp at Receipt: 2.3C ROI

Event and Year: August 2018

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Antimony - Dissolved	< 0.001	mg/l	0.0010	6020B	27 Aug 18 14:14	BB
Arsenic - Dissolved	< 0.002	mg/l	0.0020	6020B	27 Aug 18 14:14	BB
Barium - Dissolved	0.0205	mg/l	0.0020	6020B	27 Aug 18 14:14	BB
Beryllium - Dissolved	< 0.0005	mg/l	0.0005	6020B	30 Aug 18 8:51	BB
Cadmium - Dissolved	< 0.0005	mg/l	0.0005	6020B	27 Aug 18 14:14	BB
Chromium - Dissolved	< 0.002	mg/l	0.0020	6020B	27 Aug 18 14:14	BB
Cobalt - Dissolved	< 0.002	mg/l	0.0020	6020B	27 Aug 18 14:14	BB
Lead - Dissolved	< 0.0005	mg/l	0.0005	6020B	27 Aug 18 14:14	BB
Molybdenum - Dissolved	0.0750	mg/l	0.0020	6020B	27 Aug 18 14:14	BB
Selenium - Dissolved	0.0727	mg/l	0.0050	6020B	2 Oct 18 11:31	CC
Thallium - Dissolved	< 0.0005	mg/l	0.0005	6020B	27 Aug 18 14:14	BB

* Holding time exceeded

CC

Approved by: Claudette K Carrol 2OCT18

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

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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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1201 Lincoln Hwy. ~ Nevada, IA 50201 ~ 800-362-0855 ~ Fax 515-382-3885
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Report Date: 2 Oct 18
Lab Number: 18-W2748
Work Order #: 82-2163
Account #: 002800
Date Sampled: 22 Aug 18 13:36
Date Received: 23 Aug 18 8:00
Sampled By: MVTL Field Services

Samantha Marshall
Montana Dakota Utilities
5181 Southgate Dr
Billings MT 59102

Project Name: MDU Lewis & Clark
Sample Description: MW118

Temp at Receipt: 2.3C ROI

Event and Year: August 2018

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	23 Aug 18	SVS
pH	* 7.8	units	N/A	SM4500 H+ B	23 Aug 18 18:00	SVS
Total Suspended Solids	4	mg/l	2	I3765-85	23 Aug 18 16:12	SVS
pH - Field	7.32	units	NA	SM 4500 H+ B	22 Aug 18 13:36	JSM
Temperature - Field	20.4	Degrees C	NA	SM 2550B	22 Aug 18 13:36	JSM
Total Alkalinity	384	mg/l CaCO3	20	SM2320-B	23 Aug 18 18:00	SVS
Conductivity - Field	1682	umhos/cm	1	EPA 120.1	23 Aug 18 13:36	JSM
Fluoride	1.28	mg/l	0.10	SM4500-F-C	23 Aug 18 18:00	SVS
Sulfate	597	mg/l	5.00	ASTM D516-07	29 Aug 18 14:02	EV
Chloride	24.0	mg/l	1.0	SM4500-Cl-E	29 Aug 18 10:32	EV
Nitrate-Nitrite as N	6.30	mg/l	0.10	EPA 353.2	27 Aug 18 14:28	EV
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	30 Aug 18 13:28	EMS
Mercury - Dissolved	< 0.0002	mg/l	0.0002	EPA 245.1	30 Aug 18 13:28	EMS
Total Dissolved Solids	1230	mg/l	10	I1750-85	27 Aug 18 9:25	SVS
Calcium - Total	84.5	mg/l	1.0	6010D	31 Aug 18 14:06	SZ
Magnesium - Total	178	mg/l	1.0	6010D	31 Aug 18 14:06	SZ
Sodium - Total	97.1	mg/l	1.0	6010D	31 Aug 18 14:06	SZ
Potassium - Total	9.3	mg/l	1.0	6010D	31 Aug 18 14:06	SZ
Lithium - Total	0.100	mg/l	0.020	6010D	18 Sep 18 13:25	SZ
Boron - Total	2.14	mg/l	0.10	6010D	6 Sep 18 10:57	SZ
Calcium - Dissolved	82.2	mg/l	1.0	6010D	10 Sep 18 9:34	BB
Magnesium - Dissolved	171	mg/l	1.0	6010D	10 Sep 18 9:34	BB
Sodium - Dissolved	95.5	mg/l	1.0	6010D	10 Sep 18 9:34	BB
Potassium - Dissolved	9.1	mg/l	1.0	6010D	10 Sep 18 9:34	BB
Lithium - Dissolved	0.089	mg/l	0.020	6010D	18 Sep 18 15:25	SZ
Boron - Dissolved	2.08	mg/l	0.10	6010D	6 Sep 18 13:57	SZ
Antimony - Total	< 0.001	mg/l	0.0010	6020B	31 Aug 18 16:36	BB
Arsenic - Total	0.0024	mg/l	0.0020	6020B	31 Aug 18 16:36	BB
Barium - Total	0.0294	mg/l	0.0020	6020B	31 Aug 18 16:36	BB
Beryllium - Total	< 0.0005	mg/l	0.0005	6020B	31 Aug 18 16:36	BB
Cadmium - Total	< 0.0005	mg/l	0.0005	6020B	31 Aug 18 16:36	BB
Chromium - Total	< 0.002	mg/l	0.0020	6020B	31 Aug 18 16:36	BB
Cobalt - Total	< 0.002	mg/l	0.0020	6020B	31 Aug 18 16:36	BB
Lead - Total	< 0.0005	mg/l	0.0005	6020B	31 Aug 18 16:36	BB
Molybdenum - Total	0.0595	mg/l	0.0020	6020B	31 Aug 18 16:36	BB
Selenium - Total	0.0573	mg/l	0.0050	6020B	4 Sep 18 10:46	BB
Thallium - Total	< 0.0005	mg/l	0.0005	6020B	31 Aug 18 16:36	BB

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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Samantha Marshall
Montana Dakota Utilities
5181 Southgate Dr
Billings MT 59102

Report Date: 2 Oct 18
Lab Number: 18-W2748
Work Order #: 82-2163
Account #: 002800
Date Sampled: 22 Aug 18 13:36
Date Received: 23 Aug 18 8:00
Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark
Sample Description: MW118

Temp at Receipt: 2.3C ROI

Event and Year: August 2018

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Antimony - Dissolved	< 0.001	mg/l	0.0010	6020B	27 Aug 18 14:14	BB
Arsenic - Dissolved	0.0024	mg/l	0.0020	6020B	27 Aug 18 14:14	BB
Barium - Dissolved	0.0226	mg/l	0.0020	6020B	27 Aug 18 14:14	BB
Beryllium - Dissolved	< 0.0005	mg/l	0.0005	6020B	30 Aug 18 8:51	BB
Cadmium - Dissolved	< 0.0005	mg/l	0.0005	6020B	27 Aug 18 14:14	BB
Chromium - Dissolved	< 0.002	mg/l	0.0020	6020B	27 Aug 18 14:14	BB
Cobalt - Dissolved	< 0.002	mg/l	0.0020	6020B	27 Aug 18 14:14	BB
Lead - Dissolved	< 0.0005	mg/l	0.0005	6020B	27 Aug 18 14:14	BB
Molybdenum - Dissolved	0.0526	mg/l	0.0020	6020B	27 Aug 18 14:14	BB
Selenium - Dissolved	0.0619	mg/l	0.0050	6020B	2 Oct 18 11:31	CC
Thallium - Dissolved	< 0.0005	mg/l	0.0005	6020B	27 Aug 18 14:14	BB

* Holding time exceeded

CC
Approved by: Claudette K. Carroll 2OCT18

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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Report Date: 2 Oct 18
Lab Number: 18-W2749
Work Order #: 82-2163
Account #: 002800
Date Sampled: 22 Aug 18 9:14
Date Received: 23 Aug 18 8:00
Sampled By: MVTL Field Services

Samantha Marshall
Montana Dakota Utilities
5181 Southgate Dr
Billings MT 59102

Project Name: MDU Lewis & Clark
Sample Description: MW120

Temp at Receipt: 2.3C ROI

Event and Year: August 2018

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	23 Aug 18	SVS
pH	* 7.3	units	N/A	SM4500 H+ B	23 Aug 18 18:00	SVS
Total Suspended Solids	4	mg/l	2	I3765-85	23 Aug 18 16:12	SVS
pH - Field	6.67	units	NA	SM 4500 H+ B	22 Aug 18 9:14	JSM
Temperature - Field	12.5	Degrees C	NA	SM 2550B	22 Aug 18 9:14	JSM
Total Alkalinity	632	mg/l CaCO3	20	SM2320-B	23 Aug 18 18:00	SVS
Conductivity - Field	4752	umhos/cm	1	EPA 120.1	22 Aug 18 9:14	JSM
Fluoride	0.42	mg/l	0.10	SM4500-F-C	23 Aug 18 18:00	SVS
Sulfate	2920	mg/l	5.00	ASTM D516-07	29 Aug 18 14:02	EV
Chloride	39.0	mg/l	1.0	SM4500-Cl-E	29 Aug 18 10:32	EV
Nitrate-Nitrite as N	0.62	mg/l	0.10	EPA 353.2	27 Aug 18 14:28	EV
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	30 Aug 18 13:28	EMS
Mercury - Dissolved	< 0.0002	mg/l	0.0002	EPA 245.1	30 Aug 18 13:28	EMS
Total Dissolved Solids	4990	mg/l	10	I1750-85	27 Aug 18 9:25	SVS
Calcium - Total	384	mg/l	1.0	6010D	31 Aug 18 14:06	SZ
Magnesium - Total	625	mg/l	1.0	6010D	31 Aug 18 14:06	SZ
Sodium - Total	291	mg/l	1.0	6010D	31 Aug 18 14:06	SZ
Potassium - Total	22.4	mg/l	1.0	6010D	31 Aug 18 14:06	SZ
Lithium - Total	0.091	mg/l	0.020	6010D	18 Sep 18 13:25	SZ
Boron - Total	6.61	mg/l	0.10	6010D	6 Sep 18 10:57	SZ
Calcium - Dissolved	374	mg/l	1.0	6010D	10 Sep 18 9:34	BB
Magnesium - Dissolved	610	mg/l	1.0	6010D	10 Sep 18 9:34	BB
Sodium - Dissolved	288	mg/l	1.0	6010D	10 Sep 18 9:34	BB
Potassium - Dissolved	22.2	mg/l	1.0	6010D	10 Sep 18 9:34	BB
Lithium - Dissolved	0.079	mg/l	0.020	6010D	18 Sep 18 15:25	SZ
Boron - Dissolved	6.62	mg/l	0.10	6010D	6 Sep 18 13:57	SZ
Antimony - Total	< 0.001	mg/l	0.0010	6020B	31 Aug 18 16:36	BB
Arsenic - Total	< 0.002	mg/l	0.0020	6020B	31 Aug 18 16:36	BB
Barium - Total	0.0451	mg/l	0.0020	6020B	31 Aug 18 16:36	BB
Beryllium - Total	< 0.0005	mg/l	0.0005	6020B	31 Aug 18 16:36	BB
Cadmium - Total	< 0.0005	mg/l	0.0005	6020B	31 Aug 18 16:36	BB
Chromium - Total	< 0.002	mg/l	0.0020	6020B	31 Aug 18 16:36	BB
Cobalt - Total	0.0023	mg/l	0.0020	6020B	31 Aug 18 16:36	BB
Lead - Total	< 0.0005	mg/l	0.0005	6020B	31 Aug 18 16:36	BB
Molybdenum - Total	0.0029	mg/l	0.0020	6020B	31 Aug 18 16:36	BB
Selenium - Total	< 0.005	mg/l	0.0050	6020B	4 Sep 18 10:46	BB
Thallium - Total	< 0.0005	mg/l	0.0005	6020B	31 Aug 18 16:36	BB

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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Samantha Marshall
Montana Dakota Utilities
5181 Southgate Dr
Billings MT 59102

Report Date: 2 Oct 18
Lab Number: 18-W2749
Work Order #: 82-2163
Account #: 002800
Date Sampled: 22 Aug 18 9:14
Date Received: 23 Aug 18 8:00
Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark
Sample Description: MW120

Temp at Receipt: 2.3C ROI

Event and Year: August 2018

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Antimony - Dissolved	< 0.001	mg/l	0.0010	6020B	27 Aug 18 14:14	BB
Arsenic - Dissolved	< 0.002	mg/l	0.0020	6020B	27 Aug 18 14:14	BB
Barium - Dissolved	0.0415	mg/l	0.0020	6020B	27 Aug 18 14:14	BB
Beryllium - Dissolved	< 0.0005	mg/l	0.0005	6020B	30 Aug 18 8:51	BB
Cadmium - Dissolved	< 0.0005	mg/l	0.0005	6020B	27 Aug 18 14:14	BB
Chromium - Dissolved	< 0.002	mg/l	0.0020	6020B	27 Aug 18 14:14	BB
Cobalt - Dissolved	0.0022	mg/l	0.0020	6020B	27 Aug 18 14:14	BB
Lead - Dissolved	< 0.0005	mg/l	0.0005	6020B	27 Aug 18 14:14	BB
Molybdenum - Dissolved	0.0029	mg/l	0.0020	6020B	27 Aug 18 14:14	BB
Selenium - Dissolved	< 0.005	mg/l	0.0050	6020B	27 Aug 18 14:14	BB
Thallium - Dissolved	< 0.0005	mg/l	0.0005	6020B	27 Aug 18 14:14	BB

* Holding time exceeded

Approved by: Claudette K Carroll CC 2OCT18

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

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

Chain of Custody Record

Project Name:	Event:	Work Order Number:
MDU Lewis and Clark	August 2018	82-2163

Report To:	MDU	Carbon Copy:	Name of Sampler(s):
Attn:	Samantha Marshall	Attn:	Jeremy Hoy
Address:	5181 Southgate Dr. Billings, MT 59102	Address:	
phone:	406-896-4227		
email:			

Sample Information						Bottle Type							Field Parameters			Analysis
Lab Number	Sample ID	Date	Time	Sample Type		1 liter	500mL Nitric	500mL Nitric (filtered)	250 mL Sulfuric				Temp (°C)	Spec. Cond.	pH	Analysis Required
W2741	Dup 1	21 Aug 18	NA	GW		X	X	X	X				NA	NA	NA	MDU L&C Spring 2018 minus Rad chem
W2742	Field Blank (FB)+	22 Aug 18	NA	GW		X	X	X	X				NA	NA	NA	
W2743	MW103	21 Aug 18	1708	GW		X	X	X	X				14.57	1437	7.25	
W2744	MW109	22 Aug 18	0735	GW		X	X	X	X				12.61	1566	7.23	
W2745	MW110	21 Aug 18	1222	GW		X	X	X	X				16.57	1039	7.21	
W2746	MW119	21 Aug 18	1400	GW		X	X	X	X				16.45	1155	7.20	
W2747	MW111	22 Aug 18	1131	GW		X	X	X	X				15.40	3307	7.18	
———	MW117 *	22 Aug 18	0940	GW		X	X	X	X				14.99	8061	7.07	
W2748	MW118	22 Aug 18	1336	GW		X	X	X	X				20.43	1682	7.32	
W2749	MW120	22 Aug 18	0914	GW		X	X	X	X				12.50	4752	6.67	

Comments: * Due to sampling error, MW117 will be recollected. NB 23 Aug 18
+ Bottles incorrectly labeled as EB - Field Blank (FB) is correct as noted on COC.

Relinquished By:		Sample Condition:	
Name:	Date/Time	Location:	Temp (°C)
1	23 Aug 18 0735	~~Log-In~~ Walk In #2	2.3 ~~TM562~~ TM805
2			

Received by:	
Name:	Date/Time
NBuchmann	23 Aug 18 0800

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CASE NARRATIVE

-MVTL Lab Reference No/SDG: 201882-2203
Client: Montana Dakota Utilities
Location: MDU Lewis & Clark
Project Identification: August 2018
MVTL Laboratory Identifications: 18-W2782
Page 1 of 1

MDU Sample Identification	MVTL Laboratory #
MW117	18-W2782

I. RECEIPT

- All samples were received at the laboratory on 28 Aug 2018 at 1123.
- Samples were collected and hand delivered by MVTL Field Service personnel to the laboratory.
- Samples were received on ice and evidence of cooling had begun.
  - Temperature of samples upon receipt was 6.2°C.
- All samples were properly preserved unless noted here and/or flagged on the individual analytical laboratory report.
- No other exceptions on sample receipt were encountered on this sample set unless noted here.

II. HOLDING TIMES

- With the exception of laboratory pH, all holding times were met for both preparation and analysis unless noted here.

III. METHODS

- Approved methodology was followed for all sample analyses.

IV. ANALYSIS

- All acceptance criteria was met for calibration, method blanks, laboratory control samples, laboratory fortified matrix/matrix duplicates unless noted here and/or flagged on the individual analytical laboratory report.
  - The recoveries for one selenium dissolved 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. Data was accepted based on acceptable recovery of the LCS. No further action was taken.

All laboratory data has been approved by MVTL Laboratories.

SIGNED: Claudette Carroll **DATE:** 2 OCT 18

Claudette Carroll - MVTL Bismarck Laboratory Manager

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Quality Control Report

Lab ID: 18-W2782 **Project:** MDU Lewis & Clark **Work Order:** 201882-2203

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	0.0160	107	80-120	0.100	18W2782q	< 0.001	0.1041	104	75-125	0.1041	0.1032	103	0.9	20	-	-	< 0.001
Antimony - Total mg/l	0.1000	114	80-120	0.400 0.400	18W2749q 18W2753q	< 0.001 < 0.001	0.4298 0.4354	107 109	75-125 75-125	0.4298 0.4354	0.4232 0.4178	106 104	1.5 4.1	20 20	- -	- -	< 0.001
Arsenic - Dissolved mg/l	0.0160	102	80-120	0.100	18W2782q	< 0.002	0.1131	113	75-125	0.1131	0.1112	111	1.7	20	-	-	< 0.002
Arsenic - Total mg/l	0.1000	93	80-120	0.400 0.400	18W2749q 18W2753q	< 0.002 0.0024	0.4042 0.3970	101 99	75-125 75-125	0.4042 0.3970	0.4020 0.3866	100 96	0.5 2.7	20 20	- -	- -	< 0.002
Barium - Dissolved mg/l	0.0160	106	80-120	0.100	18W2782q	0.0203	0.1203	100	75-125	0.1203	0.1185	98	1.5	20	-	-	< 0.002
Barium - Total mg/l	0.1000	98	80-120	0.400 0.400	18W2749q 18W2753q	0.0451 0.0501	0.4376 0.4406	98 98	75-125 75-125	0.4376 0.4406	0.4374 0.4432	98 98	0.0 0.6	20 20	- -	- -	< 0.002
Beryllium - Dissolved mg/l	0.0160	106	80-120	0.100	18W2782q	< 0.0005	0.1078	108	75-125	0.1078	0.1072	107	0.6	20	-	-	< 0.0005
Beryllium - Total mg/l	0.1000	100	80-120	0.400 0.400	18W2749q 18W2753q	< 0.0005 < 0.0005	0.4096 0.4108	102 103	75-125 75-125	0.4096 0.4108	0.4078 0.4092	102 102	0.4 0.4	20 20	- -	- -	< 0.0005
Boron - Dissolved mg/l	0.40 0.40 0.40	105 108 110	80-120 80-120 80-120	0.400	18-W2753	0.53	0.89	90	75-125	0.89	0.90	92	1.1	20	- - -	- - -	< 0.1
Boron - Total mg/l	0.40 0.40	110 110	80-120 80-120	2.00 0.400 0.400	18-W2749 18-W2753 18-W2761	6.61 0.53 0.45	8.50 0.93 0.87	94 100 105	75-125 75-125 75-125	8.50 0.93 0.87	8.57 0.93 0.83	98 100 95	0.8 0.0 4.7	20 20 20	- - -	- - -	< 0.1 < 0.1 < 0.1
Cadmium - Dissolved mg/l	0.0160	106	80-120	0.100	18W2782q	< 0.0005	0.1000	100	75-125	0.1000	0.1015	102	1.5	20	-	-	< 0.0005
Cadmium - Total mg/l	0.1000	112	80-120	0.400 0.400	18W2749q 18W2753q	< 0.0005 < 0.0005	0.4238 0.4290	106 107	75-125 75-125	0.4238 0.4290	0.4072 0.4190	102 105	4.0 2.4	20 20	- -	- -	< 0.0005
Calcium - Dissolved mg/l	20.0	112	80-120	100	18W2743q	90.3	186	96	75-125	186	188	98	1.1	20	- -	- -	< 1 < 1
Calcium - Total mg/l	20.0	109	80-120	500 500	18M2274q 18W2782q	160 431	695 960	107 106	75-125 75-125	695 960	690 960	106 106	0.7 0.0	20 20	- -	- -	< 1 < 1
Chloride mg/l	30.0	95	80-120	30.0	18-W2782	46.6	76.3	99	80-120	76.3	77.4	103	1.4	20	-	-	< 1
Chromium - Dissolved mg/l	0.0160	104	80-120	0.100	18W2782q	< 0.002	0.1020	102	75-125	0.1020	0.1036	104	1.6	20	-	-	< 0.002

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Quality Control Report

Lab ID: 18-W2782 **Project:** MDU Lewis & Clark **Work Order:** 201882-2203

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
Chromium - Total mg/l	0.1000	94	80-120	0.400 0.400	18W2749q 18W2753q	< 0.002 < 0.002	0.3880 0.3836	97 96	75-125 75-125	0.3880 0.3836	0.3878 0.3766	97 94	0.1 1.8	20 20	- -	- -	< 0.002
Cobalt - Dissolved mg/l	0.0160	105	80-120	0.100	18W2782q	< 0.002	0.1003	100	75-125	0.1003	0.0990	99	1.3	20	-	-	< 0.002
Cobalt - Total mg/l	0.1000	95	80-120	0.400 0.400	18W2749q 18W2753q	0.0023 < 0.002	0.3928 0.3874	98 97	75-125 75-125	0.3928 0.3874	0.3876 0.3830	96 96	1.3 1.1	20 20	- -	- -	< 0.002
Fluoride mg/l	0.50	100	90-110	0.500 0.500	18-W2743 18-W2761	0.75 < 0.1	1.22 0.58	94 116	80-120 80-120	1.22 0.58	1.21 0.58	92 116	0.8 0.0	20 20	- -	- -	< 0.1 < 0.1
Lead - Dissolved mg/l	0.0160	108	80-120	0.100	18W2782q	< 0.0005	0.0935	93	75-125	0.0935	0.0930	93	0.5	20	-	-	< 0.0005
Lead - Total mg/l	0.1000	98	80-120	0.400 0.400	18W2749q 18W2753q	< 0.0005 < 0.0005	0.3782 0.3750	95 94	75-125 75-125	0.3782 0.3750	0.3786 0.3790	95 95	0.1 1.1	20 20	- -	- -	< 0.0005
Lithium - Dissolved mg/l	0.400 0.400	106 106	80-120 80-120	0.400	18-W2748	0.089	0.460	93	75-125	0.460	0.462	93	0.4	20	- -	- -	< 0.02
Lithium - Total mg/l	0.400 0.400	106 106	80-120 80-120	0.400	18-W2749	0.091	0.506	104	75-125	0.506	0.505	104	0.2	20	- - -	- - -	< 0.02 < 0.02 < 0.02
Magnesium - Dissolved mg/l	20.0	108	80-120	100	18W2743q	114	206	92	75-125	206	208	94	1.0	20	- -	- -	< 1 < 1
Magnesium - Total mg/l	20.0	110	80-120	500 500	18M2274q 18W2782q	13.4 1320	550 1810	107 98	75-125 75-125	550 1810	545 1800	106 96	0.9 0.6	20 20	- -	- -	< 1 < 1
Mercury - Dissolved mg/l	0.0020	105	85-115	0.002 0.002	18-W2753 18-W2782	< 0.0002 < 0.0002	0.0023 0.0021	115 105	70-130 70-130	0.0023 0.0021	0.0020 0.0021	100 105	14.0 0.0	20 20	- -	- -	< 0.0002
Mercury - Total mg/l	0.0020	105	85-115	0.002	18-W2650q	< 0.0002	0.0021	105	70-130	0.0021	0.0020	100	4.9	20	-	-	< 0.0002
Molybdenum - Dissolved mg/l	0.0160	106	80-120	0.100	18W2782q	0.0043	0.1131	109	75-125	0.1131	0.1130	109	0.1	20	-	-	< 0.002
Molybdenum - Total mg/l	0.1000	113	80-120	0.400 0.400	18W2749q 18W2753q	0.0029 0.0320	0.4386 0.4662	109 109	75-125 75-125	0.4386 0.4662	0.4324 0.4536	107 105	1.4 2.7	20 20	- -	- -	< 0.002
Nitrate-Nitrite as N mg/l	0.50	92	90-110	1.00	18-W2784	< 0.1	0.96	96	90-110	0.96	0.96	96	0.0	20	-	-	< 0.1

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ACIL

Quality Control Report

Lab ID: 18-W2782 **Project:** MDU Lewis & Clark **Work Order:** 201882-2203

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
pH units	- -	- -	- -	- -	- -	- -	- -	- -	- -	8.6 8.0	8.6 8.1	- -	0.0 1.2	20 20	- -	- -	- -
Potassium - Dissolved mg/l	10.0	101	80-120	20.0	18W2743q	8.5	29.0	102	75-125	29.0	29.6	106	2.0	20	- -	- -	< 1 < 1
Potassium - Total mg/l	10.0	104	80-120	100 100	18M2274q 18W2782q	56.0 33.1	166 146	110 113	75-125 75-125	166 146	166 146	110 113	0.0 0.0	20 20	- -	- -	< 1 < 1
Selenium - Dissolved mg/l	0.0160	97	80-120	0.100	18W2782q	0.0415	0.1770	136	75-125	0.1770	0.1773	136	0.2	20	-	-	< 0.005
Selenium - Total mg/l	0.1000	112	80-120	0.100	18W2743q	0.0523	0.2142	81	75-125	0.2142	0.2225	85	3.8	20	-	-	< 0.005
Sodium - Dissolved mg/l	20.0	106	80-120	100	18W2743q	90.1	183	93	75-125	183	185	95	1.1	20	- -	- -	< 1 < 1
Sodium - Total mg/l	20.0	110	80-120	500 500	18M2274q 18W2782q	710 625	1250 1160	108 107	75-125 75-125	1250 1160	1230 1150	104 105	1.6 0.9	20 20	- -	- -	< 1 < 1
Sulfate mg/l	100	100	80-120	1000	18-W2761	560	1590	103	80-120	1590	1540	98	3.2	20	-	-	< 5
Thallium - Dissolved mg/l	0.0160	109	80-120	0.100	18W2782q	< 0.0005	0.0944	94	75-125	0.0944	0.0958	96	1.5	20	-	-	< 0.0005
Thallium - Total mg/l	0.1000	96	80-120	0.400 0.400	18W2749q 18W2753q	< 0.0005 < 0.0005	0.3832 0.3786	96 95	75-125 75-125	0.3832 0.3786	0.3828 0.3824	96 96	0.1 1.0	20 20	- -	- -	< 0.0005
Total Alkalinity mg/l CaCO3	410	99	90-110	410	18-W2782	415	804	95	80-120	804	800	94	0.5	20	99	80-120	< 20 < 20
Total Dissolved Solids mg/l	-	-	-	-	-	-	-	-	-	9480	9620	-	1.5	20	-	-	< 10
Total Suspended Solids mg/l	-	-	-	-	-	-	-	-	-	2600	2750	-	5.6	20	-	-	< 2

Approved by: C. Cantrell

20 OCT 18

MVTL

2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

Field Datasheet

Groundwater Assessment

Company:	MDU Lewis and Clark
Event:	August 2018
Sample ID:	117
Sampling Personal:	Jerry Ahr

Weather Conditions: Temp: 55 °F Wind: U @ 5-10 Precip: **Sunny / Partly Cloudy / (Cloudy)**

Well Information

Well Locked?	Yes	(No)	
Well Labeled?	(Yes)	No	
Casing Straight?	(Yes)	No	
Grout Seal Intact?	(Yes)	No	Not Visible
Repairs Necessary:			

Casing Diameter:	2"
Water Level Before Purge:	6.26 ft
Depth to Top of Pump:	9.86 ft
Water Level After Sample:	8.15 ft
Measurement Method:	Electric Water Level Indicator

Sampling Information

Purging Method:	Bladder
Sampling Method:	Bladder
Dedicated Equip?:	Yes (No)
Duplicate Sample?:	Yes (No)
Duplicate Sample ID:	—

Control Settings		
Purge:	8	sec.
Recover:	55	sec.
PSI:	20	

Purge Date:	27 Aug 18	Time Purging Began:	1051 (am)/pm
Well Purged Dry?	(Yes) No	Time Purged Dry:	1136 (am)/pm
Sample Date:	28 Aug 18	Time of Sampling:	0637 am/pm

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

Field Measurements

Stabilization (3 consecutive)		Temp (°C)	Spec. Cond.	pH	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Water Level (ft)	Pumping Rate	mL Removed	Description: Clarity, Color, Odor, Ect.
SEQ #	Time		±5%	±0.1	±10%	±20 mV	±10%	0.25 ft	ml/min		Clear, Slightly Turbid, Turbid
1	1056	13.86	8194	6.92	7.16	234.5	38.3	6.62	100.0	500.0	Clear
2	1106	14.30	8238	7.09	6.86	253.0	27.4	7.10	100.0	1000.0	Clear
3	1116	14.67	8222	7.11	6.92	265.5	50.1	7.83	100.0	1000.0	Clear
4	1126	14.86	8197	7.10	7.01	272.6	34.5	8.91	100.0	1000.0	Clear
5	1136	15.01	8042	7.11	7.14	283.7	27.6	Below Pump	100.0	1000.0	Clear
6											
7	0632	Purged for 5 min		to clear				6.65		recharge	
8	0637	13.12	8167	7.17	6.88	280.2	3.13	7.15	100.0	500.0	
9											
10											

Stabilized: Yes (No)

Total Volume Removed: 5,000 mL

Comments:

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Report Date: 2 Oct 18
Lab Number: 18-W2782
Work Order #: 82-2203
Account #: 002800
Date Sampled: 28 Aug 18 6:37
Date Received: 28 Aug 18 11:23
Sampled By: MVTL Field Services

Samantha Marshall
Montana Dakota Utilities
5181 Southgate Dr
Billings MT 59102

Project Name: MDU Lewis & Clark
Sample Description: MW117

Temp at Receipt: 6.2C ROI

Event and Year: August 2018

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	28 Aug 18	SVS
pH	* 7.6	units	N/A	SM4500 H+ B	29 Aug 18 17:00	SVS
Total Suspended Solids	13	mg/l	2	I3765-85	28 Aug 18 16:37	SVS
pH - Field	7.17	units	NA	SM 4500 H+ B	28 Aug 18 6:37	JSM
Temperature - Field	13.1	Degrees C	NA	SM 2550B	28 Aug 18 6:37	JSM
Total Alkalinity	415	mg/l CaCO3	20	SM2320-B	29 Aug 18 17:00	SVS
Conductivity - Field	8167	umhos/cm	1	EPA 120.1	28 Aug 18 6:37	JSM
Fluoride	0.27	mg/l	0.10	SM4500-F-C	29 Aug 18 17:00	SVS
Sulfate	6610	mg/l	5.00	ASTM D516-07	29 Aug 18 14:21	EV
Chloride	46.6	mg/l	1.0	SM4500-Cl-E	29 Aug 18 10:54	EV
Nitrate-Nitrite as N	19.8	mg/l	0.10	EPA 353.2	10 Sep 18 16:11	EV
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	30 Aug 18 13:28	EMS
Mercury - Dissolved	< 0.0002	mg/l	0.0002	EPA 245.1	30 Aug 18 13:28	EMS
Total Dissolved Solids	9480	mg/l	10	I1750-85	31 Aug 18 8:46	SVS
Calcium - Total	431	mg/l	1.0	6010D	10 Sep 18 14:34	BB
Magnesium - Total	1320	mg/l	1.0	6010D	10 Sep 18 14:34	BB
Sodium - Total	625	mg/l	1.0	6010D	10 Sep 18 14:34	BB
Potassium - Total	33.1	mg/l	1.0	6010D	10 Sep 18 14:34	BB
Lithium - Total	0.124	mg/l	0.020	6010D	18 Sep 18 13:25	SZ
Boron - Total	12.1	mg/l	0.10	6010D	6 Sep 18 10:57	SZ
Calcium - Dissolved	420	mg/l	1.0	6010D	10 Sep 18 9:34	BB
Magnesium - Dissolved	1290	mg/l	1.0	6010D	10 Sep 18 9:34	BB
Sodium - Dissolved	615	mg/l	1.0	6010D	10 Sep 18 9:34	BB
Potassium - Dissolved	32.2	mg/l	1.0	6010D	10 Sep 18 9:34	BB
Lithium - Dissolved	0.128	mg/l	0.020	6010D	18 Sep 18 15:25	SZ
Boron - Dissolved	12.4	mg/l	0.10	6010D	6 Sep 18 13:57	SZ
Antimony - Total	< 0.001	mg/l	0.0010	6020B	31 Aug 18 16:36	BB
Arsenic - Total	< 0.002	mg/l	0.0020	6020B	31 Aug 18 16:36	BB
Barium - Total	0.0223	mg/l	0.0020	6020B	31 Aug 18 16:36	BB
Beryllium - Total	< 0.0005	mg/l	0.0005	6020B	31 Aug 18 16:36	BB
Cadmium - Total	< 0.0005	mg/l	0.0005	6020B	31 Aug 18 16:36	BB
Chromium - Total	0.0041	mg/l	0.0020	6020B	31 Aug 18 16:36	BB
Cobalt - Total	< 0.002	mg/l	0.0020	6020B	31 Aug 18 16:36	BB
Lead - Total	< 0.0005	mg/l	0.0005	6020B	31 Aug 18 16:36	BB
Molybdenum - Total	0.0050	mg/l	0.0020	6020B	31 Aug 18 16:36	BB
Selenium - Total	0.0381	mg/l	0.0050	6020B	2 Oct 18 12:41	CC
Thallium - Total	< 0.0005	mg/l	0.0005	6020B	31 Aug 18 16:36	BB

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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Report Date: 2 Oct 18
Lab Number: 18-W2782
Work Order #: 82-2203
Account #: 002800
Date Sampled: 28 Aug 18 6:37
Date Received: 28 Aug 18 11:23
Sampled By: MVTL Field Services

Samantha Marshall
Montana Dakota Utilities
5181 Southgate Dr
Billings MT 59102

Project Name: MDU Lewis & Clark
Sample Description: MW117

Temp at Receipt: 6.2C ROI

Event and Year: August 2018

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Antimony - Dissolved	< 0.001	mg/l	0.0010	6020B	29 Aug 18 14:29	BB
Arsenic - Dissolved	< 0.002	mg/l	0.0020	6020B	29 Aug 18 14:29	BB
Barium - Dissolved	0.0203	mg/l	0.0020	6020B	29 Aug 18 14:29	BB
Beryllium - Dissolved	< 0.0005	mg/l	0.0005	6020B	29 Aug 18 14:29	BB
Cadmium - Dissolved	< 0.0005	mg/l	0.0005	6020B	29 Aug 18 14:29	BB
Chromium - Dissolved	< 0.002	mg/l	0.0020	6020B	29 Aug 18 14:29	BB
Cobalt - Dissolved	< 0.002	mg/l	0.0020	6020B	29 Aug 18 14:29	BB
Lead - Dissolved	< 0.0005	mg/l	0.0005	6020B	29 Aug 18 14:29	BB
Molybdenum - Dissolved	0.0043	mg/l	0.0020	6020B	29 Aug 18 14:29	BB
Selenium - Dissolved	0.0415	mg/l	0.0050	6020B	29 Aug 18 14:29	BB
Thallium - Dissolved	< 0.0005	mg/l	0.0005	6020B	29 Aug 18 14:29	BB

* Holding time exceeded

Approved by: Claudette K Carrep CC 20CT18

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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MVTL **Laboratories, Inc.**
2616 E. Broadway
Bismarck, ND 58501
Phone (701) 258-9720

Chain of Custody Record

Project Name:	Event:	Work Order Number:
MDU Lewis and Clark	August 2018	82-2203

Report To:	MDU	Carbon Copy:	Name of Sampler(s):
Attn:	Samantha Marshall	Attn:	
Address:	5181 Southgate Dr. Billings, MT 59102	Address:	
phone:	406-896-4227		
email:			

Sample Information					Bottle Type							Field Parameters			Analysis
Lab Number	Sample ID	Date	Time	Sample Type		1 liter	500mL Nitric	500mL Nitric (filtered)	250 mL Sulfuric			Temp (°C)	Spec. Cond.	pH	Analysis Required
W2782	MW117	28 Aug 18	0637	GW		X	X	X	X			13.12	8167	7.17	MDU L&C Spring 2018

Comments:

Relinquished By:		Sample Condition:	
Name:	Date/Time	Location:	Temp (°C)
1	28 Aug 18 1123	~~Log In~~ Walk In #2	Ro I 6.2 TM562 / ~~TM805~~
2			

Received by:	
Name:	Date/Time
	28 Aug 2018 1123

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CASE NARRATIVE – AMENDED 3 DEC 18 (Reporting)

MVTL Lab Reference No/SDG: 201882-2900
Client: Montana Dakota Utilities
Location: MDU Lewis & Clark
Project Identification: Fall (October) 2018 (Radiochem)
MVTL Laboratory Identifications: 18-W3933 through 18-W3935

MDU Sample Identification	MVTL Laboratory #
MW120	18-W3933
MW117	18-W3934
Dup-1	18-W3935

I. RECEIPT

- All samples were received at the laboratory on 31 Oct 2018 at 0800.
- Samples were collected and hand delivered by MVTL Field Service personnel to the laboratory.
- Samples were received on ice and evidence of cooling had begun.
  - Temperature of samples upon receipt was 1.8°C.
- No other exceptions on sample receipt were encountered on this sample set unless noted here.
- All samples requiring radiochemistry analysis were sent via courier to Inter-Mountain Labs (IML) for analysis there. Samples were received at IML on 2 Nov 18.
  - All samples were properly preserved unless noted on the individual analytical laboratory report or on the IML Case Narrative.

II. HOLDING TIMES

- All holding times were met for both preparation and analysis unless noted on the individual analytical laboratory report or on the IML Case Narrative.

III. METHODS

- Approved methodology was followed for all sample analyses.
  - Please refer to the IML Case Narrative for more information regarding methodology.

IV. ANALYSIS

- All acceptance criteria was met for calibration, method blanks, laboratory control samples, laboratory fortified matrix/matrix duplicates unless noted on the individual analytical laboratory report or on the IML Case Narrative.

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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MEMBER ACIL

CASE NARRATIVE – AMENDED 3 DEC 18 (Reporting)

MVTL Lab Reference No/SDG: 201882-2900
Client: Montana Dakota Utilities
Location: MDU Lewis & Clark
Project Identification: Fall (October) 2018 (Radiochem)
MVTL Laboratory Identifications: 18-W3933 through 18-W3935

V. REPORTING

- Per email dated 1 Dec 18 from Terri Olson, Barr, the radiochem data package had results that were reported as ND rather than as actual concentrations and the QC report was missing the LCS result. IML Laboratories was contacted on 3 Dec 18 and the radiochem data package was amended to resolve these issues.

All laboratory data has been approved by MVTL Laboratories.

SIGNED: Claudette Carroll **DATE:** 3 Dec 18

Claudette Carroll - MVTL Bismarck Laboratory Manager

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Claudette Carroll

From: Terri A. Olson <TOlson@barr.com>
Sent: Saturday, December 1, 2018 6:31 PM
To: Claudette Carroll; Barr Data Management; 'Marshall, Samantha'; Justin Soberaski
Subject: RE: Emailing: 201882-2900.csv, MVTLS1811037-F.xls, 201882-2900 MDU L&C.pdf, 201882-2900 MDU.txt, 201882-2900 mduccr.txt

Follow Up Flag: Follow up
Flag Status: Flagged

Also noted that Radium 226 is missing the LCS. There is a MB and LCSD but no LCS.

Thank-you,

Terri A. Olson
Senior Data Quality Specialist
Minneapolis, MN office: 952.842.3578
TOlson@barr.com
www.barr.com

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-----Original Message-----
From: Terri A. Olson
Sent: Saturday, December 1, 2018 5:39 PM
To: 'Claudette Carroll' <ccarroll@mvtl.com>; Barr Data Management <BarrDM@barr.com>; Marshall, Samantha <Samantha.Marshall@mdu.com>; Justin Soberaski <jsoberaski@barr.com>
Subject: RE: Emailing: 201882-2900.csv, MVTLS1811037-F.xls, 201882-2900 MDU L&C.pdf, 201882-2900 MDU.txt, 201882-2900 mduccr.txt

Hello Claudette,

The radiochemistry results and uncertainties were reported as ND and NA instead of numbers being used as requested and handled previously.

Please request a revision from IML.

Thank-you,

Terri A. Olson
Senior Data Quality Specialist
Minneapolis, MN office: 952.842.3578
TOlson@barr.com
www.barr.com

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-----Original Message-----
From: Claudette Carroll <ccarroll@mvtl.com>
Sent: Friday, November 30, 2018 8:59 AM
To: Barr Data Management <BarrDM@barr.com>; Marshall, Samantha <Samantha.Marshall@mdu.com>; Terri A. Olson <TOlson@barr.com>; Justin Soberaski <JSoberaski@barr.com>
Subject: Emailing: 201882-2900.csv, MVTLS1811037-F.xls, 201882-2900 MDU L&C.pdf, 201882-2900 MDU.txt, 201882-2900 mduccr.txt

Good morning Sam,

Attached is a data package for the radiochem sampling done at the MDU Lewis & Clark site in Oct 2018. Hard copies to follow in the mail. Please let me know if you have any questions.

Have a good Friday and a great weekend!
Claudette

ccarroll@mvtl.com
701-258-9720
2616 E. Broadway Ave/Bismarck, ND 58501

Your message is ready to be sent with the following file or link attachments:

201882-2900.csv
MVTLS1811037-F.xls
201882-2900 MDU L&C.pdf
201882-2900 MDU.txt
201882-2900 mduccr.txt

MINNESOTA VALLEY TESTING LABORATORIES, INC.
1126 North Front St. ~ New Ulm, MN 56073 ~ 800-782-3557 ~ Fax 507-359-2890
2 North German 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

Report Date: 29 Nov 18
Lab Number: 18-W3933
Work Order #: 82-2900
Account #: 002800
Date Sampled: 30 Oct 18 10:17
Date Received: 31 Oct 18 8:00
Sampled By: MVTL Field Services

Samantha Marshall
Montana Dakota Utilities
5181 Southgate Dr
Billings MT 59102

Project Name: MDU Lewis & Clark

PO #: 169917 OP

Sample Description: MW120

Temp at Receipt: 1.8C ROI

Event and Year: October 2018

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	6.63	units	NA	SM 4500 H+ B	30 Oct 18 10:17	DJN
Temperature - Field	10.3	Degrees C	NA	SM 2550B	30 Oct 18 10:17	DJN
Conductivity - Field	4833	umhos/cm	1	EPA 120.1	30 Oct 18 10:17	DJN
Radium 226	See Attached Report				27 Nov 18	OL
Radium 228	See Attached Report				26 Nov 18	OL

OL = Analysis performed by an Outside Laboratory.

Approved by: Claudette K. Carroll CC 30 NOV 18

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

Report Date: 29 Nov 18
Lab Number: 18-W3934
Work Order #: 82-2900
Account #: 002800
Date Sampled: 30 Oct 18 9:04
Date Received: 31 Oct 18 8:00
Sampled By: MVTL Field Services

Samantha Marshall
Montana Dakota Utilities
5181 Southgate Dr
Billings MT 59102

Project Name: MDU Lewis & Clark

PO #: 169917 OP

Sample Description: MW117

Temp at Receipt: 1.8C ROI

Event and Year: October 2018

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	7.10	units	NA	SM 4500 H+ B	30 Oct 18 9:04	DJN
Temperature - Field	10.1	Degrees C	NA	SM 2550B	30 Oct 18 9:04	DJN
Conductivity - Field	8424	umhos/cm	1	EPA 120.1	30 Oct 18 9:04	DJN
Radium 226	See Attached Report				27 Nov 18	OL
Radium 228	See Attached Report				26 Nov 18	OL

OL = Analysis performed by an Outside Laboratory.

Approved by: Claudette K Carrep CC 30NOV18

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

Report Date: 29 Nov 18
Lab Number: 18-W3935
Work Order #: 82-2900
Account #: 002800
Date Sampled: 30 Oct 18
Date Received: 31 Oct 18 8:00
Sampled By: MVTL Field Services

Samantha Marshall
Montana Dakota Utilities
5181 Southgate Dr
Billings MT 59102

Project Name: MDU Lewis & Clark

Sample Description: Dup-1

PO #: 169917 OP

Temp at Receipt: 1.8C ROI

Event and Year: October 2018

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
Radium 226	See Attached Report			27 Nov 18	OL
Radium 228	See Attached Report			26 Nov 18	OL

OL = Analysis performed by an Outside Laboratory.

Approved by: Claudette K. Carroll CC 30 NOV 18

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.

Inter-Mountain Labs
1673 Terra Avenue, Sheridan, Wyoming 82801 ph: (307) 672-8945

Your Environmental Monitoring Partner

Date: 11/28/2018

CLIENT: MVTL Laboratories, Inc.
Project: 201882-2900
Lab Order: S1811037

CASE NARRATIVE

Report ID: S1811037001

Samples 18-W3933 MW120, 18-W3934 MW117 and 18-W3935 Dup-1 were received on November 2, 2018.

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 Inter-Mountain Laboratories except as indicated in this case narrative.

Reviewed by:
Wade Nieuwsma, Assistant Laboratory Manager

Inter-Mountain Labs
1673 Terra Avenue, Sheridan, Wyoming 82801 ph: (307) 672-8945

Your Environmental Monitoring Partner

Sample Analysis Report

Company:	MVTL Laboratories, Inc. 2616 E Broadway Ave. Bismarck, ND 58501	**Date Reported**	11/28/2018
		Report ID	S1811037001
ProjectName:	201882-2900	**WorkOrder:**	S1811037
Lab ID:	S1811037-001	**CollectionDate:**	10/30/2018 10:17:00 AM
ClientSample ID:	18-W3933 MW120	**DateReceived:**	11/2/2018 1:15:00 PM
COC:	201882-2900	**FieldSampler:**	
PWS ID:		**Matrix:**	Water
Comments			

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Radionuclides - Total							
Radium 226	0.13	pCi/L		0.2	SM 7500 Ra-B	11/27/2018 1359	AA
Radium 226 Precision (±)	0.1	pCi/L			SM 7500 Ra-B	11/27/2018 1359	AA
Radium 228	-1.9	pCi/L		1	Ga-Tech	11/26/2018 1338	AA
Radium 228 Precision (±)	1.2	pCi/L			Ga-Tech	11/26/2018 1338	AA

These results apply only to the samples tested.

RL - Reporting Limit

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
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: _____
Wade Nieuwsma, Assistant Laboratory Manager

Sample Analysis Report

Company: MVTL Laboratories, Inc.
2616 E Broadway Ave.
Bismarck, ND 58501

Date Reported 11/28/2018
Report ID S1811037001

ProjectName: 201882-2900
Lab ID: S1811037-002
ClientSample ID: 18-W3934 MW117
COC: 201882-2900
PWS ID:
Comments

WorkOrder: S1811037
CollectionDate: 10/30/2018 9:04:00 AM
DateReceived: 11/2/2018 1:15:00 PM
FieldSampler:
Matrix: Water

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Radionuclides - Total							
Radium 226	0.4	pCi/L		0.2	SM 7500 Ra-B	11/27/2018 1359	AA
Radium 226 Precision (±)	0.1	pCi/L			SM 7500 Ra-B	11/27/2018 1359	AA
Radium 228	-0.3	pCi/L		1	Ga-Tech	11/26/2018 1642	AA
Radium 228 Precision (±)	1.4	pCi/L			Ga-Tech	11/26/2018 1642	AA

These results apply only to the samples tested.

RL - Reporting Limit

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
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: _____
Wade Nieuwsma, Assistant Laboratory Manager

Sample Analysis Report

Company: MVTL Laboratories, Inc.
2616 E Broadway Ave.
Bismarck, ND 58501

Date Reported 11/28/2018
Report ID S1811037001

ProjectName: 201882-2900
Lab ID: S1811037-003
ClientSample ID: 18-W3935 Dup-1
COC: 201882-2900
PWS ID:
Comments

WorkOrder: S1811037
CollectionDate: 10/30/2018
DateReceived: 11/2/2018 1:15:00 PM
FieldSampler:
Matrix: Water

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Radionuclides - Total							
Radium 226	0.16	pCi/L		0.2	SM 7500 Ra-B	11/27/2018 1359	AA
Radium 226 Precision (±)	0.1	pCi/L			SM 7500 Ra-B	11/27/2018 1359	AA
Radium 228	0.8	pCi/L		1	Ga-Tech	11/26/2018 1946	AA
Radium 228 Precision (±)	1.5	pCi/L			Ga-Tech	11/26/2018 1946	AA

These results apply only to the samples tested.

RL - Reporting Limit

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
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: _____
Wade Nieuwsma, Assistant Laboratory Manager

Inter-Mountain Labs
1673 Terra Avenue, Sheridan, Wyoming 82801 ph: (307) 672-8945

Your Environmental Monitoring Partner

ANALYTICAL QC SUMMARY REPORT

CLIENT: MVTL Laboratories, Inc.
Work Order: S1811037
Project: 201882-2900

Date: 11/28/2018
Report ID: S1811037001

Radium 228 by Ga/Tech Sample Type **MBLK** Units: pCi/L

MB-536 (11/23/18 17:19)	RunNo: 163499	PrepDate: 11/07/18 0:00			BatchID 15218		
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Total Radium 228	ND	1					

Radium 228 by Ga/Tech Sample Type **LCS** Units: pCi/L

LCS-536 (11/23/18 20:23)	RunNo: 163499	PrepDate: 11/07/18 0:00			BatchID 15218		
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Total Radium 228	33	1	39		85.2	65.9 - 132	

Radium 228 by Ga/Tech Sample Type **MS** Units: pCi/L

MS-536 (11/24/18 02:29)	RunNo: 163499	PrepDate: 11/07/18 0:00			BatchID 15218		
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Radium 228 (Dissolved)	30	1	39	ND	77.9	50 - 139	

MS-536 (11/24/18 02:29)	RunNo: 163499	PrepDate: 11/07/18 0:00			BatchID 15218		
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Total Radium 228	30	1	39	ND	77.9	50 - 139	

Radium 228 by Ga/Tech Sample Type **MSD** Units: pCi/L

MSD-536 (11/24/18 05:32)	RunNo: 163499	PrepDate: 11/07/18 0:00			BatchID 15218		
Analyte	Result	RL	Conc	%RPD	%REC	% RPD Limits	Qual
Radium 228 (Dissolved)	35	1	30	13.3	88.9	20	

MSD-536 (11/24/18 05:32)	RunNo: 163499	PrepDate: 11/07/18 0:00			BatchID 15218		
Analyte	Result	RL	Conc	%RPD	%REC	% RPD Limits	Qual
Total Radium 228	35	1	30	13.3	88.9	20	

Radium 226 in Water - Sample Type **MBLK** Units: pCi/L

MB-1930 (11/27/18 11:46)	RunNo: 163517	PrepDate: 11/19/18 0:00			BatchID 15292		
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Radium 226	ND	0.2					

Radium 226 in Water - Sample Type **LCS** Units: pCi/L

LCS1930 (11/27/18 11:46)	RunNo: 163517						
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Radium 226	4.8	0.2	5.98		80.7	67.1 - 122	

Radium 226 in Water - Sample Type **LCSD** Units: pCi/L

LCSD-1930 (11/27/18 11:46)	RunNo: 163517	PrepDate: 11/19/18 0:00			BatchID 15292		
Analyte	Result	RL	Conc	%RPD	%REC	% RPD Limits	Qual
Radium 226	5.2	0.2	5.2	0	86.9	20	

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		

MVTL

LABORATORIES, Inc.
2616 E Broadway Ave
Bismarck, ND 58501
Phone: (701) 258-9720
Toll Free: (800) 279-6885 Fax: (701) 258-9724

Chain of Custody Record

201882-2900

Company Name and Address:	Account #:	Phone #: 701-258-9720
MVTL 2616 E Broadway Bismarck, ND 58501	Contact: Claudette	Fax #:
	Name of Sampler:	For faxed report check
Billing Address (indicate if different from above):		E-mail: ccarroll@mvtl.com
	Quote Number:	For e-mail report check box
PO Box 249 New Ulm, MN 56073		Date Submitted: 31-Oct-18
	Project Name/Number:	Purchase Order #: BL6110

S1811037

Sample Information

IML Lab Number	MVTL Lab Number	Client Sample ID	Sample Type	Date Sampled	Time Sampled	Bottle Type: Untreated	1000 ml HNO3	VOC Vials Unpreserved	Glass Jar	Other		Analysis: Analysis Required
001	18-W3933	MW120	GW	30-Oct-18	1017		4					Ra226 & Ra228
002	18-W3934	MW117	GW	30-Oct-18	0904		4					Ra226 & Ra228
003	18-W3935	Dup-1	GW	30-Oct-18								Ra226 & Ra228

Comments: All results must be reported as a numerical value.

Transferred by:	Date:	Time:	Sample Condition:	Received by:	Date:		Temp:
T. Olson	31-Oct-18	1700	Intact	Kathy Bro	11.2.18	13:15	11.3°C
2.							

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

Field Datasheet

Groundwater Assessment

Company: MDU Lewis and Clark
Event: October 2018
Sample ID: MW120
Sampling Personal: Darren Nieswaag

Weather Conditions: Temp: 35 °F Wind: South @ 10 Precip: **Sunny / Partly Cloudy / Cloudy**

Well Information

Well Locked?	Yes	(No)	
Well Labeled?	(Yes)	No	
Casing Straight?	(Yes)	No	
Grout Seal Intact?	Yes	No	(Not Visible)
Repairs Necessary:			

Casing Diameter:	2"
Water Level Before Purge:	15.36 ft
Depth to Top of Pump:	16.92 ft
Water Level After Sample:	15.97 ft
Measurement Method:	Electric Water Level Indicator

Sampling Information

Purging Method:	Bladder		
Sampling Method:	Bladder		
Dedicated Equip?:	Yes	(No)	
Duplicate Sample?:	(Yes)	No	
Duplicate Sample ID:	Dup-1		

Control Settings		
Purge:	6	sec.
Recover:	54	sec.
PSI:	08	

Purge Date:	30Oct18	Time Purging Began:	0952 (am)/pm
Well Purged Dry?	Yes (No)	Time Purged Dry:	~~am/pm~~
Sample Date:	30Oct18	Time of Sampling:	1017 (am)/pm

Bottle List: X2	1L Raw	500mL Nitric	500mL Nitric (filtered)	250 Sulfuric
	4 - 1L Nitric			

Field Measurements

Stabilization (3 consecutive) SEQ #	Time	Temp (°C)	Spec. Cond. ±5%	pH ±0.1	DO (mg/L) ±10%	ORP (mV) ±20 mV	Turbidity (NTU) ±10%	Water Level (ft) 0.25 ft	Pumping Rate ml/min	mL Removed	Description: Clarity, Color, Odor, Ect. Clear, Slightly Turbid, Turbid
1	0957	10.15	4821	6.65	4.02	-0.3	2.76	15.58	100	500	clear
2	1002	10.19	4785	6.64	3.82	-6.9	2.06	15.58	100	500	cl
3	1007	10.17	4772	6.63	0.66	-11.6	1.92	15.58	100	500	cl
4	1012	10.22	4794	6.63	0.64	-16.4	2.04	15.58	100	500	cl
5	1017	10.29	4833	6.63	0.68	-18.1	1.93	15.58	100	500	cl
6											
7											
8											
9											
10											

Stabilized: (Yes) No

Total Volume Removed: 2500 mL

Comments:

MVTL

2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

Field Datasheet

Groundwater Assessment

Company: MDU Lewis and Clark

Event: October 2018

Sample ID: 117

Sampling Personal: Darren Wiesnarg

Weather Conditions: Temp: 32 °F Wind: S 7 @ Precip: ~~Sunny~~ / Partly Cloudy / Cloudy

Well Information

Well Locked?	Yes	~~No~~	
Well Labeled?	~~Yes~~	No	
Casing Straight?	~~Yes~~	No	
Grout Seal Intact?	Yes	No	Not Visible
Repairs Necessary:			

Casing Diameter:	2"
Water Level Before Purge:	5.94 ft
Depth to Top of Pump:	9.84 ft
Water Level After Sample:	9.44 ft
Measurement Method:	Electric Water Level Indicator

Sampling Information

Purging Method:	Bladder
Sampling Method:	Bladder
Dedicated Equip?:	Yes ~~No~~
Duplicate Sample?:	Yes ~~No~~
Duplicate Sample ID:	—

Control Settings		
Purge:	6	sec.
Recover:	54	sec.
PSI:	08	

Purge Date:	29OCT18	Time Purging Began:	1915 am/pm
Well Purged Dry?	~~Yes~~ No	Time Purged Dry:	am/pm
Sample Date:	30Oct18	Time of Sampling:	0904 am/pm

Bottle List:	500mL Nitric	4 L Raw Water Nitric

Field Measurements

Stabilization (3 consecutive) SEQ #	Time	Temp (°C)	Spec. Cond. ±5%	pH ±0.1	DO (mg/L) ±10%	ORP (mV) ±20 mV	Turbidity (NTU) ±10%	Water Level (ft) 0.25 ft	Pumping Rate ml/min	mL Removed	Description: Clarity, Color, Odor, Ect. Clear, Slightly Turbid, Turbid
1	1920	11.16	8301	6.99	5.70	-30.2	22.4	6.68	100	500	clear
2	1930	11.20	8305	7.00	5.95	-31.2	43.1	7.01	100	1000	clear
3	1945	11.13	8311	7.00	6.03	-29.5	41.4	8.08	100	1500	clear
4	2000	11.32	8161	7.00	5.75	-26.9	41.1	Top of Pump	100	1500	clear
5											
6	0859	Purged	line for 5 min.	before	Sampling			6.68		recharge	
7	0904	10.12	8424	7.10	7.28	17.0	8.50	7.08	100	500	clear
8											
9										0	
10											

Stabilized: ~~Yes~~ No

Total Volume Removed: 5000 mL

Comments:

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

Chain of Custody Record

Project Name:	Event:	Work Order Number:
MDU Lewis and Clark	October 2018	82-2900

Report To:	MDU	Carbon Copy:	Name of Sampler(s):
Attn:	Samantha Marshall	Attn:	Darren Nieswaag
Address:	5181 Southgate Dr. Billings, MT 59102	Address:	
phone:	406-896-4227		
email:			

Sample Information					Bottle Type								Field Parameters			Analysis
Lab Number	Sample ID	Date	Time	Sample Type		1 liter Nitric							Temp (°C)	Spec. Cond.	pH	Analysis Required
W3933	MW120	30Oct18	10:17	GW		4							10.29	4833	6.63	Rad 226 and 228
W3934	MW 117	30Oct18	0904	GW		4							10.12	8424	7.10	
W3935	Dup-1	30Oct18	1017	GW		4							—	—	—	

Comments:

Relinquished By:		Sample Condition:	
Name:	Date/Time	Location:	Temp (°C)
1 Dan Nie	30Oct18 1905	Log In ~~Walk In #2~~	ROI 1.8 TM562 / ~~TM805~~
2			

Received by:	
Name:	Date/Time
	31 Oct 2018 0800