

2023 Annual Groundwater Monitoring and Corrective Action Report

CCR Landfill

R.M. Heskett Station Mandan, North Dakota

Prepared for Montana-Dakota Utilities Co.

January 2024

2023 Annual Groundwater Monitoring and Corrective Action Report

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Acronyms

Acronym	Description
ASD	Alternative Source Demonstration
CCR	Coal Combustion Residuals
CFR	Code of Federal Regulations
EPA	Environmental Protection Agency
MDU	Montana Dakota Utilities Co.
NDAC	North Dakota Administrative Code
NDDEQ	North Dakota Department of Environmental Quality
SSI	Statistically Significant Increase
TDF	Tire-Derived Fuel
TDS	Total Dissolved Solids

Executive Summary

This 2023 Annual Groundwater Monitoring and Corrective Action Report (Annual Report) describes the monitoring program and results for the CCR landfill at MDU's R.M. Heskett Station (Site). The permitted landfill is the only CCR Unit at this Site. Content of this report is to satisfy requirements of the federal CCR rule and the State of North Dakota Permit Number 0087.

At the beginning, end, and throughout 2023, the CCR Unit was operating under a detection monitoring program as described in 40 CFR 257.94 and NDAC 33.1-20-08-06-04. Pursuant to § 257.94 and NDAC 33.1-20-08-06-04, statistically significant increases (SSIs) were determined for:

- October 2022: chloride at MW80R
- May 2023: calcium at MW80R, chloride at MW80R, and fluoride at MW1-90

Evaluation of the fall 2023 data is ongoing as required by the CCR Rules. Subsequent determinations and actions (if any) will be addressed in the 2024 Annual Report. Successful alternative source demonstrations (ASDs) were completed for the October 2022 and May 2023 SSIs. The ASD documentation is included in this report under Appendix B. Statistical evaluation of the August 2023 detection monitoring data is in progress, and results are anticipated in 2024. Therefore, no assessment monitoring program (§ 257.95 and NDAC 33.1-20-08-06-04) or related corrective or remedial measures (§§ 257.96, 257.97, and 257.98; NDAC 33.1-20-08-06-06, -07, and -08) were necessary.

1.0 Introduction

Montana-Dakota Utilities Co. (MDU) owns and operates R.M. Heskett Station (Site), comprised of a substantially decommissioned coal-fired generating station and a gas-fired turbine located in Mandan, Morton County, North Dakota (Figure 1). Coal unit operations at the Site ended in March 2022, and decommissioning tasks have been ongoing through 2023. One coal combustion residual (CCR) unit, as defined by 40 CFR 257.53 and North Dakota Administrative Code (NDAC) 33.1-20-08-01, is located on the property. The CCR unit is a landfill containing coal combustion by-products, asbestos wastes generated from construction activity associated with MDU-owned facilities, decommissioning wastes, and ash derived from burning tire-derived fuel (TDF) at the facility. The CCR unit is required to comply with the provisions of the US Environmental Protection Agency (EPA) CCR Rule (40 CFR Parts 257 and 261, Disposal of Coal Combustion Residuals from Electric Utilities) and the North Dakota Department of Environmental Quality (NDDEQ) CCR Rule (NDAC Title 33.1, Article 20, Chapter 8).

This 2023 Annual Groundwater Monitoring and Corrective Action Report (Annual Report) describes the monitoring program and results for the CCR landfill at the Site.

1.1 Purpose

As stated in § 257.90(e) and NDAC 33.1-20-08-06-01(e), the Annual Report must:

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

1.2 CCR Rule Requirements

Additional requirements for the Annual Report, as outlined in § 257.90(e) and NDAC 33.1-20-08-06-01(e), and this Site's compliance with the CCR Rules, are summarized in Table 1.

Table 1 CCR Rule Requirements and Compliance

EPA CCR Rule Reference (40 CFR)	NDDEQ CCR Rule Reference (NDAC)	Content Required in Report	Location
§ 257.90(e)(1)	§ 33.1-20-08-06- 01(e)(1)	Monitoring System Figure: A map, aerial image, or diagram showing the CCR unit and all background (or upgradient) and downgradient monitoring wells, to include the well identification numbers, that are part of the groundwater monitoring program for the CCR unit.	Section 2.1 Groundwater Monitoring System; see Figure 1
§ 257.90(e)(2)		Monitoring System Adjustments: Identification of any monitoring wells that were installed or decommissioned during the preceding year, along with a narrative description of why those actions were taken.	Section 2.1.1 Changes to Groundwater Monitoring System
§ 257.90(e)(3)	§ 33.1-20-08-06- 01(e)(3)	Data and Collection Summary : In addition to all the monitoring data obtained under §257.90 through §257.98 and §33.1-20-08-06, a summary including the number of groundwater samples that were collected, and whether the sample was required by the detection monitoring or assessment monitoring programs.	Section 2.3 Data and Collection Summary; monitoring data included in Table 2, Table 3, Appendix A, and Appendix C
§ 257.90(e)(4)		Monitoring Program: A narrative discussion of any transition between monitoring programs (e.g., the date and circumstances for transitioning from detection monitoring to assessment monitoring in addition to identifying the constituent(s) detected at a statistically significant increase over background levels).	Not applicable – No transition between monitoring programs was necessary
§ 257.90(e)(5)	§ 33.1-20-08-06- 01(e)(5)	Other Information : Other information required, if applicable, to be included in the annual report as specified in §257.90 through §257.98 and §33.1-20-08-06.	Section 2.2 Actions Completed/Problems Encountered; Appendix B
§ 257.90(e)(6)	<u>n/a</u>	Executive Summary: A section at the beginning of the annual report that provides an overview of the current status of groundwater monitoring and corrective action programs for the CCR unit.	Executive Summary

2.0 Groundwater Monitoring Program

This section documents the status of the groundwater monitoring and corrective action program for the CCR unit in 2023. A description of the groundwater monitoring system is included in Section 2.1, key actions completed and problems encountered are described in Section 2.2, the monitoring and analytical results are described in Section 2.3, and key activities planned for 2024 are described in Section 2.4.

2.1 Groundwater Monitoring System

The certified groundwater monitoring well network around the CCR unit consists of one upgradient well (MW-13) and four downgradient wells (MW-80R, MW1-90, MW2-90, and MW3-90). Well locations are shown on Figure 1.

2.1.1 Changes to Groundwater Monitoring System

In 2021, MDU applied for a modification to Permit 0087 from NDDEQ. The permit application included an updated groundwater monitoring network for the CCR unit. The modified permit was issued on February 14, 2022. The system described in Section 2.1 and shown on Figure 1 supplanted the groundwater monitoring system described in the Groundwater Monitoring System Certification (Barr, 2017a).

2.2 Actions Completed/Problems Encountered

The following actions were completed in 2023:

- **Detection Monitoring Sampling:** Groundwater samples were collected from each well in the groundwater monitoring system on May 17-18, 2023 and August 28-29, 2023. Groundwater samples were analyzed for Appendix III constituents, per the detection monitoring program of the CCR Rules (§ 257.94 and NDAC 33.1-20-08-06-04) (Table 3).
- SSI Evaluation: SSI evaluations were conducted in accordance with the Groundwater Statistical Method Selection Certification (Statistical Certification; Barr, 2017b) for the May 2023 detection monitoring event, which resulted in potential SSIs. SSI evaluations for the August 2023 detection monitoring event is ongoing as required by the CCR Rules. Subsequent determinations and actions (if any) will be addressed in the 2024 Annual Report.
- Verification Retesting: Verification resampling was conducted on August 18, 2023, and
 confirmed the potential SSIs for calcium at MW-80R and fluoride at MW1-90 identified in the May
 2023 event SSI evaluation. The potential SSI for calcium at MW2-90 was not verified. The SSI for
 chloride at MW-80R was not resampled since previous ASDs have demonstrated a source other
 than the CCR unit.
- Alternative Source Demonstration (ASD): ASDs were conducted on the verified SSIs for the October 2022 and May 2023 detection monitoring events. Both ASDs demonstrated an alternative

source, as allowed by the CCR Rules (§ 257.94(e)(2) and NDAC 33.1-20-08-06-04(e)(2)). More details are provided in Section 2.3.

2.3 Data and Collection Summary

2.3.1 October 2022 Detection Monitoring Event

As mentioned in the 2022 Annual Report (Barr, 2023), an SSI evaluation was conducted on the results of the October 2022 detection monitoring event. One SSI (chloride at MW80R) was confirmed. Groundwater samples were collected from two groundwater monitoring network wells at the Site on October 17, 2022. Downgradient monitoring wells MW1-90, MW2-90, and MW3-90 could not be sampled due to insufficient volume.

An Appendix III ASD was conducted on the verified SSIs and was able to successfully demonstrate that a natural variation in groundwater quality and/or "a source other than the CCR unit" resulted in the SSIs, as allowed by § 257.94(e)(2) and NDAC 33.1-20-08-06-04(e)(2). The Alternative Source Demonstration: October 2022 Event is included in Appendix B.

2.3.2 May 2023 Detection Monitoring Event

Groundwater samples were collected from the five groundwater monitoring network wells at the Site on May 17-18, 2023. Four potential SSIs (calcium at MW2-90 and MW-80R, chloride at MW-80R, and fluoride at MW1-90) were identified. Verification resampling was conducted on August 18, 2023, and confirmed three potential SSIs (calcium at MW-80R, chloride at MW-80R, and fluoride at MW1-90). A summary of results is included in Table 2. Field data sheets and analytical laboratory reports for detection monitoring sampling are included in Appendix A. Water level contours are shown on Figure 2, and flow calculations are included in Appendix C.

An Appendix III ASD was conducted on the verified SSIs and was able to successfully demonstrate that a natural variation in groundwater quality resulted in the SSIs, as allowed by § 257.94(e)(2) and NDAC 33.1-20-08-06-04(e)(2). The Alternative Source Demonstration: May 2023 Event Report is included in Appendix B.

2.3.3 August 2023 Detection Monitoring Event

Groundwater samples were collected from the five groundwater monitoring network wells at the Site on August 28-29, 2023. A summary of results is included in Table 2. Field data sheets and analytical laboratory reports for detection monitoring sampling are included in Appendix A. Water level contours are shown on Figure 3, and flow calculations are included in Appendix C.

Statistical analysis of the results was ongoing at the end of 2023. If the analysis identifies any SSIs, appropriate actions will be initiated per the CCR Rules as applicable.

2.4 Activities for Upcoming Year

The following key activities for analytical results and statistical evaluations are planned for 2024:

- Complete SSI evaluation and, if necessary, ASD or assessment monitoring determination for the August 2023 detection monitoring event in accordance with the Statistical Certification (Barr, 2017b).
- Evaluate analytical results from 2024 semi-annual detection monitoring events for SSIs according to the Statistical Certification (Barr, 2017b).
- Evaluate water levels to determine a location for one or more wells to be constructed or reconstructed in the area where monitoring wells were dry in October 2022. Water levels were sufficient in 2023 to allow for representative samples to be collected. Additional wells may be installed by the end of 2024 and described in the 2024 annual report.

3.0 Operational Activity

As mentioned previously, coal-fired unit operation at Heskett Station ceased in March 2022. Remaining landfill capacity was consumed in 2023 by waste generated during decommissioning activities. Final closure of the remaining open area of the landfill began in October 2023 with the geomembrane cover and sand drainage layer installed; final closure is expected to be complete in 2024. During 2023, approximately 855 cubic yards of ash-impacted decommissioning debris were hauled to the landfill. Based on an estimated one ton per cubic yard bulk density, approximately 855 tons of solid waste were hauled to landfill Slot 10 during 2023.

3.1 Asbestos Disposal and Other Materials

No asbestos was disposed of in the Landfill in 2023.

3.2 Inspections and Maintenance

In accordance with the CCR Rule, MDU staff conducted weekly inspections of the CCR landfill, and a qualified professional engineer prepared the required annual report. The inspections found the site to be in good order, with no appearances of an actual or potential structural weakness of the landfill. The annual report for 2023 is posted to MDU's CCR Rule compliance data website. MDU also implemented its fugitive dust control plan during 2023; the annual dust CCR fugitive dust report is also posted to MDU's CCR Rule compliance data website.

Phase I and II leachate systems were each flushed with approximately 2,000 gallons of water in October 2023. The system was flushed from the standpipes to the Evaporation Pond. There were no obstructions of flow.

The Ash Landfill cover was inspected for erosion during 2023. No erosion was observed on the seeded areas, and vegetation is well established around Phases I and II. The covers of the ash disposal site are in good condition on all closed slots. The ash slot expansion area has good coverage. Hay was farmed on the final cover area in 2023.

The banks of the Evaporation Pond were observed on each inspection and found to be in good condition with no significant erosion.

3.3 Leachate Sampling

A leachate sample was collected from the Evaporation Pond on June 30, 2023. The leachate laboratory results are included in Appendix A.

4.0 References

- Barr Engineering Co. (Barr), 2017a. Groundwater Monitoring System Certification, R.M. Heskett Station. Prepared for Montana-Dakota Utilities Co. October 2017.
- Barr, 2017b. Statistical Method Selection Certification, R.M. Heskett Station. Prepared for Montana-Dakota Utilities Co. October 2017.
- Barr, 2022. 2022 Annual Groundwater Monitoring and Corrective Action Report: CCR Landfill, R.M. Heskett Station. Prepared for Montana-Dakota Utilities Co. January 2023.

Tables

Table 2 Water Quality Analytica Data Summary

Table 2 Water Quality Analytical Data Summary 2023 Annual Monitoring Report Heskett CCR Groundwater Compliance

		Location	MW1-90	MW1-90	MW1-90	MW2-90	MW2-90	MW2-90	MW3-90	MW3-90	MV	V13	MW	/13	MW80R	MW80R	MW80R	QC	QC
		Date	5/17/23	8/18/23	8/29/23	5/18/23	8/18/23	8/29/23	5/18/23	8/29/23	5/17	7/23	8/28	3/23	5/18/23	8/18/23	8/28/23	5/17/23	8/29/23
	Sa	mple Type	N	R	N	N	R	N	N	N	N	FD	N	FD	N	R	N	FB	FB
Parameter	Analysis Location	Units																	
Appendix III																			
Boron, total	Lab	mg/l	< 0.5 U		< 0.5 U	< 0.5 U		< 0.5 U	0.14	< 0.1 U	0.70	0.69	< 0.5 U	< 0.5 U	< 0.5 U		< 0.5 U	< 0.1 U	< 0.1 U
Calcium, total	Lab	mg/l	403		406	469	432	477	428	470	408	402	398	385	479	458	528	< 1 U	< 1 U
Chloride	Lab	mg/l	62.7		90.7	85.6		80.5	35.9	39.5	75.8	76.0	117	117	182		193	< 2.0 U	< 2.0 U
Fluoride	Lab	mg/l	1.21	1.13	1.14	1.00		1.03	0.12	0.13	0.90	0.92	0.74	0.74	0.22		0.23	< 0.1 U	< 0.1 U
рН	Field	pH units	6.93	6.84	6.86	6.86	7.01	7.04	6.81	6.98	6.86		7.03		6.99	7.00	7.01		
Solids, total dissolved	Lab	mg/l	10700		13100	8410		8600	4430	4670	10800	10800	12700	12500	6990		7240	< 10 U	< 10 U
Sulfate, as SO4	Lab	mg/l	6540		7710	5010		4940	2510	2660	6490	6910	7490	7840	4150		4130	< 5 U	< 5 U

-- Not analyzed/Not available.
N Sample Type: Normal
R Sample Type: Resample
FB Sample Type: Field Blank
FD: Sample Type: Field Duplicate
U: The analyte was analyzed for, but

Table 3 Sampling Event Summary

Table 3 Sampling Event Summary 2023 Annual Monitoring Report Heskett CCR Groundwater Compliance

Event Classification and Number	Monitoring Well	Up or Down Gradient	Event date	No. Samples
Detection Monitoring Event #1	MW1-90	Down	5/17/2023	1
Detection Monitoring Event #1	MW2-90	Down	5/17/2023	1
Detection Monitoring Event #1	MW3-90	Down	5/17/2023	1
Detection Monitoring Event #1	MW-13	Up	5/17/2023	2
Detection Monitoring Event #1	MW-80R	Down	5/17/2023	1
Detection Monitoring Event #1, Resample	MW1-90	Down	8/18/2023	1
Detection Monitoring Event #1, Resample	MW-80R	Down	8/18/2023	1
Detection Monitoring Event #2	MW1-90	Down	8/29/2023	1
Detection Monitoring Event #2	MW2-90	Down	8/29/2023	1
Detection Monitoring Event #2	MW3-90	Down	8/29/2023	1
Detection Monitoring Event #2	MW-13	Up	8/28/2023	2
Detection Monitoring Event #2	MW-80R	Down	8/28/2023	1

Figures

Figure 1 Site Layout and CCR Monitoring Network



Figure 2 May 2023 Groundwater Elevations

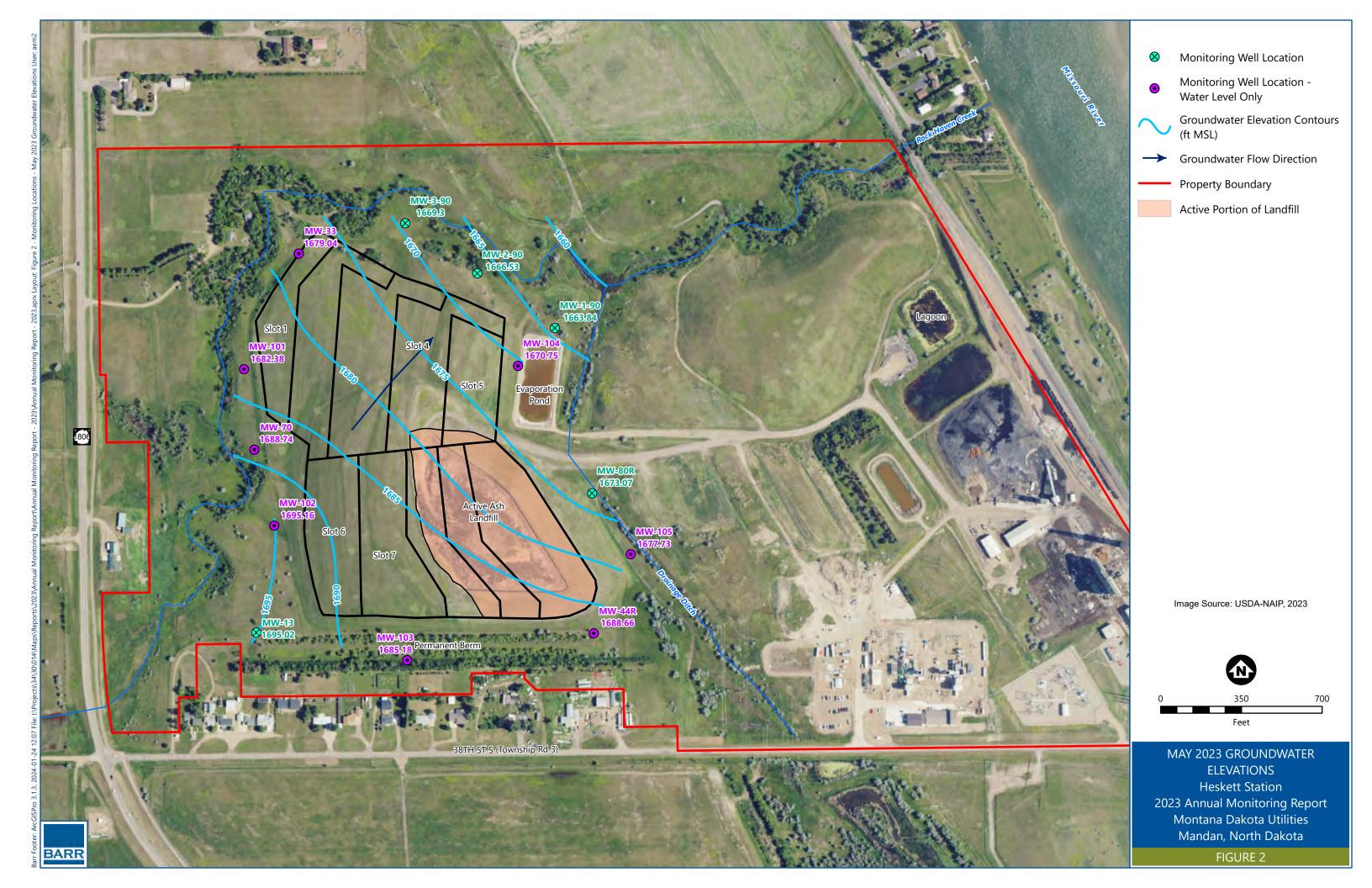
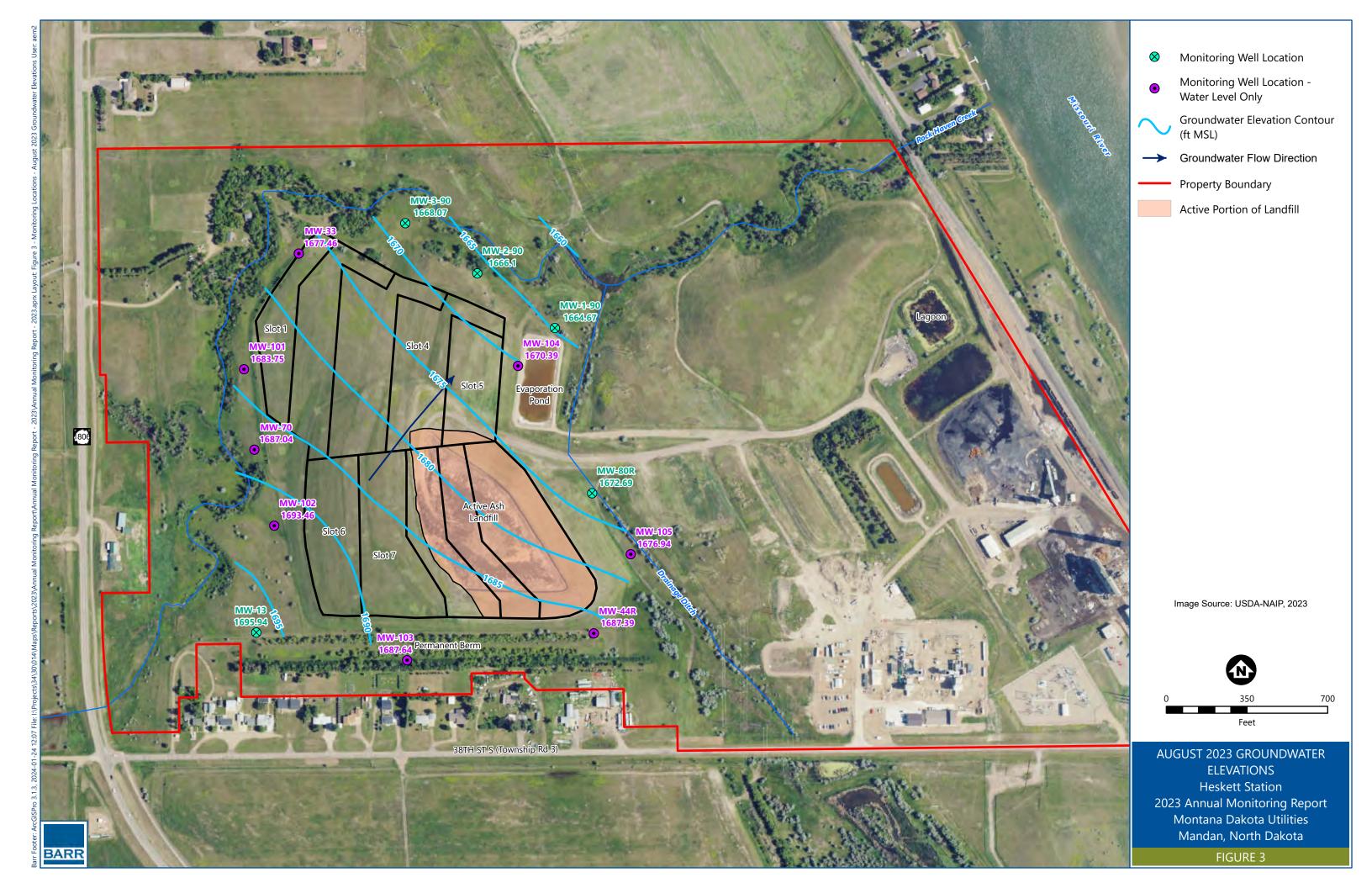


Figure 3 August 2023 Groundwater Elevations



Appendices

Appendix A

Laboratory Reports and Field Sheets

Laboratory Reports and Field Sheets: 2023

Appendix A Laboratory Reports and Field Sheets



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

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Workorder: MDU Heskett (16035) PO: 196081 OP

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

CCR_APPENDIX III

Certificate of Analysis

Approval

All data reported has been reviewed and approved by:



Claudette Carroll, Lab Manager Bismarck, ND

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

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

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

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Workorder Summary

Workorder Comments

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

Sample Comments

16035001 (MW13) - Sample

Total and dissolved selenium results have been rechecked. CC 8Jun23

16035006 (Dup 1) - Sample

Time sampled was not supplied by the client.

Total and dissolved selenium results have been rechecked. CC 8Jun23

16035007 (Field Blank (FB)) - Sample

Time sampled was not supplied by the client.

Analysis Results Comments

16035001 (MW13)

Sample analyzed beyond holding time.(pH)

16035002 (MW1-90)

Matrix spike and/or matrix spike duplicate recovery was low; the associated laboratory control sample recovery was acceptable.(Fluoride)

16035002 (MW1-90)

Sample analyzed beyond holding time.(pH)

16035003 (MW2-90)

Sample analyzed beyond holding time.(pH)

16035004 (MW3-90)

Sample analyzed beyond holding time.(pH)

16035005 (MW80R)

Sample analyzed beyond holding time.(pH)

16035006 (Dup 1)

Matrix spike and/or matrix spike duplicate recovery was high; the associated laboratory fortified blank recovery was acceptable.(Chloride)

16035006 (Dup 1)

Sample analyzed beyond holding time (pH)

16035007 (Field Blank (FB))

Sample analyzed beyond holding time.(pH)

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

 Lab ID:
 16035001
 Date Collected:
 05/17/2023 11:05
 Matrix:
 Groundwater

 Sample ID:
 MW13
 Date Received:
 05/18/2023 14:00
 Collector:
 MVTL Field Service

Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
10106	umhos/cm	1	1	05/17/2023 11:05	05/17/2023 11:05	JSM	
Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
6.86	units	0.01	1	05/17/2023 11:05	05/17/2023 11:05	JSM	
Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
11.63	degrees C		1	05/17/2023 11:05	05/17/2023 11:05	JSM	
Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
6490	mg/L	500	100	05/24/2023 15:12	05/24/2023 15:12	AMC	
Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
0.70	mg/L	0.5	5	05/19/2023 06:51	05/31/2023 10:50	SLZ	
408	mg/L	5	5	06:51	14:26	SLZ	
Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
7.8	units	0.1	1	05/19/2023 02:56	05/19/2023 02:56	RAA	*
				Dranarad			
Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Results 75.8	Units mg/L	RDL 2.0	DF 1	05/23/2023 11:38	05/23/2023 11:38	AMC	Qual
				05/23/2023	05/23/2023		Qual
				05/23/2023	05/23/2023		Qual
	Results 6.86 Results 11.63 Results 6490 Results 0.70 408 Results	Results Units 6.86 units Results Units 11.63 degrees C Results Units 6490 mg/L Results Units 0.70 mg/L 408 mg/L Results Units	Results Units RDL 6.86 units 0.01 Results Units RDL 11.63 degrees C Results Units RDL 6490 mg/L 500 Results Units RDL 0.70 mg/L 5 408 mg/L 5 Results Units RDL	Results Units RDL DF 6.86 units 0.01 1 Results Units RDL DF 11.63 degrees C 1 Results Units RDL DF 6490 mg/L 500 100 Results Units RDL DF 0.70 mg/L 0.5 5 408 mg/L 5 5 Results Units RDL DF	10106 umhos/cm 1 1 05/17/2023 11:05 Results Units RDL DF Prepared 6.86 units 0.01 1 05/17/2023 11:05 Results Units RDL DF Prepared 11.63 degrees C 1 05/17/2023 11:05 Results Units RDL DF Prepared 6490 mg/L 500 100 05/24/2023 15:12 Results Units RDL DF Prepared 0.70 mg/L 0.5 5 05/19/2023 06:51 408 mg/L 5 5 05/19/2023 06:51 Results Units RDL DF Prepared 7.8 units 0.1 1 05/19/2023	10106 umhos/cm 1 1 05/17/2023 11:05 05/17/2023 11:05 Results Units RDL DF Prepared Analyzed 6.86 units 0.01 1 05/17/2023 05/17/2023 11:05 05/17/2023 11:05 Results Units RDL DF Prepared Analyzed 11.63 degrees C 1 05/17/2023 05/17/2023 11:05 05/17/2023 11:05 Results Units RDL DF Prepared Analyzed 6490 mg/L 500 100 05/24/2023 05/24/2023 15:12 05/24/2023 15:12 Results Units RDL DF Prepared Analyzed 0.70 mg/L 0.5 5 05/19/2023 05/31/2023 05/22/2023 10:50 408 mg/L 5 5 05/19/2023 06:51 14:26 Results Units RDL DF Prepared Analyzed Results Units RDL DF Prepared Analyzed	Results

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

 Lab ID:
 16035001
 Date Collected:
 05/17/2023 11:05
 Matrix:
 Groundwater

 Sample ID:
 MW13
 Date Received:
 05/18/2023 14:00
 Collector:
 MVTL Field Service

Temp @ Receipt (C): 4.8

Method: USGS I-1750-85

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Total Dissolved Solids	10800	mg/L	10	1	05/19/2023 10:38	05/19/2023 10:38	RAA	



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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

 Lab ID:
 16035002
 Date Collected:
 05/17/2023 14:35
 Matrix:
 Groundwater

 Sample ID:
 MW1-90
 Date Received:
 05/18/2023 14:00
 Collector:
 MVTL Field Service

Temp @ Receipt (C): 4.8 Received on Ice: Yes

Method: 120.1

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Specific Conductance - Field	8999	umhos/cm	1	1	05/17/2023 14·35	05/17/2023 14:35	JSM	

Method: 150.2

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
pH - Field	6.93	units	0.01	1	05/17/2023 14:35	05/17/2023 14:35	JSM	

Method: 170.1

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Temperature - Field C	8.84	degrees	С	1	05/17/2023 14:35	05/17/2023 14:35	JSM	

Method: ASTM D516-16

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Sulfate	6540	mg/L	500	100	05/24/2023 15:14	05/24/2023 15:14	AMC	

Method: EPA 6010D

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Boron	<0.5	mg/L	0.5	5	05/19/2023 06:51	05/31/2023 10:52	SLZ	
Calcium	403	mg/L	5	5	05/19/2023 06:51	05/22/2023 14:27	SLZ	

Method: SM4500 H+ B-2011

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
рН	7.6	units	0.1	1	05/19/2023	05/19/2023	RAA	*

Method: SM4500-CI-E 2011

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Chloride	62.7	mg/L	2.0	1	05/23/2023 11:39	05/23/2023 11:39	AMC	

Method: SM4500-F-C-2011

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Fluoride	1.21	mg/L	0.1	1	05/19/2023 03·33	05/19/2023 03:33	RAA	*

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Report Date: Friday, June 9, 2023 8:39:47 AM



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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

 Lab ID:
 16035002
 Date Collected:
 05/17/2023 14:35
 Matrix:
 Groundwater

 Sample ID:
 MW1-90
 Date Received:
 05/18/2023 14:00
 Collector:
 MVTL Field Service

Temp @ Receipt (C): 4.8 Received on Ice: Yes

Method: USGS I-1750-85

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Total Dissolved Solids	10700	mg/L	10	1	05/19/2023 10:38	05/19/2023 10:38	RAA	



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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

 Lab ID:
 16035003
 Date Collected:
 05/18/2023 11:15
 Matrix:
 Groundwater

 Sample ID:
 MW2-90
 Date Received:
 05/18/2023 14:00
 Collector:
 MVTL Field Service

Temp @ Receipt (C): 4.8 Received on Ice: Yes

Method: 120.1

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Specific Conductance - Field	7541	umhos/cm	1	1	05/18/2023 11:15	05/18/2023 11:15	JSM	

Method: 150.2

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
pH - Field	6.86	units	0.01	1	05/18/2023 11:15	05/18/2023 11:15	JSM	

Method: 170.1

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Temperature - Field C	8.67	degrees	С	1	05/18/2023	05/18/2023	JSM	

Method: ASTM D516-16

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Sulfate	5010	mg/L	250	50	05/24/2023 15:15	05/24/2023 15:15	AMC	

Method: EPA 6010D

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Boron	<0.5	mg/L	0.5	5	05/19/2023 06:51	05/31/2023 10:52	SLZ	
Calcium	469	mg/L	5	5	05/19/2023 06:51	05/22/2023 14:28	SLZ	

Method: SM4500 H+ B-2011

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
pH	7.3	units	0.1	1	05/19/2023 04:01	05/19/2023	RAA	*

Method: SM4500-CI-E 2011

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Chloride	85.6	mg/L	2.0	1	05/23/2023 11:40	05/23/2023 11:40	AMC	

Method: SM4500-F-C-2011

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Fluoride	1.00	mg/L	0.1	1	05/19/2023 04:01	05/19/2023 04:01	RAA	

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Report Date: Friday, June 9, 2023 8:39:47 AM



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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

 Lab ID:
 16035003
 Date Collected:
 05/18/2023 11:15
 Matrix:
 Groundwater

 Sample ID:
 MW2-90
 Date Received:
 05/18/2023 14:00
 Collector:
 MVTL Field Service

Temp @ Receipt (C): 4.8 Received on Ice: Yes

Method: USGS I-1750-85

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Total Dissolved Solids	8410	mg/L	10	1	05/19/2023 10:38	05/19/2023 10:38	RAA	



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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

 Lab ID:
 16035004
 Date Collected:
 05/18/2023 10:00
 Matrix:
 Groundwater

 Sample ID:
 MW3-90
 Date Received:
 05/18/2023 14:00
 Collector:
 MVTL Field Service

Temp @ Receipt (C): 4.8 Received on Ice: Yes

Method: 120.1

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Specific Conductance - Field	4657	umhos/cm	1	1	05/18/2023 10:00	05/18/2023 10:00	JSM	

Method: 150.2

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
pH - Field	6.81	units	0.01	1	05/18/2023 10:00	05/18/2023 10:00	JSM	

Method: 170.1

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Temperature - Field C	8.11	degrees	С	1	05/18/2023 10:00	05/18/2023 10:00	JSM	

Method: ASTM D516-16

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Sulfate	2510	mg/L	100	20	05/24/2023 15:16	05/24/2023 15:16	AMC	

Method: EPA 6010D

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Boron	0.14	mg/L	0.1	1	05/19/2023 06:51	05/31/2023 10:53	SLZ	
Calcium	428	mg/L	5	5	05/19/2023 06:51	05/22/2023 14:29	SLZ	

Method: SM4500 H+ B-2011

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
pH	7.6	units	0.1	1	05/19/2023	05/19/2023	RAA	*

Method: SM4500-CI-E 2011

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Chloride	35.9	mg/L	2.0	1	05/23/2023 11:41	05/23/2023 11:41	AMC	

Method: SM4500-F-C-2011

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Fluoride	0.12	mg/L	0.1	1	05/19/2023 04:27	05/19/2023 04:27	RAA	

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

 Lab ID:
 16035004
 Date Collected:
 05/18/2023 10:00
 Matrix:
 Groundwater

 Sample ID:
 MW3-90
 Date Received:
 05/18/2023 14:00
 Collector:
 MVTL Field Service

Temp @ Receipt (C): 4.8 Received on Ice: Yes

Method: USGS I-1750-85

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Total Dissolved Solids	4430	mg/L	10	1	05/19/2023 10:38	05/19/2023 10:38	RAA	



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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

 Lab ID:
 16035005
 Date Collected:
 05/18/2023 12:51
 Matrix:
 Groundwater

 Sample ID:
 MW80R
 Date Received:
 05/18/2023 14:00
 Collector:
 MVTL Field Service

Temp @ Receipt (C): 4.8 Received on Ice: Yes

Method: 120.1

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Specific Conductance - Field	6568	umhos/cm	1	1	05/18/2023 12:51	05/18/2023 12:51	JSM	

Method: 150.2

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
pH - Field	6.99	units	0.01	1	05/18/2023 12:51	05/18/2023 12:51	JSM	

Method: 170.1

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Temperature - Field C	7.89	degrees	С	1	05/18/2023 12:51	05/18/2023 12:51	JSM	

Method: ASTM D516-16

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Sulfate	4150	mg/L	200	40	05/24/2023 15:17	05/24/2023 15:17	AMC	

Method: EPA 6010D

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Boron	<0.5	mg/L	0.5	5	05/19/2023 06:51	05/31/2023 10:56	SLZ	
Calcium	479	mg/L	5	5	05/19/2023 06:51	05/22/2023 14:33	SLZ	

Method: SM4500 H+ B-2011

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
pH	7.4	units	0.1	1	05/19/2023	05/19/2023	RAA	*

Method: SM4500-CI-E 2011

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Chloride	182	mg/L	2.0	1	05/23/2023 11:42	05/23/2023 11:42	AMC	

Method: SM4500-F-C-2011

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Fluoride	0.22	mg/L	0.1	1	05/19/2023 04:44	05/19/2023 04:44	RAA	

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

 Lab ID:
 16035005
 Date Collected:
 05/18/2023 12:51
 Matrix:
 Groundwater

 Sample ID:
 MW80R
 Date Received:
 05/18/2023 14:00
 Collector:
 MVTL Field Service

Temp @ Receipt (C): 4.8 Received on Ice: Yes

Method: USGS I-1750-85

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Total Dissolved Solids	6990	mg/L	10	1	05/19/2023 10:38	05/19/2023 10:38	RAA	



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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

 Lab ID:
 16035006
 Date Collected:
 05/17/2023
 Matrix:
 Groundwater

 Sample ID:
 Dup 1
 Date Received:
 05/18/2023 14:00
 Collector:
 MVTL Field Service

Temp @ Receipt (C): 4.8

Method: ASTM D516-16

Wethod: ASTW D516-16								
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Sulfate	6910	mg/L	500	100	05/24/2023 15:18	05/24/2023 15:18	AMC	
Method: EPA 6010D								
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Boron	0.69	mg/L	0.5	5	05/19/2023 06:51	05/31/2023 10:58	SLZ	
Calcium	402	mg/L	5	5	05/19/2023 06:51	05/22/2023 14:33	SLZ	

Method: SM4500 H+ B-2011

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
рН	7.6	units	0.1	1	05/19/2023 15:32	05/19/2023 15:32	RAA	*

Method: SM4500-CI-E 2011

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Chloride	76.0	mg/L	2.0	1	05/23/2023	05/23/2023	AMC	*

Method: SM4500-F-C-2011

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Fluoride	0.92	mg/L	0.1	1	05/19/2023 15:32	05/19/2023 15:32	RAA	_

Method: USGS I-1750-85

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Total Dissolved Solids	10800	mg/L	10	1	05/19/2023 10:38	05/19/2023 10:38	RAA	

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

Lab ID:16035007Date Collected:05/17/2023Matrix:GroundwaterSample ID:Field Blank (FB)Date Received:05/18/2023 14:00Collector:MVTL Field Service

Temp @ Receipt (C): 4.8

Method: ASTM D516-16

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Sulfate	<5	mg/L	5	1	05/24/2023 15:19	05/24/2023 15:19	AMC	

Method: EPA 6010D

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Boron	<0.1	mg/L	0.1	1	05/19/2023 06:51	05/31/2023 10:59	SLZ	
Calcium	<1	mg/L	1	1	05/19/2023 06:51	05/22/2023 14:35	SLZ	

Method: SM4500 H+ B-2011

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
pH	7.5	units	0.1	1	05/19/2023 14:50	05/19/2023 14:50	RAA	*

Method: SM4500-CI-E 2011

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Chloride	<2.0	mg/L	2.0	1	05/23/2023 11:52	05/23/2023 11:52	AMC	

Method: SM4500-F-C-2011

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Fluoride	<0.1	mg/L	0.1	1	05/19/2023 14:50	05/19/2023 14:50	RAA	_

Method: USGS I-1750-85

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Total Dissolved Solids	<10	mg/L	10	1	05/19/2023 10·38	05/19/2023 10·38	RAA	

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

MVTL Field Services

Sampling Report

MDU Heskett

 Sample Event:
 Spring 2023
 Work Order #:
 16035

 Sampling Dates:
 May 17-18, 2023
 16039

Well Condition: All wells were found to be in good condition.

With exception to well 3-90 which has an ant colonie in the outer casing, and

well 1-90 which needs the base repaired.

Samples collected Duplicate Sample Location
MW13 MW13

MW1-90 MW2-90 MW3-90 MW80R

Samples collected were placed on ice and transported back to the MVTL Laboratory in Bismarck, ND for analysis.

Jeremy Meyer MVTL Field Services

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

C Results Summary							WO #:	16035	
Sulfate	75.00	313-1	.7.57	Units: mg/L	77 27		1. 7	Corre	
дс туре	Original Sample ID	Blank Rissult	Spike Amount	Spike % Recovery	Spike Duplicate N. Recovery	Lower Control Limit (%)	Limit (%)	RPD (%)	RPD Limit (%)
FB			100	101.0		BS	115		
н			100	96.5		85-	115		
rii			100	95.7		85	115		
H			300	94.2		85	115		
Fil			100	92.6		89-	115		
10			100	98.2		85	115		
18			100	95.1		85	115		
+b			100	92,6		85	115		
AG:		(45)							
AG		es.							
AB		is.							
(B)		151							
AS		45							
ia.		45							
AEI.		45							
AB:		15							
AS/MSD	15870009		1000	86.7	88.2	85	115	1.0	-20
AS/MSD	159350UL		500	82.1	80.1	85	115	0,9	-50
AD /A AUTY	15974003		1000	70.4	9276	96	115	10	201
MS/MSDI			100	70.4	87.0	85	115	1.9	30
AS/MSD	16030002		500	77.5	77.5	85	315	0,0	20
NS/MSD	16157001		500	76.6	79.4	85)15	1.9-	30
15/MSD	16380002		1000	95,9	945	85	115	134	20
AT (A AUT)	Magazine		7000	011	16.1		112	10	701
MS/MSD	16387006		2000	93.3	96.1	85	115	1,9	20
Chloride	Talk Solve	23.53		Units: mg/L	2000			value .	175.005
IC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery	Spike Duplicate % Recovery	Lower Control Limit (%)	Limit (%)	RPD (%)	RPD Limit (%)
FB			30	106.0		90	110		
FB			30	94.2		90	(110		
FB			30	106.0		90	110		
							110		





Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Chloride				Units: mg/L					
DC Type	Original Sample (D)	Blank Result	Spike Amount	Spike % Recovery	Spike Duplicate % Resovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
ft)			30	106/0		90	110		
FB			30	106.0		90	110		
fil			10	106.0		90	110		
			N	100.41		and?	-140		
FR			30	92.3		90	THO		
10		-29							
49		12.0							
15		-20							
10		<2.0							
10		<2.0							
16		12.0							
18		12.0							
in		-20							
16		r2.0							
18		12.0							
45/MSD.	15870012		10.	48.3	92.1	80	120	0.6	80
HS/MSDI	15955001		30	130.2	1.80()	80	120	0,0	20
ts/Msix	1603500e		30	123.4	124 4	80	120	0,0	20
45/MSD	16239003		BO	85.7	87-1	80	120	0.6	50
Boron				Units: mg/L					
IC Type	Original Sample ID:	Blank Result	Spike Amount	Spike % Necovery	Spike Duplicate % Recovery	Lower Control	Upper Control Limit (%)	RPD (%)	RPD Limit (10)
B-M5			0,4	103.0	и политу	Link (%)	Limit (24)		
18-M5			0.4	103.0					
10		-0.1							
19		<0.1							
alcium				Units: mg/L					
СТуре	Original Sample ID	Blank Risult	Spike Amount	Spike % Recovery	Spike Duplicine Ni Recovery	Lower Control Limit (%)	Limit (%)	RPD (N)	RPD Limit (%)
EI-MI			100	109.0		85	115		
B-MI			:100	110.0		85	(15		
B-AAI			100	109.0		85	115		
iā.		-il-							
		-(1)							
400									
40:		111							





Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Calcium				Units:	mg/L					
DC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery		Spike Duplicate N. Resovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
WE	15937001								0.9	20
AJP:	19974007								0.9	20
UP .	1603500F								17	20
Soron				Units:	mg/L					
С Туре	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery	ing/ c	Spike Duplicate Si Recovery	Lawer Control Limit (%)	Lipper Control	RPD (%)	RPD Limit (%)
DS/PDSD	16035001		0.5	92.0		96.0	75	125	5.3	20
DS/POSD	16035005		0.5	95,0		96.0	75	125	0.5	20
alcium				Units:	mg/L					
IC Type	Original Sample (D	Blank Result	Spike Amount	Spike % Recovery		Spike Duplicate % Recovery	Lower Control Limit (%)	Upper Control Limit (%)	TOPO (%)	RPD Limit (%)
D5/PDSD	15497002		80	104.0		104,0	75-	125	0.3	20
05/2050	15727003		80	105.0		101.0	75	125	0.9	20
os/Poso	15870012		400	102.0		101.0	75	.175	0.5	20.
05/P050	15907003		10	105.0		109.0	15	125	1.5	20
05/P050	15974001		80	102.0		102.0	75	325	0.1	20.
os/PBSD	15974009		'88	99.3		97.4	75	125	1.1	90
Н				Units:	units					
C Type	Original Sample ID	Blank Result	Spike Amount	Spike %	units	Spike Duplicate	Lower Control	Upper Control	RPD (%)	RPD Limit (%)
UP.	15870003			Recovery		% Recovery	Limit (%)	Limit (%)	£.4.	30
UP	15870017								0.6	20
UF -	15913001								0.1	20.
UP.	15974001								0.6	201
nie.	16035003								1.0	20
UE:	16035006								62	20
Н				Units:	units					
C Type	Original Sample (D	Blank Result	Spike Amount	Spire % Recovery		Spine Duplicate Recovery	Lower Control Limit (%)	Lipper Control Limit (%)	WPD (%)	APD Limit (%)
RM-PH			6	100.5			98.33	101.67		
RM-PH			6	99.0			98,33	101.67		
85a-171)			b	99.0			98.33	101.67		
RM-P/I			0	98.5			9833	101.67		
				99.3			98,33	101.67		
BÁLPII			8 -	99.3						
RM Pri			8	99.2			98.33	101.67		



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Account #: 2800

Client: Montana-Dakota Utilities - Bismarck

рН				Units:	units					
QC Type	Original Sample (D)	Blank Result	Spike Amount	Spike % Recovery		Spike Duplicate % Resovery	Lawer Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
CRM-PH			6	100.7			98 33	101.67		
Fluoride				Units	mg/L					
QC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery		Spile Doplicate Becovery	Lawer Control Limit (%)	Limit (%)	RPD (96)	RPD Limit (%)
ORM-FI			3.59	103.0			83 6	111		
CRAN F			3.19	102.0			83.8	III		
F6.7			65	idad			90	110		
184			9.5	104,0			90	110		
160			0.5	100 ()			90	110		
FBF			0.5	100.0			90	110		
Fire			0.5	108.0			90	110		
48-2		-01								
io-		-0.1								
AB.F		01								
#B.₽		10-1								
46-7		×0.1								
MS/MSD-F	15937000		9.5	98.0		100.0	*	:120	3.1	20
AS/MSD-F	16035007		0.5	78.0		84.0	(80)	120	1.9	20
ns/msb-f	16035006		4.5	94.0		10.0	:801	120	1.9	20
Total Dissolve	ed Solids			Units:	mg/L					
QC Type	Original Sample ID.	Blank Result	Spike Amount	Spike % Recovery	- North	Spike Displicate To Recovery	Lawer Control Limit (%)	Upper Control	RPD (%)	RPD Limit (%)
MAR			736	98.0			90.35	(110.35		
Ma		<10								
ME	16035006									20





Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

MI	Minneso 2616 E. Br Bismarck, (701) 258-9	borato	poratories				W0: 16035			Utilities		Chain of Custod Record			
Report To: Attn: Address: Phone: Email:	MDU Todd Peterson 400 N. 4th St Bismarck, ND 58501 701-425-2427 Todd.Peterson@mdu.cc		CC:								Project Na Event: Sampled I	Spr.		MDU Heskett 3 Fall 2022	
	Sam				_	nple	Containe	ers		Field Re	adings	Ė			
Lab Number	Sample ID	Date	Time	Sample Type	1 Liter Raw	500 mL HNO3	500 mL HNO3 (filtered)	250 mL H2504			Temp (°C)	Spec. Cond.	Hd	Turbidity (NTU)	Analysis Required
001	MW13	17 Mey 23	1105	GW	Х	х	Х		1 11		11.63	10/06	686	0.86	
002	MW1-90	17 May 23	1435	GW	Х	X	х	х			8.84	8999	6.93	0.10	
003	MW2-90	18 May 23	ills	GW	X	X	X	х			8.67	7541	6.86	0.02	
6004	MW3-90	18 May 23	1000	GW	Х		х	х			8.11	4657	6.81	0,13	MDU Heskett List
005	MW80R	18 May 23	1251	GW	Х		Х				7.89	6568	6.99	3.45	WIDO HESKETT LIST
000	Dup 1	17 May 23	_	GW	X		X)		-	_	
007	Field Blank (FB)	17 My 23	-	GW	х	х	X	х			NA	NA	NA	NA	
				1											

TM562 / FM805

Date/Time

18 My 23

Location

حوا المحافظ Walk In #2





Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

MVIL	•
/// / / L	4
	•

Field Datasheet

Surface water Assessment

Company: MDU Heskett
Event: Spring 2023

Sampling Personal:

Weather Conditions	: Temp:	70	°F	Wind:	W	@5-10	Precip:	Sunny / Partly Cloudy / Cloudy
Well ID	Date	Time	Casing Diameter	Water Level (ft)			Co	mments
MW70		1332	2"	17.60				
MW33		1520	2"	38.91				
MW101		1334	2"	37.15				
MW102	(7 May 23	1330	2"	11.48				
MW103		1344	2"	32,35				
MW44R		1340	2"	22.91				
MW104		1350	2"	13,76				
MW105		1525	2"	11.41				

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Appearance or Comment

Clarity, Color, Odor, Ect.

Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

MV			Fiel	d Da	atask	eet		Company:		MDU Hes		
VIV				-				Event:		Spring		
			G	roundwate	er Assessm	ent		Sample ID			1,3	
2616 E. Broadway Ave	, Bismarck, ND							Sampling F	Personal:	سال	7th	
Phone: (701) 25											•	
Weather Conditio	ns:	Temp:	70	°F	Wind:	W	@ 5-10		Precip:	Sunny / Pa	artly Cloudy / Cloud	¥
	WELL INF	ORMATIO	N					SAN	APLING IN	FORMATI	ON	
Well Locked?	YES	NO			7	Purging Me	thod:	Bladder]	Control Setti	ngs:
Well Labeled?	YES	NO]	Sampling N	1ethod:	Bladder		1	Purge: 5	Sec.
Casing Strait?	YES	NO.]	Dedicated	Equipment?	YES	NO]	Recover: 25	Sec.
Grout Seal Intact?	YES	NØ	Not \	/isible							PSI: 20	
Repairs Necessary?					4	Duplicate S		YES	NO			
	sing Diameter		2"	ft	4	Duplicate S	ample ID:	Dy /		J		
	Before Purge		5	ft	-		0.44	I- 11-4-		1		
Total Depth of Well: ft Well Volume: liters					4	1 Liter Raw	BOTT	le List: 1 Gal Nitric		4		
Denth to	Depth to Top of Pump: — ft				-	500mL Nitrio		1 Gai Nitric		1		
	After Sample		3,40	ft	1	500mL Nitrio						
	ment Method		Water Level		1	250mL Sulfu						
		-			_ CIE	LD READIN				,		
Stabilization Pa	rameters	Temp.	Spec.	I	DO	ORP	Turbidity		Pumping	mL	Appearance or Co	mment
(3 Consecu	tive)	(°C)	Cond.	pH	(mg/L)	(mV)	(NTU)	Water Level	Rate	Removed	Clarity, Color, Od	
Purge Date	Time	±0.5*	±5%	±0.1	±10%	±10		(ft)	mL/Min		clear, slightly turb	d, turbid
1 -2	1030	Start of Wel	Purge									
17 May 23	1050	12-72	10107	6.86	4,33	246.3	0.33	29,67	100.0	2000.0	Clear	
•	1055	11.28	10094	6.85	4.21	249.4	0.52	29,75	100.0	500,0	Ules	
	1100	11,57	10105	6,86	4.17	249.5	0,87	29.82	100:0	500,0	cles	
	1105	11.63	10106	686	4.27	247.3	0.86	29.85	100.0	2012	Clear	
	-											
	-											
	-	+			-							
	-	-	-		-							
	111-11-0	abilized?	YES	NO						350.0		

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Turbidity

(NTU)

0.86

Report Date: Friday, June 9, 2023 8:39:47 AM

Spec.

10106

pН

6.86

Sample Date

17 My23

Comments:

Time

1105

(°C)

11.63



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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

			Eiol	4 D	atask			Company:		MDU Hesl	kett		
MVT			riei	u Da	ildSi	ieet		Event:		Spring 2023			
	4		G	roundwate	er Assessmo	ent		Sample ID:		1-90			
2616 E. Broadway Ave, B	ismarck. ND							Sampling F			-61		
Phone: (701) 258-								- BB.			71. 2		
Weather Conditions		Temp:		°F	Wind:		@		Precip:	Sunny / Pa	artly Cloudy / Cloud	dv	
	WELL INF		A.I					CAN				-1	
Well Locked?	YES	NO NO	14		7	Purging Me	thod:	Bladder	IPLING IN	FORIVIATI	FORMATION Control Settings:		
Well Labeled?	YES	(NØ			1	Sampling M		Bladder		1	Purge: S	Sec.	
Casing Strait?	(YES)	NO			1	Dedicated B			NO	1	Recover: 55	Sec.	
Grout Seal Intact?	YES	NO	Not \	/isible	Nere	Dedicated !	quipinciici	(123)	110	,	PSI: 10	360.	
Repairs Necessary?					1	Duplicate S	ample?	YES	(NQ	1	1011		
	ng Diameter:		2"		1	Duplicate S				1			
Water Level B	efore Purge:	12.0	20	ft	1			-		,			
	pth of Well:			ft	1		Bott	le List:		1			
	Vell Volume:			liters]	1 Liter Raw		1 Gal Nitric		1			
	op of Pump:		48	ft		500mL Nitric				1			
10100				ft		500mL Nitric	(filtered)			1			
Measureme	Indicator		250mL Sulfu	ric]						
					FIE	LD READIN	IGS						
Stabilization Parar	meters	Temp.	Spec.	pH	DO	ORP	Turbidity	Water Level	Pumping	mL	Appearance or C	omment	
(3 Consecutiv	re)	(°C)	Cond.	pn	(mg/L)	(mV)	(NTU)	water Level	Rate	Removed	Clarity, Color, O	dor, Ect.	
Purge Date	Time	±0.5°	±5%	±0.1	±10%	±10		(ft)	mL/Min		clear, slightly turb	oid, turbid	
17 May 23	1400	Start of Wel											
, .	1410	8.60	9196	7.01	7.93	268.2	0.61	12.16	1000	10000	Clear		
	1415	B147	8264	6.97	7.64	261.0	0.33	12.17	100.0	500.0	Clear		
1	1400	8,44	8470	6.95	7.19	265,3	0,71	12.17	10.0	5000	Clear		
	1425	8.41	8744	694	6.64	270.1	0.34	12.18	100.0	Sazo	Clear		
	1430	8.77	8 899	6,94	6.14	270.3	0.66	12,18	1000	500.0	Clear		
	1422	8,84	8999	6.93	6.07	272.5	0.10	12.18	100.0	500.0	Clear		
1													
					 								
			_	-	 			-					
	Well St	abilized?	(YES)	NO	1			Total Vol	ume Purged:	3500.0	mL.		
		Toma	$\overline{}$				w. 11.0		ame i argea.	33000			
Sample Date	Time	Temp. (°C)	Spec. Cond.	pH			Turbidity (NTU)				Appearance or C		
17 Mar 2)	11/30	8.84	8999	6.93			0.10				Clarity, Color, Oc	uor, Ect.	
	11417												
Comments:	1435		d blank				0.10						

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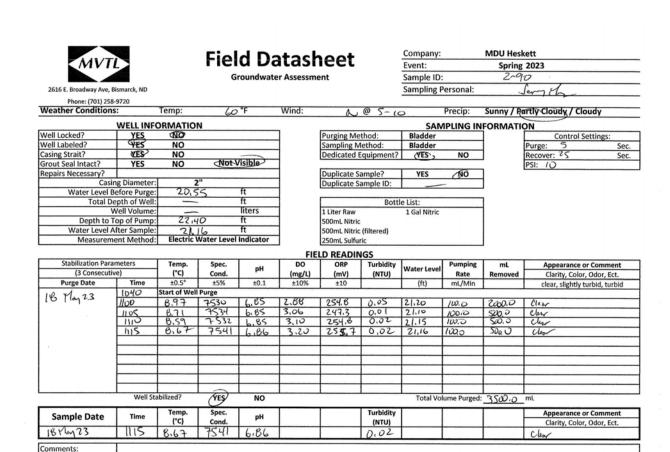


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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

MVTL	
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Phone: (701) 258-9720

Field Datasheet

Groundwater Assessment

 Company:
 MDU Heskett

 Event:
 Spring 2023

 Sample ID:
 3 - 9 o

 Sampling Personal:
 Jan 14

Sunny / Partly Cloudy / Cloudy

Purge:

Recover: 25

Control Settings:

Sec.

Weather Conditions: Wind: Temp: 60 °F WELL INFORMATION Well Locked? NO NO Well Labeled? Casing Strait? Not Visible Grout Seal Intact? YES NO ry? Ant colonic Casing Diameter: Repairs Necessary? Water Level Before Purge 1716 Total Depth of Well: Well Volume: liters 20,10 Depth to Top of Pump ft Water Level After Sample: ft **Electric Water Level Indicator** Measurement Method:

SAMPLING INFORMATION
Purging Method: Bladder
Sampling Method: Bladder
Dedicated Equipment? (YES) NO
Rec
PSI

Precip:

N @5-10

Duplicate Sample ID:

Bottle List:

1 Liter Raw 1 Gal Nitric

SOOmL Nitric

500mL Nitric (filtered)

250mL Sulfuric

FIELD READINGS

Stabilization Par		Temp. Spec.		pН	DO	ORP	Turbidity	Water Level	Pumping	ml.	Appearance or Comment
(3 Consecut		(°C)	Cond.	P	(mg/L)	(mV)	(NTU)	water Lever	Rate	Removed	Clarity, Color, Odor, Ect.
Purge Date	Time	±0.5°	±5%	±0.1	±10%	±10		(ft)	mL/Min		clear, slightly turbid, turbid
18 Hay 23	0925	Start of Wel	l Purge								
10 11240	0945	8.15	4727	6.82	4.16	221.2	0.22	17.42	100.0	2000.0	Clear
	OSO	8.00	4684	6.81	4.20	224.6	4.38	17.46	100:0	500.0	Clear
	0955	8.10 4681		6.02	4.25	221.6	0,67	17:48	100.0	500.0	Clear
	1000	8.11	4687	6,81	4.24	222.3	0.13	17.49	100,0	500.0	Clear
1											
1											
		<u> </u>									
	Well St	abilized?	MES	NO				Total Vo	lume Purged:	35,10.0	ml

Sample Date	Time Temp. Spec. pH				Turbidity (NTU)	Appearance or Comment Clarity, Color, Odor, Ect.				
18 May 23	(000)	8.11	4657	6,81	0, 13	Clear				
Comments:				***************************************						

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Account #: 2800 Client:

Montana-Dakota Utilities - Bismarck



Field Datasheet

Groundwater Assessment

Wind:

MDU Heskett Company: Event: Spring 2023 Sample ID: Sampling Personal:

Sunny / Partly Cloudy Cloudy

Purge: Recover: 55

Control Settings

Sec.

N@5-10 Temp: WELL INFORMATION Well Locked? Well Labeled? NO NO Purging Method: YES Sampling Method: Casing Strait? NO Not Visible Grout Seal Intact? (YES)

Repairs Necessary? Casing Diameter: Water Level Before Purge: 13,71 Total Depth of Well: liters Well Volume: Depth to Top of Pump: ft Water Level After Sample Measurement Method:

SAMPLING INFORMATION Bladder Bladder (YES) NO Dedicated Equipment?

Precip:

(NO Duplicate Sample? YES Duplicate Sample ID

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

FIELD READINGS

Stabilization Par	rameters	Temp.	Spec.	pH	DO	ORP	Turbidity	Water Level	Pumping	mL	Appearance or Comment		
(3 Consecut	tive)	(°C)	Cond.	pri	(mg/L)	(mV)	(NTU)	water Level	Rate	Removed	Clarity, Color, Odor, Ect.		
Purge Date	Time	±0.5°	±5%	±0.1	±10%	±10		(ft)	mL/Min		clear, slightly turbid, turbid		
18 May 22	1216	Start of Wel	art of Well Purge										
10 Pray oc	1236	7.76	6517	6.69	1157	218,5	5.63	14,26	100.0	2000,0	Clerr		
	1241	7.89	6507	6.91	1,28	210.3	4.48	14.28	100,0	500.0	Cler		
	1246	7.85	6557	6.93	1,26	213.9	3.01	14.28	100.0	50,0	Cluse		
	1251	7.69	6568	6,99	1.19	203,2	3,45	14,29	100.0	5000	Cles		
	Well St	abilized?	YES	NO				Total Vo	ume Purged:	35000	mL.		

Sample Date	Time	Temp. (°C)	Spec. Cond.	pH	Turbidity (NTU)	,	Appearance or Comment , Clarity, Color, Odor, Ect.
Belower	1251	7.89	6568	6.99	3,45		Clear
Comments:	T						

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Workorder: MDU Heskett (16035) PO: 196081 OP

Todd Peterson Montana-Dakota Utilities 400 N 4th St Bismarck, ND 58501 CCR_APPENDIX IV

Certificate of Analysis

Approval

All data reported has been reviewed and approved by:



Claudette Carroll, Lab Manager Bismarck, ND

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

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

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

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Workorder Summary

Workorder Comments

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

Sample Comments

16035001 (MW13) - Sample

Total and dissolved selenium results have been rechecked. CC 8Jun23

16035006 (Dup 1) - Sample

Time sampled was not supplied by the client.

Total and dissolved selenium results have been rechecked. CC 8Jun23

16035007 (Field Blank (FB)) - Sample

Time sampled was not supplied by the client.



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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

 Lab ID:
 16035001
 Date Collected:
 05/17/2023 11:05
 Matrix:
 Groundwater

 Sample ID:
 MW13
 Date Received:
 05/18/2023 14:00
 Collector:
 MVTL Field Service

Temp @ Receipt (C): 4.8

Method: EPA 245.1

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Mercury	<0.0002	mg/L	0.0002	1	05/25/2023 09·40	05/26/2023 09:07	MDE	

Method: EPA 6010D

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Lithium	0.640	mg/L	0.1	5	05/19/2023 06:51	05/31/2023 15:48	SLZ	

Method: EPA 6020B

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Antimony	<0.001	mg/L	0.001	5	05/19/2023 06:51	05/22/2023 18:28	MDE	
Arsenic	<0.002	mg/L	0.002	5	05/19/2023 06:51	05/22/2023 18:28	MDE	
Barium	0.0082	mg/L	0.002	5	05/19/2023 06:51	05/22/2023 18:28	MDE	
Beryllium	<0.0005	mg/L	0.0005	5	05/19/2023 06:51	05/22/2023 18:28	MDE	
Cadmium	<0.0005	mg/L	0.0005	5	05/19/2023 06:51	05/22/2023 18:28	MDE	
Chromium	<0.002	mg/L	0.002	5	05/19/2023 06:51	05/22/2023 18:28	MDE	
Cobalt	<0.002	mg/L	0.002	5	05/19/2023 06:51	05/22/2023 18:28	MDE	
Lead	<0.0005	mg/L	0.0005	5	05/19/2023 06:51	05/22/2023 18:28	MDE	
Molybdenum	<0.002	mg/L	0.002	5	05/19/2023 06:51	05/22/2023 18:28	MDE	
Selenium	0.0563	mg/L	0.005	5	05/19/2023 06:51	05/22/2023 18:28	MDE	
Thallium	<0.0005	mg/L	0.0005	5	05/19/2023 06:51	05/22/2023 18:28	MDE	

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Report Date: Friday, June 9, 2023 8:42:32 AM

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

 Lab ID:
 16035002
 Date Collected:
 05/17/2023 14:35
 Matrix:
 Groundwater

 Sample ID:
 MW1-90
 Date Received:
 05/18/2023 14:00
 Collector:
 MVTL Field Service

Temp @ Receipt (C): 4.8 Received on Ice: Yes

Method: EPA 245.1

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Mercury	<0.0002	mg/L	0.0002	1	05/25/2023 09·40	05/26/2023 09:07	MDE	

Method: EPA 6010D

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Lithium	0.537	mg/L	0.1	5	05/19/2023 06:51	05/31/2023 15:50	SLZ	

Method: EPA 6020B

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Antimony	<0.001	mg/L	0.001	5	05/19/2023 06:51	05/22/2023 18:14	MDE	
Arsenic	<0.002	mg/L	0.002	5	05/19/2023 06:51	05/22/2023 18:14	MDE	
Barium	0.0094	mg/L	0.002	5	05/19/2023 06:51	05/22/2023 18:14	MDE	
Beryllium	<0.0005	mg/L	0.0005	5	05/19/2023 06:51	05/22/2023 18:14	MDE	
Cadmium	<0.0005	mg/L	0.0005	5	05/19/2023 06:51	05/22/2023 18:14	MDE	
Chromium	<0.002	mg/L	0.002	5	05/19/2023 06:51	05/22/2023 18:14	MDE	
Cobalt	<0.002	mg/L	0.002	5	05/19/2023 06:51	05/22/2023 18:14	MDE	
Lead	<0.0005	mg/L	0.0005	5	05/19/2023 06:51	05/22/2023 18:14	MDE	
Molybdenum	<0.002	mg/L	0.002	5	05/19/2023 06:51	05/22/2023 18:14	MDE	
Selenium	0.0245	mg/L	0.005	5	05/19/2023 06:51	05/22/2023 18:14	MDE	
Thallium	<0.0005	mg/L	0.0005	5	05/19/2023 06:51	05/22/2023 18:14	MDE	

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

 Lab ID:
 16035003
 Date Collected:
 05/18/2023 11:15
 Matrix:
 Groundwater

 Sample ID:
 MW2-90
 Date Received:
 05/18/2023 14:00
 Collector:
 MVTL Field Service

Temp @ Receipt (C): 4.8 Received on Ice: Yes

Method: EPA 245.1

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Mercury	<0.0002	mg/L	0.0002	1	05/25/2023 09·40	05/26/2023 09:07	MDE	

Method: EPA 6010D

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Lithium	0.960	mg/L	0.1	5	05/19/2023 06:51	05/31/2023 15:51	SLZ	

Method: EPA 6020B

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Antimony	<0.001	mg/L	0.001	5	05/19/2023 06:51	05/22/2023 18:18	MDE	
Arsenic	<0.002	mg/L	0.002	5	05/19/2023 06:51	05/22/2023 18:18	MDE	
Barium	0.0087	mg/L	0.002	5	05/19/2023 06:51	05/22/2023 18:18	MDE	
Beryllium	<0.0005	mg/L	0.0005	5	05/19/2023 06:51	05/22/2023 18:18	MDE	
Cadmium	<0.0005	mg/L	0.0005	5	05/19/2023 06:51	05/22/2023 18:18	MDE	
Chromium	<0.002	mg/L	0.002	5	05/19/2023 06:51	05/22/2023 18:18	MDE	
Cobalt	<0.002	mg/L	0.002	5	05/19/2023 06:51	05/22/2023 18:18	MDE	
Lead	<0.0005	mg/L	0.0005	5	05/19/2023 06:51	05/22/2023 18:18	MDE	
Molybdenum	<0.002	mg/L	0.002	5	05/19/2023 06:51	05/22/2023 18:18	MDE	
Selenium	0.0693	mg/L	0.005	5	05/19/2023 06:51	05/22/2023 18:18	MDE	
Thallium	<0.0005	mg/L	0.0005	5	05/19/2023 06:51	05/22/2023 18:18	MDE	

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

 Lab ID:
 16035004
 Date Collected:
 05/18/2023 10:00
 Matrix:
 Groundwater

 Sample ID:
 MW3-90
 Date Received:
 05/18/2023 14:00
 Collector:
 MVTL Field Service

Temp @ Receipt (C): 4.8 Received on Ice: Yes

Method: EPA 245.1

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Mercury	0.0002	mg/L	0.0002	1	05/25/2023 09·40	05/26/2023 09:07	MDE	

Method: EPA 6010D

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Lithium	0.198	mg/L	0.02	1	05/19/2023 06:51	05/31/2023 15:51	SLZ	

Method: EPA 6020B

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Antimony	<0.001	mg/L	0.001	5	05/19/2023 06:51	05/22/2023 18:23	MDE	
Arsenic	<0.002	mg/L	0.002	5	05/19/2023 06:51	05/22/2023 18:23	MDE	
Barium	0.0099	mg/L	0.002	5	05/19/2023 06:51	05/22/2023 18:23	MDE	
Beryllium	<0.0005	mg/L	0.0005	5	05/19/2023 06:51	05/22/2023 18:23	MDE	
Cadmium	<0.0005	mg/L	0.0005	5	05/19/2023 06:51	05/22/2023 18:23	MDE	
Chromium	<0.002	mg/L	0.002	5	05/19/2023 06:51	05/22/2023 18:23	MDE	
Cobalt	<0.002	mg/L	0.002	5	05/19/2023 06:51	05/22/2023 18:23	MDE	
Lead	<0.0005	mg/L	0.0005	5	05/19/2023 06:51	05/22/2023 18:23	MDE	
Molybdenum	<0.002	mg/L	0.002	5	05/19/2023 06:51	05/22/2023 18:23	MDE	
Selenium	0.2849	mg/L	0.005	5	05/19/2023 06:51	05/22/2023 18:23	MDE	
Thallium	<0.0005	mg/L	0.0005	5	05/19/2023 06:51	05/22/2023 18:23	MDE	

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

 Lab ID:
 16035005
 Date Collected:
 05/18/2023 12:51
 Matrix:
 Groundwater

 Sample ID:
 MW80R
 Date Received:
 05/18/2023 14:00
 Collector:
 MVTL Field Service

Temp @ Receipt (C): 4.8 Received on Ice: Yes

Method: EPA 245.1

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Mercury	<0.0002	mg/L	0.0002	1	05/25/2023 09·40	05/26/2023 09:07	MDE	

Method: EPA 6010D

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Lithium	0.816	mg/L	0.1	5	05/19/2023 06:51	05/31/2023 15:54	SLZ	

Method: EPA 6020B

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Antimony	<0.001	mg/L	0.001	5	05/19/2023 06:51	05/22/2023 19:10	MDE	
Arsenic	<0.002	mg/L	0.002	5	05/19/2023 06:51	05/22/2023 19:10	MDE	
Barium	0.0139	mg/L	0.002	5	05/19/2023 06:51	05/22/2023 19:10	MDE	
Beryllium	<0.0005	mg/L	0.0005	5	05/19/2023 06:51	05/22/2023 19:10	MDE	
Cadmium	<0.0005	mg/L	0.0005	5	05/19/2023 06:51	05/22/2023 19:10	MDE	
Chromium	<0.002	mg/L	0.002	5	05/19/2023 06:51	05/22/2023 19:10	MDE	
Cobalt	<0.002	mg/L	0.002	5	05/19/2023 06:51	05/22/2023 19:10	MDE	
Lead	<0.0005	mg/L	0.0005	5	05/19/2023 06:51	05/22/2023 19:10	MDE	
Molybdenum	0.0028	mg/L	0.002	5	05/19/2023 06:51	05/22/2023 19:10	MDE	
Selenium	0.0428	mg/L	0.005	5	05/19/2023 06:51	05/22/2023 19:10	MDE	
Thallium	<0.0005	mg/L	0.0005	5	05/19/2023 06:51	05/22/2023 19:10	MDE	

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Report Date: Friday, June 9, 2023 8:42:32 AM

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

 Lab ID:
 16035006
 Date Collected:
 05/17/2023
 Matrix:
 Groundwater

 Sample ID:
 Dup 1
 Date Received:
 05/18/2023 14:00
 Collector:
 MVTL Field Service

Temp @ Receipt (C): 4.8

Method: EPA 245.1

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Mercury	<0.0002	mg/L	0.0002	1	05/25/2023 09·40	05/26/2023 09:07	MDE	

Method: EPA 6010D

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Lithium	0.639	mg/L	0.1	5	05/19/2023 06:51	05/31/2023 15:55	SLZ	

Method: EPA 6020B

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Antimony	<0.001	mg/L	0.001	5	05/19/2023 06:51	05/22/2023 19:01	MDE	
Arsenic	<0.002	mg/L	0.002	5	05/19/2023 06:51	05/22/2023 19:01	MDE	
Barium	0.0083	mg/L	0.002	5	05/19/2023 06:51	05/22/2023 19:01	MDE	
Beryllium	<0.0005	mg/L	0.0005	5	05/19/2023 06:51	05/22/2023 19:01	MDE	
Cadmium	<0.0005	mg/L	0.0005	5	05/19/2023 06:51	05/22/2023 19:01	MDE	
Chromium	<0.002	mg/L	0.002	5	05/19/2023 06:51	05/22/2023 19:01	MDE	
Cobalt	<0.002	mg/L	0.002	5	05/19/2023 06:51	05/22/2023 19:01	MDE	
Lead	<0.0005	mg/L	0.0005	5	05/19/2023 06:51	05/22/2023 19:01	MDE	
Molybdenum	<0.002	mg/L	0.002	5	05/19/2023 06:51	05/22/2023 19:01	MDE	
Selenium	0.0575	mg/L	0.005	5	05/19/2023 06:51	05/22/2023 19:01	MDE	
Thallium	<0.0005	mg/L	0.0005	5	05/19/2023 06:51	05/22/2023 19:01	MDE	

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

Lab ID:16035007Date Collected:05/17/2023Matrix:GroundwaterSample ID:Field Blank (FB)Date Received:05/18/2023 14:00Collector:MVTL Field Service

Temp @ Receipt (C): 4.8

Method: EPA 245.1

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Mercury	<0.0002	mg/L	0.0002	1	05/25/2023 09:40	05/26/2023 09:07	MDE	

Method: EPA 6010D

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Lithium	<0.02	mg/L	0.02	1	05/19/2023 06:51	05/31/2023 15:56	SLZ	

Method: EPA 6020B

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Antimony	<0.001	mg/L	0.001	5	05/19/2023 06:51	05/22/2023 19:06	MDE	
Arsenic	<0.002	mg/L	0.002	5	05/19/2023 06:51	05/22/2023 19:06	MDE	
Barium	<0.002	mg/L	0.002	5	05/19/2023 06:51	05/22/2023 19:06	MDE	
Beryllium	<0.0005	mg/L	0.0005	5	05/19/2023 06:51	05/22/2023 19:06	MDE	
Cadmium	<0.0005	mg/L	0.0005	5	05/19/2023 06:51	05/22/2023 19:06	MDE	
Chromium	<0.002	mg/L	0.002	5	05/19/2023 06:51	05/22/2023 19:06	MDE	
Cobalt	<0.002	mg/L	0.002	5	05/19/2023 06:51	05/22/2023 19:06	MDE	
Lead	<0.0005	mg/L	0.0005	5	05/19/2023 06:51	05/22/2023 19:06	MDE	
Molybdenum	<0.002	mg/L	0.002	5	05/19/2023 06:51	05/22/2023 19:06	MDE	
Selenium	<0.005	mg/L	0.005	5	05/19/2023 06:51	05/22/2023 19:06	MDE	
Thallium	<0.0005	mg/L	0.0005	5	05/19/2023 06:51	05/22/2023 19:06	MDE	

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Client: Montana-Dakota Utilities - Bismarck Account #: 2800

MVTL Field Services

Sampling Report

MDU Heskett

Sample Event: Spring 2023 Work Order #: 16035 Sampling Dates: May 17-18, 2023 16039

Well Condition: All wells were found to be in good condition.

With exception to well 3-90 which has an ant colonie in the outer casing, and

well 1-90 which needs the base repaired.

Duplicate Sample Location Samples collected MW13 **MW13**

MW1-90 MW2-90 MW3-90 MW80R

Samples collected were placed on ice and transported back to the MVTL Laboratory in Bismarck, ND for analysis.

> Jeremy Meyer **MVTL Field Services**

Friday, June 9, 2023 8:42:32 AM





Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

C Result	s Summary							WO #:	160	35
ithium				Units:	mg/L					
QC Type	Original Sample ID	Blank Rissult	Spike Amount	Spike % Recovery		Spike Displicate N. Resovery	Lower Control Limit (%)	Limit (%)	RPD (%)	RPD Limit (%)
FB-DE			0.4	104.0			85	115		
FII-DE			0.4	104.0			85	911		
48		10.04								
AG		-0.04								
Jthium				Units:	mg/L					
ОС Туре	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery		Spire Duplicate S-Recovery	Lawer Control Limit (%)	Lipper Control Limit (%)	RPD (%)	RPD Limit (%)
D5/P0SD	16035001		2	92.0		90.9	75	125	0.9	20
DS/PDSD	16035005		2	91.6		90.3	75	125	10	20
Beryllium				Units:	mg/L					
QC Type:	Original Sample (D	Blank Result	Spike Amount	Spike % Recovery		Spike Duplicate N Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
AS/M5D	15936005		0,4	113,0		113.0	70	130	0,2	20
admium				Units:	mg/L					
IC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery		Spike Duplicate % Recovery	Lower Control Limit (%)	Upper Control Limit (%)	KPD (%)	RPD (imit (%)
45		×0.000≦								
IS/MSD	15936005		0.4	100,0		98.2	70	130	2.0	20
Antimony				Units:	mg/L					
дс туре	Original Sample ID	Blank Rasult	Spille Amount	Spike % Recovery		Spike Displicate N. Recovery	Lower Control Limit (%)	Upper Control Limit (%)	APD (N)	RPD Limit (%)
PX	15905001		DI	113.0			75	125		
PC	15913001		0,1	108.0			75	325		
Arsenic				Units:	mg/L					
QC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery		Spike Duplicate & Recovery	Lower Control Limit (%)	Lipper Control	RPD (%)	RPD Limit (%)
PK	15905001		0.1	115.0			75	125		
Barium				Units:	mg/L					
QC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery		Spike Duplicate % Recovery	Lower Control Limit (%)	Upper Control	RPD (%)	RPD Limit (%)
PK	15905001		0.1	107.0			75	125		
Pe	15913001		0,1	99,3			75	125		
Beryllium				Units:	mg/L					
DC Type	Original Sample (D	Blank Result	Spike Amount	Spike %. Recovery		Spike Duplicate % Recovery	Lower Control Limit (%)	Upper Control	(NED (NE)	RPD Limit (%)
PK	15905001		0.1	113.0			75	175		
PY.	15913001		1.0	114.0			75	125		
admium				Units:	mg/L					
C Type	Original Sample (E)	Blank Result	Spike Amount	Spike %. Recovery		Spike Duplicate N. Recovery	Lower Control Limit (%)	Limit (%)	RPD (%)	RPD Limit (%)





Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Cadmium	tambar room	make t	4000	Units:	mg/L	*****	1	000000000000000000000000000000000000000	man from	The second second
СТуре	Original Sample ID:	Blank Result	Spike Amount	Spike % Recovery		Spike Duplicate N. Resovery	Lawer Control Limit (%)	Limit (%)	RPD (%)	RPD Limit (%)
PK	15913001		0.1	106.0			75	125		
Chromium				Units:	mg/L					
IC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery		Spile Deplicate Recovery	Lower Control	Upper Control Limit (%)	RPD (96)	RPD Limit (%)
W	15905001		0.1	112.0			75	125		
×	15913001		0.1	111.0			75	125		
obalt				Units:	mg/L					
C Type	Original Sample (D	Blank Result	Spike Amount	Spike % Recovery		Spike Duplicate % Recovery	Lower Control Limit (%)	Upper Control Limit (%)	HPD (%)	RPD Limit (%)
PK.	15905001		0.1	112.0		History	75	175		
*	15913001		ō, t	110,0			75	125		
ead				Units:	mg/L					
C Type	Original Sample ID	Blank Résult	Spike Amount	Spike % Recovery		Spike Duplicate In Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
75	15905001		6.1	103.0			75	175		
8	15913001		0.1	95.7			75	125		
Nolybdenum				Units:	mg/L					
СТуре	Original Sample (C)	Blank Result	Spike Amount	Spike % Recovery		Spike Duplicate N. Racovery	Lower Control Limit (%)	Limit (%)	RPD (%)	RPD Limit (%)
96	15905001		0.1	121.0			75	125		
×	15913001		0.1	121.0			75	125		
elenium				Units:	mg/L					
C Type	Original Sample (D	Blank Result	Spike Amount	Spike % Recovery		Spire Duplicate Recovery	Lawer Control	Lipper Control	RPD (%)	RPD Limit (%)
×	15905001		D.1	106.0			75	125		
K.	15913001		0.1	96.5			76	125		
hallium				Units:	mg/L					
C Type	Original Sample (D	Blank Result	Spike Amount	Spire %	- da	Spice Duplicate	Lawer Control	Lipper Control	RPD (%)	RPD Limit (%)
×	15905001		0.1	Recovery 102.0		% Recovery	Elmit (%). 75	125		
HK.	15913001		10.1	95.5			75.	125		
ntimony C Type	Original Sample (D)	Blank Result	Spike Amount	Units: Spike %	mg/L	Spike Duplicate	Lower Control	Upper Control	IPD (%)	RPD Limit (15)
II-M5	Sugar Sample (C)	anning Nestura	II.1	Recovery 98-5		% Recovery	Limit (%)	Limit (%)	in a late	in a municipal
B-MS			B.T	99.6			80	120		
8-445			6.1	101.0			80	:120		
0		<0.001								
0		∹0.001								
o .		<0.001								





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Client: Montana-Dakota Utilities - Bismarck

Antimony					ng/L				
QC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery	Spike Duplicate % Resovery	Lawer Control Limit (%)	Limit (%)	RPD (%)	RPD Limit (%)
AS/MSIX	15913001		0.8	99.0	101:0	75	125	1.8	20
M5/M5D	16035001		0.4	102.0	98.9	75	125	3.0	20
AS/M5D	16035005		0.4	99.0	98.7	15	125	0.3	20'
Arsenic				Units: n	ng/L				
OC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery	Spike Duplicate Si Recovery	Lawer Control Limit (%)	Lipper Control	RPD (96)	RPD Limit (%)
FB-MS			0.1	98.8		80	120		
FB-M5			0.1	101,0		80	120		
FB-MS			0.1	100.0		80	120		
ia .		-0.007							
ив		s0.002							
46		~0.002							
H5/MSDI	15905001		0.4	103.0	404.0.	76	125	2.0	10
AS/MSD	15913001		0.4	96.7	(01.0	75	125	5.7	20
rs/MSD	160956001		6.4	104.0	(02.0	75	125	1:5	20
IS/MSD	15035005		0.4	98.5	102.0	75	125	4,0	90
Barium					ng/L				
IC Type	Original Sample ID:	Blank Result	Spike Amount	Spike % Recovery	Spike Duplicate % Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
FB-MS			0,1	97.2		30	170		
FB-M5			9.1	99.8		30	120		
FB M5			0.1	97.4		80	120		
to		<0.002							
10		<0.002							
ea .		10.002							
45/MUO	15905001		0.4	101-0	00.5	75	1725	1.8	20
45/M503	15913001		:0.4	98.2	00.3	75	(125	0.7	20
HS/MSIX	16035001		0.4	97.6	07.3	76	125	0.5	20
45/MSD	16035005		0.4	99.3	97.4	75	175	2.0	20.
Beryllium				Units: n	ng/L				
	Original Sample ID	Blank Result	Spike Amount	Spike %	Spike Duplicate Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
CC Type FB-MS			0.1	111.0		80	120		



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Beryllium				Units:	mg/L					
QC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery		Spike Duplicate % Resovery	Lawer Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
F8-M5			0.1	101.0		SE FREIDNESY.	80	120		
ив		x0.0003								
MBI I		<0.000\$								
ABI BEN		0.0005								
AS/MSDI	15905001		0.4	103-0		1040	76	125	0.0	20
ASYMASIO	15913001		0.4	101.0		105.0	75	125	44	20
45/MSDI	16035001		0.4	110.0		105.0	75	125	14	20
45/845D	16035000		0.4	104.0		100.0	16.	196	67	50
45/MSO	16035005		0.4	104.0		104.0	15-	125	0.7	20
Cadmium					mg/L					0.0
QC Type:	Original Sample (D	Blank Result	Spike Amount	Spike % Recovery		5pixe Duplicate % Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (55)
FB-A/15			0.1	110.0			80	120		
FB-M5			0.1	105.0			80	120		
FB-MS			0.6	111.0			80	170		
18		<0.0005								
le l		< 0.0005								
HS/MSD	15905001		0.4	107.0		(07.0	75	125	0.5	20
NS/MSD	15913001		8.4	102.0		104.0	75	125	1.5	20
MS/MSD	16035001		0.4	104,0		103.0	75	125	1.7	20
rs/MSD	16035005		0,4	105.0		101.0	75	125	2.2	(20)
Chromium				Units:	mg/L					
IC Type	Original Sample ID	Blank Result	Spike Amount	Spike W Recovery		Spike Duplicate % Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
H-M5			0.1	105.0		200000	80	120		
TIF-AA5			0.1	106.0			80	120		
rij-M5			0,1	109-0			80	120		
(3)		×0.003								
ia .		×0.002								
ia.		0.007								
ts/MSD	15905001		0,4	104-0		102.0	76	125	1.6	20
IS/MSD:	15913001		0.4	100.0		107.0	75	125	7.0	-20
						101.0		125	127	
45/M/SX	16035001		0.4	10430			75			30





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Cobalt				Units: mg/					
DC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery	Spike Duplicate % Resovery	Lower Control	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
FB-M5			0.1	110.0		80	120		
FB 4A5			0.1	108.0		80	120		
HI-MS			0.1	100.0		80	120		
AW		+0.002							
As		×D.002							
ABI		10.002							
45/MSDI	15905001		0.4	105.0	101.0	75	125	2.2	20
45/M50	15913001		0.4	103.0	1010	75-	125	0.5	-20
IS/MSD	16035001		0.4	105.0	(01.0	75	125	11	50
HS/M50	16035005		0.4	1054)	104.0	75	125	1.0	20
ead				Units: mg/					
IC Type	Original Sample (D	Blank Result	Spike Amount	Spike %	Spike Duplicate	Lower Control	Upper Control	RPD (%)	RPD Limit (%)
FB-MS	4		0.0	Kecovery 98.2	% Recovery	Limit (%) 80	Limit (%) 120		
FB-MS			0.1	99.5		80	120		
EB-M5			0.1	99,9		80	120		
fa		19.0005							
10		-:0.0005							
to		(0.0005							
45/MSD	15905001		0.4	99.7	96.1	75	325	2.5	70
15/M50	15913001		0.4	294.6	961	25	125	0.9	20
rs/MsD	16035001		6.4	94.4	94.3	75	125	1.3	20
15/MSD	16035005		0.4	93.3	92.6	.75	125	0.8	20
Molybdenum				Units: mg/					
(С Туре	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery	Spike Duplicine Ni Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
FIHAMS			0.1	111.0	2000	80	120		
B-MS			0.1	112.0		80	120		
II-MS.			n.c	TIAO		80	120		
		-0.003							
40		-0.002							
68		10.002							
40		-0.003							





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Molybdenum					mg/L					
DC Туре	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery		Spike Duplicate N. Resovery	Lawer Control Limit (%)	Limir (%)	RPD (%)	RPD Limit (%)
VIS/MSIX	15913001		0.8	111.0		112.0	75	125	0.6	20
M5/MSD	16035001		0.4	120.0		115.0	75	125	4.7	20
AS/M5O	16035005		0.4	113.0		114.0	15	125	.0.7	20'
Selenium				Units:	mali					
oc Type	Original Sample ID	Blank Result	Spike Amount	Spike %	mg/L	Spike Duplicate	Lawer Control	Lipper Control	RPD (%)	RPD Limit (%)
FB-MS			0.1	Recovery 94.7		5 Recovery	Limit (%) 80	120		
FB-MS			9.1	89.9			80	120		
FB-MS			0.1	90.4			80	120		
				30.0				ALII		
de		-0.005								
dB.		+0.005								
46		-0.005								
AS/MSD	15905001		0.4	102.0		96.4	76.	125	6.1	40
AS/MSD	15933001		0.4	94.8		VES-	75	175	17	90
AS/MSD	16035601		0.6	98,0		90 4	75	125	0.4	201
AS/MSD	16035005		0.4	98.0		95.8	75	175	11	20
Thallium				Units:	mg/L					
QC Type	Original Sample ID:	Blank Result	Spike Amount	Spike % Recovery		Spike Duplicate % Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
FB-MS			0,1	99,4			30	120		
FB-M5			1.0	99.6			380	120-		
375										
FILMS			6.1	98.5			80	120		
		10.000	6.1				80			
10.		×0.0003	0.1				80			
FB-MS		×0.0009	6,1				80			
ria.			6.1				а0-			
rta rta	15905001	×0.0000	0.1			per	30) 75		3.6	30
AGI AGI AGI/AAUX	,1595500 (15935001	×0.0000		98.5		967 962		.320	2.6	30
AG AG/ABO	15913001	×0.0000	0.4	98.5 99.6 96.5		96.7	75 75	125	0.8	20
AG AG AG AG/AGIO AG/AGIO AG/AGIO AG/AGIO AG/AGIO	15913001 16035001	×0.0000	0.4 0.4	98.5 99.6 96.5 94.5		96.2	75 75	125 125 125	0.3	20
AG AG/ABO	15913001	×0.0000	0.4	98.5 99.6 96.5		96.7	75 75	125	0.8	20
AG AG/AGO. AG/	15913001 16035001 16035005	×0.0003	0.4 0.4 0.4	98.5 99.6 96.5 94.5 96.2 Units:	mg/L	96.7 94.7 94.4	75 75 75	125 125 125 125	0.5	30 30 20
A6 A	15913001 16035001	×0.0000	0.4 0.4 0.4 0.4 5pile Amount	98.5 96.5 96.5 96.5 96.5 96.5 Spike % Recovery	mg/L	96.2	75 75 75 Lawer Control Limit (iii)	125 125 125 125 125	0.3	20
AG AG AG AS/ABIO AS/ABIO AS/ABIO AS/ABIO AS/ABIO AS/ABIO	15913001 16035001 16035005	×0.0003	0.4 0.4 0.4	98.5 96.5 96.5 96.5 96.2 Units:	mg/L	94.7 94.4 Spile Duplicate	75 75 75 75	125 125 125 125	0.5	30 30 20





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Mercury				Units: mg/	L.				
QC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery	Spike Duplicate % Resovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
IFB			0.003	102.0		85	115		
RB		×0.0003							
MB		×0.0002							
wa		0.0002							
MB/MSDI	15913001		0.002	96.9	23.2	70	130	0.0	30
MSYMSOX	16380007		0.007	102.0	08.0	70	130	0.0	20
MS/MSD	18199001		0.002	97.4	$\bar{g}_0 +$	70	150.	0.0	20
M5/M50	16476010		0.002	101.0	90.4	10	130	10.5	20
WS/MSIT	16476016		0.002	89.2	0.88	10	130	0,0	90





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Location
Log In>
Walk In #2

Date/Time

18 Ply 23

MI	Minneso 2616 E. Br Bismarck, (701) 258-5	Montana – Dakota Uti WO: 16035							5	Chain of Custon						
Report To: Attn: Address: Phone: Email:	MDU Todd Peterson 400 N. 4th St Bismarck, ND 58501 701-425-2427 Todd.Peterson@mdu.co	cc:									Project Na Event: Sampled E	Spri	May de 0	MDU Heskett 3 Fall 2022		
Lab Number	Sam		Sample				Containers				Field Readings					
	Sample ID	Date	Time	Sample Type	1 Liter Raw	500 mL HNO3	500 mL HNO3 (filtered)	250 mL H2SO4				Temp (°C)	Spec. Cond.	Н	Turbidity (NTU)	Analysis Required
001	MW13	17 Mey 23	1105	GW	Х		х	Х				11.63	10/06	6.86	0.86	
002	MW1-90	17 May 23	1435	GW	Х		_	X				6.84	8999	6.93	0.10	
003	MW2-90	18 May 23	ills	GW	X	_		Х				8.67	7541	6.86	0.02	
6004	MW3-90	18 May 23	1000	GW	X			X	\perp			8.11	4657	6.81	0,13	MDU Heskett List
005	MW80R	18 May 23	1251	GW	х	-	Х	-	+	+	_	7.89	6568	6.99	3.45	moo neskett eist
	Dup 1	17 May 23	-	GW	X	X	X	_	+	+		_		-	-	
000	Field Blank (FB)	17 Mry 23	-									NA	NA	NA	NA	

TM562 / FM805

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.

Received By

Date/Time





Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

M	VΙ		•
,,,	• •	-	1
	-		

Field Datasheet

Surface water Assessment

Company: MDU Heskett
Event: Spring 2023

Sampling Personal:

Weather Conditio	ns: Temp:	70	°F	Wind:	W	@5-10	Precip: Sunny / Partly Cloudy / Cloudy
Well ID	Date	Time	Casing Diameter	Water Level (ft)			Comments
MW70		1332	2"	17.60			
MW33		1520	2"	38.91			
MW101		1334	2"	37.15			
MW102	(7 May 23	1330	2"	11.48			
MW103]```	1344	2"	32,35			
MW44R		1340	2"	22.91			
MW104		1350	2"	13,76			
MW105		1525	2"	11.41			

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

MVT			Fial	d Da	atask	taar		Company:		MDU Heskett			
MVI	-							Event:		Spring	Spring 2023		
			G	roundwate	er Assessm	ent		Sample ID:			13		
2616 E. Broadway Ave, I	2616 E. Broadway Ave, Bismarck, ND							Sampling P	ersonal:	Ju	7 Ph		
Phone: (701) 258		Temp:											
Weather Condition	70	°F	Wind:	W	@ 5-10		Precip:	Sunny / P	artly Cloudy / Cloudy				
	WELL INF	ORMATIO	N					SAN	IPLING IN	FORMATI	ON		
Well Locked?	YES	NO]	Purging Me	thod:	Bladder		1	Control Settings:		
Well Labeled?	YES	NO]	Sampling N		Bladder]	Purge: Sec.		
Casing Strait?	YES	NO	N-CY	o-11-1]	Dedicated	quipment?	YES	NO]	Recover: 25 Sec.		
Grout Seal Intact?	YES	NØ	Not \	/isible	1	0 11 1		1 /3=2		,	PSI: 20		
Repairs Necessary?	ng Diameter:		2"		-	Duplicate S		(YES	NO	1			
Water Level E		29,2		ft	-	Duplicate S	ample ID:	Dy /		J			
	epth of Well:	2 110	-	ft	1		Bott	le List:	1				
	Well Volume:	_		liters	1	1 Liter Raw	Dott	1 Gal Nitric	1				
Depth to 1	Top of Pump:	_		ft	1	500mL Nitrio				1			
Water Level A			3.40	ft]	500mL Nitrio	(filtered)						
Measurem	Measurement Method: Electric Water Leve		Water Level	Indicator]	250mL Sulfu	ric						
					FIE	LD READIN	IGS						
Stabilization Para		Temp.	Spec.	pH	DO	ORP	Turbidity	Water Level	Pumping	mL	Appearance or Comment		
(3 Consecuti		(°C)	Cond.	Pn	(mg/L)	(mV)	(NTU)	Water Level	Rate	Removed	Clarity, Color, Odor, Ect.		
Purge Date	Time	±0.5°	±5%	±0.1	±10%	±10		(ft)	mL/Min		clear, slightly turbid, turbid		
1 23	1030	Start of Wel			1.1.2	T 2 11 2		120:2					
17 May 23	1050	12-72	10107	6.86	4,33	246.3	0.33	29,67	100.0	2000.0	Clear		
	1055	11.28	10094	6.85	4.21	249.4	0.52	29.75	100.0		Un		
1	1105	11.63	30101	6,00	4.27	247.3	0.86	29.85	100.0	50,0	Clear		
	1103	11103	10108	Cato	71.21	1294.0	0.00	21,03	700.0	200.0	- CHIED		
1													
	144-11-0-	abilized?	YES							200			
	well St	abilized?	YES	NO				Total Vol	ume Purged:	3500.0	mL .		
Sample Date	Time	Temp.	Spec.	pН			Turbidity				Appearance or Comment		
- Sumple Date		(°C)	Cond.	p			(NTU)				Clarity, Color, Odor, Ect.		

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0.86

Report Date: Friday, June 9, 2023 8:42:32 AM

1105

11.63

10106

17 May 23

Comments:



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2616 E. Broadway Ave, B					atasheet are Assessment			Company: Event: Sample ID: Sampling F		MDU Heskett Spring 2023			
Phone: (701) 258-	9720												
Weather Conditions	:	Temp:		°F	Wind:		@		Precip:	Sunny / Partly Cloudy / Cloudy			
	WELL INFO	ORMATIO	N					SAN	ADLING IN	FORMATI	ON		
Well Locked?	YES	NO			1	Purging Method: Bladder					Control Settings:		
Well Labeled?	YES	NØ			1	Sampling Method: Bladder				1	Purge: S Sec.		
Casing Strait?	(YES)	NO			1.		Equipment?	(YES)	NO	1	Recover: 5 Sec.		
Grout Seal Intact?	YES	би	Not \	/isible	None						PSI: 10		
Repairs Necessary?	sing Diameter: 2"				1	Duplicate S		YES	NQ	1			
				4	4	Duplicate S	ample ID:			J			
Water Level B	etore Purge:		X	ft	-		0.44	le List:		1			
	Vell Volume:			liters	-	1 Liter Raw	BOLL	1 Gal Nitric		4			
	op of Pump:		49,	ft	-	500mL Nitrio		1 Gai Nitric		1			
Water Level A				ft	1	500mL Nitrio				1			
	ent Method:		Water Level	Indicator	1	250mL Sulfu				1			
						LD READIN				•			
Stabilization Parar	meters	Temp.	Spec.		DO	ORP	Turbidity	Т	Pumping	mL	Appearance or Comment		
(3 Consecutiv		(°C)	Cond.	pH	(mg/L)	(mV)	(NTU)	Water Level	Rate	Removed	Clarity, Color, Odor, Ect.		
Purge Date	Time	±0.5°	±5%	±0.1	±10%	±10	(1110)	(ft)	mL/Min	Kemoved	clear, slightly turbid, turbid		
17 May 23	1400	Start of Wel	Purge			-				1	erear, siigricif carbia, carbia		
11112903	1410	8.60	8264	7.01	7.93	268.2	0.61	12.16	1000	10000	Cles		
1	1415	B147	8264	6.97	7.64	261.0	0.33	12.17	100.0	500.0	Cles		
	1420	8.44	8470	6.95	7,19	265,3	0.71	12.17	100.0	5000	Clear		
	1425	B.41	8744	694	6.64	270.1	0.34	12.18	100.0	502.0	Clear		
	1430	B.77	8899	6.94	6.14	270.3	0.66	12,18	100:0	500.0	Clear		
	1435	8,84	8999	6.93	6.07	272.5	0.10	12.18	100.0	500.0	cless		
1													
					-	-							
1						-				-			
	Well Sta	abilized?	(YES)	NO				Total Vo	lume Durged	3500.0	mL.		
			$\overline{}$					Total vo	unie ruigeu	3500.0			
Sample Date	Time	Temp. (°C)	Spec.	pH			Turbidity				Appearance or Comment		
17 Mar 23	1435	8.84	8999	/ 02	+	-	D.(O				Clarity, Color, Odor, Ect.		
17 (120)	11472	0.04	0.144	6.93			0.10						
Comments:	Collee	ted fiel	d blank	@ 144	0								

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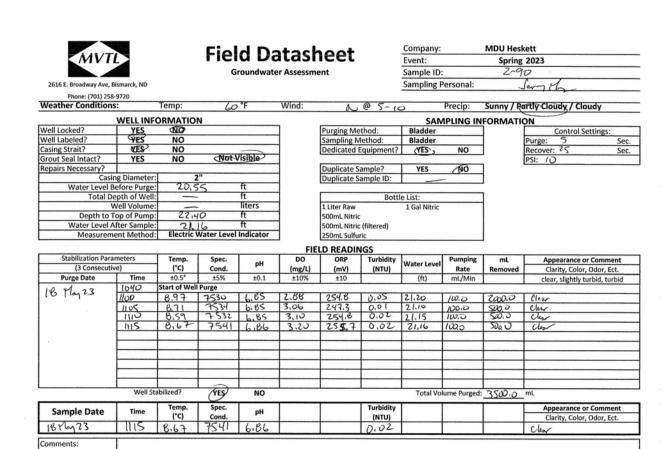


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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

	MV	π	
516 E. Br	roadway A	ve, Bismarc	k, N
Ph	one: (701)	258-9720	

Measurement Method:

Field Datasheet

Groundwater Assessment

 Company:
 MDU Heskett

 Event:
 Spring 2023

 Sample ID:
 3 - 90

 Sampling Personal:
 Jan 16

Sunny / Partly Cloudy / Cloudy

Purge: 5 Recover: 25

Control Settings:

Sec.

Weather Conditions: Wind: Temp: WELL INFORMATION Well Locked? NO NO Well Labeled? Not Visible Grout Seal Intact? YES NO ry? Ant colonic Casing Diameter: Repairs Necessary? Water Level Before Purge 1716 Total Depth of Well: Well Volume: liters 20,10 Depth to Top of Pump: ft Water Level After Sample:

	SAM	PLING INF	ORMATION
Purging Method:	Bladder		
Sampling Method:	Bladder		Pur
Dedicated Equipment?	(YES)	NO	Rec
			PSI:
Duplicate Sample?	YES	NO	

Precip:

N @ 5-10

Duplicate Sample ID: YES NO

Bottle List:

1 Liter Raw 1 Gal Nitric

SOOmL Nitric

500mL Nitric (filtered)

250mL Sulfuric

FIELD READINGS

Stabilization Par		Temp.			DO	ORP	Turbidity	Water Level	Pumping	mL	Appearance or Comment
(3 Consecu	tive)	(°C)	Cond.	pН	(mg/L)	(mV)	(NTU)	water Lever	Rate	Removed	Clarity, Color, Odor, Ect.
Purge Date	Time	±0.5°	±5%	±0.1	±10%	±10		(ft)	mL/Min		clear, slightly turbid, turbid
18 Hay 23	0925	Start of Wel	tart of Well Purge								
10 11340	0945	8.15	4727	6.82	4.16	221.2	0.22	17.42	100.0	2000.0	Clear
	OSSO	8.00	4684	6.81	4.20	224.6	4.38	17.46	100:0	500.0	Clear
	0955	8.10	4681	6.02	4.25	221.6	0,67	17:48	100.0	500.0	Clear
	1000	8.11	4687	6,81	4.24	222.3	0.13	17.49	100,0	500.0	Clear
			1								
	Well St	abilized?	MES	NO				Total Vo	ume Purged:	35,10,0	mL.

Sample Date	Time	Temp. (°C)	Spec. Cond.	рН	Turbidity (NTU)	Appearance or Comment Clarity, Color, Odor, Ect.
18 May 23	(000)	8.11	4657	6,81	0, 13	Clear
Comments:				***************************************		

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Account #: 2800

Client:

Montana-Dakota Utilities - Bismarck



Field Datasheet

Groundwater Assessment

Wind:

Company: MDU Heskett

Event: Spring 2023

Sample ID: SO R

Sampling Personal:

Sunny / Partly Cloudy Cloudy

Purge: 5

Control Settings

Sec.

Temp: WELL INFORMATION Well Locked? Well Labeled? YES NO NO Casing Strait? NO Not Visible Grout Seal Intact? (YES) Repairs Necessary? Casing Diameter: Water Level Before Purge: 13,71 Total Depth of Well: liters Well Volume: Depth to Top of Pump: ft Water Level After Sample Measurement Method:

	SAM	PLING IN	FORMATI	ON
Purging Method:	Bladder			
Sampling Method:	Bladder			Pur
Dedicated Equipment?	(YES)	NO	1	Red
				PSI

Precip:

N@5-10

Duplicate Sample? YES NO

Bo	Bottle List: 1 Gal Nitric	
1 Liter Raw	1 Gal Nitric	
500mL Nitric		
500mL Nitric (filtered)		
250mL Sulfuric		

FIELD READINGS

Stabilization Par	rameters	Temp.	Spec.	pH	DO	ORP	Turbidity	Water Level	Pumping	mL	Appearance or Comment
(3 Consecut	tive)	(°C)	Cond.	Pri	(mg/L)	(mV)	(NTU)	water Level	Rate	Removed	Clarity, Color, Odor, Ect.
Purge Date	Time	±0.5°	±5%	±0.1	±10%	±10		(ft)	mL/Min		clear, slightly turbid, turbid
10 11 22	12/6	Start of Wel	l Purge								
18 Hay 22	1236	7.76	6517	6.89	1157	218,5	5.83	14,26	100.0	2000,0	Cler
	1241	7.89	6507	6.91	1,28	210.3	4.48	14.28	100,0	500.0	Cler
	1246	7.85	6557	6.93	1,26	213.9	3.01	14.28	100.0	500,0	Char
	1251	7.89	6568	6,99	1.19	203,2	3,45	14.29	100.0	500.0	Cles
	Well St	abilized?	YES	NO				Total Vo	ume Purged:	35000	mL

Sample Date	Time	Temp. (°C)	Spec. Cond.	pH	Turbidity (NTU)	,	Appearance or Comment , Clarity, Color, Odor, Ect.
Belower	1251	7.89	6568	6.99	3,45		Clear
Comments:	T						

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Workorder: MDU Heskett (16035) PO: 196081 OP

Todd Peterson Montana-Dakota Utilities 400 N 4th St Bismarck, ND 58501 STATE

Certificate of Analysis

Approval

All data reported has been reviewed and approved by:



Claudette Carroll, Lab Manager Bismarck, ND

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

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

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

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Workorder Summary

Workorder Comments

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

Sample Comments

16035001 (MW13) - Sample

Total and dissolved selenium results have been rechecked. CC 8Jun23

16035006 (Dup 1) - Sample

Time sampled was not supplied by the client.

Total and dissolved selenium results have been rechecked. CC 8Jun23

16035007 (Field Blank (FB)) - Sample

Time sampled was not supplied by the client.

Analysis Results Comments

16035001 (MW13)

Sample analyzed beyond holding time.(pH)

16035002 (MW1-90)

Matrix spike and/or matrix spike duplicate recovery was low; the associated laboratory control sample recovery was acceptable.(Fluoride)

16035002 (MW1-90)

Sample analyzed beyond holding time.(pH)

16035003 (MW2-90)

Sample analyzed beyond holding time.(pH)

16035004 (MW3-90)

Sample analyzed beyond holding time.(pH)

16035005 (MW80R)

Sample analyzed beyond holding time.(pH)

16035006 (Dup 1)

Matrix spike and/or matrix spike duplicate recovery was high; the associated laboratory fortified blank recovery was acceptable.(Chloride)

16035006 (Dup 1)

Sample analyzed beyond holding time (pH)

16035007 (Field Blank (FB))

Sample analyzed beyond holding time.(pH)



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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

 Lab ID:
 16035001
 Date Collected:
 05/17/2023 11:05
 Matrix:
 Groundwater

 Sample ID:
 MW13
 Date Received:
 05/18/2023 14:00
 Collector:
 MVTL Field Service

Temp @ Receipt (C): 4.8

Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
10106	umhos/cm	1	1	05/17/2023 11:05	05/17/2023 11:05	JSM	
Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
6.86	units	0.01	1	05/17/2023 11:05	05/17/2023 11:05	JSM	
Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
11.63	degrees C		1	05/17/2023 11:05	05/17/2023 11:05	JSM	
Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
6490	mg/L	500	100	05/24/2023 15:12	05/24/2023 15:12	AMC	
Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
0.86	NTU	0.1	1	05/17/2023 11:05	05/17/2023 11:05	JSM	
Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
<0.0002	mg/L	0.0002	1	05/25/2023 09:40	05/30/2023 10:41	MDE	
Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
rtoounto				05/18/2023	05/18/2023		
6.43	mg/L	0.2	1	15:36	15:36	AMC	
	mg/L	0.2	1			AMC	
	mg/L Units	0.2 RDL	1 DF			AMC By	Qual
	Results 6.86 Results 11.63 Results 6490 Results 0.86	Results Units 6.86 units Results Units 11.63 degrees C Results Units 6490 mg/L Results Units 0.86 NTU	10106 umhos/cm 1 Results Units RDL 6.86 units 0.01 Results Units RDL 11.63 degrees C Results Units RDL 6490 mg/L 500 Results Units RDL 0.86 NTU 0.1 Results Units RDL Results Units RDL	Results Units RDL DF 6.86 units 0.01 1 Results Units RDL DF 11.63 degrees C 1 Results Units RDL DF 6490 mg/L 500 100 Results Units RDL DF 0.86 NTU 0.1 1 Results Units RDL DF	10106 umhos/cm 1 1 05/17/2023 11:05 Results Units RDL DF Prepared 6.86 units 0.01 1 05/17/2023 11:05 Results Units RDL DF Prepared 11.63 degrees C 1 05/17/2023 11:05 Results Units RDL DF Prepared 6490 mg/L 500 100 05/24/2023 15:12 Results Units RDL DF Prepared 0.86 NTU 0.1 1 05/17/2023 11:05 Results Units RDL DF Prepared <0.0002	10106 umhos/cm 1 1 05/17/2023 11:05 05/17/2023 11:05 Results Units RDL DF Prepared Analyzed 6.86 units 0.01 1 05/17/2023 11:05 05/17/2023 11:05 Results Units RDL DF Prepared Analyzed 11.63 degrees C 1 05/17/2023 11:05 05/17/2023 11:05 Results Units RDL DF Prepared Analyzed 6490 mg/L 500 100 05/24/2023 15:12 05/24/2023 15:12 Results Units RDL DF Prepared Analyzed 0.86 NTU 0.1 1 05/17/2023 11:05 05/17/2023 11:05 Results Units RDL DF Prepared Analyzed <0.0002	Results Units RDL DF Prepared Analyzed By 6.86 units 0.01 1 05/17/2023 11:05 05/17/2023 11:05 JSM Results Units RDL DF Prepared Analyzed By 11.63 degrees C 1 05/17/2023 11:05 05/17/2023 11:05 JSM Results Units RDL DF Prepared Analyzed By 6490 mg/L 500 100 05/24/2023 15:12 05/24/2023 15:12 AMC Results Units RDL DF Prepared Analyzed By 0.86 NTU 0.1 1 05/17/2023 11:05 05/17/2023 11:05 JSM Results Units RDL DF Prepared Analyzed By <0.0002

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

 Lab ID:
 16035001
 Date Collected:
 05/17/2023 11:05
 Matrix:
 Groundwater

 Sample ID:
 MW13
 Date Received:
 05/18/2023 14:00
 Collector:
 MVTL Field Service

Temp @ Receipt (C): 4.8

Method: EPA 6010D

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Boron, Dissolved	0.67	mg/L	0.5	5	05/19/2023 07:59	05/31/2023 10:11	SLZ	
Calcium	408	mg/L	5	5	05/19/2023 06:51	05/22/2023 14:26	SLZ	
Iron, Dissolved	<0.5	mg/L	0.5	5	05/19/2023 07:59	05/24/2023 11:43	SLZ	
Magnesium	635	mg/L	5	5	05/19/2023 06:51	05/22/2023 14:26	SLZ	
Manganese, Dissolved	<0.25	mg/L	0.25	5	05/19/2023 07:59	05/24/2023 11:43	SLZ	
Potassium	24.4	mg/L	5	5	05/19/2023 06:51	05/22/2023 14:26	SLZ	
Sodium	1910	mg/L	5	5	05/19/2023 06:51	05/22/2023 14:26	SLZ	

Method: EPA 6020B

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Arsenic, Dissolved	<0.004	mg/L	0.004	10	05/19/2023 07:59	05/25/2023 15:51	MDE	
Barium, Dissolved	0.0089	mg/L	0.004	10	05/19/2023 07:59	05/25/2023 15:51	MDE	
Cadmium, Dissolved	<0.001	mg/L	0.001	10	05/19/2023 07:59	05/25/2023 15:51	MDE	
Chromium, Dissolved	<0.004	mg/L	0.004	10	05/19/2023 07:59	05/25/2023 15:51	MDE	
Lead, Dissolved	<0.001	mg/L	0.001	10	05/19/2023 07:59	05/25/2023 15:51	MDE	
Molybdenum, Dissolved	<0.004	mg/L	0.004	10	05/19/2023 07:59	05/25/2023 15:51	MDE	
Selenium, Dissolved	0.0843	mg/L	0.01	10	05/19/2023 07:59	05/25/2023 15:51	MDE	
Silver, Dissolved	<0.001	mg/L	0.001	10	05/19/2023 07:59	05/25/2023 15:51	MDE	

Method: SM1030F

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Anion Summation	148	meq/L		1	06/06/2023 16:45	06/06/2023 16:45	CALC	
Cation Summation	156	meq/L		1	06/06/2023 16:45	06/06/2023 16:45	CALC	
Percent Difference	2.85	%		1	06/06/2023 16:45	06/06/2023 16:45	CALC	
TDS - Summation	9860	mg/L	12.5	1	06/06/2023 16:45	06/06/2023 16:45	CALC	

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Report Date: Friday, June 9, 2023 8:54:10 AM

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

 Lab ID:
 16035001
 Date Collected:
 05/17/2023 11:05
 Matrix:
 Groundwater

 Sample ID:
 MW13
 Date Received:
 05/18/2023 14:00
 Collector:
 MVTL Field Service

Temp @ Receipt (C): 4.8

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Alkalinity, Phenolphthalein	<20.5	mg/L as CaCO3	20.5	1	05/19/2023 02:56	05/19/2023 02:56	RAA	
Alkalinity, Total	505	mg/L as CaCO3	20.5	1	05/19/2023 02:56	05/19/2023 02:56	RAA	
Bicarbonate	505	mg/L as CaCO3	20.5	1	05/19/2023 02:56	05/19/2023 02:56	RAA	
Carbonate	<20.5	mg/L as CaCO3	20.5	1	05/19/2023 02:56	05/19/2023 02:56	RAA	
Hydroxide	<20.5	mg/L as CaCO3	20.5	1	05/19/2023 02:56	05/19/2023 02:56	RAA	
Method: SM2340B-2011								
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Hardness - Total	3630	mg/L as CaCO3	6.62	1	06/06/2023 16:45	06/06/2023 16:45	CALC	
Method: SM2510 B-2011 EC								
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Specific Conductance	9967	umhos/cm	1	1	05/19/2023 02:56	05/19/2023 02:56	RAA	
Method: SM4500 H+ B-2011								
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
рН	7.8	units	0.1	1	05/19/2023 02:56	05/19/2023 02:56	RAA	*
Method: SM4500-CI-E 2011								
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Chloride	75.8	mg/L	2.0	1	05/23/2023 11:38	05/23/2023 11:38	AMC	
Method: SM4500-F-C-2011								
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Fluoride	0.90	mg/L	0.1	1	05/19/2023 02:56	05/19/2023 02:56	RAA	
Method: USDA 20b								
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Sodium Adsorption Ratio	13.8		0.17	1	06/06/2023 16:45	06/06/2023 16:45	CALC	

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

Date Collected: Lab ID: 16035002 05/17/2023 14:35 Matrix: Groundwater Sample ID: MW1-90 05/18/2023 14:00 MVTL Field Service Date Received: Collector:

Temp @ Receipt (C): Received on Ice: 4.8 Yes

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Specific Conductance - Field	8999	umhos/cm	1	1	05/17/2023 14:35	05/17/2023 14:35	JSM	
Method: 150.2								
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
pH - Field	6.93	units	0.01	1	05/17/2023 14:35	05/17/2023 14:35	JSM	

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Quai
Temperature - Field C	8.84	degrees (С	1	05/17/2023 14:35	05/17/2023 14:35	JSM	

Method: ASTM D516-16

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Sulfate	6540	mg/L	500	100	05/24/2023 15:14	05/24/2023 15:14	AMC	

Method: EPA 180.1

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Turbidity - Field	0.1	NTU	0.1	1	05/17/2023 14·35	05/17/2023 14·35	JSM	

Method: EPA 245.1

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Mercury, Dissolved	<0.0002	mg/L	0.0002	1	05/25/2023 09:40	05/30/2023 10:41	MDE	

Method: EPA 353.2

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Nitrate + Nitrite as N	7.85	mg/L	1	5	05/18/2023 15·47	05/18/2023 15 [.] 47	AMC	

Method: EPA 365.1

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Phosphorus as P	<0.1	mg/L	0.1	1	05/25/2023 15:40	05/26/2023 11:15	AMC	

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Friday, June 9, 2023 8:54:10 AM Report Date:





Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

 Lab ID:
 16035002
 Date Collected:
 05/17/2023 14:35
 Matrix:
 Groundwater

 Sample ID:
 MW1-90
 Date Received:
 05/18/2023 14:00
 Collector:
 MVTL Field Service

Temp @ Receipt (C): 4.8 Received on Ice: Yes

Method: EPA 6010D

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Boron, Dissolved	<0.5	mg/L	0.5	5	05/19/2023 07:59	05/31/2023 10:12	SLZ	
Calcium	403	mg/L	5	5	05/19/2023 06:51	05/22/2023 14:27	SLZ	
Iron, Dissolved	<0.5	mg/L	0.5	5	05/19/2023 07:59	05/24/2023 11:44	SLZ	
Magnesium	845	mg/L	5	5	05/19/2023 06:51	05/22/2023 14:27	SLZ	
Manganese, Dissolved	<0.25	mg/L	0.25	5	05/19/2023 07:59	05/24/2023 11:44	SLZ	
Potassium	20.9	mg/L	5	5	05/19/2023 06:51	05/22/2023 14:27	SLZ	
Sodium	1390	mg/L	5	5	05/19/2023 06:51	05/22/2023 14:27	SLZ	

Method: EPA 6020B

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Arsenic, Dissolved	<0.002	mg/L	0.002	5	05/19/2023 07:59	05/23/2023 17:15	MDE	
Barium, Dissolved	0.0092	mg/L	0.002	5	05/19/2023 07:59	05/23/2023 17:15	MDE	
Cadmium, Dissolved	<0.0005	mg/L	0.0005	5	05/19/2023 07:59	05/23/2023 17:15	MDE	
Chromium, Dissolved	<0.002	mg/L	0.002	5	05/19/2023 07:59	05/23/2023 17:15	MDE	
Lead, Dissolved	<0.0005	mg/L	0.0005	5	05/19/2023 07:59	05/23/2023 17:15	MDE	
Molybdenum, Dissolved	<0.002	mg/L	0.002	5	05/19/2023 07:59	05/23/2023 17:15	MDE	
Selenium, Dissolved	0.0270	mg/L	0.005	5	05/19/2023 07:59	05/23/2023 17:15	MDE	
Silver, Dissolved	<0.0005	mg/L	0.0005	5	05/19/2023 07:59	05/23/2023 17:15	MDE	

Method: SM1030F

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Anion Summation	146	meq/L		1	05/25/2023 08:15	05/25/2023 08:15	CALC	
Cation Summation	150	meq/L		1	05/25/2023 08:15	05/25/2023 08:15	CALC	
Percent Difference	1.68	%		1	05/25/2023 08:15	05/25/2023 08:15	CALC	
TDS - Summation	9480	mg/L	12.5	1	05/25/2023 08:16	05/25/2023 08:16	CALC	

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

 Lab ID:
 16035002
 Date Collected:
 05/17/2023 14:35
 Matrix:
 Groundwater

 Sample ID:
 MW1-90
 Date Received:
 05/18/2023 14:00
 Collector:
 MVTL Field Service

Temp @ Receipt (C): 4.8 Received on Ice: Yes

Alkalinity, Phenolphthalein	Ву	Qual
Bicarbonate 349	RAA	
Section Sect	RAA	
Caronate	RAA	
Method: SM2340B-2011	RAA	
Parameter Results Units RDL DF Prepared Analyzed	RAA	
Hardness - Total		
Method: SM2510 B-2011 EC Parameter Results Units RDL DF Prepared Analyzed O5/19/2023 O3/33 O3/33	Ву	Qual
Parameter Results Units RDL DF Prepared Analyzed	CALC	
Specific Conductance 9020 umhos/cm 1 1 05/19/2023 03:33 05/19/2023 03:33 Method: SM4500 H+ B-2011 Perameter Results Units RDL DF Prepared Analyzed pH 7.6 units 0.1 1 05/19/2023 03:33 05/19/2023 03:33 Method: SM4500-CI-E 2011 Prepared Analyzed Chloride 62.7 mg/L 2.0 1 05/23/2023 05/23/2023 11:39 05/23/2023 11:39 Method: SM4500-F-C-2011 Prepared Analyzed Fluoride 1.21 mg/L 0.1 1 05/19/2023 05/19/2023 03:33 05/19/2023 03:33 Method: USDA 20b Parameter Results Units RDL DF Prepared Analyzed Prepared Analyzed		
Method: SM4500 H+ B-2011 Method: SM4500 H+ B-2011 Parameter Results Units RDL DF Prepared O5/19/2023 O5/19/2023 O3:33	Ву	Qual
Parameter Results Units RDL DF Prepared Analyzed pH 7.6 units 0.1 1 05/19/2023 03:33 05/19/2023 03:33 Method: SM4500-CI-E 2011 Prepared Analyzed Chloride 62.7 mg/L 2.0 1 05/23/2023 11:39 05/23/2023 11:39 Method: SM4500-F-C-2011 Parameter Results Units RDL DF Prepared Analyzed Fluoride 1.21 mg/L 0.1 1 05/19/2023 03:33 03:33 Method: USDA 20b Parameter Results Units RDL DF Prepared Analyzed 05/25/2023 05/25/2023 05/25/2023 05/25/2023 05/25/2023	RAA	
PH 7.6 units 0.1 1 05/19/2023 03:33		
PH 7.6 units 0.1 1 03:33 03:33 Method: SM4500-CI-E 2011 Results Units RDL DF Prepared Analyzed Chloride 62.7 mg/L 2.0 1 05/23/2023 11:39 05/23/2023 11:39 Method: SM4500-F-C-2011 Parameter Results Units RDL DF Prepared Analyzed Fluoride 1.21 mg/L 0.1 1 05/19/2023 03:33 05/19/2023 03:33 Method: USDA 20b Parameter Results Units RDL DF Prepared Analyzed 05/25/2023 05/25/2023 05/25/2023 05/25/2023 05/25/2023	Ву	Qual
Parameter Results Units RDL DF Prepared Analyzed Chloride 62.7 mg/L 2.0 1 05/23/2023 11:39 05/23/2023 11:39 Method: SM4500-F-C-2011 Parameter Results Units RDL DF Prepared Analyzed Fluoride 1.21 mg/L 0.1 1 05/19/2023 03:33 05/19/2023 03:33 Method: USDA 20b Parameter Results Units RDL DF Prepared Analyzed 05/25/2023 05/25/2023 05/25/2023 05/25/2023 05/25/2023	RAA	*
Chloride 62.7 mg/L 2.0 1 05/23/2023 11:39 05/23/2023 11:39 Method: SM4500-F-C-2011 Results Units RDL DF Prepared Analyzed Fluoride 1.21 mg/L 0.1 1 05/19/2023 03:33 05/19/2023 03:33 Method: USDA 20b Prepared Analyzed Analyzed Parameter Results Units RDL DF Prepared Analyzed		
Method: SM4500-F-C-2011 Results Units RDL DF Prepared Analyzed Fluoride 1.21 mg/L 0.1 1 05/19/2023 03:33 05/19/2023 03:33 Method: USDA 20b Prepared Analyzed Analyzed Parameter Results Units RDL DF Prepared Analyzed	Ву	Qual
Parameter Results Units RDL DF Prepared Analyzed Fluoride 1.21 mg/L 0.1 1 05/19/2023 05/19/2023 03:33 05/19/2023 03:33 Method: USDA 20b Parameter Results Units RDL DF Prepared Analyzed 05/25/2023 05/25/2023 05/25/2023 05/25/2023 05/25/2023	AMC	
Fluoride 1.21 mg/L 0.1 1 05/19/2023 05/19/2023 03:33 Method: USDA 20b Parameter Results Units RDL DF Prepared Analyzed 05/25/2023 05/25/2023		
Method: USDA 20b	Ву	Qual
Parameter Results Units RDL DF Prepared Analyzed	RAA	*
05/25/2023 05/25/2023		
05/25/2023 05/25/2023	Ву	Qual
Sodium Adsorption Ratio 9.02 0.17 1 0012012020 00120120120 00120120120 00120120120 00120120120 00120120120 00120120120 00120120120 00120120120 00120120120 00120120120 00120120120 00120120120 00120120 00120120120 00120120120 001201200000000	CALC	

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

 Lab ID:
 16035003
 Date Collected:
 05/18/2023 11:15
 Matrix:
 Groundwater

 Sample ID:
 MW2-90
 Date Received:
 05/18/2023 14:00
 Collector:
 MVTL Field Service

Temp @ Receipt (C): 4.8 Received on Ice: Yes

Method: 120.1								
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Specific Conductance - Field	7541	umhos/cm	1	1	05/18/2023 11:15	05/18/2023 11:15	JSM	
Method: 150.2								
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
pH - Field	6.86	units	0.01	1	05/18/2023 11:15	05/18/2023 11:15	JSM	
Method: 170.1								
Parameter	Results	Unite	BDI	DF	Prenared	Analyzod	Rv	Oual

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Temperature - Field C	8.67	degrees (0	1	05/18/2023 11:15	05/18/2023 11:15	JSM	

Method: ASTM D516-16

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Sulfate	5010	mg/L	250	50	05/24/2023 15:15	05/24/2023 15:15	AMC	

Method: EPA 180.1

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Turbidity - Field	<0.1	NTU	0.1	1	05/18/2023 11·15	05/18/2023 11·15	JSM	

Method: EPA 245.1

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Mercury, Dissolved	<0.0002	mg/L	0.0002	1	05/25/2023 09:40	05/30/2023 10:41	MDE	

Method: EPA 353.2

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Nitrate + Nitrite as N	30.3	mg/L	2	10	05/18/2023 15:49	05/18/2023 15:49	AMC	

Method: EPA 365.1

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Phosphorus as P	<0.1	mg/L	0.1	1	05/25/2023 15:40	05/26/2023 11:16	AMC	

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

 Lab ID:
 16035003
 Date Collected:
 05/18/2023 11:15
 Matrix:
 Groundwater

 Sample ID:
 MW2-90
 Date Received:
 05/18/2023 14:00
 Collector:
 MVTL Field Service

Temp @ Receipt (C): 4.8 Received on Ice: Yes

Method: EPA 6010D

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Boron, Dissolved	<0.5	mg/L	0.5	5	05/19/2023 07:59	05/31/2023 10:12	SLZ	
Calcium	469	mg/L	5	5	05/19/2023 06:51	05/22/2023 14:28	SLZ	
Iron, Dissolved	<0.5	mg/L	0.5	5	05/19/2023 07:59	05/24/2023 11:45	SLZ	
Magnesium	746	mg/L	5	5	05/19/2023 06:51	05/22/2023 14:28	SLZ	
Manganese, Dissolved	<0.25	mg/L	0.25	5	05/19/2023 07:59	05/24/2023 11:45	SLZ	
Potassium	26.8	mg/L	5	5	05/19/2023 06:51	05/22/2023 14:28	SLZ	
Sodium	815	mg/L	5	5	05/19/2023 06:51	05/22/2023 14:28	SLZ	

Method: EPA 6020B

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Arsenic, Dissolved	<0.002	mg/L	0.002	5	05/19/2023 07:59	05/23/2023 17:19	MDE	
Barium, Dissolved	0.0084	mg/L	0.002	5	05/19/2023 07:59	05/23/2023 17:19	MDE	
Cadmium, Dissolved	<0.0005	mg/L	0.0005	5	05/19/2023 07:59	05/23/2023 17:19	MDE	
Chromium, Dissolved	<0.002	mg/L	0.002	5	05/19/2023 07:59	05/23/2023 17:19	MDE	
Lead, Dissolved	<0.0005	mg/L	0.0005	5	05/19/2023 07:59	05/23/2023 17:19	MDE	
Molybdenum, Dissolved	<0.002	mg/L	0.002	5	05/19/2023 07:59	05/23/2023 17:19	MDE	
Selenium, Dissolved	0.0767	mg/L	0.005	5	05/19/2023 07:59	05/23/2023 17:19	MDE	
Silver, Dissolved	<0.0005	mg/L	0.0005	5	05/19/2023 07:59	05/23/2023 17:19	MDE	

Method: SM1030F

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Anion Summation	121	meq/L		1	06/06/2023 16:39	06/06/2023 16:39	CALC	
Cation Summation	121	meq/L		1	06/06/2023 16:39	06/06/2023 16:39	CALC	
Percent Difference	-0.10	%		1	06/06/2023 16:39	06/06/2023 16:39	CALC	
TDS - Summation	7550	mg/L	12.5	1	06/06/2023 16:39	06/06/2023 16:39	CALC	

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Report Date: Friday, June 9, 2023 8:54:10 AM

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2800 Account #: Client: Montana-Dakota Utilities - Bismarck

Analytical Results

Lab ID: 16035003 **Date Collected:** 05/18/2023 11:15 Matrix: Groundwater Sample ID: MW2-90 Date Received: 05/18/2023 14:00 MVTL Field Service Collector:

Temp @ Receipt (C): Received on Ice: 4.8 Yes

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Alkalinity, Phenolphthalein	<20.5	mg/L as CaCO3	20.5	1	05/19/2023 04:01	05/19/2023 04:01	RAA	
Alkalinity, Total	619	mg/L as CaCO3	20.5	1	05/19/2023 04:01	05/19/2023 04:01	RAA	
Bicarbonate	619	mg/L as CaCO3	20.5	1	05/19/2023 04:01	05/19/2023 04:01	RAA	
Carbonate	<20.5	mg/L as CaCO3	20.5	1	05/19/2023 04:01	05/19/2023 04:01	RAA	
Hydroxide	<20.5	mg/L as CaCO3	20.5	1	05/19/2023 04:01	05/19/2023 04:01	RAA	
Method: SM2340B-2011								
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Hardness - Total	4240	mg/L as CaCO3	6.62	1	06/06/2023 16:39	06/06/2023 16:39	CALC	
Method: SM2510 B-2011 EC								
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Specific Conductance	7312	umhos/cm	1	1	05/19/2023 04:01	05/19/2023 04:01	RAA	
Method: SM4500 H+ B-2011								
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
pH	7.3	units	0.1	1	05/19/2023 04:01	05/19/2023 04:01	RAA	*
Method: SM4500-CI-E 2011								
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Chloride	85.6	mg/L	2.0	1	05/23/2023 11:40	05/23/2023 11:40	AMC	
Method: SM4500-F-C-2011								
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Fluoride	1.00	mg/L	0.1	1	05/19/2023 04:01	05/19/2023 04:01	RAA	
Method: USDA 20b								
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Sodium Adsorption Ratio	5.44		0.17	1	06/06/2023 16:39	06/06/2023 16:39	CALC	

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Report Date: Friday, June 9, 2023 8:54:10 AM

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JSM

10:00

Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

Lab ID: 16035004 **Date Collected:** 05/18/2023 10:00 Matrix: Groundwater Sample ID: MW3-90 Date Received: 05/18/2023 14:00 MVTL Field Service Collector:

Temp @ Receipt (C): Received on Ice: 4.8 Yes

8.11

Method: 120.1								
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Specific Conductance - Field	4657	umhos/cm	1	1	05/18/2023 10:00	05/18/2023 10:00	JSM	
Method: 150.2								
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
pH - Field	6.81	units	0.01	1	05/18/2023 10:00	05/18/2023 10:00	JSM	
Method: 170.1								
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Tomporature Field C	0 11	dogroos C		1	05/18/2023	05/18/2023	ISM	

Method: ASTM D516-16

Temperature - Field C

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Sulfate	2510	mg/L	100	20	05/24/2023 15:16	05/24/2023 15:16	AMC	

10:00

degrees C

Method: EPA 180.1

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Turbidity - Field	0.13	NTU	0.1	1	05/18/2023 10:00	05/18/2023 10:00	JSM	

Method: EPA 245.1

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Mercury, Dissolved	<0.0002	mg/L	0.0002	1	05/25/2023 09:40	05/30/2023 10:41	MDE	

Method: EPA 353.2

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Nitrate + Nitrite as N	0.57	mg/L	0.2	1	05/18/2023 15:40	05/18/2023 15:40	AMC	

Method: EPA 365.1

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Phosphorus as P	<0.1	mg/L	0.1	1	05/25/2023 15:40	05/26/2023 11:17	AMC	

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

 Lab ID:
 16035004
 Date Collected:
 05/18/2023 10:00
 Matrix:
 Groundwater

 Sample ID:
 MW3-90
 Date Received:
 05/18/2023 14:00
 Collector:
 MVTL Field Service

Temp @ Receipt (C): 4.8 Received on Ice: Yes

Method: EPA 6010D

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Boron, Dissolved	0.14	mg/L	0.1	1	05/19/2023 07:59	05/31/2023 10:13	SLZ	
Calcium	428	mg/L	5	5	05/19/2023 06:51	05/22/2023 14:29	SLZ	
Iron, Dissolved	<0.1	mg/L	0.1	1	05/19/2023 07:59	05/24/2023 11:46	SLZ	
Magnesium	206	mg/L	5	5	05/19/2023 06:51	05/22/2023 14:29	SLZ	
Manganese, Dissolved	<0.05	mg/L	0.05	1	05/19/2023 07:59	05/24/2023 11:46	SLZ	
Potassium	12.2	mg/L	5	5	05/19/2023 06:51	05/22/2023 14:29	SLZ	
Sodium	589	mg/L	5	5	05/19/2023 06:51	05/22/2023 14:29	SLZ	

Method: EPA 6020B

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Arsenic, Dissolved	<0.002	mg/L	0.002	5	05/19/2023 07:59	05/23/2023 17:23	MDE	
Barium, Dissolved	0.0094	mg/L	0.002	5	05/19/2023 07:59	05/23/2023 17:23	MDE	
Cadmium, Dissolved	<0.0005	mg/L	0.0005	5	05/19/2023 07:59	05/23/2023 17:23	MDE	
Chromium, Dissolved	<0.002	mg/L	0.002	5	05/19/2023 07:59	05/23/2023 17:23	MDE	
Lead, Dissolved	<0.0005	mg/L	0.0005	5	05/19/2023 07:59	05/23/2023 17:23	MDE	
Molybdenum, Dissolved	<0.002	mg/L	0.002	5	05/19/2023 07:59	05/23/2023 17:23	MDE	
Selenium, Dissolved	0.2812	mg/L	0.005	5	05/19/2023 07:59	05/23/2023 17:23	MDE	
Silver, Dissolved	<0.0005	mg/L	0.0005	5	05/19/2023 07:59	05/23/2023 17:23	MDE	

Method: SM1030F

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Anion Summation	63.1	meq/L		1	06/06/2023 16:41	06/06/2023 16:41	CALC	
Cation Summation	64.2	meq/L		1	06/06/2023 16:41	06/06/2023 16:41	CALC	
Percent Difference	0.87	%		1	06/06/2023 16:41	06/06/2023 16:41	CALC	
TDS - Summation	4080	mg/L	12.5	1	06/06/2023 16:41	06/06/2023 16:41	CALC	

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Report Date: Friday, June 9, 2023 8:54:10 AM

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2800 Account #: Client: Montana-Dakota Utilities - Bismarck

Analytical Results

Lab ID: 16035004 **Date Collected:** 05/18/2023 10:00 Matrix: Groundwater Sample ID: MW3-90 Date Received: 05/18/2023 14:00 MVTL Field Service Collector:

Temp @ Receipt (C): Received on Ice: 4.8 Yes

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Alkalinity, Phenolphthalein	<20.5	mg/L as CaCO3	20.5	1	05/19/2023 04:27	05/19/2023 04:27	RAA	
Alkalinity, Total	494	mg/L as CaCO3	20.5	1	05/19/2023 04:27	05/19/2023 04:27	RAA	
Bicarbonate	494	mg/L as CaCO3	20.5	1	05/19/2023 04:27	05/19/2023 04:27	RAA	
Carbonate	<20.5	mg/L as CaCO3	20.5	1	05/19/2023 04:27	05/19/2023 04:27	RAA	
Hydroxide	<20.5	mg/L as CaCO3	20.5	1	05/19/2023 04:27	05/19/2023 04:27	RAA	
Method: SM2340B-2011								
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Hardness - Total	1920	mg/L as CaCO3	6.62	1	06/06/2023 16:41	06/06/2023 16:41	CALC	
Method: SM2510 B-2011 EC								
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Specific Conductance	4606	umhos/cm	1	1	05/19/2023 04:27	05/19/2023 04:27	RAA	
Method: SM4500 H+ B-2011								
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
pH	7.6	units	0.1	1	05/19/2023 04:27	05/19/2023 04:27	RAA	*
Method: SM4500-CI-E 2011								
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Chloride	35.9	mg/L	2.0	1	05/23/2023 11:41	05/23/2023 11:41	AMC	
Method: SM4500-F-C-2011								
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Fluoride	0.12	mg/L	0.1	1	05/19/2023 04:27	05/19/2023 04:27	RAA	
Method: USDA 20b								
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Sodium Adsorption Ratio	5.85		0.17	1	06/06/2023 16:41	06/06/2023 16:41	CALC	

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JSM

12:51

Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

Lab ID: 16035005 **Date Collected:** 05/18/2023 12:51 Matrix: Groundwater Sample ID: MW80R Date Received: 05/18/2023 14:00 MVTL Field Service Collector:

Temp @ Receipt (C): Received on Ice: 4.8 Yes

7.89

Method: 120.1								
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Specific Conductance - Field	6568	umhos/cm	1	1	05/18/2023 12:51	05/18/2023 12:51	JSM	
Method: 150.2								
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
pH - Field	6.99	units	0.01	1	05/18/2023 12:51	05/18/2023 12:51	JSM	
Method: 170.1								
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Temperature - Field C	7 90	dogroos C		1	05/18/2023	05/18/2023	ISM	

Method:	MT2A	D51	6_1	6

Temperature - Field C

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Sulfate	4150	mg/L	200	40	05/24/2023 15:17	05/24/2023 15:17	AMC	

12:51

degrees C

Method: EPA 180.1

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Turbidity - Field	3.45	NTU	0.1	1	05/18/2023 12·51	05/18/2023 12:51	JSM	

Method: EPA 245.1

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Mercury, Dissolved	<0.0002	mg/L	0.0002	1	05/25/2023 09:40	05/30/2023 10:41	MDE	

Method: EPA 353.2

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Nitrate + Nitrite as N	22.7	mg/L	2	10	05/18/2023 15:50	05/18/2023 15:50	AMC	

Method: EPA 365.1

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Phosphorus as P	<0.1	mg/L	0.1	1	05/25/2023 15:40	05/26/2023 11:19	AMC	

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Report Date: Friday, June 9, 2023 8:54:10 AM

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

 Lab ID:
 16035005
 Date Collected:
 05/18/2023 12:51
 Matrix:
 Groundwater

 Sample ID:
 MW80R
 Date Received:
 05/18/2023 14:00
 Collector:
 MVTL Field Service

Temp @ Receipt (C): 4.8 Received on Ice: Yes

Method: EPA 6010D

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Boron, Dissolved	<0.5	mg/L	0.5	5	05/19/2023 07:59	05/31/2023 10:14	SLZ	
Calcium	479	mg/L	5	5	05/19/2023 06:51	05/22/2023 14:33	SLZ	
Iron, Dissolved	<0.5	mg/L	0.5	5	05/19/2023 07:59	05/24/2023 11:47	SLZ	
Magnesium	626	mg/L	5	5	05/19/2023 06:51	05/22/2023 14:33	SLZ	
Manganese, Dissolved	0.29	mg/L	0.25	5	05/19/2023 07:59	05/24/2023 11:47	SLZ	
Potassium	5.75	mg/L	5	5	05/19/2023 06:51	05/22/2023 14:33	SLZ	
Sodium	642	mg/L	5	5	05/19/2023 06:51	05/22/2023 14:33	SLZ	

Method: EPA 6020B

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Arsenic, Dissolved	<0.002	mg/L	0.002	5	05/19/2023 07:59	05/23/2023 17:28	MDE	
Barium, Dissolved	0.0108	mg/L	0.002	5	05/19/2023 07:59	05/23/2023 17:28	MDE	
Cadmium, Dissolved	<0.0005	mg/L	0.0005	5	05/19/2023 07:59	05/23/2023 17:28	MDE	
Chromium, Dissolved	<0.002	mg/L	0.002	5	05/19/2023 07:59	05/23/2023 17:28	MDE	
Lead, Dissolved	<0.0005	mg/L	0.0005	5	05/19/2023 07:59	05/23/2023 17:28	MDE	
Molybdenum, Dissolved	0.0023	mg/L	0.002	5	05/19/2023 07:59	05/23/2023 17:28	MDE	
Selenium, Dissolved	0.0448	mg/L	0.005	5	05/19/2023 07:59	05/23/2023 17:28	MDE	
Silver, Dissolved	<0.0005	mg/L	0.0005	5	05/19/2023 07:59	05/23/2023 17:28	MDE	

Method: SM1030F

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Anion Summation	106	meq/L		1	06/06/2023 16:41	06/06/2023 16:41	CALC	
Cation Summation	103	meq/L		1	06/06/2023 16:41	06/06/2023 16:41	CALC	
Percent Difference	-1.41	%		1	06/06/2023 16:41	06/06/2023 16:41	CALC	
TDS - Summation	6500	mg/L	12.5	1	06/06/2023 16:41	06/06/2023 16:41	CALC	

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2800 Account #: Client: Montana-Dakota Utilities - Bismarck

Analytical Results

Lab ID: 16035005 **Date Collected:** 05/18/2023 12:51 Matrix: Groundwater MW80R Sample ID: Date Received: 05/18/2023 14:00 MVTL Field Service Collector:

Temp @ Receipt (C): Received on Ice: 4.8 Yes

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Alkalinity, Phenolphthalein	<20.5	mg/L as CaCO3	20.5	1	05/19/2023 04:44	05/19/2023 04:44	RAA	
Alkalinity, Total	666	mg/L as CaCO3	20.5	1	05/19/2023 04:44	05/19/2023 04:44	RAA	
Bicarbonate	666	mg/L as CaCO3	20.5	1	05/19/2023 04:44	05/19/2023 04:44	RAA	
Carbonate	<20.5	mg/L as CaCO3	20.5	1	05/19/2023 04:44	05/19/2023 04:44	RAA	
Hydroxide	<20.5	mg/L as CaCO3	20.5	1	05/19/2023 04:44	05/19/2023 04:44	RAA	
Method: SM2340B-2011								
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Hardness - Total	3770	mg/L as CaCO3	6.62	1	06/06/2023 16:41	06/06/2023 16:41	CALC	
Method: SM2510 B-2011 EC								
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Specific Conductance	6420	umhos/cm	1	1	05/19/2023 04:44	05/19/2023 04:44	RAA	
Method: SM4500 H+ B-2011								
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
рН	7.4	units	0.1	1	05/19/2023 04:44	05/19/2023 04:44	RAA	*
Method: SM4500-CI-E 2011								
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Chloride	182	mg/L	2.0	1	05/23/2023 11:42	05/23/2023 11:42	AMC	
Method: SM4500-F-C-2011								
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Fluoride	0.22	mg/L	0.1	1	05/19/2023 04:44	05/19/2023 04:44	RAA	
Method: USDA 20b								
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Sodium Adsorption Ratio	4.54		0.17	1	06/06/2023 16:41	06/06/2023 16:41	CALC	

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

Lab ID:16035006Date Collected:05/17/2023Matrix:GroundwaterSample ID:Dup 1Date Received:05/18/2023 14:00Collector:MVTL Field Service

Temp @ Receipt (C): 4.8

Method: ASTM D516-16

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Sulfate	6910	mg/L	500	100	05/24/2023 15:18	05/24/2023 15:18	AMC	

Method: EPA 245.1

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Mercury, Dissolved	<0.0002	mg/L	0.0002	1	05/25/2023 09:40	05/30/2023 10:41	MDE	

Method: EPA 353.2

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Nitrate + Nitrite as N	6.42	mg/L	0.2	1	05/18/2023 15:52	05/18/2023 15:52	AMC	

Method: EPA 365.1

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	ву	Quai
Phosphorus as P	<0.1	mg/L	0.1	1	05/25/2023 15:40	05/26/2023 11:20	AMC	

Method: EPA 6010D

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Boron, Dissolved	0.67	mg/L	0.5	5	05/19/2023 07:59	05/31/2023 10:14	SLZ	
Calcium	402	mg/L	5	5	05/19/2023 06:51	05/22/2023 14:33	SLZ	
Iron, Dissolved	<0.5	mg/L	0.5	5	05/19/2023 07:59	05/24/2023 11:48	SLZ	
Magnesium	628	mg/L	5	5	05/19/2023 06:51	05/22/2023 14:33	SLZ	
Manganese, Dissolved	<0.25	mg/L	0.25	5	05/19/2023 07:59	05/24/2023 11:48	SLZ	
Potassium	24.3	mg/L	5	5	05/19/2023 06:51	05/22/2023 14:33	SLZ	
Sodium	1910	mg/L	5	5	05/19/2023 06:51	05/22/2023 14:33	SLZ	

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

Lab ID:16035006Date Collected:05/17/2023Matrix:GroundwaterSample ID:Dup 1Date Received:05/18/2023 14:00Collector:MVTL Field Service

Temp @ Receipt (C): 4.8

Method: EPA 6020B

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Arsenic, Dissolved	<0.002	mg/L	0.002	5	05/19/2023 07:59	05/23/2023 17:32	MDE	
Barium, Dissolved	0.0064	mg/L	0.002	5	05/19/2023 07:59	05/23/2023 17:32	MDE	
Cadmium, Dissolved	<0.0005	mg/L	0.0005	5	05/19/2023 07:59	05/23/2023 17:32	MDE	
Chromium, Dissolved	<0.002	mg/L	0.002	5	05/19/2023 07:59	05/23/2023 17:32	MDE	
Lead, Dissolved	<0.0005	mg/L	0.0005	5	05/19/2023 07:59	05/23/2023 17:32	MDE	
Molybdenum, Dissolved	<0.002	mg/L	0.002	5	05/19/2023 07:59	05/23/2023 17:32	MDE	
Selenium, Dissolved	0.0844	mg/L	0.005	5	05/19/2023 07:59	05/23/2023 17:32	MDE	
Silver, Dissolved	<0.0005	mg/L	0.0005	5	05/19/2023 07:59	05/23/2023 17:32	MDE	

Method: SM1030F

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Anion Summation	156	meq/L		1	05/25/2023 08:17	05/25/2023 08:17	CALC	
Cation Summation	155	meq/L		1	05/25/2023 08:17	05/25/2023 08:17	CALC	
Percent Difference	-0.28	%		1	05/25/2023 08:17	05/25/2023 08:17	CALC	
TDS - Summation	10200	mg/L	12.5	1	05/25/2023 08:17	05/25/2023 08:17	CALC	

Method: SM2320 B-2011

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Alkalinity, Phenolphthalein	<20.5	mg/L as CaCO3	20.5	1	05/19/2023 15:32	05/19/2023 15:32	RAA	
Alkalinity, Total	496	mg/L as CaCO3	20.5	1	05/19/2023 15:32	05/19/2023 15:32	RAA	
Bicarbonate	496	mg/L as CaCO3	20.5	1	05/19/2023 15:32	05/19/2023 15:32	RAA	
Carbonate	<20.5	mg/L as CaCO3	20.5	1	05/19/2023 15:32	05/19/2023 15:32	RAA	
Hydroxide	<20.5	mg/L as CaCO3	20.5	1	05/19/2023 15:32	05/19/2023 15:32	RAA	

Method: SM2340B-2011

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Hardness - Total	3590	mg/L as CaCO3	6.62	1	05/25/2023 08:17	05/25/2023 08:17	CALC	

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

Lab ID:16035006Date Collected:05/17/2023Matrix:GroundwaterSample ID:Dup 1Date Received:05/18/2023 14:00Collector:MVTL Field Service

Temp @ Receipt (C): 4.8

Method: SM2510 B-2011 EC

Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
10020							-20-0
	umhos/cm	1	1	05/19/2023 15:32	05/19/2023 15:32	RAA	
Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
7.6	units	0.1	1	05/19/2023 15:32	05/19/2023 15:32	RAA	*
					Results Units RDL DF Prepared 7.6 units 0.1 1 05/19/2023	Results Units RDL DF Prepared Analyzed 7.6 units 0.1 1 05/19/2023 05/19/2023	Results Units RDL DF Prepared Analyzed By 7.6 units 0.1 1 05/19/2023 05/19/2023 RΔΔ

Method: SM4500-CI-E 2011

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Chloride	76.0	mg/L	2.0	1	05/23/2023 11:44	05/23/2023 11:44	AMC	*

Method: SM4500-F-C-2011

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Fluoride	0.92	mg/L	0.1	1	05/19/2023 15:32	05/19/2023 15:32	RAA	

Method: USDA 20b

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Sodium Adsorption Ratio	13.9		0.17	1	05/25/2023 08:17	05/25/2023 08:17	CALC	

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

Lab ID:16035007Date Collected:05/17/2023Matrix:GroundwaterSample ID:Field Blank (FB)Date Received:05/18/2023 14:00Collector:MVTL Field Service

Temp @ Receipt (C): 4.8

Method: ASTM D516-16

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Sulfate	<5	mg/L	5	1	05/24/2023 15:19	05/24/2023 15:19	AMC	

Method: EPA 245.1

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Mercury, Dissolved	<0.0002	mg/L	0.0002	1	05/25/2023 09:40	05/30/2023 10:41	MDE	

Method: EPA 353.2

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Nitrate + Nitrite as N	<0.2	mg/L	0.2	1	05/18/2023 15:43	05/18/2023 15:43	AMC	

Method: EPA 365.1

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Phosphorus as P	<0.1	mg/L	0.1	1	05/25/2023 15:40	05/26/2023 11:21	AMC	

Method: EPA 6010D

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Boron, Dissolved	<0.1	mg/L	0.1	1	05/19/2023 07:59	05/31/2023 10:15	SLZ	
Calcium	<1	mg/L	1	1	05/19/2023 06:51	05/22/2023 14:35	SLZ	
Iron, Dissolved	<0.1	mg/L	0.1	1	05/19/2023 07:59	05/24/2023 11:49	SLZ	
Magnesium	<1	mg/L	1	1	05/19/2023 06:51	05/22/2023 14:35	SLZ	
Manganese, Dissolved	<0.05	mg/L	0.05	1	05/19/2023 07:59	05/24/2023 11:49	SLZ	
Potassium	<1	mg/L	1	1	05/19/2023 06:51	05/22/2023 14:35	SLZ	
Sodium	<1	mg/L	1	1	05/19/2023 06:51	05/22/2023 14:35	SLZ	

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Report Date: Friday, June 9, 2023 8:54:10 AM

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

Lab ID:16035007Date Collected:05/17/2023Matrix:GroundwaterSample ID:Field Blank (FB)Date Received:05/18/2023 14:00Collector:MVTL Field Service

Temp @ Receipt (C): 4.8

Method: EPA 6020B								
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Arsenic, Dissolved	<0.002	mg/L	0.002	5	05/19/2023 07:59	05/23/2023 17:37	MDE	
Barium, Dissolved	<0.002	mg/L	0.002	5	05/19/2023 07:59	05/23/2023 17:37	MDE	
Cadmium, Dissolved	<0.0005	mg/L	0.0005	5	05/19/2023 07:59	05/23/2023 17:37	MDE	
Chromium, Dissolved	<0.002	mg/L	0.002	5	05/19/2023 07:59	05/23/2023 17:37	MDE	
Lead, Dissolved	<0.0005	mg/L	0.0005	5	05/19/2023 07:59	05/23/2023 17:37	MDE	
Molybdenum, Dissolved	<0.002	mg/L	0.002	5	05/19/2023 07:59	05/23/2023 17:37	MDE	
Selenium, Dissolved	<0.005	mg/L	0.005	5	05/19/2023 07:59	05/23/2023 17:37	MDE	
Silver, Dissolved	<0.0005	mg/L	0.0005	5	05/19/2023 07:59	05/23/2023 17:37	MDE	
Method: SM1030F								
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
TDS - Summation	<12.5	mg/L	12.5	1	05/25/2023 08:18	05/25/2023 08:18	CALC	
Method: SM2320 B-2011								
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Alkalinity Phenolphthalein	<20.5	mg/L as	20.5	1	05/19/2023	05/19/2023	PΔΔ	

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Alkalinity, Phenolphthalein	<20.5	mg/L as CaCO3	20.5	1	05/19/2023 14:50	05/19/2023 14:50	RAA	
Alkalinity, Total	<20.5	mg/L as CaCO3	20.5	1	05/19/2023 14:50	05/19/2023 14:50	RAA	
Bicarbonate	<20.5	mg/L as CaCO3	20.5	1	05/19/2023 14:50	05/19/2023 14:50	RAA	
Carbonate	<20.5	mg/L as CaCO3	20.5	1	05/19/2023 14:50	05/19/2023 14:50	RAA	
Hydroxide	<20.5	mg/L as CaCO3	20.5	1	05/19/2023 14:50	05/19/2023 14:50	RAA	
Method: SM2340B-2011								

Parameter	Results	Units	RDL	DF	Prepared	An

Parameter	Results	Units	KDL	DF	Prepared	Anaiyzed	ву	Quai
Hardness - Total	<6.62	mg/L as CaCO3	6.62	1	05/25/2023 08:17	05/25/2023 08:17	CALC	

Method: SM2510 B-2011 EC

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Specific Conductance	3	umhos/cm	1	1	05/22/2023 08:09	05/22/2023 08:09	RAA	_

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

Lab ID:16035007Date Collected:05/17/2023Matrix:GroundwaterSample ID:Field Blank (FB)Date Received:05/18/2023 14:00Collector:MVTL Field Service

Temp @ Receipt (C): 4.8

Method: SM4500 H+ B-2011

Method: SM4500-F-C-2011

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
pH	7.5	units	0.1	1	05/19/2023 14:50	05/19/2023 14:50	RAA	*
Method: SM4500-CI-E 2011								
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual

Chloride	<2.0	mg/L	2.0	1	05/23/2023 11:52	05/23/2023 11:52	AMC

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Fluoride	<0.1	mg/L	0.1	1	05/19/2023 14·50	05/19/2023 14 ⁻ 50	RAA	

Method: USDA 20b								
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Sodium Adsorption Ratio	<0.17		0.17	1	05/25/2023 08:17	05/25/2023 08:17	CALC	

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

MVTL Field Services

Sampling Report

MDU Heskett

analysis.

 Sample Event:
 Spring 2023
 Work Order #:
 16035

 Sampling Dates:
 May 17-18, 2023
 16039

Well Condition: All wells were found to be in good condition.

With exception to well 3-90 which has an ant colonie in the outer casing, and

well 1-90 which needs the base repaired.

Samples collected Duplicate Sample Location
MW13 MW13

MW1-90 MW2-90 MW3-90 MW80R

Samples collected were placed on ice and transported back to the MVTL Laboratory in Bismarck, ND for

Jeremy Meyer MVTL Field Services





Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

C Results Summary							WO #:	160	16035		
Sulfate QC Type	Original Sample ID	Blank Result	Spike Amount	Units: mg/L Spike % Recovery	Spike Duplicate	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)		
FB			100	101.0		85	115				
FI			100	95.1		85	115				
FB			100	92.6		85	115				
H			300	92.6		85	115				
FB.			100	98.2		85	115				
0			100	04.2		85	115				
0			100	95-2		85	115				
Ь			100	96.5		85	115				
Lov-		45)									
16		d)									
ë		3									
16		iš)									
ø		45									
is.		d									
ië		45									
18		15									
HS/MSEI	15870009		1000	86.7	88.3	85	115	1.0	20		
IS/MSD	15935001		500	82.1	80-1	85	115	0,9	20		
is/MSD	15974003		100	70.4	87.0	85	115	1.9	20		
S/MSD	16030002		500	77,5	77.5	85	:115	0.0	20		
S/MSD	16157001		500	76.6	79.4	.85	215	1.9	70		
SYMSD	16380002		1000	95,9	94.5	85	115	134	70		
rs/MSD	16387006		2000	93.3	96.1	85	115	1.9	20		
litrate + Nitr	rite as N			Units: mg/L							
IC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery	Spike Duplicate N. Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)		
FB			0,5	102.0		90	110				
IS/MSD	16035007		1	94.0	04.0	90	110	0.0	20		





Account #: 2800

Client: Montana-Dakota Utilities - Bismarck

Phosphorus as P				Units: mg/	L				
QC Туре	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery	Spike Duplicate % Resovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
LFB)			0.5	100.0		90	110		
FB			0.5	100.0		90	110		
FIL			0.5	98.0		90	110		
FB			0.5	98.0		90	CHD		
ės.			0.5	106-0		90	110		
in the second		ort							
MBI									
MS		<0.1							
Mo		<0.1							
wis		10.1							
MB		0.1							
MS/MSD	16078007		ī	108.0	107.0	90	im	0,4	20
AS/MSD	16386005		1	106.0	107.0	90	110	0.9	20
AS/MSD	16437001		5	118/0	112.0	90	110	1.6	20
AS/MSEI	16476007			107.0	106.0	90	110	0.9	20
us/Msia	16540001		1-	107.0	(080)	90	iio	0,9	50
AS/MSEX	16540017		3	116.0	(16.0	90	130	0.0	40
ris/MsD	16540014		λ	115.0	115.0	90	110	0.0	20
AS/MSEI	16541010		1	115.0	135.0	00	110	0.0	20
MS/MSD	16543001		1	113,0	114.0	90	210	0.4	.20
Chloride				Units: mg/	L				
QC Type	Original Sample (D)	Blank Result	Spike Amount	Spike % Recovery	Spike Duplicate N. Recovery	Lower Control Limit (%)	Upper Control	RPD (%)	RPD Limit (%)
FB -			30	105.0		90	110		
16			30	106.0		90	110		
FB			30	106.0		90	110		
Ħ			30	94.2		90	110		
FB			30-	106.0		90	-110-		
fi.			30	106.0		90	110		
FB			30-	106.0		90	110		
50 50									
			30	92.2		90	110		



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Chloride				Units: mg/					
QC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery	Spike Duplicate W. Resovery	Lawer Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
As		+2.0							
ем		-20							
AB		+2.0							
(8)		=3.0							
16		0.0							
400		17.0							
10		×2.0							
AL VIANO	I LEAVING T		100		0.11		-50		
AS/MSD	15870012		AO	98.3	92.1	30	120	0.6	20
IS/MSEE	15958001		m	130 2	310.7	80	720	0.0	-80
HS/MSO	16035000		30	121.5	121.4	80	100	0.0	20
IS/MSD	16239003		40	86-7	87.3	80	izb	0,6	20
Calcium				Units: mg/	Ĺ				
IC Type	Original Sample ID	Blank Result	Spike Amount	Spice %	5pike Duplicate Ni Recovery	Lawer Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
В-МІ			100	109.0	on Mercovery.	85 85	115		
B-MI			100	109.0		85	115		
B-Mi			100	110.0		85	iis		
10		-0.1							
ro-		H							
16		141							
υį	15907001							v.i.	.00
01	15937001							(11)	20
M.	15974007							0.9	20
VF	16035006							1.7	30
ron, Dissolved				Units: mg/	L				
кс Туре	Original Sample (D	Blank Result	Spike Amount	Spike % Recovery	5p ke Duplicate Ancovery	Lawer Control Limit (%)	Lipper Control Limit (%)	RPD (%)	RPD Limit (%)
B-OE			0.4	108.0		85	115		
N-DE			D.A	107.0		89	115		
16-01			0.4	110-0		âŝ	115		
18		-0.1							
		-0.1							
ie.									



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Iron, Dissolved				Units:	mg/L					
QC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery		Spike Duplicate % Resovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
Ms/Msix	15905001								1.4	20'
MS/MSD	15936005								0.6	20
M5/M50	15937002								0.2	20
WS/MSD	15974006								0.2	20
Magnesium				Units:	mg/L					
QC Type	Original Sample (D)	Blank Result	Spike Amount	Spike %	Ing/ c	Spike Duplicate	Lawer Control	Upper Control	RPD (%)	RPD Limit (%)
FBAN			100	Recovery 106/0		* Recovery	Limit (%)	Limit (%)	7.00	
H-MI			100	106 ()			85	115		
FBAN			100	105/0			85	115		
Ma		ale								
Mg.		-1								
Mis		000								
DVP.	(590700)								0.3	30.
WF.	15937001) ė	20
NUP.	15974007								0.7	90
	23444300									
OUP	16035006).8	50
Manganese, Dis	solved			Units:	mg/L					
QC Type	Onginal Sample ID.	Blank Result	Spike Amount	Spike % Recovery		Spike Duplicate N Resovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
FILCE			0.4	108.0			85	115		
FII-OE			0.4	110.0			85	115		
30-0E			0.4	110.0			85	cm		
Mo		-00.00								
ка		x0.05								
		10.05								
vis,	15905001								0.4	20
WS/MSO:	-15905001 15936005								0.4	20
MS/MSX	15836005								0.9	20
MS/MSO. MS/MSO. MS/MSO.	15936005 15937002								0.0	20
MB MB7MSXX MB7MSXX MB7MSXX MB7MSXX	15836005								0.9	20
MS/MSO. MS/MSO. MS/MSO.	15936005 15937002			Units:	mg/L				0.0	20





Account #: 2800

Client: Montana-Dakota Utilities - Bismarck

Potassium	14.000	m 40 %		Units:	mg/L		100000000		242	2000
QC Type	Original Sample (D.	Blank Result	Spike Amount	Spike % Recovery		Spike Duplicate N. Resovery	Lawer Control Limit (%)	Limit (%)	RPD (%)	RPD Limit (%)
FB-MI			300	105.0			85	115		
FB-6AI			100	105.0			.85	115		
vis.		-41								
ma.		140								
ARI		-0,0								
Ag		ole								
AJP	15907001								0.4	20.
(AR	15937001								0.5	20
UK	15974007								0.4	90
UF	16035006								0.3	20
Sodium	100000		.000.000	Units	mg/L	old Louis	Company Control	40.21.4		Annual V
QC Type	Original Sample (O	Blank Result	Spike Amount	Spike % Recovery		5pike Duplicate % Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
PB-MI			190	107.0			85	115		
FII-ANI			(00	105,0			85	1)5		
FB-MI			100	109.0			85	115		
46		-21								
AG		-0								
10.		- e).								
AG.		-61								
UF	15907001								1.1	20
UP.	15937001								10,7	40
UP	15974007								0.1	20
UP	16033000								1.8	20
	-300000									
Boron, Dissolv	ed			Units:	mg/L					
(⊂Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery		Spike Duplicate N. Rucovery	Lower Control Limit (%)	Lipper Control Limit (%)	RPD (%)	RPD Limit (%)
PK/SPKD	16073001		0,5	96.4		98.0	75	125	1.1	20
PK/SPKD	16596001		:0.5	110.0		111.0	75	125	0.7	20
no return	1.00 Miles		AF	ne 2		MA	76	325	75	700
PK/SPKD	16596003		0.5	95.6		94.9	75	325	0.5	20
PK/SPKD	16687004		0.5	93.1		945	75	125	Li	20
Calcium				Units:	mg/L					
IC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery		Spike Duplicate Recovery	Lawer Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
D5/PDSD	15497002		80	104.0		104.0	75	125	0.9	50



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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Calcium				Units: m	g/L				
ОС Туре	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery	Spike Duplicate % Resovery	Lawer Control	Lipper Control Limit (%)	RPD (%)	RPD Limit (%)
DS/PDSD	15870013		100	102.0	101.0	75	325	0.1	20
DS/PDSD	15907003		110	105.0	103.0	75	125	1.5	20
D5/PDSD	15974001		RO	102.0	102.0	75	325	0.1	20
DS/PDSD	15974009		AD-	99.3	97.4	75	1725	1.1.	20
ron, Dissolved					g/L				
C Type	Original Sample (D)	Blank Result	Spike Amount	Spike ** Recovery	Spike Duplicate Recovery	Lawer Control Limit (%)	Limit (%)	RPD (%)	RPD Limit (%)
PK/SPKD	15262007		0.4	100,0	100.0	75-	125	0.3	50
PK/SPKD	15308005		0.4	90-5	92.9	75	125	2.6	-20
PR/SPKD	15727001		0.4	87.2	H6.4	75	125	ú,a	-20
PK/SPND	15870006		0.4	93,6	94.6	75	175	1/1	20
PK/SPKO	16073001		0.4	88.8	88.0	75	125	0.6	30
PW/SPWD	160730(4		0.4	93.1	-04.0	75	125	1.8	50
Magnesium				Units: m	g/L				
t Type	Original Sample (D)	Blank Result	Spike Amount	Spike % Recovery	Spike Duplicate N. Recovery	Lower Control Limit (%)	Upper Control	RPD (%)	RPD Limit (%)
05/PDS0	15497002		190	-107.0	108:0	75	125	0.4	50
D5/PDSD	15727003		80	100.0	108-0	75	125	0.5	20
DS/PDSD	15870012		400	105.0	106.0	75	125	0,2	āu.
D3/FD3D	13070011		400	203.0	1000	45	110	W.Z.	
D5/PDSD	15907001		80	108.0	100.0	75	125	1.4	20
DS/PDSD	15974001		ж	107.0	107.0	75	125	0.1	20
DS/PDSD	15974009		80	104.0	108.0	75	125	1.2	26
Manganese, D	issolved			Units: m	g/L				
дс Туре	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery	Spike Duplicate % Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
PK/SPKD	19262007		0.4	91.4	91.1	75	125	0.4	20
PK/SPKD	15308005		0.4	91.6	03.8	75	125	2.4	20
PK/SPKD	15777001		0.4	92.6	921	76	125	0.1	20
PK/SPKD	15870000		9.4	84.4	85.6	15	125	11	20
PK/SPKD	16073001		0.4	84.8	85 É	75	125	0.5	20
PK/SPKD	16073004		0.4	86.0	91.1	75-	125	4.3	20
otassium		545			g/L				
QC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery	5pixe Duplicate % Recovery.	Lawer Control Limit (%)	Lipper Control Limit (%)	HPD (%)	RPD Limit (56)
DS/PBSD	15497002		BD	104,0	105.0	75	175	1.1	50





Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Potassium				Units:	mg/L					
QC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery		Spike Duplicate N. Resovery	Lawer Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
D5/PDSD	15870013		1000	104/0		104.0	75	125	0.4	20'
DS/PDSD	15907003		80	107.0		105.0	75	125	EF	20
DS/PDSD	15974001		80	105.0		toso	75	125	0.2	20
DS/PDSD	15974009		AO-	105.0		104.0	75	1725	0.0	20
odium				Units:	mg/L					
ос Туре	Original Sample ID	Blank Result	Spike Amount	Spike # Recovery		5p ke Duplicate Recovery	Lawer Control Limit (%)	Limit (%)	RPD (%)	RPD Limit (%)
DS/PDSD	15497002		80	104.0		105.0	75.	125	E,D	50
05/2050	15727003		80	1040		107.0	75	125	17	50
D5/PDSD	15870012		400	102.0		(0.1.0	75	125	0,3	20
D5/PD5D	15907003		10	99,1		100.0	75	175	0,6	20
05/P050	15974001		80	105.0		1,07.0	75	125	1.1	90
OS/POSD	159740(9)		80	99,6		101.0	75	125	0.7	90
Issania Dive	shiped			United	ma!					
Arsenic, Disso	Original Sample ID	Blank Result	Spike Amount	Units:	mg/L	Solve Disableste	Lower Control	Upper Control	RPD (%)	RPD Limit (%)
IC Type	Original Sample ID.	BIANK MESUE		Recovery		Spike Duplicate In Recovery	Limit (%)	Limit (%)	RPD (%)	RND DIMIT (20)
B-M5			U.X	98.3			95	-115		
rd.		≺0.002								
IS/MSD	15936005		0.4	101.0		97.1	70	130	4.0	20
Sarium, Disso	olved			Units:	mg/L					
IC Type	Original Sample ID	Blank Rissult	Spike Amount	Spike % Recovery		Spike Duplicate W Recovery	Lower Control	Lipper Control	RPD (%)	RPD Limit (%)
FBLAMS			0.1	98.2			85	115		
AEI		<0.002								
ts/Mstx	15936005		DA	96.8		96.7	70	130	0.0	20
Cadmium, Dis IC Type	Ssolved Original Sample ID	Blank Result	Spike Amount	Units:	mg/L	Spike Duplicate	Lower Control	Upper Control	RPD (%)	RPD Limit (%)
Fit-M5			0.1	Recovery 109.0		* Recovery	Limit (%) 85	Limit (%)		
H)		<0.0005								
IS/MSD	15936005		9,4	104.0		101 0	90	130	9.2	je.
	to the state of			Units:	mg/L					
hromium D				Spike %	Br	Spike Duplicate	Lower Control	Upper Control	RPD (%)	RPD Limit (%)
	Original Sample (D	Blank Result	Spike Amount	Spike to		St. Rescourses				
C Type		Blank Result	Spike Amount	Recovery 1147)		% Recovery	Limit (%) 85	Limit (%)		
Chromium, D IC Type III-MS		Blank Results		Recovery		% Recovery				



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ead, Dissolved	d			Units:	mg/L					
QC Type	Original Sample ID:	Blank Result	Spike Amount	Spike % Recovery		Spike Duplicate N. Resovery	Lower Control Limit (%)	Limit (%)	RPD (%)	RPD Limit (%)
F8-M5			0.1	104.0			85	Ths:		
MB EN		(0.0003								
45/M5D	15936005		0.4	101.0		99.7	70	130	1.2	20'
- Jane	estemai		-	******		-04		1.00		
Molybdenum,		Sand	200	Units:	mg/L				4.5	The let
СТуре	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery		Spike Duplicate Si-Recovery	Lawer Control Limit (%)	Lipper Control Limit (%)	RPD (96)	RPD Limit (%)
F6-M5			0.1	110.0			85	115		
ie.		-0.007								
IS/MSD	15936005		0.4	104.0		(02.0	70	130	14	20
elenium, Diss	olved			Units:	mg/L					
IC Type	Original Sample ID	Blank Résult	Spiké Amount	Spike % Recovery		Spike Duplicate % Recovery	Lower Control Limit (%)	Upper Control Limit (%)	KPD (%)	RPD Limit (%)
B-M5			0.1	91.8			85	115		
10		<0.005								
rs/Msio	15936005		0.4	101.0		100.0	70	(1)0	1:0	20
									- 1	
ilver, Dissolve				Units:	mg/L					
IC Type	Original Sample ID:	Blank Result	Spile Amount	Spike %. Recovery		Spike Duplicate In Recovery	Limit (%)	Limit (%)	KPD (N.)	RPD Limit (%)
B-MS			.0.1	107.0			85	115		
la		<0.0005								
IS/MSIX	15936005		0.4	86.5		87.8	70	130	1.4	20.
Arsenic, Dissol		Blank Result		Units:	mg/L		Name of the last	Harris & Colonia	APD (%)	nor (C. day)
С Туре	Original Sample ID	Blank Require	Spille Amount	Recovery		Spike Duplicate Recovery	Lower Control Limit (%)	Limit (%)	APD (N)	RPD Limit (%)
rx.	15905001		1.0	115.0			75	125		
NC.	15913001		0.1	110.0			75	125		
PK/SPKD	16035001		n.r	112.0		112.0	75	125	0.5	-gn
W/SPKD	16035007		0.1	107.0		108.0	75	125	0.6	20
Barium, Dissol		Blank Result	total income	Units:	mg/L	Solve Developer	Lawer Control	Henry Francis	IPD (%)	RPD Lovet (%)
E Type	Original Sample ID	Diana, Hesurs	Spike Amount	Spike % Recovery		Spike Duplicate % Recovery	Limit (%)	Upper Control Limit (%)	1050 (40)	tre-ry resist (20)
PK:	15905001		0.1	107.0			75	125		
PK:	15913001		0.1	99.3			75	125		
PK/SPND	16035001		0.2	101.0		102.0	75	125	n.5	20
PK/SPWD	150350H7		6.1	100.0		0.80	75	125	63	70
admium, Diss	solved			Units:	mg/L					
C Type	Original Sample (D)	Blank Result	Spike Amount	Spike %		Spike Duplicate	Lower Control	Upper Control	KPD (%)	RPD Limit (%)
P#.	15905001		0.1	Recovery 111.0		Te Rocovery	25	125		



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Cadmium, Dissol				Units:	mg/L					
2C Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery		Spike Duplicate N. Restovery	Lawer Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
PK	15913001		0.1	106.0			75	125		
PK/SPKD	16035001		9.2	106.0		105.0	75	125	0.8	20
ny /cown	16035007		0.1	111.0		100.0	16	1125	54	70'
PK/SPKD	4DUSSON7		0.1	111.0		109.0	15	325	15	20'
Chromium, Disse		1.00	- 45	Units:	mg/L					
СТуре	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery		Spike Duplicate Si-Recovery	Lawer Control Limit (%)	Lipper Control Limit (%)	RPD (96)	RPD Limit (%)
PK	15905001		0.1	112.0			75	125		
PN.	15913001		0.1	111.0			75	125		
PK/SPKD	16035001		0.5	125.0		124.0	75	025	0.7	20
Li tralla			0	Vic. II		200		200	9.0	
PN/SPKD	16035007		0.1	110,0		109.0	75	125	0.7	20
ead, Dissolved				Units:	mg/L					
(C Type	Original Sample (D	Blank Result	Spike Amount	Spike % Recovery		Spike Duplicate W Recovery	Lawer Control Limit (%)	Upper Control Limit (%)	RPD (%)	RS/D Limit (%)
PK.	15905001		0,1	103.0			75	125		
OK-	15913001		0.1	95,7			75	125		
PK/SPKD	16035001		0.2	106.0		1,07.0	75	125	10	90
			-			ule'a	~	435		Sin
W/SPIID	16033007		0.1	107,0		106.0	75	125	0.9	20
Aolybdenum, Di				Units:	mg/L	Sub years			F. 17	747-54
C Type	Original Sample ID	Blank Result	Spike Amount	Splite % Recovery		Spike Duplicate To Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
PK -	15905001		0.1	121.0			75	125		
ik.	15913001		0.1	121.0			75	125		
K/SPKD	16035001		0.2	111.0		111.0	75	125	0.5	20.
N/SPKD	16035007		0.1	107.0		107.0	75	325	10.3	20:
To all the	* CONTRACTOR OF THE PARTY OF TH		45.0	autou.		***(M**	14			200
elenium, Dissol		2016 C	A	Units:	mg/L	7-4-00				2440
IC Type	Original Sample ID 15905001	Blank Result	Spike Amount 0.1	Spike W Recovery 106:0		Spike Duplicate In Ancovery	Linker Commi Limit (%) 75	Limit (%)	RPD (%)	RPD Limit (%)
	12900001		0.1	1004)			(a	125		
×	15913001		0.5	96.5			75	125		
W/SPKD	16035001		0.2	117.0		119.0	75	125	1.1	20
W/SPKD	16035007		0.1	107.0		ILLO	75.	125	2.9	90
ilver, Dissolved	Original Sample (D	Blank Result	Spike Amount	Units:	mg/L	Spike Duplicate	Lower Control	Upper Control	RPD (%)	RPD Limit (%)
C type	15905001	motivi incinis	6.1	Recovery 110.0	_	% Recovery	Limit (%)	Limit (%)	Hen (se)	re-p time (59)
	Water Street		0.1	104.0			75	125		
PN	15913001									
PK/SPR()	16032001		0.2	96.6		96.0	75	275	0.5	700.





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Arsenic, Diss	olved			Units: mg/L					
QC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery	Spike Duplicate % Recovery	Lawer Control	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
FB-M5			0.1	98.8	36 Relibrery	80	120		
FB M5			0.1	100.σ		80	120		
HI-M5			0.1	101.0		80	120		
IN .		+0.002							
10,		×D 002							
ia .		10.003							
IS/MSDI	15905001		0.4	103-0	101.0	75	125	2.0	20
15/M501	15913001		9.4	96-2	103.0	15-	125	5.7	20
IS/MSD	16035001		0.4	104.0	102.0	75	125	1.5	-20
5/M50	r6035005		0.4	98.5	102.0	75	105	4.0	20
Barium, Diss	olveid			Units: mg/L					
IC Type	Original Sample (D.	Blank Result	Spike Amount	Spike %	Spike Duplicate	Lower Control	Upper Control	RPD (%)	RPD Limit (%)
E-MS			0.0	Kecovery 97.4	% Recovery	Limit (%) 80	Limit (%) 120		
- 10				41.5		77	1986		
B-M5			0.1	97,2		80	120		
B-M5			0.1	99.8		30	120		
В		10 002							
rii.		×0.002							
10		<0.002							
IS/MSD	15905001		0.4	100.0	99.5	75	325	1.8	80
S/MSD	15913001		0.4	98.2	10.2	25	125	0.7	200
S/MSD	16035001		0.4	97.6	6903	25	125	0.5	20
5/MSD	16035005		0.4	99.3	97.4	75	125	2.0	20
admium, D	issolved			Units: mg/L					
СТуре	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery	Spike Duplicate Ni Recovery	Lower Control Limit (%)	Limit (%)	RPD (%)	RPD Limit (%)
THAMS			.0.1	110.0		80	120		
B-M5			0.1	111.0		80	320		
			D-f	110.0		80	120		
II-MS:									
		×0.0005							
16		×0.0005							
18-4AS.									



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Cadmium, D	issolved			Units:	mg/L					
QC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery		Spike Duplicate N. Resovery	Lawer Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
MS/MSIX	15913001		0.8	102.0		104.0	75	125	1.5	20
M5/M5D	16035001		0.4	104.0		101.0	75	125	T.F	20
MS/M50	16035005		0.4	105.0		103.0	75	125	7.2	20
ėt aradina i	No. of the d			I fallen	- n					
Chromium, I OC Type	Original Sample ID	Blank Result	Spike Amount	Units:	mg/L	Spike Duplicate	Lawer Control	Upper Control	RPD (96)	RPD Limit (%)
FB-MS			0.1	Recovery 109,0		% Recovery	Limit (%) 80	120		
FB-M5			0.1	105,0			80	120		
71140			951	100//						
FB-MS			0.1	105 ()			80	120		
ME		<0.007								
мв		s0.002								
ME		~0.002								
in the same	william.									
M5/MSD	15905001		0.4	104.0		102.0	76.	125	1.9	80
AS/MSD	15913001		0.4	100.0		103.0	75	125	7.0	90
MS/MSD	16095001		0.4	104.0		103 0	75	125	7.7	80
MS/MSD	16035005		0.4	104.0		101.0	75	175	1.7	20
Lead, Dissolv	ved			Units:	mg/L					
дс Туре	Original Sample (C)	Blank Result	Spike Amount	Spike % Recovery		Spike Duplicate % Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
FB-MS			0,1	99.9		TE INCLUSION !	30	120		
FB-M5			9.1	99,5			:80	120		
FB-M5			6.1	98.2			80	120		
			49.4	30.0				-110		
via		×0.0000								
Md		<0.0000								
		10.0000								
ev.		- Section								
	15905001	10.000	0.4	98.2		06.2	75	125	iii	20
MS/MINX		10.500.5								
MS/MSD:	15913001		0.4	.04 6		94.7	75	175	0.5	70
MS/MINX		100000								
MS/MSD:	15913001	TOOLIGE.	0.4	.04 6		94.7	75	175	0.5	70
M5/MSD:	15913001 16035001 16035005 n, Dissolved		0.4	94.4	mg/L	04.7	75	125 125 125	0.5	20 20 20
ME/MED: ME/MED: ME/MED: ME/MED: ME/MED: MOIlybdenun DC:Type	15913001 16035001 16035005	Slank Result	DA 0.4 0.4 Spike Amount	94 4 94 4 93 3 Units: Spike 5 Recovery	mg/L	04.7	75 75 Lower Control Limit (%)	125 125 125 Upper Control Limit (fi)	0.5	20
MS/MSD: MS/MSD: MS/MSD: MS/MSD: MS/MSD: MS/MSD	15913001 16035001 16035005 n, Dissolved		0.4 0.4 0.4	91 4 93 3 Units:	mg/L	94.7 94.2 92.6 Spile Duplicate	75 75 Lawer Control	125 125 125	0.5	20 20 20



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Molybdenum, Di	ssolved			Units:	mg/L					
QC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery		Spike Duplicate % Resovery	Lawer Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
F8-M5			0.1	112.0			80	120		
AB .		10.003								
ΑĐ		×0.002								
48		+0.002								
IS/MSD	15905001		0.4	1100		112.0	75	125	1.0	20
ISYMSO.	15913001		:0.8	ma		112.0	75	125	0.6	20
IS/MSD	16035001		0.4	120.0		115.0	76	125	ÀT	20
15/M50	16035005		0.4	113.0		114.0	75-	125	67	20
elenium, Dissol	ved			Units:	mg/L					
IC Type:	Original Sample (D	Blank Result	Spike Amount	Spike % Recovery		Spike Displicate % Recovery	Lower Control Limit (%)	Upper Control	RPD (%)	RPD Limit (55)
B-MS			0.1	94.7		HE INDIVISION .	80 190	120		
HI-MS			0.1	96.4			80	120		
13-MS			0.6	39.9			80	170		
		- American		30.7						
19		<0.005								
e .		<0.005								
e e		10 005								
as/MSD	15905001		0.4	502,0		96.1	75	125	5.5	20
ds/MsD	15913001		30.4	94.3		965	75	125	1.7	20
IS/MSD	16035001		0.4	98.0		90.4	75	125	0.4	90
IS/MSD	16035005		0.4	98.0		95.8	75	125	2.1	20
	777777									
ilver, Dissolved					mg/L					
IC Type	Original Sample ID:	Blank Result	Spike Amount	Spike % Recovery		Spike Duplicate & Recovery	Lower Control Limit (%)	Limit (%)	RPD (%)	RPD Limit (%)
B-MS			0.1	103.0			80	120		
B-M5			0.1	110.0			80	120		
BAA5			-(B.X	110.0			жо	120-		
4		+0.000%								
ia.		<0.0005								
is.		<0.0005								
		-0.0002								
S/MSD.	15905001		.0,8	46.3		60.6	75	125	6.8	20
5/MSO	15913001		0.4	86.5		88.0	75	125	1.9	30



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Silver, Dissolve				Units:	mg/L					
QC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery		Spike Duplicate N. Resovery	Lawer Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
45/MSO	16035005		0.4	.48.4		47.5	75	125	11	20
Mercury, Disso	lved			Units	mg/L					
ос туре	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery		Spire Deplicate Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (96)	RPD Limit (%)
Fii			0.003	101.9			85	135		
FB			n.002	99.6			89	115		
96		<0.0002								
ig		<0.0002								
		.0034	0.00	-						
HS/MSDI	16035007		0.003	98.5		97.8	70	130	0.0	20
ts/MSD	16387000		0.002	97.0		92.0	70	130	5,4	20
Alkalinity, Total	1			Units:	mg/L					
IC Type	Original Sample (D	Blank Result	5pike Amount	Spike % Recovery		Spike Duplicate % Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
RM			501	92,6			80	120		
RM			501	90,6			80	126		
9			410	94.7			90	210		
8			940	94,0			90	-210		
16			410	93.0			.90	110		
19			610	93.5			90	(310)		
ra .			410	93.8			90	110		
n e			910	94.4			90	110		
FB			410	93.7			90	:110		
10			410	94.4			190	(110		
			410	94.9			-	440		
10		<20.1								
ia .		120.5								
in .		120.5								
18		<20.5								
ia .		20.5								
LIV		1205								
16		120.5								
(a		20.5								
45/MSX	15870001		410	93.1.		384	100	320	92	30



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Alkalinity, To	otal			Units: mg	/L.				
QC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery	Spike Duplicate % Resovery	Lower Control	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
AS/MSO	15913001		410	93.3	94-1	80	120	0.4	20
AS/MSD	15974001		410	93.8	93.7	80	120	0.8	20
45/M5D	16035001		410	113.0	90.0	80	120	9.9	20
45/M50X	16035007		A10	107.0	96.7	80	120	6.9	20
pecific Con	ductance			Units: um	has/cm				
C Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery	5p ke Duplicate Recovery	Lawer Control Limit (%)	Limit (%)	RPD (%)	RPD Limit (%)
RM C			1409	102.8		95	105		
RALC			1409	101.8		95	105		
RM-C			1409	102.1		95	105		
RM-C			1409	100.5		95	105		
RM-C			1409	£00.9		95	105		
RM-(1409	101.1		95	105		
RM-C			3,409	101.0		95	105		
RM-C			1409	102,2		99	0.05		
RM-C			1409	100.6		95	105		
RM-C			1409	101 4		95	105		
Н				Units: uni	ts				
C Type	Original Sample ID.	Blank Résult	Spike Amount	Spike %	Spike Duplicate	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
UE	15870002			Recovery	AN INCOMPANY	Faunt (sat)		5,4	20
UP	15870012							0.6	20
UF	15913001							0.1	20
UF	15974001							0.6	20
nie	16035003							1.0	20
ui:	1603500F							la	20
pecific Cond	ductance			Units: um	hos/cm				
C Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery	Spike Duplicate Recovery	Lawer Control Limit (%)	Limit (%)	RPD (96)	RPD Limit (%)
DP.	15870002							0.1	20'
DE -	15870012							0.1	20
r)iv	15913001							ű.i	20
UP.	15974001							0.2	20.
								0.0	40





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specific Cond				Units:	umhos					
QC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery		Spike Duplicate N. Russivery	Lower Control	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
W.F.	1603500F								0.0	20
UP	16035007								14.2	20
Н				Units:	units					
IC Type	Original Sample (D	Blank Result	Spike Amount	Spike % Recovery		Spike Duplicate & Recovery	Lawer Control	Upper Control Limit (%)	HPD (%)	RPD Limit (%)
RM-PH			Я	98.5		-,,,,,,,,,,,	98.33	101.67		
RAL Pry			ù	99.5			98.33	101.67		
RM-P/I			0	99.0			98,33	101.57		
RAL Pri			0	99.0			98.33	101.67		
RM-Pri			0	100 7			98.33	101.67		
RIA PH			0	99.3			88,33	101.67		
RM-PH			6	99.2			98,33	101.67		
RM-Pri			6	100 8			98,33	101 67		
luoride				Units:	mg/L					
C Type	Original Sample (E)	Blank Result	Spike Amount	Spike % Recovery	HARAT.	Spike Duplicate N. Recovery	Lower Control Limit (%)	Upper Control	RPD (%)	RPD Limit (%)
RM-FI			3.39	103.0			83,6	-111		
UM-F			1,10	102.0			84.8	m		
B 6			0.5	104.0			90	cité		
B-F			0.5	100.0			90	110		
ве			9.5	1000			90	110		
8-7			0,1	100.0			90	110		
per-			0.5	108.0			190	(110)		
40		-00.1								
8-6		×0.1								
8-F		-0.1								
8 €		×0.1								
e-F		<0.1								
s/MsD-F	15937003		D.S.	98.0		100.0	80	120	1.3	-20.
5/MSD-F	16035002		0.5	78.0		840	80	120	1.9	-20
april and										



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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Total Dissolv	ved Solids			Units: mg/L					
ОС Турн	Original Sample (D)	Blank Result	Spike Amount	Spike % Recovery	Spike Duplicate N. Resovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
CRM.			736	98.0		90 35	J16.85		
мв		(10)							
NZF	4603500G							0.0	30





Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

MI	2616 E. Br Bismarck,	2616 E. Broadway Ave							16035	Dakota			Chain of Custody Record		
Report To: Attn: Address: Phone: Email:	Todd Peterson ss: 400 N, 4th St Bismarck, ND 58501											Project Na Event: Sampled E	Spri	Nay 23 6	MDU Heskett 3 -Fall 2022
	Sam	ple Information	11				San	nple	Container	s		Field Re	adings		
Lab Number	Sample ID	Date	Time	Sample Type	1 Liter Raw	500 mL HNO3	500 mL HNO3 (filtered)	250 mL H2SO4			Temp (°C)	Spec. Cond.	Н	furbidity (NTU)	Analysis Required
001	MW13	17 Men 23	1105	GW	Х		X				11.63	10/06	6.86	0.86	
002	MW1-90	17 May 23	1435	GW	Х	х	х	х			6.84	8999	6.93	0.10	
003	MW2-90	18 May 23	1115	GW	X	X	X	X			8.67	7541	6.86	0.02	
	MW3-90	18 May 23	1000	GW	X		X	_			8.11	9657	6.81	0,13	MDU Heskett List
400			13071	GW	X	X	X	Х			7.89	6568	6.99	3.45	WIDO HESKELL LIST
005	MW80R	18 May 23	1251		-										
6004	MW80R Dup 1 Field Blank (FB)	18 May 23 17 May 23 17 May 23	1251	GW	X		X	-			NA NA	NA NA	NA NA	NA NA	

TM562 / FM805

Received By

Date/Time

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Date/Time

18 Ply 23

Location

حوا المحافظ Walk In #2





Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

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	•			
_	1/1	Vī	7	٩.
•	///	v		1
		-		
-				

Field Datasheet

Surface water Assessment

Company: MDU Heskett
Event: Spring 2023

Sampling Personal:

Phone: (701) 258- Weather Conditions		70	°F	Wind:	W	@ S-10	Precip:	Sunny / Partly Cloudy / Cloudy
Well ID	Date	Time	Casing Diameter	Water Level (ft)			Co	mments
MW70		1332	2"	17.60				
MW33		1520	2"	38.91				
MW101]	1334	2"	37.15				
MW102	(7 May 23	1330	2"	11.48				
MW103	1	1344	2"	32,35				
MW44R]	1340	2"	22.91				
MW104		1350	2"	13.76				
MW105		1525	2"	11.41				

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Appearance or Comment

Clarity, Color, Odor, Ect.

Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

MVI			Fiel	d Da	atasł	neet		Company:		MDU Hesl		
	4		G	roundwate	er Assessm	ent		Sample ID			13	
2616 E. Broadway Ave,	Bismarck, ND							Sampling I)u	7	
Phone: (701) 25								oumpining i	Croonan.		177	_
Weather Condition		Temp:	70	°F	Wind:	W	@ 5-10		Precip:	Sunny / Pa	artly Cloudy / Cloudy	_
	WELL INF	ORMATIO	N					SAN	APLING IN	FORMATI	ON	_
Well Locked?	YES	NO	-		7	Purging Me	ethod:	Bladder	iii Liivo iiv]	Control Settings:	
Well Labeled?	YES	NO			1	Sampling N		Bladder		1		ec.
Casing Strait?	YES	NO			1	Dedicated	Equipment?	YES	NO	1		ec.
Grout Seal Intact?	YES	NØ	Not \	/isible]						PSI: 20	
Repairs Necessary?						Duplicate S		(YES	NO]		
	ing Diameter		!"	,	1	Duplicate S	ample ID:	Dy /]		
	Before Purge		5	ft	1							
Total	Depth of Well			ft	1		Bottl	le List:]		
	Well Volume			liters	4	1 Liter Raw		1 Gal Nitric				
	Top of Pump			ft	4	500mL Nitrie				1		
	After Sample nent Method		, ୩୦ Nater Level		-	500mL Nitrie				1		
ivieasurer	nent wethou	Electric	water Level	indicator	J	250mL Sulfu				J		
Stabilization Par	amotore	T				LD READIF			n			
(3 Consecut		Temp. (°C)	Spec. Cond.	pH	DO (****	ORP (mV)	Turbidity	Water Level	Pumping	mL	Appearance or Comment	
Purge Date	Time	±0.5°	±5%	±0.1	(mg/L) ±10%	±10	(NTU)	(ft)	Rate mL/Min	Removed	Clarity, Color, Odor, Ect.	
	1030	Start of Wel		10.1	110/0	110		1 (10)	THE/IVIII		clear, slightly turbid, turbid	_
17 May 23	1050	12.72	10107	686	4,33	246.3	0.33	129,67	100.0	2000.0	Clear	_
[4,]	1055	11.28	10094	6.85	4.21	249,4	0.52	29.75	100.0	500,0	cles	
	11 00	11.57	10102	6,86	4.17	249.5	0,87	29.82	100:0	500,0	Clear	-
	1105	11.63	10106	686	4.27	242.3	0.86	29.85	100.0	56), 5	Clear	
					1.0	-	V.V.	1				
												_
												_
			(-)									
	Well St	abilized?	YES	NO				Total Vo	lume Purged:	3500.0	mL.	

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Turbidity

(NTU)

0.86

Report Date: Friday, June 9, 2023 8:54:10 AM

Spec.

10106

pН

6.86

Sample Date

17 My23

Comments:

Time

1105

(°C)

11.63





Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

			Eiol	۲ D	atask	annt.		Company:		MDU Hes	kett
MVT			riei	uDo	atasi	ieet	47 4	Event:		Spring	
			G	roundwate	er Assessm	ent		Sample ID:	:		1-90
2616 E. Broadway Ave, B	ismarck, ND							Sampling F	Personal:		2001
Phone: (701) 258	-9720										7.
Weather Conditions		Temp:		°F	Wind:		@		Precip:	Sunny / P	artly Cloudy / Cloudy
	WELL INFO	ORMATIO	N					SAN	ADLING IN	FORMATI	ON
Well Locked?	YES	NO		~~~	7	Purging Me	thod:	Bladder	IF LING IN		Control Settings:
Well Labeled?	YES	(NØ			1	Sampling N		Bladder		1	Purge: S Sec.
Casing Strait?	(YES)	NO			1		Equipment?	(YES)	NO	1	Recover: 55 Sec.
Grout Seal Intact?	YES	би	Not \	/isible	None					•	PSI: 10
Repairs Necessary?						Duplicate S	ample?	YES	(NQ]	
	ng Diameter:		2"			Duplicate S	ample ID:]	
Water Level B		12.0	22	ft							
	epth of Well:			ft	1		Bott	le List:]	
	Vell Volume:	1,,,	. 10	liters	1	1 Liter Raw		1 Gal Nitric		1	
	op of Pump:		48	ft	4	500mL Nitrio					
Water Level A	ent Method:	IZ.	Water Level		-	500mL Nitrio				1	
ivieasurem	ent ivietnoa:	Electric	water Level	indicator	_	250mL Sulfu	ric			J	
					FIE	LD READIN	IGS				
Stabilization Para		Temp.	Spec.	pH	DO	ORP	Turbidity	Water Level	Pumping	mL	Appearance or Comment
(3 Consecutiv	-	(°C)	Cond.		(mg/L)	(mV)	(NTU)		Rate	Removed	Clarity, Color, Odor, Ect.
Purge Date	Time	±0.5°	±5%	±0.1	±10%	±10		(ft)	mL/Min		clear, slightly turbid, turbid
17 May 23	1400	Start of Wel		-							
	1410	8.60	8196	7.01	7.93	268.2	0.61	12.16	1000	10000	Clear
	1415	B147	8264	6.97	7.64	261.0	0.33	12.17	100.0	500.0	Clear
	1425	8,44	8476	6.95	7.19	265,3	0,71	12.17	1000	2000	Clear
	1430		8744	694	6.64	270.1	0.34	12.18	100.0	Sazo	Clear
	1435	8.77	8 899 8999	6.94		270.3	0.66	12,18	100:0	500.0	Clear
	1422	8,64	64-1-1	6,75	6.07	L+2.5	0.10	12.18	100.0	500.0	Clear
					+					-	
			 					_		-	
						-		-		-	
	Well Sta	abilized?	(YES)	NO				Total Vo	lume Purged	3500.0	mL.
Sample Date	Time	Temp.	Spec.	pH	T		Turbidity	Г			Appearance or Comment
		(°C)	Cond.				(NTU)				Clarity, Color, Odor, Ect.
17 May 27	1435	8.84	8999	6.93			0.10				
Comments:	Collee	ted fiel	d blank	@ 144	0						

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck



Field Datasheet

Groundwater Assessment

Wind:

 Company:
 MDU Heskett

 Event:
 Spring 2023

 Sample ID:
 Z~90

 Sampling Personal:
 Serry Lh

Sunny / Partly Cloudy / Cloudy

Purge: 5

Control Settings:

Sec.

Precip:

Temp: WELL INFORMATION Well Locked? **WO** Well Labeled? NO Casing Strait? NO Not Visible Grout Seal Intact? Repairs Necessary?

Casing Diameter: Water Level Before Purge: 20,55 ft Total Depth of Well: Well Volume: ft liters Depth to Top of Pump: 22,40 ft Water Level After Sample で入りし ft Electric Water Level Indicator Measurement Method:

	SAM	PLING IN	FORMAT	ION
Purging Method:	Bladder]	
Sampling Method:	Bladder		1	Pur
Dedicated Equipment?	(YES)	NO	1	Rec
				PSI
0 11 1 0 10	1450	42	1	

N@5-10

Duplicate Sample? YES NO
Duplicate Sample ID:

	Bottle List:	
1 Liter Raw	1 Gal Nitric	
500mL Nitric		
500mL Nitric (filtered	i)	
250mL Sulfuric		

FIELD READINGS

Stabilization Parar	meters	Temp.	Spec.	pH	DO	ORP	Turbidity	Water Level	Pumping	mL	Appearance or Comment
(3 Consecutiv	e)	(°C)	Cond.	рn	(mg/L)	(mV)	(NTU)	water Level	Rate	Removed	Clarity, Color, Odor, Ect.
Purge Date	Time	±0.5*	±5%	±0.1	±10%	±10		(ft)	mL/Min		clear, slightly turbid, turbid
18 May 23	1040	Start of Well	Purge								
10 112	lloo	8.97	7530	6.85	2.88	254.8	0.05	21.20	100.0	20000	Clear
	1105	6.71	7534	6.85	3,06	247.3	0.01	21.10	1000	500.0	clear
	1110	8,59	7532	6.85	3,10	254.8	0.02	21.15	100.0	500,0	Clear
	1115	B.67	7541	6,86	3.20	255.7	0.02	21,16	100.0	50a U	Clear
	Well St	abilized?	YES	NO				Total Vo	lume Purged:	3500.0	mL .

Sample Date	Time	Temp. (°C)	Spec. Cond.	рН	Turbidity (NTU)	Appearance or Comment Clarity, Color, Odor, Ect.
18 Yley 23	1115	8.67	7541	6.86	0.02	Clear
Comments:						

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Client: Montana-Dakota Utilities - Bismarck Account #: 2800

MVTL	
2616 E. Broadway Ave. Bismare	k. ND

Phone: (701) 258-9720 Weather Conditions:

Field Datasheet

Groundwater Assessment

Wind:

MDU Heskett Company: Spring 2023 Event: Sample ID: -90 Sampling Personal:

Sunny / Partly Cloudy / Cloudy

Purge:

Recover: 25

Control Settings:

Sec.

60 °F WELL INFORMATION Well Locked? NO NO Well Labeled? Casing Strait? Not Visible Grout Seal Intact? YES NO ry? Ant colonic Casing Diameter: Repairs Necessary? Water Level Before Purge 1716 Total Depth of Well: Well Volume: liters 20,10 Depth to Top of Pump ft Water Level After Sample: ft Measurement Method:

Temp:

SAMPLING INFORMATION Purging Method: Bladder Sampling Method: Dedicated Equipment? Bladder NO (YES)

Precip:

N @5-10

NO Duplicate Sample? YES Duplicate Sample ID:

Bottle List: 1 Liter Raw 1 Gal Nitric 500ml Nitrio 500mL Nitric (filtered) 250mL Sulfuric

FIELD READINGS Stabilization Parameters

		opes.			0	raibiaity		. amping	11111	Appearance or comment
e)		Cond.	Pri	(mg/L)	(mV)	(NTU)	water Level	Rate	Removed	Clarity, Color, Odor, Ect.
	±0.5°	±5%	±0.1	±10%	±10		(ft)	mL/Min		clear, slightly turbid, turbid
0925	Start of Well	Purge								
0945	8.15	4727	6.82	4.16	221.2	0.22	17.42	100.0	2000.0	Clear
OSSO	8.00	4684	6.61	4.20	224.6	4.38	17.46			Clear
0955	8.10	4681	6.02	4.25	221.6	0,67	17.48	100.0	500,0	Clear
1000	8.11	4657	6,81	4,24	222.3	0.13	17.49	100,0	500.0	Cles
		}								
Well Sta	abilized?	MES	NO				Total Vol	ume Purged:	3500,0	mL
	Time 0925 0945 0955 0955 1000	Time ±0.5° 0925 Start of Wel 0945 8.65 0950 8.00 0955 8.00	Time	Time	Cod. (mg/l)	Code Code	Cond. (mg/L) (mV) (NTU) Time		Time	Code Code

Sample Date	Time	Temp. (°C)	Spec. Cond.	pH	Turbidity (NTU)	Appearance or Comment Clarity, Color, Odor, Ect.
18 May 23	(0vO)	8,11	4657	6,81	0, 13	cles
Comments:						

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Account #: 2800

Client:

Montana-Dakota Utilities - Bismarck



Field Datasheet

Groundwater Assessment

Company: MDU Heskett

Event: Spring 2023

Sample ID: SP R

Sampling Personal:

Purge: 5

Weather Conditions: Temp: 6°F Wind: 20 5 10 Precip: Sunny / Partly Cloudy Cloudy

Weather Conditions: Temp: 6°F Wind: 20 5 10 Precip: Sunny / Partly Cloudy Cloudy

Well LINFORMATION

Well Locked? YES NO Purging Method: Bladder Control Settings:

YES	(NO)	
YES	NO	
(YES)	NO	
(YES)	NO	Not Visible
Diameter:	2"	
fore Purge:	13.7	ft
th of Well:		ft
ell Volume:	_	liters
p of Pump:	_	ft
er Sample:	14.3	
nt Method:	Electric Wa	ter Level Indicator
	Diameter: fore Purge: th of Well: ell Volume: p of Pump: er Sample:	Diameter: 2" ore Purge: (3, 7) th of Well: ell Volume: or of Pump: or Sample: 14,3

	SAIVI	PLING IN
Purging Method:	Bladder	
Sampling Method:	Bladder	
Dedicated Equipment?	(YES)	NO

Duplicate Sample?	YES	(NO
Duplicate Sample ID:	-	-

	Bottle List:
1 Liter Raw	1 Gal Nitric
500mL Nitric	
500mL Nitric (filtered	d)
250mL Sulfuric	

FIELD READINGS

Stabilization Par		Temp.	Spec.	pH	DO	ORP	Turbidity	Water Level	Pumping	mL	Appearance or Comment
(3 Consecut	ive)	(°C)	Cond.	P	(mg/L)	(mV)	(NTU)	water Level	Rate	Removed	Clarity, Color, Odor, Ect.
Purge Date	Time	±0.5°	±5%	±0.1	±10%	±10		(ft)	mL/Min		clear, slightly turbid, turbid
10 11 22	1216	Start of Wel	l Purge								
18 Hay 22	1236	7.76	6517	6.89	1157	218,5	5.83	14,26	100,0	2000,0	Clerr
	1241	7.89	6507	6.91	1,28	210.3	4.48	14.28	100,0	500.0	Cler
	1246	7.85	6557	6.93	1,26	213.9	3.01	14.28	100.0	500,0	Chan
	1551	7.89	6568	6,99	1.19	203,2	3,45	14,29	100.0	500.0	Cles
				L							
	Well St	abilized?	VES	NO				Total Vo	lume Purged	35100	ml

Sample Date	Time	Temp. (°C)	Spec. Cond.	pН	Turbidity (NTU)	Appearance or Comment , Clarity, Color, Odor, Ect.
Blasse	1251	7.89	6568	6.99	3,45	Cher

Comments:

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Workorder: MDU Heskett Spring 2023 (16039) PO: 196081 OP

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

Certificate of Analysis

Approval

All data reported has been reviewed and approved by:



Claudette Carroll, Lab Manager Bismarck, ND

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

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

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

Subcontracted Analyses

Analyzed By	Company	Address	Phone	Certification
SUBv	Energy Labs Casper	2393 Salt Creek Highway, Casper. WY 82601	307-235-0515	CERT

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Report Date: Thursday, June 29, 2023 4:36:15 PM



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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Workorder Summary

Workorder Comments

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

Sample Comments

16039006 (Dup 1) - Sample

Time sampled was not supplied by the client.

16039007 (Field Blank (FB)) - Sample

Time sampled was not supplied by the client.





Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

 Lab ID:
 16039001
 Date Collected:
 05/17/2023 11:05
 Matrix:
 Groundwater

 Sample ID:
 MW13
 Date Received:
 05/18/2023 14:00
 Collector:
 MVTL Field Service

Temp @ Receipt (C): Ambient

Contract Lab

Method: Contracted Result

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Radium 226	See Attached			1	06/28/2023 16:35	06/28/2023 16:35	SUBv	
Radium 228	See Attached			1	06/28/2023 16:35	06/28/2023 16:35	SUBv	





Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

 Lab ID:
 16039002
 Date Collected:
 05/17/2023 14:35
 Matrix:
 Groundwater

 Sample ID:
 MW1-90
 Date Received:
 05/18/2023 14:00
 Collector:
 MVTL Field Service

Temp @ Receipt (C): Ambient

Contract Lab

Method: Contracted Result

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Radium 226	See Attached			1	06/28/2023 16:35	06/28/2023 16:35	SUBv	
Radium 228	See Attached			1	06/28/2023 16:35	06/28/2023 16:35	SUBv	



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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

 Lab ID:
 16039003
 Date Collected:
 05/18/2023 11:15
 Matrix:
 Groundwater

 Sample ID:
 MW2-90
 Date Received:
 05/18/2023 14:00
 Collector:
 MVTL Field Service

Temp @ Receipt (C): Ambient

Contract Lab

Method: Contracted Result

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Radium 226	See Attached			1	06/28/2023 16:35	06/28/2023 16:35	SUBv	
Radium 228	See Attached			1	06/28/2023 16:35	06/28/2023 16:35	SUBv	





Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

 Lab ID:
 16039004
 Date Collected:
 05/18/2023 10:00
 Matrix:
 Groundwater

 Sample ID:
 MW3-90
 Date Received:
 05/18/2023 14:00
 Collector:
 MVTL Field Service

Temp @ Receipt (C): Ambient

Contract Lab

Method: Contracted Result

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Radium 226	See Attached			1	06/28/2023 16:35	06/28/2023 16:35	SUBv	
Radium 228	See Attached			1	06/28/2023 16:35	06/28/2023 16:35	SUBv	

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.

Report Date: Thursday, June 29, 2023 4:36:15 PM





Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

 Lab ID:
 16039005
 Date Collected:
 05/18/2023 12:51
 Matrix:
 Groundwater

 Sample ID:
 MW80R
 Date Received:
 05/18/2023 14:00
 Collector:
 MVTL Field Service

Temp @ Receipt (C): Ambient

Contract Lab

Method: Contracted Result

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Radium 226	See Attached			1	06/28/2023 16:35	06/28/2023 16:35	SUBv	
Radium 228	See Attached			1	06/28/2023 16:35	06/28/2023 16:35	SUBv	





Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

 Lab ID:
 16039006
 Date Collected:
 05/18/2023
 Matrix:
 Groundwater

 Sample ID:
 Dup 1
 Date Received:
 05/18/2023 14:00
 Collector:
 MVTL Field Service

Temp @ Receipt (C): Ambient

Contract Lab

Method: Contracted Result

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Radium 226	See Attached			1	06/28/2023 16:35	06/28/2023 16:35	SUBv	
Radium 228	See Attached			1	06/28/2023 16:35	06/28/2023 16:35	SUBv	



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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

Lab ID:16039007Date Collected:05/18/2023Matrix:GroundwaterSample ID:Field Blank (FB)Date Received:05/18/2023 14:00Collector:MVTL Field Service

Temp @ Receipt (C): Ambient

Contract Lab

Method: Contracted Result

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Radium 226	See Attached			1	06/28/2023 16:35	06/28/2023 16:35	SUBv	
Radium 228	See Attached			1	06/28/2023 16:35	06/28/2023 16:35	SUBv	



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Account #: 2800

Client:

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ANALYTICAL SUMMARY REPORT

June 23, 2023

Minnesota Valley Testing Laboratories

C23050788

1126 N Front St

New Ulm, MN 56073-1176

Work Order:

Quote ID: C15480

Project Name: 16039

Energy Laboratories, Inc. Casper WY received the following 7 samples for Minnesota Valley Testing Laboratories on 5/22/2023 for analysis.

Lab ID	Client Sample ID	Collect Date	Receive Date	Matrix	Test
C23050788-001	16039001; MW13	05/17/23 11:05	5 05/22/23	Groundwater	Radium 226, Total Radium 228, Total
C23050788-002	16039002; MW1-90	05/17/23 14:35	5 05/22/23	Groundwater	Same As Above
C23050788-003	16039003; MW2-90	05/18/23 11:1:	5 05/22/23	Groundwater	Same As Above
C23050788-004	16039004; MW3-90	05/18/23 10:00	05/22/23	Groundwater	Same As Above
C23050788-005	16039005; MW80R	05/18/23 12:5	05/22/23	Groundwater	Same As Above
C23050788-006	16039006; Dup 1	05/17/23 11:05	5 05/22/23	Groundwater	Same As Above
C23050788-007	16039007; Field Blank (FB)	05/17/23 11:05	5 05/22/23	Groundwater	Same As Above

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

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

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

Report Approved By:

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

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Billings, MI 496, 452, 6325 + Casper, WY 307, 235, 8515

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

 Client:
 Minnesota Valley Testing Laboratories
 Report Date:
 06/23/23

 Project:
 16039
 Collection Date:
 05/17/23 11:05

 Lab ID:
 C23050788-001
 DateReceived:
 05/22/23

 Client Sample ID:
 16039001; MW13
 Matrix:
 Groundwater

Analyses	Result Ur	nits	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
RADIONUCLIDES, TOTAL							
Radium 226	0.2 pC	CIVIL	U			E903.0	06/05/23 12:17 / kdk
Radium 226 precision (±)	0.2 pC	CI/L				E903.0	06/05/23 12:17 / kdk
Radium 226 MDC	0.3 pc	CI/L				E903.0	06/05/23 12:17 / kdk
Radium 228	0.9 pC	Oi/L	U			RA-05	06/07/23 12:36 / trs
Radium 228 precision (±)	1.1 pc	CI/L				RA-05	06/07/23 12:36 / trs
Radium 228 MDC	1.7 pc	Ci/L				RA-05	06/07/23 12:36 / trs

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

U - Not detected at Minimum Detectable Concentration

MCL - Maximum Contaminant Level

ND - Not detected at the Reporting Limit (RL)

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

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LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

 Client:
 Minnesota Valley Testing Laboratories

 Project:
 16039

 Lab ID:
 C23050788-002

 Client Sample ID:
 16039002; MW1-90

Report Date: 06/23/23 Collection Date: 05/17/23 14:35 DateReceived: 05/22/23

Matrix: Groundwater

	Units	Qualifiers	RL	QCL	Method	Analysis Date / By
0.2	pCi/L	0			E903.0	06/05/23 12:17 / kdk
0.2	pCI/L				E903.0	06/05/23 12:17 / kdk
0.3	pCI/L				E903.0	06/05/23 12:17 / kdk
1.4	pCi/L	Ü			RA-05	06/07/23 12:36 / trs
1.3	pCI/L				RA-05	06/07/23 12:36 / trs
1.9	pCi/L				RA-05	06/07/23 12:36 / trs
	0.2 0.3 1.4 1.3	0.2 pCi/L 0.2 pCi/L 0.3 pCi/L 1.4 pCi/L 1.3 pCi/L 1.9 pCi/L	0.2 pG//L 0.3 pC//L 1.4 pC//L 1.3 pC//L	0.2 pG//L 0.3 pG//L 1.4 pG//L 1.3 pG//L	0.2 pG/L 0.3 pC/L 1.4 pC/L 1.3 pC/L	0.2 pG/L E903.0 0.3 pC/L E903.0 1.4 pC/L Ú RA-05 1.3 pC/L RA-05

Report Definitions RL - Analyte Reporting Limit

OCL - Quality Control Limit

U - Not detected at Minimum Detectable Concentration

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

(MDC)

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

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LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

 Client:
 Minnesota Valley Testing Laboratories

 Project:
 16039

 Lab ID:
 C23050788-003

 Client Sample ID:
 16039003; MW2-90

Report Date: 06/23/23 Collection Date: 05/18/23 11:15 DateReceived: 05/22/23 Matrix: Groundwater

Analyses	Result Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
RADIONUCLIDES, TOTAL						
Radium 226	0.2 pCi/L	U.			E903.0	06/05/23 12:17 / kdk
Radium 226 precision (±)	0.2 pC/L				E903.0	06/05/23 12:17 / kdk
Radium 226 MDC	0.3 pCI/L				E903.0	06/05/23 12:17 / kdk
Radium 228	0.2 pCi/L	U			RA-05	06/07/23 12:36 / trs
Radium 228 precision (±)	1.1 pCl/L				RA-05	06/07/23 12:36 / trs
Radium 228 MDC	1.8 pCi/L				RA-05	06/07/23 12:36 / trs

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

U - Not detected at Minimum Detectable Concentration (MDC)

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

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Client: Montana-Dakota Utilities - Bismarck Account #: 2800

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LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Minnesota Valley Testing Laboratories 16039 Project: C23050788-004 Lab ID: Client Sample ID: 16039004; MW3-90

Report Date: 06/23/23 Collection Date: 05/18/23 10:00 DateReceived: 05/22/23

Matrix: Groundwater

Analyses	Result	Units	Qualifiers	RL	MCL	Method	Analysis Date / By
RADIONUCLIDES, TOTAL							
Radium 226	0.08	pCi/L	0			E903.0	06/05/23 12:17 / kdk
Radium 226 precision (±)	0.2	pCI/L				E903.0	06/05/23 12:17 / kdk
Radium 226 MDC	0.3	pCI/L				E903.0	06/05/23 12:17 / kdk
Radium 228	0.6	pCi/L	Ü			RA-05	06/07/23 12:36 / trs
Radium 228 precision (±)	1.1	pCi/L				RA-05	06/07/23 12:36 / trs
Radium 228 MDC	1.9	pCi/L				RA-05	06/07/23 12:36 / trs

Report Definitions

RL - Analyte Reporting Limit QCL - Quality Control Limit

U - Not detected at Minimum Detectable Concentration

MCL - Maximum Contaminant Level

ND - Not detected at the Reporting Limit (RL)

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

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LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

 Client:
 Minnesota Valley Testing Laboratories

 Project:
 16039

 Lab ID:
 C23050788-005

 Client Sample ID:
 16039005; MW80R

Report Date: 06/23/23 Collection Date: 05/18/23 12:51 DateReceived: 05/22/23 Matrix: Groundwater

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
RADIONUCLIDES, TOTAL							
Radium 226	0.1	pCi/L	U			E903.0	06/05/23 12:17 / kdk
Radium 226 precision (±)	0.2	pCI/L				E903.0	06/05/23 12:17 / kdk
Radium 226 MDC	0.3	pCI/L				E903.0	06/05/23 12:17 / kdk
Radium 228	-0.4	pCi/L	U			RA-05	06/20/23 11:27 / trs
Radium 228 precision (±)	0.8	pCi/L				RA-05	06/20/23 11:27 / trs
Radium 228 MDC	1.3	pCi/L				RA-05	06/20/23 11:27 / trs

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

U - Not detected at Minimum Detectable Concentration (MDC)

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

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

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LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch Minnesota Valley Testing Laboratories

Project: 16039 Lab ID: C23050788-006 Client Sample ID: 16039006; Dup 1

Client:

Report Date: 06/23/23 Collection Date: 05/17/23 11:05 DateReceived: 05/22/23

Matrix: Groundwater

Analyses	Result Ur	ite	Qualifiers	RL	MCL	Method	Analysis Date / By
74101,900	1103011 01	1110	againter 5	144	200	mutatou	rately sid better by
RADIONUCLIDES, TOTAL							
Radium 226	0.1 pC	WL.	U			E903.0	06/05/23 13:57 / kdk
Radium 226 precision (±)	0.2 pC	WL.				E903.0	06/05/23 13:57 / kdk
Radium 226 MDC	0.3 pC	WL.				E903.0	06/05/23 13:57 / kdk
Radium 228	0.4 pC	Di/L	U			RA-05	06/07/23 12:36 / trs
Radium 228 precision (±)	1.1 pc	WL.				RA-05	06/07/23 12:36 / trs
Radium 228 MDC	1.9 pC	Ci/L				RA-05	06/07/23 12:36 / trs

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

U - Not detected at Minimum Detectable Concentration (MDC)

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

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LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Minnesota Valley Testing Laboratories 16039 Project: C23050788-007 Lab ID:

Client Sample ID: 16039007; Field Blank (FB)

Report Date: 06/23/23 Collection Date: 05/17/23 11:05 DateReceived: 05/22/23

Matrix: Groundwater

				MCL		
Analyses	Result Units	Qualifiers	RL	QCL	Method	Analysis Date / By
RADIONUCLIDES, TOTAL						
Radium 226	0.03 pCi/L	0			E903.0	06/05/23 13:57 / kdk
Radium 226 precision (±)	0.2 pCI/L				E903.0	06/05/23 13:57 / kdk
Radium 226 MDC	0.3 pCl/L				E903.0	06/05/23 13:57 / kdk
Radium 228	1.4 pCi/L	Ü			RA-05	06/07/23 12:36 / trs
Radium 228 precision (±)	1.1 pCl/L				RA-05	06/07/23 12:36 / trs
Radium 228 MDC	1.9 pCi/L				RA-05	06/07/23 12:36 / trs

Report Definitions

RL - Analyte Reporting Limit QCL - Quality Control Limit

U - Not detected at Minimum Detectable Concentration

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

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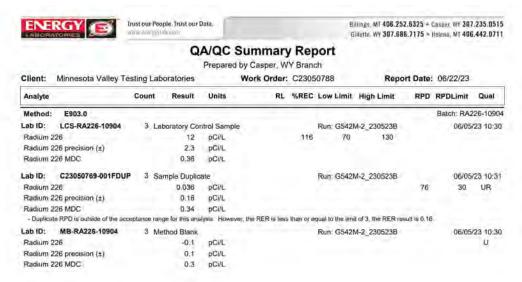


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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck



Qualifiers:

RL - Analyte Reporting Limit

R - Relative Percent Difference (RPD) exceeds advisory limit

ND - Not detected at the Reporting Limit (RL)

U - Not detected at Minimum Detectable Concentration (MDC)

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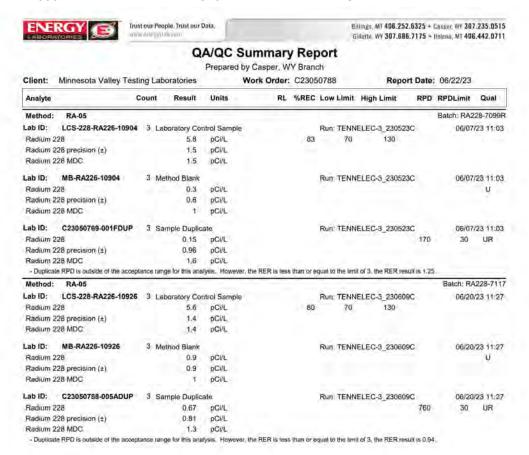


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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck



Qualifiers:

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)

R - Relative Percent Difference (RPD) exceeds advisory limit

U - Not detected at Minimum Detectable Concentration (MDC)

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

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Nork Order Receipt Che	cklist								
Minnesota Valley Testing Lab	C	C23050788							
ogin completed by: Manford E. Hurley	Dat	Date Received: 5/22/2023							
eviewed by: cjohnson		E	Received by: ecl						
eviewed Date: 5/23/2023		C	arrier name: UPS						
hipping container/cooler in good condition?	Yes 🔽	No 🔲	Not Present						
ustody seals intact on all shipping container(s)/cooler(s)?	Yes 🗌	No 🔲	Not Present ✓						
ustody seals intact on all sample bottles?	Yes 🔲	No 🖂	Not Present ☑						
hain of custody present?	Yes 🔽	No 🗆							
hain of custody signed when relinquished and received?	Yes 🗸	No 🖂							
hain of custody agrees with sample labels?	Yes 🗸	No 🗀							
amples in proper container/bottle?	Yes 🗹	No. 🗆							
ample containers intact?	Yes 🗸	No 🖂							
ufficient sample volume for indicated test?	Yes 🔽	No 🖂							
I samples received within holding time? exclude analyses that are considered field parameters uch as pH. DO, Res Cl, Sulfite, Ferrous Iron, etc.)	Yes 🔽	No 🔲							
emp Blank received in all shipping container(s)/cooler(s)?	Yes 🗸	No 🖂	Not Applicable						
ontainer/Temp Blank temperature:	21.0°C No los								
onlainers requiring zero headspace have no headspace or abble that is <6mm (1/4").	Yes 🔲	No 🏻	No VOA vials submitted ✓						
atar - pH acceptable upon receipt?	Yes 🔽	No 🗌	Not Applicable						
tandard Reporting Procedures: ab measurement of analytes considered field H, Dissolved Oxygen and Residual Chlorine,									
olid/soil samples are reported on a wet weight ata units are typically noted as -dry. For agric nd ground prior to sample analysis.									
he reference date for Radon analysis is the sa nalyses is the analysis date. Radiochemical pr									
ontact and Corrective Action Comn	nents:								
he DUP and Field Blank samples were assign valuate the holding time.	ed the earliest	collection tin	ne for the requested analysis in order to						

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Account #:

2800

Client:

Montana-Dakota Utilities - Bismarck

MINNESOTA VALLEY TESTING LABORATORIES, INC.

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	(800) 279-6885	Fax: (701) 2	58-9724		Account #:							72.2	9		
Company Nar	ompany Name and Address:											Phone #:	701-258-972	0	
MVTL 2616 E Broadway Bismarck, ND 58501 Billing Address (indicate if different from above): PO Box 249 New Ulm, MN 56073					Contact: Claudette Name of Sampler:							Fax #: For faxed report check box E-mail: ccarroll@mvtl.com			
					Quote Number							For e-mail report check box Date Submitted: 18-May-23			
					Project Name/Number:							Purchase Order #: BL6698			
Sample Information					Bottle Type						ре				
IML Lab Number	MVTL Lab Number	Client	Sample ID	Sample Type	Date Sampled	Time Sampled	Untreated	1 Gal HNO3	VOC Vials Umpreserved	Glass Jar	Other	Α	nalysis Req	uired	
	16039001	N	/W13	GW	17-May-23	1105		1					Ra226 & Ra	228	
	16039002	M	W1-90	GW	17-May-23	1435		1					Ra226 & Ra	228	
	16039003	M	W2-90	GW	18-May-23	1115		1					Ra226 & Ra	228	
	16039004	M	W3-90	GW	18-May-23	1000		1			Ra226 &		Ra226 & Ra	228	
	16039005	M	W80R	GW	18-May-23	1251		1					Ra226 & Ra	228	
	16039006		Oup 1	GW	17-May-23			1					Ra226 & Ra	228	
	16039007	Field I	Blank (FB)	GW	17-May-23			1		H			Ra226 & Ra	228	
		All	results mu	st be r	eported a	as a nur	ne	ric	al v	alu	ie				
Trai	nsferred by:	Date:	Time:	Sample	Condition:	Re	ecei	ved	by:			Date:		Te	emp:
T. Olson		18-May-23	1700			Eric	7	or	KI	1	,	5/22/22	9:340	0	

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Account #:

2800

MINNESOTA VALLEY TESTING LABORATORIES, INC.

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

Client:

Montana-Dakota Utilities -

Bismarck

HNO NITHE AC Revision Date 24-Dec-2021 Nitric sold, Trace Metal Grade Toxic If inhaled Corresive to the respiratory tract Precasionary observations of the Control of the Con Influenceary was in a fundamental installation in the property of the position comfortable for breathing IF INHALED Remove victims to their air and knep at rest in a position comfortable for breathing immediately call a POISON CENTER or doctor/physician. Eyes
Fix EYES: Rinas cautiously with water for soveral manutes. Remove contact lenses, if present and easy to do, Continue rinsing Ingestion

F SWALLOWED: Rinse mouth. DO NOT induce varning. If SWALLINGER PROPERTY IN THE COST OF CONTROL OF CONTRO Store in a well-ventil Store in a dry place Dispose of contents/container to an approved Hazards not otherwise classified (HNOC)

Component CAS No Weig
Natic acid _% (C s 70 %) 7697-37-2 65-
Water 7732-18-5 30 -

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Thermo Fisher

SAFETY DATA SHEET

Creation Date 12-Mar-2009

Revision Date 24-Dec-2021

1. Identification Nitric acid, Trace Metal Grade

> A509-212; A509-500; A509P212; A509P500; A509SK212 7697-37-2 Azolic acid; Engraver's acid; Aque fortis

CAS No Synonyme Laboratory chemicals.
Food, drug, peelicide or blockful product use

Details of the supplier of the safety data sheet.

Company Fisher Scientific Company One Reagent Lans Fair Lawn, NJ 07410 Tet. (201) 796-7100

Cat No. :

Emergency Telephone Number

CHEMTREC's, inside the USA: 800-424-9300 CHEMTREC's, Outside the USA: 001-703-527-3887

2. Hazard(s) identification Clessification. This chemical is considered hazardous by the 2012 DSHA Hazard Communication Standard (29 DFR 1910, 1200) ous Eve Demage/Eve Initation

Label Elements

Signal Word Danger

Hazard Statements
May intensity fire; oxidizer
May be compalve to metals
Causes severe skin burns and eye damage

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Report Date:

Thursday, June 29,

2023 4:36:15 PM

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Account #:

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Client:

Montana-Dakota Utilities -

Bismarck

Revision Date 24-Dec-2021 Liquid
Clear Coortess, Light yellow
Strong Acrid
No reformation available
< 1.0 (0.1M)
41 °C 7 41.8 °F
Not applicable
Not applicable
Not replicable
Not applicable
Not applicable No data available No data avalable 0.94 kPa (20°C) 0.94 kPa (20°C)
No information availa
1,40
miscible
No data evellable
No information availa
No information availa
HNOS
63,01 10. Stability and reactivity repatible products. Combustible material. Excess heat. Exposure to sir or moisture over riged periods. Combustible material, Strong bases, Reducing Agent, Metals, Finely powdered mittal Organic materials, Aldehydes, Alcohols, Cyanides, Ammonia, Strong reducing agents None under normal processing. 11. Toxicological information Based on ATE data, the classification criteria are not met. ATE > 2000 mg/kg. Based on ATE data, the disselfication criteria are not met. ATE > 2000 mg/kg. Category 3. ATE = 1 - 5 mg/L Category 4. Based on ATE data, the classification criteria are not met. ATE > 20 mg/L. Products
Delayed and immediate effects as well as chronic effects from short and long-term expor

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Page 6/9

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Thursday, , June 29, 2023 4:36:15 PM

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Report Date:

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Nitric acid, Trace Metal Grade

Physical State
Appearance
Odor Threshold
pH Melling Point/Range
Boiling Point/Range
Flash Point
Evaporation Rate
Flammability or expli
Unner

Planmability or explosive in Upper Lower Vapor Pressure Vapor Danily Specific Gravity Solubility Partition coefficient; n-octan Autoignition Temperature Dacomposition Temperature Wacoulty Molecular Formula Molecular Weight

Reactive Hazard

Incompatible Materials

Hazardous Polymerization Hazardous Reactions

Product information
Oral LD50
Dermal LD50
Mist LC50
Vapor LC50
Component information
Component
Nitre add ... % [C ≤ 70 %]

Acute Toxicity

Stability



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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Nitric soid, Trace Metal Grade

16. Other Information

Prepared by Regulatory Attain

Regulatory Attain

Regulatory Attain

Email EMBDIS RA@therefisher.com

Creation neas

15-Mer. 2008

Prepared by 2-Mer. 2008

Prepared by 2-Mer. 2008

15-Mer. 2008

Prepared by 2-Mer. 2008

Revision flats

2-Mer. 2001

Revision Summary

Discalainer

The Information provided in this Salety Data Sheet is correct to the best of our knowledge, information and belief at the data of the publication. The information given is designed only as a guidence for safe handling, was processing, storage, transportation, Gisposal and releases and is not to be considered a warray or quality septication. The information relates only to the specific production feedings and in your behalfful in the safe or in may process, unless specified in the section material used in combination with any other materials or in may process, unless specified in the SDS

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Date/Time

18 May 23

Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Location Log In Walk In #2

Date/Time

16 Pm 23

MI	2616 E. B	roadway Ave ND 58501	esting La	aboratories			Montana – Dakota Utilities WO: 16039			Cha	ain of Custody Record
Report To: Attn: Address: Phone: Email:	MDU Todd Peterson 400 N. 4th St Bismarck, ND 58501 701-425-2427 Todd.Peterson@mdu.co	om		CC:					Event: Sampled By:		MDU Heskett
	Sam	ple Information	1		Sa	mple Con	tainers		Field Reading	s	
Lab Number	Sample ID	Date	Time	Sample Type	1 Gal Nitric						Analysis Required
001	MW13	17 Man 23	1105	GW	x	+					r inarysis required
002	MW1-90	17 Man 23	1435	GW	x						
003	MW2-90	18 May 23	1115	GW	x					1	1
009	MW3-90	18 May 23	1000	GW	x						
005	MW80R	18 May 23	1251	GW	x						Rad 226 & 228
006	Dup 1	17 My 23		GW	х						1
	Field Blank (FB)	17-Mm23	_	GW	x						1

Temp (°C)

TM562 / TM805



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www.MVTL.com



Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Workorder: MDU Heskett (19770) **PO:** 196081 OP

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

Certificate of Analysis

Approval

All data reported has been reviewed and approved by:



Claudette Carroll, Lab Manager Bismarck, ND

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

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

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



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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Workorder Summary

Workorder Comments

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

Analysis Results Comments

19770001 (Evap Pond)

Sample analyzed beyond holding time.(pH)



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PDW

08:00

Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

units

Analytical Results

Lab ID:19770001Date Collected:06/30/2023 08:00Matrix:GroundwaterSample ID:Evap PondDate Received:06/30/2023 08:27Collector:MVTL Field Service

Temp @ Receipt (C): 17.06 Received on Ice: Yes

8.38

Method: 120.1

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Specific Conductance - Field	4183	umhos/cm	1	1	06/30/2023 08:00	06/30/2023 08:00	PDW	
Method: 150.2								
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Field	0.00	!4	0.04	4	06/30/2023	06/30/2023	DDW	

1

08:00

0.01

Me	th	nd	. 1	170	•

pH - Field

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Temperature - Field C	21.66	degrees (0	1	06/30/2023 08:00	06/30/2023 08:00	PDW	

Method: ASTM D516-16

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Sulfate	2530	mg/L	100	20	07/07/2023 10:51	07/07/2023 10:51	AMC	

Method: EPA 245.1

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Mercury, Dissolved	<0.0002	mg/L	0.0002	1	07/07/2023 12:05	07/10/2023 11·20	MDE	

Method: EPA 353.2

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Nitrate + Nitrite as N	<0.2	mg/L	0.2	1	07/06/2023 09:53	07/06/2023 09:53	EJV	

Method: EPA 365.1

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Phosphorus as P	<0.1	mg/L	0.1	1	07/06/2023 16:30	07/07/2023 09:40	EJV	

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Report Date: Wednesday, July 12, 2023 3:54:51 PM



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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

 Lab ID:
 19770001
 Date Collected:
 06/30/2023 08:00
 Matrix:
 Groundwater

 Sample ID:
 Evap Pond
 Date Received:
 06/30/2023 08:27
 Collector:
 MVTL Field Service

Temp @ Receipt (C): 17.06 Received on Ice: Yes

Method: EPA 6010D

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Barium, Dissolved	<0.1	mg/L	0.1	1	07/03/2023 07:44	07/03/2023 12:40	SLZ	
Boron, Dissolved	1.16	mg/L	0.1	1	07/03/2023 07:44	07/06/2023 10:54	SLZ	
Calcium	46.1	mg/L	5	5	06/30/2023 17:30	07/10/2023 12:46	SLZ	
Iron, Dissolved	<0.1	mg/L	0.1	1	07/03/2023 07:44	07/03/2023 12:40	SLZ	
Magnesium	19.9	mg/L	5	5	06/30/2023 17:30	07/10/2023 12:46	SLZ	
Manganese, Dissolved	<0.05	mg/L	0.05	1	07/03/2023 07:44	07/03/2023 12:40	SLZ	
Molybdenum, Dissolved	<0.1	mg/L	0.1	1	07/03/2023 07:44	07/03/2023 12:40	SLZ	
Potassium	77.1	mg/L	5	5	06/30/2023 17:30	07/10/2023 12:46	SLZ	
Sodium	1020	mg/L	5	5	06/30/2023 17:30	07/10/2023 12:46	SLZ	

Method: EPA 6020B

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Arsenic, Dissolved	<0.002	mg/L	0.002	5	07/03/2023 07:44	07/03/2023 12:19	CC	
Cadmium, Dissolved	<0.0005	mg/L	0.0005	5	07/03/2023 07:44	07/03/2023 12:19	CC	
Chromium, Dissolved	<0.002	mg/L	0.002	5	07/03/2023 07:44	07/03/2023 12:19	CC	
Lead, Dissolved	<0.0005	mg/L	0.0005	5	07/03/2023 07:44	07/03/2023 12:19	CC	
Selenium, Dissolved	0.0058	mg/L	0.005	5	07/03/2023 07:44	07/03/2023 12:19	CC	
Silver, Dissolved	<0.0005	mg/L	0.0005	5	07/03/2023 07:44	07/03/2023 12:19	CC	

Method: SM1030F

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Anion Summation	55.9	meq/L		1	07/12/2023 15:52	07/12/2023 15:52	CALC	
Cation Summation	50.3	meq/L		1	07/12/2023 15:52	07/12/2023 15:52	CALC	
Percent Difference	-5.27	%		1	07/12/2023 15:52	07/12/2023 15:52	CALC	
TDS - Summation	3790	mg/L	12.5	1	07/12/2023 15:52	07/12/2023 15:52	CALC	

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

 Lab ID:
 19770001
 Date Collected:
 06/30/2023 08:00
 Matrix:
 Groundwater

 Sample ID:
 Evap Pond
 Date Received:
 06/30/2023 08:27
 Collector:
 MVTL Field Service

Temp @ Receipt (C): 17.06 Received on Ice: Yes

		Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Alkalinity, Phenolphthalein	<20.5	mg/L as CaCO3	20.5	1	06/30/2023 23:01	06/30/2023 23:01	AMC	
Alkalinity, Total	142	mg/L as CaCO3	20.5	1	06/30/2023 23:01	06/30/2023 23:01	AMC	
Bicarbonate	141	mg/L as CaCO3	20.5	1	06/30/2023 23:01	06/30/2023 23:01	AMC	
Carbonate	<20.5	mg/L as CaCO3	20.5	1	06/30/2023 23:01	06/30/2023 23:01	AMC	
Hydroxide	<20.5	mg/L as CaCO3	20.5	1	06/30/2023 23:01	06/30/2023 23:01	AMC	
Method: SM2340B-2011								
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Hardness - Total	197	mg/L as CaCO3	6.62	1	07/12/2023 15:52	07/12/2023 15:52	CALC	
Method: SM2510 B-2011 EC								
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Specific Conductance	4273	umhos/cm	1	1	06/30/2023 23:01	06/30/2023 23:01	AMC	
Method: SM4500 H+ B-2011								
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
рН	8.4	units	0.1	1	07/05/2023 13:47	07/05/2023 13:47	RAA	*
Method: SM4500-CI-E 2011								
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Chloride	11.1	mg/L	2.0	1	07/06/2023 10:23	07/06/2023 10:23	AMC	
Method: SM4500-F-C-2011								
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Fluoride	0.30	mg/L	0.1	1	06/30/2023 23:01	06/30/2023 23:01	AMC	
Method: USDA 20b								
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

C Resul	ts Summary						WO #:	197	70
Sulfate				Units: mg/L					
(C Type	Original Sample ID	Blank Result.	Spike Amount	Spike % Recovery	Spike Duplicate % Recovery	Lower Control Limit (%)	Lipper Control Limit (%)	RPD (%)	RPD Limit (%)
FB			100	101.G		RS	115		
16			100	105-0		85	115		
i di			100	107 0		85	115		
Hå.			100	101.0		85	115		
a			100	94.5		65	115		
			100	34.5		8 5			
Đ			100	98.2		85	115		
ù.			100	94,6		85.	115		
ru -			100	:100,C		85	115		
d		riğ.							
ia .		15							
iii.		15							
a		15							
B)		d							
в		0							
i i		d.							
B		C)							
IS/MSD	1961900i		1000	88.0	88.3	85	115	0.0	50
S/MSD	19625002		500	108.3	107,1	85	115	0.7	20
S/MSD	-19772001		500	111.6	120.6	85	115	0.7	20
S/MSD	19801002		500	62.1	76.4	85	115	5.6	26
IS/MSD	19801012		1000	85.9	88.5	61	115	1.3	20
S/MSD	19922005		500	84.4	88.0	85.	115	2.5	20
S/MSD	20040001		500	60.5	56.3	RS	115	4.2	20
litrate + Nit	rite as N			Units: mg/L					
СТуре	Original Sample ID	Blank Result.	Spike Amount	Spike %	Spike Duplicate	Lower Control	Upper Control	RPD (%)	RPD Limit (%)
ð.			0.5	Recovery 100.0	% Recovery	30 Timit (%)	Umit (%)		
ů.			0.5	94.0		90	iio		
di .			0.5	100.0		90	110		



Client:

Montana-Dakota Utilities - Bismarck



Account #: 2800

Nitrate + Nitrite	as N			Units:	mg/L					
QC Туре	Original Sample ID	Blank Result	Spike Amount	Spike M Recovery		Spike Duplicate Secovery	Lower Control	Lipper Control Limit (%)	RPD (%)	RPD Limit (%)
Fil			0.5	100.0			90	iiα		
AS/MSD	19630002		1	84.0		85.0	50	110	0.1	20
IS/MSD	19772006		i	104.0		103-0	.90	110	0.2	20
IS/MSD	19922008		1	98.0		100.0	50	110	20	20
IS/MSD	19924001		ģ	99.0		101.0	90	220	0.6	- 20
hosphorus as P				Units:	mg/L					
IC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery		Spike Duplicate % Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
ги			0.5	104.0			90	110		
i			0.5	106.0			90	110		
			0.5	106.0			90	110		
19		<0.1								
ě		80.1								
6		40.1								
sylvisto	19922004		11	105 0		708.0	90	119	1.9	90
5/M5D	19926001		J	102.0		1040	90	110	0.5	20
S/MSD	20069001		-	((12)0		115.0	99	330	0.6	20
ts/Msta	20071001		1	109.0		113.0	90	110	10	20
Chloride				Units:	mg/L					
СТуре	Original Sample ID	Blank Result	Splike Amount	Spike W Recovery	116	Spike Duplicate % Recovery	Lower Control Limit (%)	Upper Control Limit (%)	KPD (%)	RPD Limit (%)
PB			30	92.6			90	110		
a)			30	98.9			90	110		
a			30	92.9			40	110		
ū			30	93.1			90	110		
p			90	92.1			90	110		
ű			80	93.1			90	110		
Ð			30	92.7			99	im		
		<2.0								

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<2.0





Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Chloride				Units:	mg/L					
QC Type	Original Sample ID	Blank Result	Spike Amount	Spike M Recovery		Spike Duplicate ** Recovery	Lower Control Limit (%)	Lipper Control Limit (%)	RPD (%)	RPD Limit (%)
AE.		<2:0								
ÁB		<2.0								
AS/MSD	19619001		30	1144		i15.2	80	120	ài	-20
HS/MSD	19772006		30	94.0		94.1	90	120	0.0	Qμ.
IS/MSD	19926001		àò	148.6		129.3	30	130	07	20
Barium, Dissolve	ed			Units:	mg/L					
IC Type	Original Sample ID	Blank Result	Spike Amount	Spike N		Spike Duplicate	Lower Control	Upper Control	RPD (%)	RPD Limit (%)
FIFQE			0.4	Recovery 111.0		% Recovery	Limit (N)	115 (N)		
10		-(0.1								
Calcium				Units:	mg/L		3 000			
QC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery		Spike Duplicate % Recovery	Limit (%)	Lipper Control Limit (%)	RPD (%)	RPD Limit (%)
FB-MI			100	111.0			89	115		
kes		id.								
UP.	19770001								11	20
ron, Dissolved				Units:	mg/L					
СТуре	Original Sample ID	Blank Result	Splike Amount	Spike W		Spike Duplicate	Lower Control	Upper Control	RPD (%)	RPD Limit (%)
FB-OE			0.4	Recovery 114.0		% Recovery	Limit (%)	Limit (%) 115		
100		<0.1								
Magnesium				Units:	mg/L					
ас Туре	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery		Spike Duplicate % Recovery	Lower Control	Lipper Control	RPD (%)	RPD Limit (%)
FB-MI			100	108.0		and the same of th	as	115		
AB		d								
ur.	19770001								31	20
Manganese, Dis	solved			Units:	mg/L					
IC Type	Original Sample ID	Blank Riesult	Spike Amount	Spike %	1100	Spike Dupkcate	Lower Control	Upper Control	RPD (%)	RPD LINE (%)
FB-OE			0.4	Recovery 115.0		% Recovery	Limit (%) 85	Limit (%)		
16		<0.09								
Molybdenum, D				Units:	mg/L		Towns 1		Con T	. 355.4.4
IC Type	Original Semple (D	Blank Result	Spike Amount	5pike % Recovery 111.0	_	Spike Duplicate 16 Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
ra-At			0.4	111.0			as.	115		
ta .		0.1								
				Units:	mg/L					
Potassium					100					



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Account #: 2800

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Potassium				Units:	mg/L					
QC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery		Spike Duplicate & Recovery	Lower Control Limit (%)	Limit (%)	RPD (%)	RPD Limit (%)
(a)		<1								
UP	19770801								31	20
odium				Units:	mg/L					
с туре	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery		Spike Duplicate	Lower Control	Upper Control Limit (%)	MED (IV)	RPD Limit (%)
(B-A/I)			100	309.0			95	215		
10		-301								
UP	19770001								2.5	20
arium, Dissolve	4			Units:	mg/L					
IC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery		Spike Duplicate W Recovery	Lower Control Limit (%)	Lipper Control Limit (%)	RPD (%)	RPD Limit (91)
PK/SPKD	19257002		0.4	1140		116.0	75	125	1.8	20
K/SFKD	19772006		0.4	110.0		112.0	75	125	1.5	20
PK/SPKD	19801016		0.4	97.0		97.7	-75	125	0.1	20
				1434						
Boron, Dissolved	Original Sample ID	Blank Result	Spike Amount	Units:	mg/L	Spike Dupkcate	Lower Control	Upper Control	RPD (%)	RPD Limit (%)
PK/SPKD	18346002		0.4	Recovery 102.0		% Recovery 102.0	Limit (%) 75	Limit (%)	0.5	20
Calcium				Units:	en a D					
Laicium IC Type	Original Sample ID	Blank Result	Spike Amount	Spike W	mg/L	Spike Duplicate	Lower Control	Upper Control	RPD (%)	RPD Limit (%)
05/PDSD	17146005		100	Recovery 105.0	-	% Recovery 105.0	Limit (%) 75	Limit (%)	0.2	20
05/P050	19772001		100	195.9		97.6	75	125	0.7	-20
DS/PDSD	19807001		200	106.0		305.0	78	125	0.3	20-
DS/PDSD	19922006		100	97.9		97.5	75	125	0.2	20
DS/PDS0	19922008		100	105.0		108.0	75	125	00	20
100,777	2112011		377			1			-03	- 72
ron, Dissolved	Original Sample ID	Blank Besult	Spike Amnunt	Units:	mg/L	Spile Ouplicate	Lower Control	Upper Control	RPD (%G)	RPD Limit (6)
PK/SPKD	19257007		0.4	Recovery 99.1		% Recovery 99.2	Limit (%) 75	Limit (%)	0.5	30
W/SPWD	19772006		0.4	90.2		91.6	75	125	16	20
PK/SPKD	19801016		0.4	102.0		102.0	75	125	0.3	20
Magnesium				Units:	mg/L					
СТуре	Original Sample (D	Blank Result	Spike Amount	5pike % Recovery		Spike Duplicate W Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
D5/PDSD	17346005		\$00)	105.0		105.0	75	125	0.1	.20
			100	97.0		97.0	75	125	0.9	20
DS/PDSD	19772001									
DS/PDSD DS/PDSD	19772001		100	1010		1010	75	125	0.1	20



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Magnesium				Units:	mg/L					
QC Type	Original Sample ID	Blank Result	Spike Amount	Spike M Recovery		Spike Duplicate Recovery	Lower Control Limit (16)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
D5/PDSD	19972006		100	105.0		105.0	75	125	0.2	.20
Manganese, Di	ssolved			Units:	mg/L					
де турн	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery		Spice Duplicate Si Recovery	Lower Control	Upper Control Limit (%)	RPD (%)	RPD Limit (III)
PK/SPKO	19257002		0.4	101.0		101.0	75.	125	0.2	-50
PH/SPHII	19772006		0,4	75.9		82.3	75	125	12	20
PN/SPND						100.0	_		6	20
PR/SPRU	19801016		0.4	1010		104.0	75	125	0.2	20
Molybdenum,				Units:	mg/L				-	
AC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery		Spike Duplicate % Recovery	Lower Control Limit (%)	Lipper Control Limit (%)	RPD (%)	RPD Limit (%)
PK/SPKD	19257007		0.4	101.0		100.0	75	125	0.9	20
PK/SPKD	1977,005		0.4	98.5		194.7	75	125	48	.20
FK/SPKO	19801016		0.4	99.1		98.3	75	125	0.9	20-
otassium				Units:	mg/L					
QC Type	Original Sample (II)	Blank Result	Spike Amount	Spike % Recovery		Spike Duplicate Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
DS/PDSD	17346005		100	103-0		104.0	75	125	9.9	30
DS/PDSO	19772001		100	101.0		102.0	75	125	0.5	20
DS/PDSD	19807001		100	1010		101.0	74	125	0.4	26
DS/PDSD	19922006		100	163.0		101.0	75.	125	0.1	20
D5/PDSD	19972008		100	104.0		103.0	11	125	1.2	20
odium				Units:	mg/L	-				
IC Type	Original Sample ID	Blank Result	Spike Ammunt	Spike % Recovery		Spike Duplicate	Lower Control Limit (%)	Lipper Control Limit (%)	RPD (%)	RPD Limit (%)
DS/PDSD	17146005		100	105.0		107.0	75	125	13	-20
DS/PDS0	19772001		100	92.8		96.4	75	125	1.7	20
DS/PDSO	10000001		100	85.2		603	75	125	1.1	20
05/P050	19927006		100	me		104.0	75)25	93	2(1
05/P050	19922009		100	206.0		105.0	75	125	0.7	20
Arsenic, Dissol	ved			Units:	mg/L					
IC Type	Original Sample ID	Blank Result	Spike Amount	Spike N Recovery		Spike Duplicate % Recovery	Lower Control Limit (%)	Upper Control	KPD (%)	RPD Limit (%)
FK/SPKD	18346002		0.1	115.0		114.0	75	125	0.3	26
Cadmium, Diss	olved			Units:	mg/L					
i⊂ Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery		Spike Duplicate % Recovery	Lower Control	Lipper Control Limit (%)	HPD (%)	RPD Limit (96)
FK/SFKD	18346007		0.1	illid		114.0	75	125	31	20
Chromium, Dis	solved			Units:	mg/L					
дс туре	Original Sample III	Blank Result	Spike Amount	Spike N		Spice Duplicate	Lower Control	Upper Control	RPD (%)	RPD Limit (%)
PK/SPKD	18346002		0.1	Recovery 99.7		% Recovery	Limit (%)	Dmit (%)	1.5	20



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ead, Dissolved				Units:	mg/L					
OC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery		Spike Duplicate * Recovery	Lower Control Limit (%)	Lipper Control Limit (%)	RPD (%)	RPD Limit (%)
PK/SPKD	18346007		0.1	102.0		102.0	75	125	0.3	.20
Selenium, Dissol	ved			Units:	mg/L					
QC Typir	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery		Spike Duplicate S Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (96)
PK/SPKO	18346002		0.1	131.0		133.0	75.	125	1.6	50
ilver, Dissolved				Units:	mg/L					
IC Type	Original Sample ID	Blank Result	Spike Amount	Spike W Recovery		Spike Duplicate % Recovery	Lower Control	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
FK/SFKD	19346002		0.1	102.0		102.0	75	125	0,1	20
Aercury, Dissolv	red	_		Units:	mg/L					
ас туре	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery		Spike Duplicate % Recovery	Lower Control Limit (%)	Upper Control Limit (%)	HPD (%)	RPD Limit (%)
Th .			0.002	95.4			65	115		
8.6		e9.0002								
is/MSD	19770001		0.002	91.8		88.6	70	180	0.0	20
Ukalinity, Total				Units:	mg/L					
Стуре	Original Sample III	Blank Result	Spike Amount	Spike % Recovery		Spike Duplicate Ili Recovery	Lower Control Limit (%)	Upper Control Limit (%)	TIPO (%)	RPD Limit (%)
RM.			501	91.7			*	120		
9			410	95.3			90	110		
ii .			-910	96.8			90	110		
11			410	96.Z			90	110		
ý.		<20.5								
W.		<20.5								
ii.		<20.5								
IS/MSD	19621001		410	91.9		16.2	80	120	Lit	20
IS/MSD	1977200i		410	760		76.0	80	120	00	20
specific Conduct	ance			Units:	umhos	s/cm				
IC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery	JiiiiiO:	Spike Dupkcate % Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPE Limit (16)
RM-C			1409	203.1		moseful	95	105		
RM-C			1409	:103.2			91	105		
H				Units:	units					
іс Туре	Original Sample (D	Blank Result	Spike Amount	Spike % Recovery		Spike Duplicate N Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
UP	19770001								9.1	.20
ÚP	19795008								1.5	20
UP.	19922004								0.7	20



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Account #: 2800

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Specific Cond	luctance			Units: umh	nos/cm				
QC Туре	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery	Spike Duplicate	Lower Control	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
UP	19619001							0.1	20
UP.	19772002							0.2	20
Н				Units: unit	5				
QC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery	Spike Ouplicate	Lower Control	Upper Control Limit (%)	RED (%)	RPD Limit (NO)
RM-PH			6	99.8	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	98.33	101.57		
RM-PH			6	100 /		58.83	101.67		
RM-PH			ş-	99.7		98.83	101.67		
BM-PH			0	99.7		98.33	101.67		
luoride				Units; mg/	TL .				
C Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery	Spire Duplicate	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
RM-F			3 39	97.3		65.6	111		
FB-F			0.5	98.0		90	μα		
10.7			0.5	96.0		90	110		
10.0			0.5	980		00	iio		
ta-r		₫II							
in é		\$0.1							
18 F		<0.1							
IS/MSD-I	19625061		0.5	302.0	204.0	-	120	0.8	.20





Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Location

Log In Walk In #2

Date/Time

30 Jul 23

MI	Minnesota Valley Testing Labora 2616 E. Broadway Ave Bismarck, ND 58501 (701) 258-9720 MDU CC:					5			WC): 197	— Dakota 70	-		Cha	ain of Custody Record
Report To: Attn: Address: Phone: Email:	MDU Todd Peterson 400 N. 4th St Bismarck, ND 58501 701-425-2427 Todd.Peterson@mdu.com Sample Information				400 Bis	f Sh O N. mai		St	58501	Ī		Project N Event: Sampled		امرز	MDU Heskett
	San	nple Information	n	_				mple	Conta	iners		Field R	eadings		
Lab Number	Sample ID	Date	Time	Sample Type	1 Liter Raw	500 mL HNO3	500 mL HNO3 (filtered)	250 mL H2SO4			Temp (°C)	Spec. Cond.	Hd		Analysis Required
001	Evap Pond	30/m23	OBOO	GW	X		Х		\Box		21.66	4183	8.38		
															MDU Active Ash List

Temp (°C) TM562-/ TM805

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Name

Heather Horse

Date/Time

30.Jun 23

Relinquished By



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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Workorder: MDU Heskett (25154) PO: 196081 OP

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

Certificate of Analysis

Approval

All data reported has been reviewed and approved by:



Claudette Carroll, Lab Manager Bismarck, ND

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

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

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

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Workorder Summary

Workorder Comments

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



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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

 Lab ID:
 25154001
 Date Collected:
 08/18/2023 10:50
 Matrix:
 Groundwater

 Sample ID:
 1-90
 Date Received:
 08/18/2023 13:10
 Collector:
 MVTL Field Service

Temp @ Receipt (C): 8.6 Received on Ice: Yes

Method: 120.1

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Specific Conductance - Field	11311	umhos/cm	1	1	08/18/2023 10:50	08/18/2023 10·50	JSM	

Method: 150.2

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
pH - Field	6.84	units	0.01	1	08/18/2023 10:50	08/18/2023 10·50	JSM	

Method: 170.1

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Temperature - Field C	14.07	degrees	С	1	08/18/2023 10:50	08/18/2023 10:50	JSM	

Method: SM4500-F-C-2011

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Fluoride	1.13	mg/L	0.1	1	08/24/2023 14:42	08/24/2023 14:42	RAA	

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Report Date: Thursday, September 7, 2023 4:36:12 PM

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

 Lab ID:
 25154002
 Date Collected:
 08/18/2023 11:28
 Matrix:
 Groundwater

 Sample ID:
 2-90
 Date Received:
 08/18/2023 13:10
 Collector:
 MVTL Field Service

Temp @ Receipt (C): 8.6 Received on Ice: Yes

Method: 120.1

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Specific Conductance - Field	7880	umhos/cm	1	1	08/18/2023 11·28	08/18/2023 11·28	JSM	

Method: 150.2

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
pH - Field	7.01	units	0.01	1	08/18/2023 11:28	08/18/2023 11:28	JSM	

Method: 170.1

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Temperature - Field C	10.46	degrees	С	1	08/18/2023 11:28	08/18/2023 11:28	JSM	

Method: EPA 6010D

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Calcium	432	mg/L	1	1	08/18/2023 16:58	08/23/2023 15:08	MDE	

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

 Lab ID:
 25154003
 Date Collected:
 08/18/2023 12:01
 Matrix:
 Groundwater

 Sample ID:
 80R
 Date Received:
 08/18/2023 13:10
 Collector:
 MVTL Field Service

Temp @ Receipt (C): 8.6 Received on Ice: Yes

Method: 120.1

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Specific Conductance - Field	6956	umhos/cm	1	1	08/18/2023 12:01	08/18/2023 12:01	JSM	

Method: 150.2

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
pH - Field	7	units	0.01	1	08/18/2023 12:01	08/18/2023 12:01	JSM	

Method: 170.1

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Temperature - Field C	10.74	degrees	С	1	08/18/2023 12·01	08/18/2023 12:01	JSM	

Method: EPA 6010D

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Calcium	458	mg/L	1	1	08/18/2023 16:58	08/23/2023 15:11	MDE	

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Report Date: Thursday, September 7, 2023 4:36:12 PM

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

C Result	ts Summary							WO #:	2515	4
Calcium QC Type	Original Sample 10	Blank Result.	Spike Amount	Units:	mg/L	Spike Duplicate	Lower Control	Upper Control	APD (%)	RPD Limit (%)
DSD	24890001		500	Recovery 101.0		% Recovery 101.0	Limit (%) 75	Limit (%) 125	0.0	20
DSD	24941003		500	96.4		100.0	75	125	0.9	20
Calcium				Units:	mg/L					
C Typir	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery		Spike Duplicate % Recovery	Lower Control	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
FD-MI			100	106.0		Johnson	85	115		
E-AAI			100	100			85	115		
В		*1								
10		×II								
ui-	24808001								**	ZD-
UP	24890005								1.1	20
UF	25154002								.i.s	20-
luoride				Units:	mg/L					
QC Type	Original Sample ID	Blank Result	Spike Amount	Spike %		Spike Duplicate	Lower Control	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
RIA F			3.39	95.9			616	111		
E F			0.5	98.0			-90	110		
B.F			0.5	704 0			90	in		
in F		50.L								
15+		∹0.1								
MSD-F	25638001		0.5	10130		109.0	80.	120	23	:20





Date/Time

Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

MI	Minnesota Valley Testing Laboratories 2616 E. Broadway Ave Bismarck, ND 58501 (701) 258-9720 MDU Todd Peterson							1	NO: 25	154	Dakota L			Ch	ain of Custody Record
Report To: Attn: Address: Phone: Email:	MDU Todd Peterson 400 N. 4th St Bismarck, ND 58501 701-425-2427 Todd.Peterson@mdu.	Peterson							Project Na Event: Sampled						
	Sai	mple Informatio	n				Samp	le C	ontainers	Jugi		Field Re	adings		
Lab Number	Sample ID	Date	Time	Sample Type	1 Liter Raw	500 mL HN03	500 mL HNO3 (filtered) 250 mL H2SO4				Temp (°C)	Spec. Cond.	Hd	Turbidity (NTU)	Analysis Required
001	1-90	18 Ay 23	1050	GW	X						14.07	11,311	6.54	3.72	Floride
002	2-90	16 Aug 23	1128	GW		X					1446	7080	7.01	as3	Colcium
003	BOR	16Am 23	1201	GW		X					10.74	6956	7.00	0.35	Calcium
Comments:	1					_	Ш			Ц	1				

Sample Condition

Temp (°C)

FOI 8.6 TM562 / TM805

Location

Log In Walk In #2

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Relinquished By

Date/Time

18 Ay 23





Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

			Eial	4 D-	atask	100+		Company:		MDU Heskett		
MVT			LIGI	uDa	ıtası	ieet		Event:		2023		
	4		G	roundwate	r Assessme	ent		Sample ID:			1-90	
2616 E. Broadway Ave, E	Bismarck, ND							Sampling P	ersonal:		25M2	
Phone: (701) 258	-9720										(0.0)	
Weather Conditions		Temp:	70	°F	Wind:		@5-10)	Precip:	Sunny / Pa	ertly Cloudy DCloudy	
	WELL INFO	ORMATIO	N					SAMPLING INFORMATION				
Well Locked?	YES	(NO			1	Purging Me	thod:	Bladder		1	Control Settings:	
Well Labeled?	MES	NO]	Sampling N		Bladder		1	Purge: 7 Sec.	
Casing Strait?	VES	NO]	Dedicated	Equipment?	(YES)	NO]	Recover: \$7 Sec.	
Grout Seal Intact?	XES	NO	Not \	∕isible]				(No		PSI: 20	
Repairs Necessary?]	Duplicate S		YES				
	ng Diameter:		."			Duplicate S	ample ID:		-			
Water Level E			7	ft						_		
	epth of Well:		-	ft	1		Bott	le List:		1		
	Well Volume:		-	liters	1	1 Liter Raw		1-Gal Nitric				
	Top of Pump:			ft	1	500mL Nitric				1		
Water Level A				ft	1	500mL-Nitrie				1		
Measurem	ent Method:	Electric	Nater Level	Indicator	J	250mL Sulfu	rie-			J		
					FIE	LD READI	NGS					
Stabilization Para		Temp.	Spec.	pH	DO	ORP	Turbidity	Water Level	Pumping	mL	Appearance or Comment	
(3 Consecuti		(°C)	Cond.	Pri	(mg/L)	(mV)	(NTU)		Rate	Removed	Clarity, Color, Odor, Ect.	
Purge Date	Time	±0.5°	±5%	±0.1	±10%	±10		(ft)	mL/Min		clear, slightly turbid, turbid	
18 4423	0955	Start of Wel										
,	1025	13,50	11296	6.85	2.17	140,5	26.16	11.18	100.0	3000,0	Cker	
	1035	14.26	11,331	6,86	1.82	142,7	5,23	11.19	100.0	1000.0	Char	
	1040	13,88	11,346	6.84	1.20	146.8	4.37	11.10	102.0	500.0	Clear	
	1045	13.93	11,299	6,83	1.73	148,0	3.87	1/119	[00.0]	500.0	Clar	
	1050	14.07	11,311	6.84	1.69	150.5	3,72	11,18	1020	500.0	Cler	
			'									
		<u></u>				1	L					
	Well St	abilized?	(YES)	NO				Total Vo	lume Purged	: 5500.0	_mL	
Sample Date	Time	Temp.	Spec.	pН			Turbidity				Appearance or Comment	
10.1.02	1.00	(°C)	Cond.	1			(NTU)	-		-	Clarity, Color, Odor, Ect.	
18 Ay23	1050	14.07	4,311	6.84			3.72				Clear	
Comments:	Repairs	ed wel	1 due	to cut	lines							

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www.MVTL.com



Account #: 2800 Client: Montana-Dakota Utilities - Bismarck



Phone: (701) 258-9720

Field Datasheet

Groundwater Assessment

 Company:
 MDU Heskett

 Event:
 2023

 Sample ID:
 2 - 90

 Sampling Personal:
 2 - 40

Sunny / Partly Cloudy / Cloudy

Recover: 58

PSI: ZO

Control Settings:

Sec.

Sec.

Weather Conditions: Wind: Temp: WELL INFORMATION Well Locked? Ø Well Labeled? NO Casing Strait? (YES NO Not Visible YES Grout Seal Intact? NO Repairs Necessary? Casing Diameter: Water Level Before Purge: Total Depth of Well: 20.74 Well Volume liters Depth to Top of Pump ft ZI.91 ft
Electric Water Level Indicator Water Level After Sample

SAMPLING INFORMATION
Purging Method: Bladder
Sampling Method: Bladder
Dedicated Equipment? (YES) NO
Ret

Precip:

@ 5-10

N

Duplicate Sample? YES NO Duplicate Sample ID:

Bottle List:

1tter Raw I-Gat Nitric

500mL Nitric

500mL Nitric (filtered)

250mL Sulfuric.

FIELD READINGS Stabilization Parameters DO Appearance or Comment pH Water Leve (3 Consecutive) (°C) Cond ±5% (mg/L) (mV) (NTU) Rate Clarity, Color, Odor, Ect. Purge Date Tim ±0.5 ±0.1 mL/Min ±10 clear, slightly turbid, turbid Start of Well Purge 1103 18 Ay 23 10.41 1113 7435 174.1 0,18 100.0 1000.0 21,85 7861 7855 7880 1,03 5.43 0,60 eles 100.0 1123 10,50 170.4 7.02 6,53 21,90 Clesy 5.13 1128 100.0 500.0 cles 168.7 (YES Well Stabilized? Total Volume Purged: 2500.0 NO

Sample Date	Time	(°C)	Spec. Cond.	рН	Turbi (NT	.,	Appearance or Comment Clarity, Color, Odor, Ect.
18 Ay23	1128	10.46	7880	7.01	0.5		Clear
Comments:							

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

			Eial	40	atash	200+		Company:		MDU Hesl	tett	
MVT			riei	u Da	itasi	ieet		Event:	Event:		2023	
	4		G	roundwate	er Assessm	r Assessment			Sample ID:		BOR	
2616 E. Broadway Ave,	Bismarck, ND				_			Sampling P	ersonal:		1-14-	
Phone: (701) 25											Jacob	
Weather Condition		Temp:	70	°F	Wind:	A ,	@ 5-15	2	Precip:	Sunny / Pa	artly Cloudy / Cloudy	
	WELL INFO	OPMATIO	N						IDLING IN	FORMATI	ON	
Vell Locked?	AFS	CNO	14		7	Purging Me	thod:	Bladder	IFLING IN	CKIVIATI	Control Settings:	
Well Labeled?	YES	NO			1	Sampling N		Bladder			Purge: 3 Sec	
Casing Strait?	YES.	NO			1		Equipment?		NO		Recover: 57 Sec	
Grout Seal Intact?	YÉS	NO	Not \	/isible	1					•	PSI: 20	
Repairs Necessary?]	Duplicate S		YES	(NO			
	ing Diameter:		2"			Duplicate S	ample ID:	_				
	Before Purge:		63	ft	1							
	Total Depth of Well: ft						Bott	le List:		1		
	Well Volume: — liters Depth to Top of Pump: — ft				4	1 Liter Raw		-1 Gal Nitric				
	Water Level After Sample: 14.39 ft				4	500mL Nitrio						
Measurement Method: Electric Water Level Indicator				-	250mL Sulfu							
Wicasarci	nene method.									ı		
Stabilization Par	rameters	Temp.	Spec.		DO	LD READIN	Turbidity		Pumping	mL	Appearance or Comment	
(3 Consecut		(°C)	Cond.	pН	(mg/L)	(mV)	(NTU)	Water Level	Rate	Removed	Clarity, Color, Odor, Ect.	
Purge Date	Time	±0.5°	±5%	±0.1	±10%	±10	(1410)	(ft)	mL/Min	Kemoveu	clear, slightly turbid, turbid	
	1136	Start of Wel	Il Purge			-		1			areary sugresty carbina, carbina	
18 Ay 23	1146	10.64	6893	7.00	1.09	143.6	0.22	14.30	100.0	1000.0	Clear	
	1151	10.74	6933	7,00	0.46	1387	0.79	14.34	1000	500,0	Clear	
	4211	10,77	6962	7.00	0,43	132.1	0.31	14.36	100,0	200.0	Clerr	
	1001	10.74	6956	7.00	0.40	131.4	0,35	14,38	1000	200.0	Char	
					-	-						
						-		-				
	-				+	+		+				
			-		+	+	-	+				
			 			 		1				
	Well St	abilized?	(ES)	NO				Total Vo	lume Purged:	2500.0	mL	
	Time	Temp.	Spec.	pH	T		Turbidity			T	Appearance or Comment	
Cample Date		1001	Cond.	рн	1	1	(NTU)	1	l	I	Clarity, Color, Odor, Ect.	
Sample Date		(°C)	Cona.	7.00			(1410)				Ches/	

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Workorder: MDU Heskett (26051) PO: 196081 OP

CCR APP IV

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

Certificate of Analysis

Approval

All data reported has been reviewed and approved by:



Claudette Carroll, Lab Manager Bismarck, ND

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

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

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

Workorder Comments

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

Work order amended 16Oct23 to add updated QC report. CC 16Oct23

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Workorder Summary

Sample Comments

26051006 (Dup 1) - Sample

Time sampled was not supplied by the client.

26051007 (Field Blank (FB)) - Sample

Time sampled was not supplied by the client.



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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

 Lab ID:
 26051001
 Date Collected:
 08/28/2023 10:51
 Matrix:
 Groundwater

 Sample ID:
 MW13
 Date Received:
 08/29/2023 13:55
 Collector:
 MVTL Field Service

Temp @ Receipt (C): 3.4 Received on Ice: Yes

Parameter Results Units RDL DF Prepared Analyzed By Qual

Method: EPA 245.1

Parameter Units RDL DF Prepared Results Analyzed Ву Qual 08/31/2023 09/01/2023 Mercury < 0.0002 mg/L 0.0002 1 MDE 14:20 14:59

Method: EPA 6010D

Parameter Results Units RDL DF Prepared Analyzed Ву Qual 08/29/2023 09/05/2023 5 0.804 SLZ Lithium mg/L 0.1 17:00 11:07

Method: EPA 6020B

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Antimony	<0.001	mg/L	0.001	5	08/29/2023 17:00	09/07/2023 15:09	MDE	
Arsenic	<0.002	mg/L	0.002	5	08/29/2023 17:00	09/07/2023 15:09	MDE	
Barium	0.0098	mg/L	0.002	5	08/29/2023 17:00	09/07/2023 15:09	MDE	
Beryllium	<0.0005	mg/L	0.0005	5	08/29/2023 17:00	09/07/2023 15:09	MDE	
Cadmium	<0.0005	mg/L	0.0005	5	08/29/2023 17:00	09/08/2023 11:08	MDE	
Chromium	<0.002	mg/L	0.002	5	08/29/2023 17:00	09/07/2023 15:09	MDE	
Cobalt	<0.002	mg/L	0.002	5	08/29/2023 17:00	09/07/2023 15:09	MDE	
Lead	<0.0005	mg/L	0.0005	5	08/29/2023 17:00	09/07/2023 15:09	MDE	
Molybdenum	<0.002	mg/L	0.002	5	08/29/2023 17:00	09/07/2023 15:09	MDE	
Selenium	0.2886	mg/L	0.005	5	08/29/2023 17:00	09/07/2023 15:09	MDE	
Thallium	<0.0005	mg/L	0.0005	5	08/29/2023 17:00	09/07/2023 15:09	MDE	

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

 Lab ID:
 26051002
 Date Collected:
 08/29/2023 12:37
 Matrix:
 Groundwater

 Sample ID:
 MW1-90
 Date Received:
 08/29/2023 13:55
 Collector:
 MVTL Field Service

Temp @ Receipt (C): 3.4 Received on Ice: Yes

Parameter Results Units RDL DF Prepared Analyzed By Qual

Method: EPA 245.1

Parameter Units RDL DF Prepared Results Analyzed Ву Qual 08/31/2023 09/01/2023 Mercury < 0.0002 mg/L 0.0002 1 MDE 14:20 14:59

Method: EPA 6010D

Parameter Results Units RDL DF Prepared Analyzed Ву Qual 08/29/2023 09/05/2023 5 0.648 SLZ Lithium mg/L 0.1 17:00 11:12

Method: EPA 6020B

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Antimony	<0.001	mg/L	0.001	5	08/29/2023 17:00	09/07/2023 15:27	MDE	
Arsenic	<0.002	mg/L	0.002	5	08/29/2023 17:00	09/07/2023 15:27	MDE	
Barium	0.0102	mg/L	0.002	5	08/29/2023 17:00	09/07/2023 15:27	MDE	
Beryllium	<0.0005	mg/L	0.0005	5	08/29/2023 17:00	09/07/2023 15:27	MDE	
Cadmium	<0.0005	mg/L	0.0005	5	08/29/2023 17:00	09/08/2023 11:25	MDE	
Chromium	<0.002	mg/L	0.002	5	08/29/2023 17:00	09/07/2023 15:27	MDE	
Cobalt	<0.002	mg/L	0.002	5	08/29/2023 17:00	09/07/2023 15:27	MDE	
Lead	<0.0005	mg/L	0.0005	5	08/29/2023 17:00	09/07/2023 15:27	MDE	
Molybdenum	<0.002	mg/L	0.002	5	08/29/2023 17:00	09/07/2023 15:27	MDE	
Selenium	0.0173	mg/L	0.005	5	08/29/2023 17:00	09/07/2023 15:27	MDE	
Thallium	<0.0005	mg/L	0.0005	5	08/29/2023 17:00	09/07/2023 15:27	MDE	

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

 Lab ID:
 26051003
 Date Collected:
 08/29/2023 10:24
 Matrix:
 Groundwater

 Sample ID:
 MW2-90
 Date Received:
 08/29/2023 13:55
 Collector:
 MVTL Field Service

Temp @ Receipt (C): 3.4 Received on Ice: Yes

Parameter Results Units RDL DF Prepared Analyzed By Qual

Method: EPA 245.1

Parameter Units RDL DF Prepared Results Analyzed Ву Qual 08/31/2023 09/01/2023 Mercury < 0.0002 mg/L 0.0002 1 MDE 14:20 14:59

Method: EPA 6010D

Parameter Results Units RDL DF Prepared Analyzed Ву Qual 08/29/2023 09/05/2023 5 SLZ Lithium 1.04 mg/L 0.1 17:00 11:13

Method: EPA 6020B

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Antimony	<0.001	mg/L	0.001	5	08/29/2023 17:00	09/07/2023 15:31	MDE	
Arsenic	<0.002	mg/L	0.002	5	08/29/2023 17:00	09/07/2023 15:31	MDE	
Barium	0.0090	mg/L	0.002	5	08/29/2023 17:00	09/07/2023 15:31	MDE	
Beryllium	<0.0005	mg/L	0.0005	5	08/29/2023 17:00	09/07/2023 15:31	MDE	
Cadmium	<0.0005	mg/L	0.0005	5	08/29/2023 17:00	09/08/2023 11:30	MDE	
Chromium	<0.002	mg/L	0.002	5	08/29/2023 17:00	09/07/2023 15:31	MDE	
Cobalt	<0.002	mg/L	0.002	5	08/29/2023 17:00	09/07/2023 15:31	MDE	
Lead	<0.0005	mg/L	0.0005	5	08/29/2023 17:00	09/07/2023 15:31	MDE	
Molybdenum	<0.002	mg/L	0.002	5	08/29/2023 17:00	09/07/2023 15:31	MDE	
Selenium	0.1323	mg/L	0.005	5	08/29/2023 17:00	09/07/2023 15:31	MDE	
Thallium	<0.0005	mg/L	0.0005	5	08/29/2023 17:00	09/07/2023 15:31	MDE	

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Report Date: Monday, October 16, 2023 9:54:41 AM

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

 Lab ID:
 26051004
 Date Collected:
 08/29/2023 08:44
 Matrix:
 Groundwater

 Sample ID:
 MW3-90
 Date Received:
 08/29/2023 13:55
 Collector:
 MVTL Field Service

Temp @ Receipt (C): 3.4 Received on Ice: Yes

Parameter Results Units RDL DF Prepared Analyzed By Qual

Method: EPA 245.1

Parameter Units RDL DF Prepared Results Analyzed Ву Qual 08/31/2023 09/01/2023 Mercury < 0.0002 mg/L 0.0002 1 MDE 14:20 14:59

Method: EPA 6010D

Parameter Results Units RDL DF Prepared Analyzed Ву Qual 08/29/2023 09/05/2023 0.221 0.02 1 SLZ Lithium mg/L 17:00 11:15

Method: EPA 6020B

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Antimony	<0.001	mg/L	0.001	5	08/29/2023 17:00	09/07/2023 15:35	MDE	
Arsenic	<0.002	mg/L	0.002	5	08/29/2023 17:00	09/07/2023 15:35	MDE	
Barium	0.0107	mg/L	0.002	5	08/29/2023 17:00	09/07/2023 15:35	MDE	
Beryllium	<0.0005	mg/L	0.0005	5	08/29/2023 17:00	09/07/2023 15:35	MDE	
Cadmium	<0.0005	mg/L	0.0005	5	08/29/2023 17:00	09/08/2023 11:34	MDE	
Chromium	<0.002	mg/L	0.002	5	08/29/2023 17:00	09/07/2023 15:35	MDE	
Cobalt	<0.002	mg/L	0.002	5	08/29/2023 17:00	09/07/2023 15:35	MDE	
Lead	<0.0005	mg/L	0.0005	5	08/29/2023 17:00	09/07/2023 15:35	MDE	
Molybdenum	<0.002	mg/L	0.002	5	08/29/2023 17:00	09/07/2023 15:35	MDE	
Selenium	0.2024	mg/L	0.005	5	08/29/2023 17:00	09/07/2023 15:35	MDE	
Thallium	<0.0005	mg/L	0.0005	5	08/29/2023 17:00	09/07/2023 15:35	MDE	

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Report Date: Monday, October 16, 2023 9:54:41 AM

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

 Lab ID:
 26051005
 Date Collected:
 08/28/2023 13:05
 Matrix:
 Groundwater

 Sample ID:
 MW80R
 Date Received:
 08/29/2023 13:55
 Collector:
 MVTL Field Service

Temp @ Receipt (C): 3.4 Received on Ice: Yes

Parameter Results Units RDL DF Prepared Analyzed By Qual

Method: EPA 245.1

Parameter Units RDL DF Prepared Results Analyzed Ву Qual 08/31/2023 09/01/2023 Mercury < 0.0002 mg/L 0.0002 1 MDE 14:20 14:59

Method: EPA 6010D

Parameter Results Units RDL DF Prepared Analyzed Ву Qual 08/29/2023 09/05/2023 5 0.893 SLZ Lithium mg/L 0.1 17:00 11:16

Method: EPA 6020B

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Antimony	<0.001	mg/L	0.001	5	08/29/2023 17:00	09/07/2023 15:41	MDE	
Arsenic	<0.002	mg/L	0.002	5	08/29/2023 17:00	09/07/2023 15:41	MDE	
Barium	0.0134	mg/L	0.002	5	08/29/2023 17:00	09/07/2023 15:41	MDE	
Beryllium	<0.0005	mg/L	0.0005	5	08/29/2023 17:00	09/07/2023 15:41	MDE	
Cadmium	<0.0005	mg/L	0.0005	5	08/29/2023 17:00	09/08/2023 11:39	MDE	
Chromium	<0.002	mg/L	0.002	5	08/29/2023 17:00	09/07/2023 15:41	MDE	
Cobalt	<0.002	mg/L	0.002	5	08/29/2023 17:00	09/07/2023 15:41	MDE	
Lead	<0.0005	mg/L	0.0005	5	08/29/2023 17:00	09/07/2023 15:41	MDE	
Molybdenum	0.0030	mg/L	0.002	5	08/29/2023 17:00	09/07/2023 15:41	MDE	
Selenium	0.0468	mg/L	0.005	5	08/29/2023 17:00	09/07/2023 15:41	MDE	
Thallium	<0.0005	mg/L	0.0005	5	08/29/2023 17:00	09/07/2023 15:41	MDE	

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

 Lab ID:
 26051006
 Date Collected:
 08/28/2023
 Matrix:
 Groundwater

 Sample ID:
 Dup 1
 Date Received:
 08/29/2023 13:55
 Collector:
 MVTL Field Service

Temp @ Receipt (C): 3.4 Received on Ice: Yes

Parameter Results Units RDL DF Prepared Analyzed By Qual

Method: EPA 245.1

Parameter Units RDL DF Prepared Results Analyzed Ву Qual 08/31/2023 09/01/2023 Mercury < 0.0002 mg/L 0.0002 1 MDE 14:20 14:59

Method: EPA 6010D

Parameter Results Units RDL DF Prepared Analyzed Ву Qual 08/29/2023 09/05/2023 5 0.769 SLZ Lithium mg/L 0.1 17:00 11:18

Method: EPA 6020B

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Antimony	<0.001	mg/L	0.001	5	08/29/2023 17:00	09/07/2023 15:45	MDE	
Arsenic	<0.002	mg/L	0.002	5	08/29/2023 17:00	09/07/2023 15:45	MDE	
Barium	0.0099	mg/L	0.002	5	08/29/2023 17:00	09/07/2023 15:45	MDE	
Beryllium	<0.0005	mg/L	0.0005	5	08/29/2023 17:00	09/07/2023 15:45	MDE	
Cadmium	<0.0005	mg/L	0.0005	5	08/29/2023 17:00	09/08/2023 11:43	MDE	
Chromium	<0.002	mg/L	0.002	5	08/29/2023 17:00	09/07/2023 15:45	MDE	
Cobalt	<0.002	mg/L	0.002	5	08/29/2023 17:00	09/07/2023 15:45	MDE	
Lead	<0.0005	mg/L	0.0005	5	08/29/2023 17:00	09/07/2023 15:45	MDE	
Molybdenum	<0.002	mg/L	0.002	5	08/29/2023 17:00	09/07/2023 15:45	MDE	
Selenium	0.2783	mg/L	0.005	5	08/29/2023 17:00	09/07/2023 15:45	MDE	
Thallium	<0.0005	mg/L	0.0005	5	08/29/2023 17:00	09/07/2023 15:45	MDE	

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

Lab ID:26051007Date Collected:08/29/2023Matrix:GroundwaterSample ID:Field Blank (FB)Date Received:08/29/2023 13:55Collector:MVTL Field Service

Temp @ Receipt (C): 3.4 Received on Ice: Yes

Parameter Results Units RDL DF Prepared Analyzed By Qual

Method: EPA 245.1

Parameter Units RDL DF Prepared Results Analyzed Ву Qual 08/31/2023 09/01/2023 Mercury < 0.0002 mg/L 0.0002 1 MDE 14:20 14:59

Method: EPA 6010D

Parameter Results Units RDL DF Prepared Analyzed Ву Qual 08/29/2023 09/05/2023 0.02 1 SLZ Lithium <0.02 mg/L 17:00 11:20

Method: EPA 6020B

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Antimony	<0.001	mg/L	0.001	5	08/29/2023 17:00	09/07/2023 15:50	MDE	
Arsenic	<0.002	mg/L	0.002	5	08/29/2023 17:00	09/07/2023 15:50	MDE	
Barium	<0.002	mg/L	0.002	5	08/29/2023 17:00	09/07/2023 15:50	MDE	
Beryllium	<0.0005	mg/L	0.0005	5	08/29/2023 17:00	09/07/2023 15:50	MDE	
Cadmium	<0.0005	mg/L	0.0005	5	08/29/2023 17:00	09/08/2023 11:47	MDE	
Chromium	<0.002	mg/L	0.002	5	08/29/2023 17:00	09/07/2023 15:50	MDE	
Cobalt	<0.002	mg/L	0.002	5	08/29/2023 17:00	09/07/2023 15:50	MDE	
Lead	<0.0005	mg/L	0.0005	5	08/29/2023 17:00	09/07/2023 15:50	MDE	
Molybdenum	<0.002	mg/L	0.002	5	08/29/2023 17:00	09/07/2023 15:50	MDE	
Selenium	<0.005	mg/L	0.005	5	08/29/2023 17:00	09/07/2023 15:50	MDE	
Thallium	<0.0005	mg/L	0.0005	5	08/29/2023 17:00	09/07/2023 15:50	MDE	

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Client:

2800

Account #:

Montana-Dakota Utilities - Bismarck

Lab Number

Montana - Dakota Utilities Minnesota Valley Testing Laboratories WO: 26051 Chain of Custody 2616 E. Broadway Ave Bismarck, ND 58501 Record (701) 258-9720 MDU CC: Project Name: Report To: **MDU** Heskett Attn: **Todd Peterson** 400 N. 4th St Address: Event: Fall 2023 Bismarck, ND 58501 Phone: Sampled By: 701-425-2427 Email: Todd.Peterson@mdu.com Sample Information Sample Containers Field Readings Furbidity (NTU) mL HNO3 (ample Type 500 mL HN03

661	3.61374.7		1.00		1	1	1	1		10 60	-1	-	24	4
00/	MW13	78 Ay 23	1051	GW	X	X	X	X		13,99	11,664	7.03	4.41	41.47
002	MW1-90	29 Au 23	1237	GW	X	X	X	X	11	16.25	11,627	6.86	4.31	
003	MW2-90	29 Au 23	1024	GW	X	X	X	X	11	13.57	7,999	7.04	3.41	
004	MW3-90	29/4/23	0844	GW	X	X	X	X		11,22	5046	6.98	3.43	MDII Hashatt Lint AA . C
005	MW80R	28 Aug 23	1305	GW	X	X	X	X		12.81	7078	7.01	2.41	MDU Heskett List AA + C
006	Dup 1	28 Aug 23	-	GW	X	X	X	X		-	_	-	-	
007	Field Blank (FB)	29 A523	-	GW	X	Х	Х	Х	H	NA	NA	NA.	NA	1
omments:			1	1	_		_		11		* *	2.2 Sept	23	
	Relinquished By		1	Samp	le C	one	litio	n	1	1		Receive	ed By	

Date

Sample ID

Spec. Cond.

Analysis Required

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nments:				* * 2	2 Sept 23
Relinquished	Ву	Sampl	le Condition		Received By
Name	Date/Time	Location	Temp (°C)	///Name	Date/Time
TO Plan	1353	∠log lo> Walk In #2	TM562/AM805	Plaxu-	29 Ang 23
. 00				1	

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Monday, October 16, 2023 9:54:41 AM Report Date:





Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

C Result	ts Summary						WO #:	26051	
Sulfate				Units: mg/L					
QC Type	Original Sample ID	Blank Result.	Spike Amount	Spike % Recovery	Spike Duplicate % Recovery	Lower Control Limit (%)	Lipper Control Limit (%)	APD (%)	RPD Limit (16)
FB			100	96.0		RS	115		
H			100	96.1		85	115		
FB			100	97.3		85	115		
10			100	963		85	115		
FD.			100	36.3		63	115		
H			100	99.6		85	115		
FD			100	98.0		85	115		
rii.			100	98.5		85.	115		
AID.		15							
Ath		· d							
AIR		6							
AEI,		15							
AB		4							
Agy		d							
AB		5							
AS/MSD	26145003		500	81.2	83.0	85	115	0.0	20
AS/MSD	26231009		1000	82.2	87.1	85	115	0.0	20
AS/MSD	26333002		100	91.6	91.9	85	115	0.0	30
AS/MSD	26428004		2000	84.2	83.1	85	115	0.5	20
AS/MISD	26649004		1000	94.8	95.3	85	115	0.8	20
Na/Mau	20049004		1000	94.8	20.3	83	115	U.B.	20
AS/MSD	27121006		500	69.5	76.7	85	115	3.9	26
Chloride				Units: mg/L					
DC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery	Spike Duplicate % Recovery	Lower Control Limit (%)	Lipper Control Limit (%)	RPD (%)	RPD Limit (%)
řa.			30	97.3		90	110		
FB			30	98.4		90	110		
Fil			30	98.9		90	110		
F-61			30	98.7		-90	110		
F6			30	98.1		90	110		
FB			30	98.1		90	110		
fu			áó	96.5		160	110		





Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Chloride				Units:	mg/L					
QC Type	Original Sample ID	Blank Result	Spike Amount	Spile M Recovery		Spike Duplicate Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
řei			801	97.8			90	110:		
FB			30	98.6			90	110		
Ally		<2.0								
4/K		<2.0								
(8		4.0								
id.		<2,0								
10		~2.0								
10		~20								
10		×2.0								
46		<2.0								
ia-		<2.0								
n it tris	2422204		30	la en		matter)	80	ine		
B/MSD	26231006		30	94.9		947	30	120:	0.3	30
S/MSD	26333002		30	94.7		93.5	- 60	120	0.9	30
s/MSD	26833003		30000	122.3		125.2	80	120	0.5	.20
5/M5D	26560001		00	86.5		82.0	30	120	0.5	20
loron				Units:	mg/L					
IC Type	Original Sample ID	Blank Result	Spike Amount	5pike % Recovery		Spike Duplicate % Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD LEMIE (%)
IN-OE			0.4	115.4			85	335		
10		<0.1								
ithium				Units:	mg/L					
IC Type	Original Sample ID	Blank Result	Spike Ammunt	Spike M. Recovery		Spike Duplicate & Recovery	Lower Control	Lipper Control Limit (%)	HPD (%)	RPD Limit (%)
(H-DE			0.4	107.d			ES	115		
10		<0.04								
Soron				Units:	mg/L					
C Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery		Spike Duplicate % Recovery	Lower Control	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
DS/PDSD	26051001		2	102.0		102.0	75	125	0.3	ХD
Calcium				Units:	mg/L					
IC Type	Original Sample ID	Blank Result	Spike Amount	Spike W Recovery		Spike Duplicate N. Recovery	Lower Control Limit (%)	Upper Control Limit (%)	KPD (%)	RPD Limit (%)
DS/PDSD	25544001		100	105.0		104.0	75	125	0,4	.26
D3/PDSD	25544001		500	104.0		104.0	75	125	0.8	26
DS/PDSD	25638001		100	101.0		101.0	73:	125	0.2	.20





Account #: 2800

Client: Montana-Dakota Utilities - Bismarck

Calcium QC Type	Original Sample ID	Blank Result	Spike Amount	Units:	mg/L	Spile Duplicate	Lower Control	Upper Control	RPD (%)	RPD Limit (%)
	17/10-22/20/0	DIVINE ARTHU		Recovery		% Recovery	Limit (%)	Limit (%)		
DS/PDSD	25791007		5001	97:1		95.0	75	125	0.6	.20
05/P050	25881002		100	92.2		92.0	75	125	0.1	20
DS/PDSO	26051007		100	106.0		iosa	75	125	12	20
Ithlum				Units:	mg/L					
СТуре	Original Sample ID	Blank Result	Spike Amount	Spike is Recovery		Spike Duplicate % Recovery	Lower Control	Upper Control Limit (%)	KPD (%)	RPD Limit (%)
D5/PDSD	26051001		25	95.6		93.2	75	125	1.8	20
Antimony				Units:	mg/L					
AC Type	Original Sample ID	Blank Result	Spike Amount	Spike til Recovery		Spike Duplicate % Recovery	Lower Control Limit (%)	Lipper Control Limit (%)	RPD (%)	RPD Limit (%)
PK	25790001		0.1	99.8			75	125		
Arsenic	. 175 176			Units:	mg/L				p-10-10-10-10-10-10-10-10-10-10-10-10-10-	
(С Түре	Original Sample (D	Blank Result.	Spike Amount	Spike % Recovery		Spike Duplicate	Lower Control Limit (%)	Limit (%)	RPD (%)	RPD Limit (16)
PK.	25790001		0.1	97.8			75	125		
Barium				Units:	mg/L					
ОС Туре	Original Sample III	Blank Result	Spike Amount	Spike % Recovery		Spike Duplicate % Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPE LEWIE (%)
PK	25750001		0.1	74.9			75	125		
Beryllium				Units:	mg/L					
С Туре	Original Sample ID	Blank Result	Spike Ammunt	Spike M Recovery		Spike Duplicate B Recovery	Lower Control Limit (46)	Lipper Control Limit (%)	RPD (%)	RPD Limit (%)
P6	25790001		0.1	101.0			75	125		
Cadmium				Units:	mg/L					
ОС Туре	Original Sample ID	Blank Result	Spike Amount	Spike N. Recovery		Spike Duplicate Si Recovery	Lower Control Limit (%)	Upper Control Cimit (%)	RPD (%)	RPD Limit (%)
PW.	25790001		0.1	94.7			75	125		
Chromium				Units:	mg/L					
IC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery		Spice Duplicate % Recovery	Lower Control	Upper Control Limit (%)	RPD (%)	RPD Limit (16)
ex:	25790061		0.1	96.1			75	125		
Cobalt				Units:	mg/L					
IC Type	Original Sample ID	Blank Result	Spike Amount	Spire is Recovery		Spike Ouplicate % Recovery	Lower Control Limit (%)	Upper Control Limit (%)	KPD (%)	RPD Limit (%)
FX	25790001		0.1	95.6			75	125		
ead				Units:	mg/L					
С Туре	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery		Spile Duplicate Si Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
PX	25790001		0.1	67.4			75	125		
Molybdenum				Units:	mg/L					
2С Туре	Original Sample III	Blank Result	Spike Amount	Spike % Recovery		Spike Duplicate	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Linux (%)
PK	25790001		0.1	98.7			75	125		
**										
Selenium				Units:	mg/L					



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Account #: 2800

Thallium QC Type	Original Sample ID	Blank Wesult	Spike Amount	Units:	mg/L	Spike Duplicate	Lower Control	Lipper Control	RPD (%)	RPD Limit (%)
DK TYPE	25790001		0.1	Recovery 84.4		% Recovery	Limit (%)	Limit (%)		
	e-rraned)		974	24.4			14			
Calcium				Units:	mg/L					
QC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery		Spike Dupkcate % Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPG (%)	RPD Limit (95)
7 (j-1yk)			100	109.0		2	85	115		
AS		7								
N/P	25909001								1.0	265
NUP.	26051002								2.5	20
Antimony			A 17 To 17 To 17	Units:	mg/L					
QC Type	Original Sample ID	Blank Result	Spike Anymint	Spike % Recovery		Spike Duplicate % Recovery	Lower Control Limit (%)	Limit (%)	RPD (N)	RPD Limit (91)
FB-MS			0.1	101.0			80	120		
FB-M5			0.1	102.0			80	120		
		in 401								
AIL		<0.001								
AN		<0.001								
AS/MSDI	25817001		0.4	109.0		104-0	75	ins	40	- 20
respondant	2001/1801			June d.		2000	158	.2.5	310	
ASY WISL	26051001		0.6	104.0		101.0	75	125	2.9	20
Arsenic				Units:	mg/L					
IC Type	Original Sample (D	Blank Result	Spike Amount	Spike %		Spike Duplicate	Lower Control	Upper Control	RPD (%)	RPD Limit (%)
F8-M5			0.1	Recovery 101.0		% Recovery	Limit (%) 80	Limit (%)		
FIFMS			0.1	98.9			81	120		
AIG		<0.002								
ABI		×0.003								
		SALAN								
AS/MSD	25817001		-0.4	102.0		104.0	75	125	â,6	30
AS/MSD	26051001		0.4	104.0		101.0	75	175	34	20
Barium				Units:	mg/L					
DC TVD4	Original Sample III	Blank Result	Spike Amount	Spike % Recovery		Spike Duplicate	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD LEVE (%)
FB-M15			0.1	95.8			80	120		
			0,1	99.4			60	120		
FB-MS										
FB-MS		4.000								
		<0.002								
46		<0.002 <0.002								
FB-MS 46 48 48/MSD	2581 <i>70</i> 01		0.4	103.4		97:6	75	125	5.4	25





Account #: 2800

Beryllium QC Type	Original Sample ID	Blank Result	Spike Amount	Units: n	ng/L	Spike Duplicate	Lower Control	Lipper Control	RPD (%)	RPD Limit (%)
CC Type	Original Sample (D	DOMEST RESULT	0.1	Recovery 101.0		2 Becovery	Limit (%)	Umit (%)	(n-n f.a)	NAD DIVINE (AN)
LFB-MS			01	107.0			80	120		
Mis		<0.0005								
Mili		<0.0005								
MS/MSD	25817001		0.4	107.0		105.0	75	125	1,6	20
MS/MSD	26051001		0,4	104.0		100.0	75	125	1.9	20
Cadmium				Units: n	ng/L					
QC Type	Original Sample (D	Blank Result	Spike Amount	Spike % Recovery		Spike DupScate % Recovery	Lower Control Limit (%)	Lipper Control Limit (%)	RPD (%)	RPD Limit (%)
FB-M5			0,1	.103.0			180	120		
Ma		<0.0005								
MS/MSD	25817001		9.4	106.0		105:0	75	125	13	20
W5/M5D	26051001		0.1	97.5		93 6	75	125	9.9	20
Chromium				Units: n	ng/L					
DC Type	Original Sample III	Blank Result	Spike Amount	Spike % Recovery		Spike Duplicate % Recovery	Lower Control	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
FB-WS			01	105 0			80	120		
FB-M5			0.1	106.0			80	120		
MB		<0.002								
MB		<0.002								
MS/MSD	25817001		0.4	110.0		104.0	73	325	5.2	20
MS/MSD	26051001		0.4	100.0		104.0:	75	125	13	.20
						9.72				
Cobalt	A SLAWITH W	45,526	4557		ng/L	62.7.57	5357			and and
QC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery		Spike Duplicate Signature Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (96)
FILMS			0.1	106.0			80	120		
FD-MS			йi	1054			80	100		
will .		40.002								
wa		<0.007								
MS/MSD	25817001		17.4	0,000		103.0	75	325	5.0	alti
MS/MSD	16051001		0.4	104.7		100.0	76	125	30	20
no/nou	10051001		0.9	104.0		2007-0	75	123	9.9.	411
Lead	Address 17-2		436.4		ng/L	ALC:	Van Brita		200 m²	Bank Control
QC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery 100.0	- 1	Spike Duplicate % Recovery	Lower Control Limit (%)	Lipper Control Limit (%)	RPD (%)	-RPD Lämit (%)
FB-MS			0.1	100.0			50	120		
ITI-M5			0.1	164			100	320:		



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Account #: 2800

Lead				Units: mg					
QC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery	Spike Duplicate Recovery	Lower Control Limit (16)	Limit (%)	RPD (%)	SPD Limit (%)
VIE.		<0.0005							
MB		<0.0005							
MS/MSD	25817001		04	96.9	92.3	75	125	47	-20
AS/IASD	26051001		0.4	A7 0	83.2	75	125	44	20
Molybdenum				Units: mg	/L				
QC Type	Original Sample (D	Blank Result	Spike Amount	Spike % Recovery	Spike Duplicate % Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
FB-M5			0.1	109.0		30	120		
FILMS			0.1	104.0		80	120		
иù		-(0,002							
		TIME .							
MB		< 0.007							
AS/M5D	25817001		0.4	109.0	104.0	75	125	ii.	20
AS/MSD	26051001		0.4	1110	106-0	75	125	46	30
ray mou	20091101			III	31864	1.3	125	-	-0.
Selenium				Units: mg	/L				
QC Type	Original Sample III	Blank Result	Spike Amount	Spike % Recovery	Spike Duplicate % Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RED (%)	RPD Limit (%)
FB-WS			01	100€		80	120		
FB.MS			0.1	1993		80	120		
46		<0.005							
***		<0.003							
AD.		<0.005							
us/MSD	25817001		0.4	106,0	97.2	79	325	9.1	20
MS/MSD	26051001		0.4	101.0	94.2	75	125	18	(20)
nor more	********		454	1404/9	5712	100		-3"	140
Thallium	ere er Tita			Units: mg				T	mail.m.
ос туре	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery	Spike Duplicate 16 Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (96)
FILMS			0.1	90.1		80	120		
16-MS			0.1	92.0		44	110		
AB		50.000s							
AB.		<0.0005							
45/MSD	25817001		77.4	94.4	90.0	75	125	4.9	20
AS/MSD	26051001		0.4	84.9	62.0	75	125	3.6	20
				200					
Mercury QC Type	Original Sample ID	Blank Result	Spike Amount	Units: mg	/L Spike Duplicate	Lower Control	Lipper Control	RPD (%)	RPD Llimit (%)
rs. type	Griginal sample ID	Preside Decoral	0.002	Recovery 98.5	% Recovery	Limit (%)	Limit (%)	Hen (a)	Wery Filmit 480
						-	-		



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Account #: 2800

Mercury				Units:	mg/L					
QC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery		Spike Duplicate % Recovery	Lower Control Limit (16)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
MS/MSD	26051007		0.002	94,6		301.0	70	130:	5.1	.20
AS/MSD	26178001		0.002	100 0		110.0	70	130	95	20
pH				Units:	units					
QC Type	Original Sample III	Blank Result	Spike Amount	Spike % Recovery		Spike Ouplicate	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
DUP	26051006								0.7	70
pH				Units:	units					
QC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery		Spike Duplicate % Recovery	Lower Control Limit (%)	Limit (%)	RPD (%)	RPD Limit (%)
RM-PH			6	199.7			98.33	101.67		
RM-PH			÷	99.7			9833	101.67		
luoride				Units:	mg/L					
ОС Туре	Original Sample ID	Blank Result.	Spike Amount	Spike % Recovery		Spike Duplicate 16 Recovery	Lower Control	Upper Control Limit (%)	RPD (%)	RPD Limit (36)
RMF			3 39	97.5			53.6	111		
10 6			0.5	(06.1)			90	110		
FB-F			0.5	106.0			90	910		
MB €		\$0.1								
vo.∓		~0.1								
ne me	Distriction		43							
MSD-F	26051005		0.5	90.0		92.0	-00.	120	12	:20
Total Dissolve	ed Solids			Units:	mg/L					
С. Туре	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery		Spike Duplicate % Recovery	Lower Control Limit (91)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
RM			7%	103.6			90.35	110.13		
Ally		\$10								





Date/Time

Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Location
Log In
Walk In #2

Date/Time

MI	2616 E. Br Bismarck,	(701) 258-9720							WO: 2	2605		a Utilitie	s	Ch	ain of Custody Record
Report To: Attn:	MDU			CC:								Project Na	me:		MDU Heskett
Address:	Todd Peterson 400 N. 4th St Bismarck, ND 58501											Event:			Fall 2023
Phone: Email:	701-425-2427	01-425-2427 odd.Peterson@mdu.com									14	Sampled E		eren	the
	Sam	ple Information	n		L			ple C	Containers			Field Re	adings		
Lab Number	Sample ID	Date	Time	Sample Type	1 Liter Raw	500 mL HN03		250 mL H2504			Temp (°C)	Spec. Cond.	Н	Turbidity (NTU)	Analysis Required
001	MW13	28 Ay 23	1051	GW	Х	X	X	x			13,99	11,664	7.03	4.41	
002	MW1-90	29 Ay 23	1237	GW	X	X	X	x			16.25	11,627	6.86	4.31	
003	MW2-90	29 An 23	1024	GW	X	X	-	X			13.57	7,999	7.04	3.41	
004	MW3-90	29/Aug23	0844	GW	X	X	-	X			11.22	5046	6.98	3.43	MDU Heskett List AA + C
005	MW80R	28 Aug 23	1305	GW	X	X	X	X			12.81	7078	7.01	2.41	WIDO HESKELL LIST FOR T. C.
006	Dup 1	28 Aug 23	-	GW	X	X	-	х			-	-	-	-	
007	Field Blank (FB)	29 Aug 23	-	GW	X	Х	X	X		1	NA	NA	NA	NA	-
Comments:						_	Ш						_		

Temp (°C)

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Relinquished By



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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck



ne: (701) 258-9720

Field Datasheet

Groundwater Assessment

liters

ft

28.66 ft Electric Water Level Indicator Wind:

 Company:
 MDU Heskett

 Event:
 Fall 2023

 Sample ID:
 13

 Sampling Personal:
 3

Sunny / Partly Cloudy / Cloudy

Weather Conditions: Temp: 75°F WELL INFORMATION Well Locked? NO Well Labeled? NO NO Casing Strait? Not Visible Grout Seal Intact? Repairs Necessary? Casing Diameter: Water Level Before Purge: 28,3 Total Depth of Well: ft

Well Volume:

Depth to Top of Pump:

Measurement Method:

Water Level After Sample:

Purging Method: Bladder
Sampling Method: Bladder
Dedicated Equipment? (YÉS) NO

SAMPLING INFORMATION
Purging Method: Bladder

N @ 5-10

Duplicate Sample ID: Dup

Precip:

Control Settings:
Purge: Z Sec.
Recover: 28 Sec.
PSI: 120
Black Br

Bottle List:

1 Liter Raw 1 Gal Nitric

500mL Nitric
500mL Nitric (filtered)
250mL Sulfuric

FIELD READINGS

Stabilization Para	meters	Temp.	Spec.	pH	DO	ORP	Turbidity	Water Level	Pumping	mL	Appearance or Comment
(3 Consecutive	ve)	(°C)	Cond.	pn	(mg/L)	(mV)	(NTU)	water Level	Rate	Removed	Clarity, Color, Odor, Ect.
Purge Date	Time	±0.5°	±5%	±0.1	±10%	±10		(ft)	mL/Min		clear, slightly turbid, turbid
28 Ay 23	0936	Start of Well	Purge								
16 Auges	1006	14.13	11,716	7.03	7.05	192.9	78,23	28,56	100.0	3000.0	Clean
1	1016	13.89	11.819	7.02	6.93	194.8	103,30	28.61	100.0	1000.0	Cler
	1026	13,92	11,746	7.03	7.10	193.6	37.61	28.62	100.0	1000.0	Clex
	1036	14:05	11,688	7.04	1,20	192.3	11.24	78,64	100.0	(0000.0	Clear
	1031	14108	11.691	7.03	6.96	186.0	4.66	28.64	1000	SWO	Clear
	1046	13.93	11,667	7.03	6.90	182.3	4.54	28.65	100.0	580:0	clarer
	1051	13.99	11.664	7.03	6.89	181,8	4.47	28.65	100.0	200	Clean
			(- (-								
	Well St	abilized?	YES	NO				Total Vo	lume Purged:	7500.0	mL.

						<u> </u>
Sample Date	Time	Temp.	Spec.	pH	Turbidity	Appearance or Comment
Sample Date	Time	(°C)	Cond.	рп	(NTU)	Clarity, Color, Odor, Ect.
28 Au 23	1051	13.99	11,664	7.03	4.47	Cler

Comments:

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

440			Eial	4 D	atash	toot		Company:		MDU Hesk	ett
MVT			riei	u D	atasi	ieet		Event:		Fall	2023
	4		G	roundwat	er Assessme	ent		Sample ID:			1-90,
2616 E. Broadway Ave, B	Bismarck, ND							Sampling P	ersonal:		Jach-
Phone: (701) 258	-9720										
eather Conditions		Temp:	70	°F	Wind:	N	@ 5-10)	Precip:	Sunny / Pa	rtly Cloudy / Cloudy
	WELL INFO	OPMATIO	N					SAN	DI ING IN	FORMATIO	ON.
ell Locked?	YES	(ND)			7	Purging Me	thod:	Bladder	ii Liito iit		Control Settings:
ell Labeled?	4ES	NO			-	Sampling M		Bladder			Purge: 2 Sec
sing Strait?	MES	NO			7	Dedicated B		YES	NO	1	Recover: 58 Se
out Seal Intact?	YES)	NO	Not \	/isible	7					•	PSI: / 5
pairs Necessary?						Duplicate S	ample?	YES	(NO)	}	BB
	ng Diameter:		2"			Duplicate S	ample ID:				
Water Level B			9	ft							
	epth of Well:			ft	_		Bott	le List:		1	
	Well Volume:			liters	4	1 Liter Raw		1 Gal Nitric		1	
	Top of Pump:		-	ft	4	500mL Nitrio				1	
Water Level A					-	500mL Nitrio				1	
Measurem	ent Method:	Electric	Water Level	Indicator		250mL Sulfu	ric			,	
					FIE	LD READIN					
Stabilization Para		Temp.	Spec.	pH	DO	ORP	Turbidity	Water Level	Pumping	mL	Appearance or Comment
(3 Consecutive		(°C)	Cond.	_	(mg/L)	(mV)	(NTU)		Rate	Removed	Clarity, Color, Odor, Ect.
Purge Date	Time	±0.5°	±5%	±0.1	±10%	±10		(ft)	mL/Min		clear, slightly turbid, turbid
29 Ay 23	1157	Start of Wel						1 ./ 2.5			
,,,	1207	15.73	11,360	6.89	1.99	198.7	16.61	11,34	100.0	1000,0	Clear
	1217	16,05	11,380	6.88	1,58	196.0	9.77	11,40	100.0	1000.0	Clear
	1227	16.60	11,398	6,86	1.51	190,2	2.37	11.42	100.0	100010	Clex
	1232	16,32	11,426	6.86	1.50	187.6	4.56	11.43	10010	500.0	Clear
	1237	16,25	11,677	6.86	1,61	186.6	4.31	11.44	100.0	500.0	Char
			-	-							
		 		-	+	 		+			
		+	+	+	+					 	
	_	-	+		+	-		 			
	Well St	abilized?	(YES	NO				Total Vo	lume Purged:	4000.0	mL.
		Temp.	Spec.	T	T	Т	Turbidity	T		T	Appearance or Comment
Commile Date				pH	1	1	(417711)	I			Clarks Calas Oder Est
Sample Date	Time	(°C)	Cond.				(NTU)				Clarity, Color, Odor, Ect.

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Membe

2800

Account #:

Client:

Comments:

+ 22 Sept 23

Montana-Dakota Utilities - Bismarck

	40		Fial	dn.	atash			Company:		MDU Hesk	ett
MVT			LIGI	uDo	lasi	ieet		Event:		Fall	2023
	40		G	roundwate	er Assessme	ent		Sample ID:			2-90
2616 E. Broadway Ave, E	Bismarck, ND							Sampling P	ersonal:	-	hich
Phone: (701) 258	3-9720										
Weather Condition		Temp:	65	°F	Wind:	N	@ 5-16	2	Precip:	Sunny / Pa	irtly Cloudy / Cloudy
	WELL INFO	RMATIO						SAN	IPLING IN	FORMATIO	ON
Well Locked?	YES				7	Purging Me	ethod:	Bladder	ii Liive iii	1	Control Settings:
Well Labeled?	CYES .	NO			1	Sampling N		Bladder			Purge: 2 Sec.
Casing Strait?	(YES	NO			1		Equipment?	(YES)	NO	1	Recover: SB Sec.
Grout Seal Intact?	YES	(NO)	Not \	/isible	1	lo careatea	- quipriierie:	1 (13)			PSI: 20
Repairs Necessary?		0				Duplicate S	Sample?	YES	OND	1	
Casi	ing Diameter:	1	2"			Duplicate S		-	_	1	33
Water Level 6	Before Purge:	70	198	ft						_	
Total D	epth of Well:	_	_	ft			Bott	e List:		1	
	Well Volume:	-	_	liters	7	1 Liter Raw		1 Gal Nitric		1	
Depth to	Top of Pump:	_		ft		500mL Nitri	c			1	
Water Level	After Sample:	21,	34	ft		500mL Nitri	c (filtered)			1	
Measurem	nent Method:	Electric	Water Level	Indicator		250mL Sulfu	ıric				
					FIF	LD READII	NGS				
Stabilization Para	ameters	Temp.	Spec.		DO	ORP	Turbidity		Pumping	mL	Appearance or Comment
(3 Consecut	ive)	(°C)	Cond.	pH	(mg/L)	(mV)	(NTU)	Water Level	Rate	Removed	Clarity, Color, Odor, Ect.
Purge Date	Time	±0.5°	±5%	±0.1	±10%	±10		(ft)	mL/Min		clear, slightly turbid, turbid
a / aa-u	0959	Start of Wel	Il Purge								
28 mg 53 "	1009	13,32	B053	7.04	5,69	208.3	6.56	21.25	100.0	1000.0	Clear
29 Aug 25	1004	13,77	7903	7.05	5,70	207.5	Oils	21,30	1000	500.0	Clear
1	1019	13,91	7949	7.04	5,44	213.1	0.28	21.33	100.0	500.0	Clear
	1024	13,57	7999	7.04	5,12	209.6	3.41	21.35	100,0	580,0	Clar
	Well St	abilized?	MES	NO				Total Vo	lume Purgeo	2500.0	mL
Sample Date	Time	Temp.	Spec.	рН			Turbidity				Appearance or Comment
The second second	same.	(°C)	Cond.	pn			(NTU)				Clarity, Color, Odor, Ect.
70 19 Aug 23	1024	12.52	2900	Inu			2 111				at .

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Client: Montana-Dakota Utilities - Bismarck Account #: 2800



Field Datasheet

Groundwater Assessment

Wind:

MDU Heskett Company: Event: Fall 2023 Sample ID: Sampling Personal:

Sunny / Partly Cloudy / Cloudy

Purge:

PSI: /D

Recover: 58

Black Box

Weather Conditions: Temp: 60 °F WELL INFORMATION Well Locked? Well Labeled? NO NO Casing Strait? Not Visible Grout Seal Intact? Repairs Necessary? Casing Diameter: Water Level Before Purge: 16,39 Total Depth of Well: ft liters Well Volume: Depth to Top of Pump: ft ft Water Level After Sample: **Electric Water Level Indicator** Measurement Method:

SAMPLING INFORMATION Purging Method: Bladder Sampling Method: Bladder (ES) Dedicated Equipment?

N@5-10

(NO **Duplicate Sample?** YES Duplicate Sample ID:

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

FIELD READINGS

Stabilization Farai	neters	i emp.	spec.	pH	1 00	UKP	Turbialty	Water Level	Pumping	l mr	Appearance or Comment	
(3 Consecutiv	e)	(°C)	Cond.	pn	(mg/L)	(mV)	(NTU)	water Level	Rate	Removed	Clarity, Color, Odor, Ect.	
Purge Date	Time	±0.5°	±5%	±0.1	±10%	±10		(ft)	mL/Min		clear, slightly turbid, turbid	
29 An 23		Start of Well	rt of Well Purge									
29 Ay 23	0624	11,13	5127	7.01	4.10	161.5	3.72	18.48	1000	1000-0	Clear	
	0629	11,33	5076	7.00	4.07	139.7	8.99	18.49	100-0	500.0	Clear	
	0934	11.34	5031	6,99	4.30	139.2	0,50	18.50	100.0	50.0	Clear	
	0839	11.17	5047	699	4.10	138.7	0.16	18,50	100.0	50.0	Clear	
	૦૬મવ	11.22	5046	6.98	4.08	131.4	3,43	18:51	1000	500.0	Clear	
	L	abilized?	(VEC)	NO.		L			lume Purged:	L	ml.	

Sample Date	Time	Temp. (°C)	Spec. Cond.	рН		Turbidity (NTU)		Appearance or Comment Clarity, Color, Odor, Ect.
29 Aug 23	0844	11.22	5046	6.98		3,43		Clear
Comments:	Collect	d field	Plank	® 062	0			

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

MVT			Fiel	d Da	atash	ieet		Company: Event:		MDU Hesk Fall	2023	
	4		G	roundwate	er Assessme	ent		Sample ID:			BOR	
2616 E. Broadway Ave,	Bismarck, ND							Sampling P	ersonal:		29	
Phone: (701) 25												
Weather Condition		Temp:		°F	Wind:		@		Precip:	Sunny / Partly Cloudy / Cloudy		
	WELL INFO	DRMATIO	N					SAM	IDLING IN	FORMATION		
Well Locked?	YES	ND			7	Purging Me	thod:	Bladder	ii Liito iit		Control Settings:	
Well Labeled?	YES	NO			1	Sampling M		Bladder			Purge: 2 Sec	
Casing Strait?	YES	NO			1	Dedicated E	quipment?	MES	NO	ĺ	Recover: 26 Sec	
Grout Seal Intact?	YES	NO	Not \	√isible	1						PSI: 20	
Repairs Necessary?						Duplicate Sa		YES	(NO)		Black Box	
	ing Diameter:		2"]	Duplicate S	ample ID:]		
	Before Purge:	14.0	29	ft								
	Depth of Well:	, –	_	ft			Bott	le List:		1		
	Well Volume:			liters	1	1 Liter Raw		1 Gal Nitric				
	Top of Pump:	-		ft	1	500mL Nitric				1		
	After Sample:		150	ft	1	500mL Nitric						
Measurer	ment Method:	Electric	Water Level	Indicator	_	250mL Sulfu	ric			J		
					FIE	LD READIN	IGS					
Stabilization Par	ameters	Temp.	Spec.	T	DO	ORP	Turbidity	Water Lavel	Pumping	mL	Appearance or Comment	
Stabilization Par (3 Consecut		(°C)	Cond.	рН		ORP (mV)		Water Level	Rate	mL Removed	Clarity, Color, Odor, Ect.	
	tive)	(°C) ±0.5°	Cond. ±5%	pH ±0.1	DO	ORP	Turbidity	Water Level (ft)				
(3 Consecut Purge Date	Time	(°C) ±0.5° Start of Wel	Cond. ±5% I Purge	±0.1	DO (mg/L) ±10%	ORP (mV) ±10	Turbidity (NTU)	(ft)	Rate mL/Min	Removed	Clarity, Color, Odor, Ect. clear, slightly turbid, turbid	
(3 Consecut Purge Date	Time [230 [240	(°C) ±0.5° Start of Wel	Cond. ±5% Purge	±0.1	DO (mg/L) ±10%	ORP (mV) ±10	Turbidity (NTU)	(ft)	Rate mL/Min		Clarity, Color, Odor, Ect. clear, slightly turbid, turbid	
(3 Consecut	Time [230 [240	(°C) ±0.5° Start of Wel (2.60)	Cond. ±5% I Purge 6962	±0.1	DO (mg/L) ±10%	ORP (mV) ±10	Turbidity (NTU)	(ft) 14.42 14.47	Rate mL/Min	/200.0	Clarity, Color, Odor, Ect. clear, slightly turbid, turbid Clear Clu	
(3 Consecut Purge Date	Time 12.30 12.40 12.50 12.55	(°C) ±0.5° Start of Wel (2.60 2.95 2.80	Cond. ±5% I Purge 6962 73032	±0.1 7.02 7.01 7.01	DO (mg/L) ±10% O:OC O:SP2 O:27	ORP (mV) ±10	Turbidity (NTU)	(ft) 14.42 14.47 14.48	Rate mL/Min 100.0	(1000.0 (1000.0 500.0	Clarity, Color, Odor, Ect. clear, slightly turbid, turbid Clear Clear Clear	
(3 Consecut Purge Date	Time 230 240 1250 1255 1300	(°C) ±0.5° Start of Wel (7.66) 7.95 12.80 12.67	Cond. ±5% I Purge 6162 7032 7064 7065	±0.1 7.02 7.01 7.01 7.01	DO (mg/L) ±10% O:OC O:SP: O:27 O:27	ORP (mV) ±10	Turbidity (NTU)	(ft) 14.42 14.44 14.45	Rate mL/Min 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0	(ロン) () (1000 .) (1000	Clarity, Color, Odor, Ect. clear, Slightly turbid, turbid Clor Clor Clear Clear	
(3 Consecut Purge Date	Time 12.30 12.40 12.50 12.55	(°C) ±0.5° Start of Wel (2.60 2.95 2.80	Cond. ±5% I Purge 6962 73032 7064	±0.1 7.02 7.01 7.01	DO (mg/L) ±10% O:OC O:SP2 O:27	ORP (mV) ±10	Turbidity (NTU)	(ft) 14.42 14.47 14.48	Rate mL/Min 100.0	(1000.0 (1000.0 500.0	Clarity, Color, Odor, Ect. clear, slightly turbid, turbid Clear Clear Clear	
(3 Consecut Purge Date	Time 230 240 1250 1255 1300	(°C) ±0.5° Start of Wel (7.66) 7.95 12.80 12.67	Cond. ±5% I Purge 6162 7032 7064 7065	±0.1 7.02 7.01 7.01 7.01	DO (mg/L) ±10% O:OC O:SP: O:27 O:27	ORP (mV) ±10	Turbidity (NTU)	(ft) 14.42 14.44 14.45	Rate mL/Min 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0	(ロン) () (1000 .) (1000	Clarity, Color, Odor, Ect. clear, Slightly turbid, turbid Clor Clor Clear Clear	
(3 Consecut Purge Date	Time 230 240 1250 1255 1300	(°C) ±0.5° Start of Wel (7.66) 7.95 12.80 12.67	Cond. ±5% I Purge 6162 7032 7064 7065	±0.1 7.02 7.01 7.01 7.01	DO (mg/L) ±10% O:OC O:SP: O:27 O:27	ORP (mV) ±10	Turbidity (NTU)	(ft) 14.42 14.44 14.45	Rate mL/Min 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0	(ロン) () (1000 .) (1000	Clarity, Color, Odor, Ect. clear, Slightly turbid, turbid Clor Clor Clear Clear	
(3 Consecut Purge Date	Time 230 240 1250 1255 1300	(°C) ±0.5° Start of Wel (7.66) 7.95 12.80 12.67	Cond. ±5% I Purge 6162 7032 7064 7065	±0.1 7.02 7.01 7.01 7.01	DO (mg/L) ±10% O:OC O:SP: O:27 O:27	ORP (mV) ±10	Turbidity (NTU)	(ft) 14.42 14.44 14.45	Rate mL/Min 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0	(ロン) () (1000 .) (1000	Clarity, Color, Odor, Ect. clear, Slightly turbid, turbid Clor Clor Clear Clear	
(3 Consecut Purge Date	Time 230 240 1250 1255 1300	(°C) ±0.5° Start of Wel (7.66) 7.95 12.80 12.67	Cond. ±5% I Purge 6162 7032 7064 7065	±0.1 7.02 7.01 7.01 7.01	DO (mg/L) ±10% O:OC O:SP: O:27 O:27	ORP (mV) ±10	Turbidity (NTU)	(ft) 14.42 14.44 14.45	Rate mL/Min 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0	(ロン) () (1000 .) (1000	Clarity, Color, Odor, Ect. clear, Slightly turbid, turbid Clor Clor Clear Clear	
(3 Consecut Purge Date	Time [230 1240 1250 1255 1300 1305	(°C) ±0.5° Start of Wel 12.6° 12.6° 12.80 12.6° 12.81	Cond. ±5% I Purge 6162	±0.1 7.52 7.01 7.01 7.01	DO (mg/L) ±10% O:OC O:SP: O:27 O:27	ORP (mV) ±10	Turbidity (NTU)	(ft) 14.42 14.43 14.43 14.43 14.43	Rate mL/Min / 00.0 / 00.0 / 00.0 / 00.0 / 00.0 / 00.0	(4x0, 0) (100	Clarity, Color, Odor, Ect. clear, slightly turbid, turbid Clar Clar Clar Clar Clar Clar	
(3 Consecut Purge Date	Time [230 1240 1250 1255 1300 1305	(°C) ±0.5° Start of Wel (7.66) 7.95 12.80 12.67	Cond. ±5% I Purge 6162 7032 7064 7065	±0.1 7.02 7.01 7.01 7.01	DO (mg/L) ±10% O:OC O:SP: O:27 O:27	ORP (mV) ±10		(ft) 14.42 14.43 14.43 14.43 14.43	Rate mL/Min / 00.0 / 00.0 / 00.0 / 00.0 / 00.0 / 00.0	(ロン) () (1000 .) (1000	Clarity, Color, Odor, Ect. clear, slightly turbid, turbid Clar Clar Clar Clar Clar Clar Clar Cla	
(3 Consecut Purge Date 26 Avy 23	Time [2 30 12 40 12 50 12 50 12 50 13 50 13 05	(°C) ±0.5° Start of Wel (2.6° (2.9°ς (2.8°) (2.6°† (2.8°) (2.8°) (2.8°) (2.8°) (2.8°) (3.8°) (4.8°)	Cond. ±5% I Purge 6162	±0.1 7.52 7.01 7.01 7.01 7.01 7.01	DO (mg/L) ±10% O:OC O:SP: O:27 O:27	ORP (mV) ±10		(ft) 14.42 14.43 14.43 14.43 14.43	Rate mL/Min / 00.0 / 00.0 / 00.0 / 00.0 / 00.0 / 00.0	(4x0, 0) (100	Clarity, Color, Odor, Ect. clear, Slightly turbid, turbid Clar Clar Clar Clar Clar Clar Clar Cla	
(3 Consecut Purge Date	Time [230 1240 1250 1255 1300 1305	(°C) ±0.5° Start of Wel 12.6° 12.80 12.80 12.67 12.67 12.81	Cond. ±5% I Purge 69 62 70 32 706 4 706 5 7016	±0.1 7.52 7.01 7.01 7.01	DO (mg/L) ±10% O:OC O:SP: O:27 O:27	ORP (mV) ±10		(ft) 14.42 14.43 14.43 14.43 14.43	Rate mL/Min / 00.0 / 00.0 / 00.0 / 00.0 / 00.0 / 00.0	(4x0, 0) (100	Clarity, Color, Odor, Ect. clear, slightly turbid, turbid Clar Clar Clar Clar Clar Clar Clar Cla	

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.

Report Date: Monday, October 16, 2023 9:54:41 AM





Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

MVTL
2616 E. Broadway Ave, Bismarck, ND

Field Datasheet

Surface water Assessment

Company: MDU Heskett
Event: Fall 2023

Sampling Personal:

leather Condition	s: Temp:		°F	Wind:	@	Precip: Sunny / Partly Cloudy / Cloudy
Well ID	Date	Time	Casing Diameter	Water Level (ft)		Comments
MW70		1207	2"	19,30		
MW33	78 Ay 23	1345	2"	40.49		
MW101		1209	2"	35.78		
MW102	7	1205	2"	13.18		
MW103	1	1220	2"	29.89		
MW44R	1	1215	2"	24.18		
MW104	7	1350	2"	14.12		
MW105	1	1225	2"	12.20		
						×

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.

Report Date: Monday, October 16, 2023 9:54:41 AM



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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Workorder: MDU Heskett (26051) PO: 196081 OP

CCR APP III

Brandon Schafer Montana-Dakota Utilities Co. 400 North Fourth Street Bismarck, ND 58501

Certificate of Analysis

Approval

All data reported has been reviewed and approved by:



Claudette Carroll, Lab Manager Bismarck, ND

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

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

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

Workorder Comments

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

Work order amended 16Oct23 to add updated QC report. CC 16Oct23

Work order amended 15Nov23 to update COC and field sheet at client request. CC 15Nov23

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.

Report Date: Wednesday, November 15, 2023 1:05:28 PM



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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Workorder Summary

Sample Comments

26051006 (Dup 1) - Sample

Time sampled was not supplied by the client.

26051007 (Field Blank (FB)) - Sample

Time sampled was not supplied by the client.

Analysis Results Comments

26051001 (MW13)

Sample analyzed beyond holding time.(pH)

26051002 (MW1-90)

Sample analyzed beyond holding time.(pH)

26051003 (MW2-90)

Sample analyzed beyond holding time.(pH)

26051004 (MW3-90)

Sample analyzed beyond holding time.(pH)

26051005 (MW80R)

Sample analyzed beyond holding time.(pH)

26051006 (Dup 1)

Sample analyzed beyond holding time.(pH)

26051007 (Field Blank (FB))

Sample analyzed beyond holding time.(pH)





Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

Lab ID:26051001Date Collected:08/28/2023 10:51Matrix:GroundwaterSample ID:MW13Date Received:08/29/2023 13:55Collector:MVTL Field Service

Temp @ Receipt (C): 3.4	Received on	Ice: Yes					
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Qual
Method: 120.1							
Specific Conductance - Field	11664	umhos/cm	1	1	08/28/2023 10:51	08/28/2023 10:51	
Opecine Conductance - Flord	11004	ummos/cm	•		00/20/2023 10:01	00/20/2023 10.01	
Method: 150.2							
pH - Field	7.03	units	0.01	1	08/28/2023 10:51	08/28/2023 10:51	
Method: 170.1							
Temperature - Field C	13.99	degrees C		1	08/28/2023 10:51	08/28/2023 10:51	
Method: ASTM D516-16							
Sulfate	7490	mg/L	500	100	09/07/2023 10:46	09/07/2023 10:46	
Method: EPA 6010D							
Boron	<0.5	mg/L	0.5	5	08/29/2023 17:00	09/05/2023 15:24	
Calcium	398	mg/L	5	5	08/29/2023 17:00	08/30/2023 11:47	
Method: SM4500 H+ B-2011							
рН	7.1	units	0.1	1	08/29/2023 16:59	08/29/2023 16:59	*
Method: SM4500-CI-E 2011							
Chloride	117	mg/L	2.0	1	09/06/2023 11:15	09/06/2023 11:15	
Method: SM4500-F-C-2011							
Fluoride	0.74	mg/L	0.1	1	08/29/2023 16:59	08/29/2023 16:59	
Method: USGS I-1750-85							
Total Dissolved Solids	12700	mg/L	10	1	09/05/2023 14:00	09/05/2023 14:00	



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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

Lab ID: 26051002 **Date Collected:** 08/29/2023 12:37 Matrix: Groundwater MW1-90 Sample ID: Date Received: 08/29/2023 13:55 MVTL Field Service Collector:

Temp @ Receipt (C): 3.4	Received on	Ice: Yes					
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Qual
Method: 120.1							
Specific Conductance - Field	11627	umhos/cm	1	1	08/29/2023 12:37	08/29/2023 12:37	
·							
Method: 150.2							
pH - Field	6.86	units	0.01	1	08/29/2023 12:37	08/29/2023 12:37	
Method: 170.1							
Temperature - Field C	16.25	degrees C		1	08/29/2023 12:37	08/29/2023 12:37	
Method: ASTM D516-16							
Sulfate	7710	mg/L	500	100	09/07/2023 10:47	09/07/2023 10:47	
Method: EPA 6010D							
Boron	<0.5	mg/L	0.5	5	08/29/2023 17:00	09/05/2023 15:30	
Calcium	406	mg/L	5	5	08/29/2023 17:00	08/30/2023 11:50	
Method: SM4500 H+ B-2011							
						00/00/0000 4= 40	*
pH	7.0	units	0.1	1	08/29/2023 17:16	08/29/2023 17:16	^
Method: SM4500-CI-E 2011							
Chloride	90.7	mg/L	2.0	1	09/06/2023 11:16	09/06/2023 11:16	
Cilionac	30.7	mg/L	2.0	•	03/00/2023 11:10	03/00/2023 11:10	
Method: SM4500-F-C-2011							
Fluoride	1.14	mg/L	0.1	1	08/29/2023 17:16	08/29/2023 17:16	
		J					
Method: USGS I-1750-85							
Total Dissolved Solids	13100	mg/L	10	1	09/05/2023 14:00	09/05/2023 14:00	





Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

 Lab ID:
 26051003
 Date Collected:
 08/29/2023 10:24
 Matrix:
 Groundwater

 Sample ID:
 MW2-90
 Date Received:
 08/29/2023 13:55
 Collector:
 MVTL Field Service

Temp @ Receipt (C): 3.4	Received on	Ice: Yes					
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Qual
Method: 120.1							
Specific Conductance - Field	7999	umhos/cm	1	1	08/29/2023 10:24	08/29/2023 10:24	
•							
Method: 150.2							
pH - Field	7.04	units	0.01	1	08/29/2023 10:24	08/29/2023 10:24	
Method: 170.1							
Temperature - Field C	13.57	degrees C		1	08/29/2023 10:24	08/29/2023 10:24	
Method: ASTM D516-16							
Sulfate	4940	mg/L	250	50	09/07/2023 10:59	09/07/2023 10:59	
Method: EPA 6010D							
Boron	<0.5	mg/L	0.5	5	08/29/2023 17:00	09/05/2023 15:32	
Calcium	477	mg/L	5	5	08/29/2023 17:00	08/30/2023 11:52	
Method: SM4500 H+ B-2011							
рН	7.2	units	0.1	1	08/29/2023 17:32	08/29/2023 17:32	*
Method: SM4500-CI-E 2011							
Chloride	80.5	mg/L	2.0	1	09/06/2023 11:17	09/06/2023 11:17	
Method: SM4500-F-C-2011							
	1.03	no ar /l	0.1	1	00/20/2022 47:22	00/20/2022 17:22	
Fluoride	1.03	mg/L	0.1	1	08/29/2023 17:32	08/29/2023 17:32	
Method: USGS I-1750-85							
Total Dissolved Solids	8600	mg/L	10	1	09/05/2023 14:00	09/05/2023 14:00	
		· 3· –		-			



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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

Lab ID: 26051004 **Date Collected:** 08/29/2023 08:44 Matrix: Groundwater Sample ID: MW3-90 Date Received: 08/29/2023 13:55 MVTL Field Service Collector:

Temp @ Receipt (C): 3.4	Received on Ice: Yes						
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Qual
Method: 120.1							
Specific Conductance - Field	5046	umhos/cm	1	1	08/29/2023 08:44	08/29/2023 08:44	
Method: 150.2							
pH - Field	6.98	units	0.01	1	08/29/2023 08:44	08/29/2023 08:44	
Made at 470 4							
Method: 170.1					00/00/0000 00 44	00/00/0000	
Temperature - Field C	11.22	degrees C		1	08/29/2023 08:44	08/29/2023 08:44	
Method: ASTM D516-16							
Sulfate	2660	mg/L	100	20	09/07/2023 10:49	09/07/2023 10:49	
		J.					
Method: EPA 6010D							
Boron	<0.1	mg/L	0.1	1	08/29/2023 17:00	09/05/2023 15:34	
Calcium	470	mg/L	5	5	08/29/2023 17:00	08/30/2023 11:53	
Method: SM4500 H+ B-2011							
рН	7.1	units	0.1	1	08/29/2023 17:50	08/29/2023 17:50	*
Method: SM4500-CI-E 2011							
Chloride	39.5	m a/I	2.0	1	09/06/2023 11:18	09/06/2023 11:18	
Chloride	39.5	mg/L	2.0	1	09/00/2023 11.16	09/00/2023 11.16	
Method: SM4500-F-C-2011							
Fluoride	0.13	mg/L	0.1	1	08/29/2023 17:50	08/29/2023 17:50	
		-					
Method: USGS I-1750-85							
Total Dissolved Solids	4670	mg/L	10	1	09/05/2023 14:00	09/05/2023 14:00	



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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

Lab ID: 26051005 **Date Collected:** 08/28/2023 13:05 Matrix: Groundwater MW80R Sample ID: Date Received: 08/29/2023 13:55 MVTL Field Service Collector:

Temp @ Receipt (C): 3.4	Received on	Ice: Yes					
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Qual
Method: 120.1							
Specific Conductance - Field	7078	umhos/cm	1	1	08/28/2023 13:05	08/28/2023 13:05	
opeoine conductance Tricia	10.0	arrings, siri	•	•	00/20/2020 10:00	00/20/2020 10:00	
Method: 150.2							
pH - Field	7.01	units	0.01	1	08/28/2023 13:05	08/28/2023 13:05	
Method: 170.1							
Temperature - Field C	12.81	degrees C		1	08/28/2023 13:05	08/28/2023 13:05	
Method: ASTM D516-16							
Sulfate	4130	mg/L	200	40	09/07/2023 10:50	09/07/2023 10:50	
Method: EPA 6010D							
Boron	<0.5	mg/L	0.5	5	08/29/2023 17:00	09/05/2023 15:35	
Calcium	528	mg/L	5	5	08/29/2023 17:00	08/30/2023 11:53	
Method: SM4500 H+ B-2011							
рН	7.4	units	0.1	1	08/29/2023 18:29	08/29/2023 18:29	*
Method: SM4500-CI-E 2011							
Chloride	193	mg/L	2.0	1	09/06/2023 11:20	09/06/2023 11:20	
Method: SM4500-F-C-2011							
Fluoride	0.23	mg/L	0.1	1	08/29/2023 18:29	08/29/2023 18:29	
Method: USGS I-1750-85							
Total Dissolved Solids	7240	mg/L	10	1	09/05/2023 14:00	09/05/2023 14:00	



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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

Lab ID: 26051006 **Date Collected:** 08/28/2023 Matrix: Groundwater Sample ID: Date Received: 08/29/2023 13:55 MVTL Field Service Dup 1 Collector:

Temp @ Receipt (C): 3.4	Received or	lce: Yes					
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Qual
Method: ASTM D516-16							
Sulfate	7840	mg/L	500	100	09/07/2023 10:51	09/07/2023 10:51	
Method: EPA 6010D							
Boron	<0.5	mg/L	0.5	5	08/29/2023 17:00	09/05/2023 15:37	
Calcium	385	mg/L	5	5	08/29/2023 17:00	08/30/2023 11:54	
Method: SM4500 H+ B-2011							
рН	7.2	units	0.1	1	08/29/2023 19:00	08/29/2023 19:00	*
Method: SM4500-CI-E 2011							
Chloride	117	mg/L	2.0	1	09/06/2023 11:21	09/06/2023 11:21	
Method: SM4500-F-C-2011							
Fluoride	0.74	mg/L	0.1	1	08/29/2023 19:00	08/29/2023 19:00	
Method: USGS I-1750-85							
Total Dissolved Solids	12500	mg/L	10	1	09/05/2023 14:00	09/05/2023 14:00	





Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

Lab ID:26051007Date Collected:08/29/2023Matrix:GroundwaterSample ID:Field Blank (FB)Date Received:08/29/2023 13:55Collector:MVTL Field Service

Temp @ Receipt (C): 34 Received on Ice: Yes

Temp @ Receipt (C): 3.4	Received or	lce: Yes					
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Qual
Method: ASTM D516-16							
Sulfate	<5	mg/L	5	1	09/07/2023 10:52	09/07/2023 10:52	
Method: EPA 6010D							
Boron	<0.1	mg/L	0.1	1	08/29/2023 17:00	09/05/2023 15:39	
Calcium	<1	mg/L	1	1	08/29/2023 17:00	08/30/2023 11:55	
Method: SM4500 H+ B-2011							
рН	7.0	units	0.1	1	08/29/2023 19:30	08/29/2023 19:30	*
Method: SM4500-CI-E 2011							
Chloride	<2.0	mg/L	2.0	1	09/06/2023 11:22	09/06/2023 11:22	
Method: SM4500-F-C-2011							
Fluoride	<0.1	mg/L	0.1	1	08/29/2023 19:30	08/29/2023 19:30	
Method: USGS I-1750-85							
Total Dissolved Solids	<10	mg/L	10	1	09/05/2023 14:00	09/05/2023 14:00	



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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

MV	- CONTRACTOR OF THE PARTY OF TH	ID 58501	sting Lal	borato	ries	i				WO	: 2	605		a Utilitie:	8	Cha	ain of Custody Record
	MDU Fodd Peterson			CC:										Project Na	me:		MDU Heskett
Address: 4	400 N. 4th St Bismarck, ND 58501													Event:			Fall 2023
Phone: 7	701-425-2427 Todd.Peterson@mdu.com	n												Sampled B		even	the
	Sampl	e Information					Sar	nple	Cont	aine	ers		T	Field Rea	adings		1
Lab Number CO/ CO2 CO2 CO3 CO4 CO5 CO6 CO7	Sample ID MW13 MW1-90 MW2-90 MW3-90 MW80R Dup 1 Field Blank (FB)	26 Ay 23 29 Ay 23 29 Ay 23 29 Ay 23 26 Ay 23 26 Ay 23 29 Ay 23	1051 1237 1024 0844 1305	GW GW GW GW GW GW	X X X X Liter Raw	X X X X X	X X X X X	X X X					13,59 16.25 13,57 16.25 13,57 11,22 12,81	88 11,664 11,627 7999 5046 7078	Ta 7.03 6.86 7.04 6.98 7.01	4:31 3:41 3:43 2:41	Analysis Required イバチ ^モ - MDU Heskett List AA + C

Relinquished By		e Condition	/ Received By	
, Name / D	Date/Time Location	Temp (°C)	/ //Wame	Date/Time
29	1355 Walk In #2	FSN 3.4 TM562/ZM805>	THAXIL	27 Am 23 1355
2				

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.

Report Date: Wednesday, November 15, 2023 1:05:28 PM



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Client: Account #: 2800 Montana-Dakota Utilities - Bismarck



Phone: (701) 258-9720 Weather Conditions:

Field Datasheet

Groundwater Assessment

7C°F

Wind:

Company: **MDU** Heskett Fall 2023 Event: Sample ID: Sampling Personal:

Sunny / Partly Cloudy / Cloudy

Purge:

PSI: 120 Black Box

Clas

Cler

Clar

Clean

Cles

5W.0

Recover: 건명

Control Settings:

Appearance or Comment

Clarity, Color, Odor, Ect.

clear, slightly turbid, turbid

Sec.

Sec.

WELL INFORMATION Well Locked? NO Well Labeled? NO Casing Strait? NO **Not Visible** Grout Seal Intact? Repairs Necessary? Casing Diameter: 28,33 Water Level Before Purge Total Depth of Well: Well Volume liters Depth to Top of Pump: Water Level After Sample: ft Measurement Method: **Electric Water Level Indicator**

Temp:

SAMPLING INFORMATION Purging Method: Bladder Sampling Method: Bladder Dedicated Equipment? NO

Precip:

Duplicate Sample? NO Duplicate Sample ID

N @ 5-10

Bottle List: 1 Liter Raw 1 Gal Nitrio 500mL Nitric 500mL Nitric (filtered) 250mL Sulfuric

FIELD READINGS Stabilization Parameters DO рΗ (3 Consecutive) (°C) Cond. (mg/L) ±10% (mV) (NTU) Rate mL/Mir Time ±0.1 Start of Well Purge 14.13 11,716 13.69 11,819 0936 28 Aug 23 3000.0 1000 28,56 103.30 28.61 100.0 37.61 28.62 100.0 13.89 13,92 14.05 1016 7.02 194.8 1000.0 193.6 7.10 11,744 7.03 1000.0 78.64 10.0 28.64 10.0 78.65 10.0 78.65 10.0 4.66 1036 11,688 7.04 188.0 7.03 6.96 SW-0 14,08

7.03

11,667

11,664

13.93

13,99

1051

7500.0

6.89

Sample Date	Time	Temp. (°C)	Spec. Cond.	pН	Turbidity (NTU)	Appearance or Comment Clarity, Color, Odor, Ect.
26 Aug 23	1051	13.99	11,664	7.03	4.47	Clerk

182.3

181,8

4.47

Comments:

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Wednesday, November 15, 2023 1:05:28 PM Report Date:



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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

MVT			Fiel	d Da	atasł	neet		Company: Event:		MDU Hest Fall	2023
			G	roundwate	er Assessm	ent		Sample ID:			1-90,
2616 E. Broadway Ave, B	ismarck, ND							Sampling P	ersonal:		Sollar
Phone: (701) 258-											
Weather Conditions	:	Temp:	70	°F	Wind:	P	@ 5-10)	Precip:	Sunny / Pa	artly Cloudy / Cloudy
	WELL INF	ORMATIO	N					SAN	IPLING IN	FORMATI	ON
Well Locked?	YES	(ND)]	Purging Me	thod:	Bladder			Control Settings:
Well Labeled?	4ES	NO				Sampling N		Bladder			Purge: 2 Sec.
Casing Strait?	AES.	NO				Dedicated I	quipment?	(YES)	NO		Recover: 58 Sec.
Grout Seal Intact?	YES	NO	Not \	/isible							PSI: / 5
Repairs Necessary?					_	Duplicate S		YES	(NO)		BB
	ng Diameter		2"		_	Duplicate S	ample ID:				
Water Level B			9	ft	_						
	epth of Well			ft	4		Bott	le List:		1	
	Vell Volume			liters	4	1 Liter Raw		1 Gal Nitric		i	
	op of Pump		-	ft	4	500mL Nitrio				l	
Water Level A			िप Water Level	ft	-	500mL Nitrio				1	
Measureme	ent Method	Electric	water Level	indicator		250mL Sulfu	ric			J .	
					FIE	LD READIN	IGS				
Stabilization Para		Temp.	Spec.	pH	DO	ORP	Turbidity	Water Level	Pumping	mL	Appearance or Comment
(3 Consecutiv		(°C)	Cond.	,	(mg/L)	(mV)	(NTU)		Rate	Removed	Clarity, Color, Odor, Ect.
Purge Date	Time	±0.5°	±5%	±0.1	±10%	±10		(ft)	mL/Min		clear, slightly turbid, turbid
29 Ay 23	1157	Start of Wel									
, -	1207	15,73	11,360	6.69	1.99	198.7	16.61	11,34	100.0	1000,0	Clear
	1217	16,05	11,380	6.88	1,58	196.0	9.77	11.40	100.0	1000.0	Clear
	1227	16.60	11,398	6.86	1.51	190,2	2.37	11.42	100.0	100000	Clex
	1232	16.32	11,426	6.86	1,58	187.0	4.56	11.43	1000	500.0	Clear
	1237	16,25	11,677	6.86	1,61	186.6	4.31	11.44	100.0	500.0	Olio
		-	-								
				-		-		-			
		+	-		+			-			
		+	 	 	+	+		 			
	Well St	abilized?	(YES	NO				Total Vo	lume Purged:	4000.0	mL
		Temp.	Spec.	T			Turbidity			7555.5	Appearance or Comment
Sample Date	Time	(°C)	Cond.	pH			(NTU)				Clarity, Color, Odor, Ect.

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.

Report Date: Wednesday, November 15, 2023 1:05:28 PM





Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

A 48 /T			Field	d Da	itash	oot		Company:		MDU Hesk		
MVTI				UUO	160211	CCL		Event:			2023	
			Gr	oundwate	r Assessme	nt		Sample ID:			2-90	
2616 E. Broadway Ave, B	ismarck, ND							Sampling Po	ersonal:	***	both	
Phone: (701) 258											,	
Veather Conditions	3:	Temp:	85	°F	Wind:	N	@ 5-10	7	Precip:	Sunny / Pa	rtly Cloudy / Clou	dy
	WELL INFO	RMATION	V					SAM	PLING IN	ORMATIC	ON	
/ell Locked?	YES	NO NO				Purging Me	thod:	Bladder			Control Set	tings:
Vell Labeled?	YES.					Sampling M		Bladder			Purge: 2 Recover: 5 %	Sec.
asing Strait?	(AES	NO	Not V	t-ll-l-	1	Dedicated B	quipment?	(YES)	NO			Sec.
Grout Seal Intact? Repairs Necessary?	YES	(NO)	NOT V	ISIDIE	-	D t t C	1-2	VEC	(Flo	, ,	PSI: 20	
	ng Diameter:	2	н		-	Duplicate S		YES	(ND		BB	
Water Level E				ft	1	Duplicate 3	ampie io.			ı		
	epth of Well:			ft	1		Bott	e List:		1		
	Well Volume:	_	_	liters]	1 Liter Raw		1 Gal Nitric				
	op of Pump:		-	ft		500mL Nitrio						
Water Level /		21,	Nater Level	ft	-	500mL Nitrio						
Measurem	ent Method:	Electric	water Level	Indicator	_	250mL Sulfu	ric			}		
					FIE	LD READIN	IGS					
Stabilization Para		Temp.	Spec.	Hq	DO	ORP	Turbidity	Water Level	Pumping	mL	Appearance or	
(3 Consecuti	ve)	(°C)	Cond.	pH	(mg/L)	(mV)	Turbidity (NTU)		Rate	mL Removed	Clarity, Color, C	Odor, Ect.
(3 Consecuti Purge Date	ve) Time	(°C) ±0.5*	Cond. ±5%	рН ±0.1				Water Level (ft)				Odor, Ect.
(3 Consecuti Purge Date	ve) Time	(°C) ±0.5° Start of Well	Cond. ±5% Purge	±0.1	(mg/L) ±10%	(mV) ±10	(NTU)	(ft)	Rate ml/Min	Removed	Clarity, Color, C clear, slightly tu	Odor, Ect.
(3 Consecuti Purge Date	7 Time	(°C) ±0.5° Start of Well 13,32	Cond. ±5% Purge BOS3	±0.1	(mg/L) ±10%	(mV) ±10	(NTU)	(ft)	Rate mL/Min	Removed	Clarity, Color, Colear, Slightly tur	Odor, Ect.
(3 Consecuti	ve) Time	(°C) ±0.5° Start of Well	Cond. ±5% Purge 8053 구クロス	±0.1	(mg/L) ±10%	(mV) ±10	(NTU)	(ft)	Rate ml/Min	/000.0 500.0 500.0	Clarity, Color, Clear, Slightly tur	Odor, Ect.
(3 Consecuti Purge Date	7 Time 0959 1069	(°C) ±0.5° Start of Well 13,32	Cond. ±5% Purge BOS 3 7903	±0.1	(mg/L) ±10% 5.69 5.70	(mV) ±10 208.3 707.5	(NTU) 6.56	(ft) 21.25 21.30	Rate mL/Min	Removed /000. つ 500. り	Clarity, Color, Colear, Slightly tur	Odor, Ect.
(3 Consecuti Purge Date	Time 0959 1009 1004	(°C) ±0.5° Start of Well 13,32 13,72	Cond. ±5% Purge 8053 구クロス	±0.1 7.04 7.05 7.04	(mg/L) ±10% 5,69 5,70 5,144	(mV) ±10 208.3 207.5 213.1	6,56 0,15	(ft) 21.25 21.30 21.33	Rate mL/Min /OD.O (UO.O) (UO.O)	/000.0 500.0 500.0	Clarity, Color, Clear, slightly turn Clear Clear Clear Clear Clear	Odor, Ect.
(3 Consecuti Purge Date	Time 0959 1009 1004	(°C) ±0.5° Start of Well 13,32 13,72	Cond. ±5% Purge 8053 구クロス	±0.1 7.04 7.05 7.04	(mg/L) ±10% 5,69 5,70 5,144	(mV) ±10 208.3 207.5 213.1	6,56 0,15	(ft) 21.25 21.30 21.33	Rate mL/Min /OD.O (UO.O) (UO.O)	/000.0 500.0 500.0	Clarity, Color, Clear, slightly turn Clear Clear Clear Clear Clear	Odor, Ect.
(3 Consecuti Purge Date	Time 0959 1009 1004	(°C) ±0.5° Start of Well 13,32 13,72	Cond. ±5% Purge 8053 구クロス	±0.1 7.04 7.05 7.04	(mg/L) ±10% 5,69 5,70 5,144	(mV) ±10 208.3 207.5 213.1	6,56 0,15	(ft) 21.25 21.30 21.33	Rate mL/Min /OD.O (UO.O) (UO.O)	/000.0 500.0 500.0	Clarity, Color, Clear, slightly turn Clear Clear Clear Clear Clear	Odor, Ect.
(3 Consecuti Purge Date	Time 0959 1009 1004	(°C) ±0.5° Start of Well 13,32 13,72	Cond. ±5% Purge 8053 구クロス	±0.1 7.04 7.05 7.04	(mg/L) ±10% 5,69 5,70 5,144	(mV) ±10 208.3 207.5 213.1	6,56 0,15	(ft) 21.25 21.30 21.33	Rate mL/Min /OD.O (UO.O) (UO.O)	/000.0 500.0 500.0	Clarity, Color, Clear, slightly turn Clear Clear Clear Clear Clear	Odor, Ect.
(3 Consecuti Purge Date	Time 0959 1009 1004	(°C) ±0.5° Start of Well 13,32 13,72	Cond. ±5% Purge 8053 구クロス	±0.1 7.04 7.05 7.04	(mg/L) ±10% 5,69 5,70 5,144	(mV) ±10 208.3 207.5 213.1	6,56 0,15	(ft) 21.25 21.30 21.33	Rate mL/Min /OD.O (UO.O) (UO.O)	/000.0 500.0 500.0	Clarity, Color, Clear, slightly turn Clear Clear Clear Clear Clear	Odor, Ect.
(3 Consecuti Purge Date	Time 0959 10 09 10 09 10 09 10 09 10 09 10 10 10 10 10 10 10 10 10 10 10 10 10	(°C) ±0.5° Start of Well 13,32 13,72	Cond. ±5% Purge 8053 구クロス	±0.1 7.04 7.05 7.04	(mg/L) ±10% 5,69 5,70 5,144	(mV) ±10 208.3 207.5 213.1	6,56 0,15	(ft) 21.25 21.30 21.33 21.35	Rate mL/Min /OD.O (UO.O) (UO.O)	(000, 0 500, 0 500, 0 500, 0	Clarity, Color, Clear, slightly turn Clear Clear Clear Clear Clear	Odor, Ect.
(3 Consecuti Purge Date 28 Acy 23 H 29 Acy 23	Ve) Time 0959 1069 1004 1014 Well St.	(°C) ±0.5° Start of Well 13,32 13,72 13,61 13,57	Cond. ±5% Purge 8053 7903 7904 7999	±0.1 7.04 7.05 7.04 7.09	(mg/L) ±10% 5,69 5,70 5,144	(mV) ±10 208.3 207.5 213.1	6,56 0,15	(ft) 21.25 21.30 21.33 21.35	Rate mL/Min /W.O (W.O) /W.O 1/O,O	(000, 0 500, 0 500, 0 500, 0	Clarity, Color, of clear, slightly tun Clear Clear Clear Clear Clear Clear Clear Clear Clear	Odor, Ect.
(3 Consecuti Purge Date	Time 0959 10 09 10 09 10 09 10 09 10 09 10 10 10 10 10 10 10 10 10 10 10 10 10	(°C) ±0.5° Start of Well {3,32 13,47 13,91 13,57	Cond. ±5% Purge 605'3 7903 7949 7959	±0.1 7.04 7.05 7.04 7.04	(mg/L) ±10% 5,69 5,70 5,144	(mV) ±10 208.3 207.5 213.1	(NTU)	(ft) 21.25 21.30 21.33 21.35	Rate mL/Min /W.O (W.O) /W.O 1/O,O	(000, 0 500, 0 500, 0 500, 0	Clarity, Color, of clear, slightly tun Clear	Odor, Ect. bid, turbid



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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck



Phone: (701) 258-9720

Field Datasheet

Groundwater Assessment

 Company:
 MDU Heskett

 Event:
 Fall 2023

 Sample ID:
 3-90

 Sampling Personal:
 3-90

Sunny / Partly Cloudy / Cloudy

Purge: 2

PSI: 10 Black Box

Recover: 58

Control Settings:

Sec.

Sec.

Weather Conditions:		Temp:	60 °F	Wind
V	VELL INFO	RMATION		
Well Locked?	YES	440		7
Well Labeled?	YES)	NO		
Casing Strait?	YES?	NO	0.5	7
Grout Seal Intact?	YES	NO	Not Visible	_
Repairs Necessary?				
Casing	Diameter:	2"		7
Water Level Bel	ore Purge:	18,39	ft	7
Total Dep	th of Well:		ft	_
We	ell Volume:	_	liters	7
Depth to To	of Pump:		ft	_
Water Level Aft	er Sample:	18,52	ft	7
Measuremer	t Method:	Electric Wa	ater Level Indicator	_

	SAM	PLING IN	FORMAT	ION
Purging Method:	Bladder		1	
Sampling Method:	Bladder		1	Pur
Dedicated Equipment?	(Es)	NO	1	Rec
			•	PSI:
Dunlicate Comple?	VEC	(NII)	1	-

N@5-10

Duplicate Sample ID:

Precip:

Bottle List:

1 Liter Raw 1 Gal Nitric
SOOML Nitric
SOOML Nitric (filtered)
250mL Sulfuric

					FIEL	.D READIN	GS				
Stabilization Parar	meters	Temp.	Spec.	pH	DO	ORP	Turbidity	Water Level	Pumping	mL	Appearance or Comment
(3 Consecutiv	e)	(°C)	Cond.	pn	(mg/L)	(mV)	(NTU)	water Level	Rate	Removed	Clarity, Color, Odor, Ect.
Purge Date	Time	±0.5°	±5%	±0.1	±10%	±10		(ft)	mL/Min		clear, slightly turbid, turbid
29 Ay 23		Start of Well	Purge								
Ly Any	ભાગ	11.13	5127	7.01	4.10	161.5	3.72	18.48	1000	1000-0	Clea
	0829	11,33	5076	7.00	4.07	139,7	8.99	18.49	100-0	500.0	Clear
	0834	11.34	5031	6,99	4.30	139.2	0,50	18.50	100.0	50.0	Clear
	0839	11.17	5047	699	4.10	138.7	0.16	1B.SD	100.0	50.0	Clear
	૦૬મધ	11.22	5046	6.98	4.08	131.4	3.43	18:51	1000	500.0	Clear
	Well St	abilized?	(YES)	NO				Total Vol	ume Purged:	3000.0	mL

Sample Date	Time	Temp. (°C)	Spec. Cond.	рН		Turbidity (NTU)	Appearance or Comment Clarity, Color, Odor, Ect.
29 Aug 23	0844	11.22	5046	6.98		3,43	Cher
Comments:	Collect	d Field	Blank	® 062	lo .		



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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

MVT	7		Fiel	d Da	atash	1eet		Company:		MDU Hesk	
VIVI	-							Event:		Fall	2023
			G	roundwate	er Assessme	ent		Sample ID:			BOR
2616 E. Broadway Ave,	Bismarck, ND							Sampling P	ersonal:		200
Phone: (701) 258											, , ,
Weather Condition	s:	Temp:		°F	Wind:		@		Precip:	Sunny / Pa	artly Cloudy / Cloudy
	WELL INFO		N					SAM	IPLING IN	FORMATIO	ON
Well Locked?	YES '	NO]	Purging Me		Bladder			Control Settings:
Well Labeled?	YES	NO]	Sampling M		Bladder			Purge: 2. Se
Casing Strait?	VES	NO	NI-61			Dedicated E	quipment?	VES	NO]	Recover:2と Se
Grout Seal Intact?	(YES)	NO	Not	Visible	_						PSI: 20
Repairs Necessary?		,			1	Duplicate S		YES	NO	1	Black Box
	ing Diameter:		2"	Ti.	_	Duplicate S	ample ID:]	
Water Level I		14.0	24	ft	1		D-11			1	
	epth of Well: Well Volume:			liters	4	4 Liber Down	Bott	le List:		4	
	Top of Pump:			ft	4	1 Liter Raw 500mL Nitric		1 Gal Nitric			
Water Level		141	1,50	ft	-	500mL Nitric					
	nent Method:		Water Level		4	250mL Nitric					
meach an	icit meanes.									1	
Stabilization Para	ameters	Toma	Case			LD READIN	Turbidity		Dumalas		
(3 Consecuti		Temp. (°C)	Spec. Cond.	pH	DO (mg/L)	ORP (mV)	(NTU)	Water Level	Pumping Rate	mL Romayad	Appearance or Comment
	Time	±0.5°	±5%	±0.1	±10%	±10	(NTO)	(ft)	mL/Min	Removed	Clarity, Color, Odor, Ect. clear, slightly turbid, turbid
				2012	210/0		1	1 100	Line / ivini.		clear, slightly turbit, turbit
Purge Date			l Purge								
	1230	Start of Wel		7.02	0,0%	152.3	11.61	14.42	100.2	100.0	Clear
28 Ay 23	1230	Start of Wel (2.6ピ	6982	7.02	0.08	152.3	11.61	14.42	1000	100.0	Clear
	1230	Start of Wel (2.60 12.95	6982 3032	7.01	Dises	123.5	0,50	14.47	100.0	1000.0	die
	1230 1240 1250 1255	Start of Wel (2.6ピ	6982 7032 7064			123.5		14.47	100.0		Clear
	1230 1240 1250 1255	Start of Wel (2.65) 17.95 (2.80)	6982 3032	7.01	0,50	123.5	0,50	14.47	100.0	Q.0001 G.002	die
	1230 1240 1250 1255	12.68 12.95 12.80 12.67	6982 7032 7064 7065	7.01 7.01 7.01	0,27	123.5	0,50	14.43	100.0 100.0 100.0	0.0001 0.002 0.002	Clar Clear Clear
	1230 1240 1250 1255	12.68 12.95 12.80 12.67	6982 7032 7064 7065	7.01 7.01 7.01	0,27	123.5	0,50	14.43	100.0 100.0 100.0	0.0001 0.002 0.002	Clar Clear Clear
	1230 1240 1250 1255	12.68 12.95 12.80 12.67	6982 7032 7064 7065	7.01 7.01 7.01	0,27	123.5	0,50	14.43	100.0 100.0 100.0	0.0001 0.002 0.002	Clar Clear Clear
	1230 1240 1250 1255	12.68 12.95 12.80 12.67	6982 7032 7064 7065	7.01 7.01 7.01	0,27	123.5	0,50	14.43	100.0 100.0 100.0	0.0001 0.002 0.002	Clar Clear Clear
	1230 1240 1250 1255 1300 1305	Start of Wel 12.66 12.95 12.80 12.67 12.81	6182 7032 7064 7065 7078	7.01 7.01 7.01 7.01	0,27	123.5	0,50	14.47 14.45 14.47 14.48	100.0 100.0 100.0 100.0	\$60.0 \$60.0 \$60.0	Clear Clear Clear Clear
	1230 1240 1250 1255 1300 1305	12.68 12.95 12.80 12.67	6982 7032 7064 7065	7.01 7.01 7.01	0,27	123.5	0,50	14.47 14.45 14.47 14.48	100.0 100.0 100.0 100.0	0.0001 0.002 0.002	Clear Clear Clear Clear
28 4 4 2 3	1230 1240 1250 1255 1300 1305	Start of Wel (2.66) 17.95 (2.67) 12.67 12.67 12.61 abilized?	(YES)	7.01 7.01 7.01 7.01 7.01	0,27	123.5	0,50 0,62 1,22 2,41	14.47 14.45 14.47 14.48	100.0 100.0 100.0 100.0	\$60.0 \$60.0 \$60.0	Clear Clear Clear Clear Clear Clear Clear Clear
	230 240 250 255 300 305	Start of Wel 12.60 12.95 12.80 12.67 12.81 abilized?	162 14032 17065 17065 17078	7.01 7.01 7.01 7.01	0,27	123.5	0,50 0,62 1,22 2,41	14.47 14.45 14.47 14.48	100.0 100.0 100.0 100.0	\$60.0 \$60.0 \$60.0	Clear Clear Clear Clear





Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

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MW104

MW105

Field Datasheet

Surface water Assessment

1350

1225

2"

2"

14.12

12.20

Company: MDU Heskett
Event: Fall 2023

Sampling Personal:

Phone: (701) 258-9720 Weather Conditions: Wind: Sunny / Partly Cloudy / Cloudy Temp: Precip: Water Casing Well ID Date Time Comments Diameter Level (ft) MW70 1207 2" 19,30 MW33 78 Aug 23 2" 40.49 1345 MW101 2" 35,78 1209 MW102 2" 1203 13.18 MW103 1220 2" 29.89 MW44R 1215 2" 24.18





Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

C Result	ts Summary				WO #:	26051			
Sulfate				Units: mg/L					
QC Type	Original Sample ID	Blank Result.	Spike Amount	Spike % Recovery	Spike Duplicate % Recovery	Lower Control Limit (%)	Lipper Control Limit (%)	APD (%)	RPD Limit (16)
FB			100	96.0		RS	115		
H			100	98.1		85	115		
FB			100	97.3		85	115		
10			100	963		85	115		
FD.			100	36.3		63	115		
H			100	99.6		85	115		
FD			100	98.0		85	115		
rii.			100	98.5		85.	115		
AID.		15							
Ath		· d							
AIR		6							
AEI,		15							
Aa.		45							
Agy		d							
AB		5							
AS/MSD	26145003		500	81.2	83.0	as	115	0.0	20
AS/MSD	26231009		1000	82.2	67.1	85	115	0.0	20
AS/MSD	26333002		100	91.6	91.9	85	115	0.0	30
AS/MSD	26428004		2000	84.2	83.1	85	115	0.5	20
ar is seen	Sections			ni n		mi.	120	24	-2
AS/MSD	26649004		1000	94.8	95.3	85	115	0,8	20
AS/MSD	27121006		500	69.5	76.7	85	115	3.9	26
Chloride				Units: mg/L					
QC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery	Spike Duplicate 16 Recovery	Lower Control Limit (%)	Lipper Control Limit (%)	RPD (%)	RPD Limit (%)
FB			30	97.3		90	110		
FH			30	98.4		50	110		
Fil			30	98.9		90	110		
5-8			30	98.7.		90	110		
						30			
F-6			30	98.1		90	110		
14			30	98.1		90	110		
řa			áó	96.5		190	110		



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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

	Lipper Control Limit (%) 110		
198			
## 420 ### 420 ### 420 ### 420 ### 420 ### 420 ### 420 ### 420 #### 420 #### 420 ####################################	110		
12.0 12.0			
12.0 12.0			
10			
10			
10			
10			
10			
10			
10			
10			
10			
1976 1976			
1976 1976			
Part			
1948 1947 190 1948 1947 190 195			
1948 1947 190 1948 1947 190 195			
SylvaSD 26333002 30 94.7 93.5 60 SylvaSD 26533003 30000 122.5 125.2 60 SylvaSD 26533003 30000 122.5 125.2 60 SylvaSD 26533003 30 86.5 82.0 50 SylvaSD 26533003 30 86.5 82.0 50 SylvaSD 26533003 30 86.5 82.0 50 SylvaSD 26533003 25544003 20 83.4 SylvaSD 26533003 25544003 250 84.7 SylvaSD 265,0000			
SylvaSD 26333002 30 94.7 93.5 60 SylvaSD 26533003 30000 122.5 125.2 60 SylvaSD 26533003 30000 122.5 125.2 60 SylvaSD 26533003 30 86.5 82.0 50 SylvaSD 26533003 30 86.5 82.0 50 SylvaSD 26533003 30 86.5 82.0 50 SylvaSD 26533003 25544003 20 83.4 SylvaSD 26533003 25544003 250 84.7 SylvaSD 265,0000	1201	0.3	20
Mark	120	0.2	24
Mark	120	0.9	20
Marie Mari			
Doron	120	0.5	.20
Coron			
CType	120	0.5	20
CType			
	Upper Control	RPD PK)	RPD Limit (%)
Company Control Cont	Limit (%)	to A Paris	100
Units: mg/L	115		
Units: mg/L			
Crype			
Recovery Secovery Limit (%)	Upper Control	HPD (%)	RPD Limit (%)
Comparison Com	Limit (%)		
Units: mg/L			
C Type			
C Type			
102.0 102.0 75	Upper Control	BPD (%)	RPD Limit (%)
IC Type Original Sample ID Blank Result Spike Amount Spike Will Recovery Spike Ouphforte No Recovery Lower Control Limit (N) DS/POSD -25544001 100 105.0 204.0 75 DS/POSD 25544001 500 104.0 104.0 75	Limit (%)	0.3	ХD
ICType Original Semple ID Blank Result Spike Amount Spike William Spike Outpficite Lower Control Limit (N) DS/POSD -25544801 100 105.0 204.0 75 DS/POSD 25544001 500 104.0 104.0 75			
Recovery % Recovery Limit (%) DS/POSD 25544001 100 105.0 104.0 75 DS/POSD 25544001 500 104.0 104.0 75			
DS/POSD 25544001 100 105.0 104.0 75 DS/POSD 25544001 500 104.0 104.0 75	Upper Control	KPD (%)	RPD Limit (%)
05/P050 25544001 500 104.0 75	Limit (%)	0.4	20
05/050	125	0.0	20
DS/PDSD 2553W01 100 100 100 100 100 100 100 100 100			
100 TO	125	0.2	20
D6/P050 25791002 1000 1016 1010 P5	125	10.5	20





Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Calcium				Units:	mg/L					
QC Type	Original Sample ID	Blank Result	Spike Amount	Spike M Recovery		Spike Duplicate	Lower Control Limit (%)	Lipper Control Limit (%)	RPD (%)	RPD Limit (%)
D5/PDSD	25791007		3001	97.1		95.0	75	125	0.6	20
DS/PDSO	25881002		100	92.2		92.0	75	125	0.1	20
05/P0S0	26051007		100	106.0		105.0	75	125	12.	20
ithium				Units:	mg/L					
СТуре	Original Sample ID	Blank Result	Spike Amount	Spike is Recovery		Spike Duplicate % Recovery	Lower Control	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
05/POSD	26051001		36	95-6		93.2	75	125	1.8	20
intimony				Units:	mg/L		_			_
СТуре	Original Sample ID	Blank Result	Spike Amount	Spike til Recovery		Spike Duplicate % Recovery	Lower Control Limit (%)	Upper Control Limit (%)	KPD (%)	RPD Limit (%)
PK -	25790001		0.1	99.8			75	125.		
Arsenic	. 200 - 100		A 7 . 17	Units:	mg/L	V- (
СТуре	Original Sample (D	Blank Result.	Spike Amount	Spike % Recovery		Spike Duplicate Secovery	Lower Control Limit (%)	Limit (%)	RPD (%)	RPD Limit (96)
W.	25790001		0.1	97.8			75	125		
arium				Units:	mg/L					
СТуря	Original Sample III	Blank Result	Spike Amount	Spike % Recovery		Spike Duplicate % Recovery	Lower Control Limit (%)	Upper Control Limit (%)	and (%)	RPE (Livit (%)
к.	25750001		0/1	74.9			75	125		
eryllium				Units:	mg/L					
СТуре	Original Sample ID	Blank Result	Spike Ammont	Spike M Recovery		Spike Duplicate B Recovery	Lower Control Limit (45)	Lipper Control Limit (%)	RPD (%)	RPD Llimit (%)
PK .	25790001		0.1	101.0			75	125		
admium				Units:	mg/L					
С Туре	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery		Spike Duplicate S Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
W.	25790001		0.1	94.7			75	125		
hromium				Units:	mg/L					
C Type	Original Sample ID	Blank Result	Spike Amount	Spike % Récovery		Spike Duplicate % Recovery	Lower Control	Limit (%)	RPD (%)	RPD Limit (%)
TK.	25790001		0.1	96.1			75	125		
obalt				Units:	mg/L					
CType	Ore nal Sample ID	Blank Result	Spike Amount	Spire 16 Recovery		Spike Ouplicate % Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (Ne)	RPD Limit (%)
W.	25790001		0.1	95.6			75	125		
ead				Units:	mg/L					
СТуре	Original Sample IO	Blank Result	Spike Amount	Spike % Recovery		Spile Duplicate Si Recovery	Lower Control Limit (%)	Upper Control Limit (%)	APD (%)	RPD Llimit (96)
-X	25790001		0.1	67.4			75	125		
Nolybdenum				Units:	mg/L					
СТуре	Original Sample III	Blank Result	Spike Amount	Spike % Recovery		Spike Duplicate	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
N.	25790001		0.1	98.7			75	125		
elenium				Units:	mg/L					
	Original Sample ID	Blank Result	Spike Amount	Spike W		Spike Dupicate	Lower Control	Lipper Control	RPD (%)	RPD Limit (96)





Account #: 2800

Thallium	AULIA COL	in the second	No. of Contract of	Units:	mg/L		(Comparison)	politica in our	Seattle Print	Asset 1 Transport
QC Type	Original Sample 10	Blank Result	Spike Amount	Spike M Recovery		Spike Duplicate % Recovery	Lower Control Limit (%)	Limit (%)	RPD (%)	RPD Limit (%)
Þ¢.	25790001		0.1	84.4			75	125		
Calcium				Units:	mg/L					
QC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery		Spike Duplicate % Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (95)
F6-Mi			100	109.0			85	115		
AB		a								
we.	25909001								1.4	26
	espends.								1700	40
UP	26051002								2.5	30
Antimony				Units:	mg/L					
IC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery		Spike Duplicate % Recovery	Lower Control Limit (%)	Lipper Control Limit (%)	RPD (%)	RPD Limit (91)
FB-MS			0.1	108.0			180	120		
FB-M5			0.1	102.0			80	120		
en.		<0.001								
4at		₹0.001								
es/MSD	25817001		0.4	109.0		104-0	73	125	40	20
tsyntsu	28051001		0.6	104.0		101.0	75	125	2.9	20
Arsenic IC Type	Original Sample (D	Blank Result	Spike Amount	Units: 5pike %	mg/L	Spike Duplicate	Lower Control	Upper Control	RPD (%)	RPD Limit (%)
18-M5			0.1	Recovery 101.0		% Recovery	Limit (%) 80	Limit (%) 120	-30200	-10-10-10-1
FIRMS										
FIEMS.			0.1	98.9			81.	120		
10		<0.002								
0		<0.002								
IS/MSD	25817001		-0.4	:102.0		104.0	-75	125	1.6	.20
nay 141214	+301 / M/4		-34	1000		awdis.	*4	163	400	. 20
IS/MSD	26051001		0.4	104.0		101.0	75	175	3.4	20
Barium				Units:	mg/L					
DC TYDE	Original Sample III	Blank Result	Spike Amount	Spike % Recovery		Spike Duplicate	Lower Control Limit (%)	Upper Control Limit (%)	RPO (%)	RPD LINE (%)
FB-M15			0.1	95.A			30	120		
FB-MS			0.1	99.4			60	120		
16		<0.002								
		-								
10		<0.002								
NS/MSD	25817001		0.4	103.0		97:6	76	125	5.4	26





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Client: Montana-Dakota Utilities - Bismarck

Beryllium QC Type	Original Sample ID	Blank Result	Spike Amount	Spike W	ng/L Spile Di	plicate Lower Control	Lipper Control	RPD (%)	RPD Limit (%)
FB-MS	1		0.1	Recovery 101.0	% Recov	ery Limit (16)	Limit (%)		1.4.4.4.4.4
FB-MS			0.1	107.0		80	120		
Mis		<0.0005							
wii		<11.0005							
Mil		<0.0005							
MS/MSD	25817001		0.4	107.0	105.0	75	125	1.6	30
MS/MSD	26051001			104.0	100.0		125		-
AOVAOR	26051001		0.4	104.0	100.0	75	1.45	3.9	20
Cadmium				Units: n	ng/L				
QC Type	Original Sample (D	Blank Result	Spike Amount	Spike %	Spike Di	pScate Lower Contro	Upper Control	RPD (%)	RPD Limit (%)
LFB-M5			0.1	Recovery 103.0	% Recov	ery Limit (%)	Limit (%)		
Ma		<0.0005							
MS/MSD	25817001		0.4	106.0	105.0	75	125	13	20
MS/MSD	26051001		0.1	97.5	93 6	75	125	3.9	20
Chromium				Units: n	mg/L				
DC Type	Original Sample III	Blank Result	Spike Amount	Spike %	Spike Or	plicate Lower Contro	Upper Control	RPD (%)	RPD Limit (%)
FB-MS			01	Recovery 105 ti	% Recov	ery Limit (%) 80	Limit (%)		
FB M5			0,1	106.0		80	120		
MB		<0.002							
MB		<0.002							
MS/MSD	25817001		0.4	110.0	104.0	75	325	5.2	20
MS/MSD	26051001		0.4	100.0	104.0	75	125	13	.20
Cobalt				Units: n	ng/L				
ос туре	Original Sample ID	Blank Result	Spike Amount	Spike %	Spike Di	picate Lower Contro	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
FB-MAS			0.1	Recovery 106.0	% Recov	ery Limit (%)	Limit (%)		
F6-M5			8.1	105.6		80	110		
will .		<0.002							
иa		<0.007							
MS/MSD	25817001		17.4	0.000	103.0	75	125	5.0	30
MARKET STATE	***************************************				1000				
MS/MSD	26051001		0.4	104.0	100.0	75	125	9.9.	30
Lead				Units; n	ng/L				
QC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery	Spike Di % Recov	plicate Lower Control ery Limit (%)	Limit (%)	RPD (%)	RPD Limit (%)
FB-MS			0.1	100.0		80	120		
in the									



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Lead				Units: mg					
QC Type	Original Sample 10	Blank Result	Spike Amount	Spike W Recovery	Spike Duplicate ** Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
Me		<0.0005							
MB		÷n.0005							
MS/MSD	25817001		04	96.9	92.3	75	125	47	20
MS/MSD	26051001		0.4	87 G	83.2	75	125	24	20
19,100	1,000,000								1,000
Molybdenum				Units: mg					
QC Type	Original Sample (D	Blank Result	Spike Amount	Spike % Recovery	Spike Duplicate % Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
FB-MS			0.1	109.0		30	120		
JIP-MS			0.1	104.0		80	120		
MB		-10,002							
ма		×0.007							
MS/MSD	25817001		9.4	109.0	104.0	75	125	4.2	20
AS/MSD	26051001		0.4	1010	106.0	75	125	16	20
Selenium				Units: mg/	/L				
QC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery	Spike Duplicate	Lower Control	Upper Control Limit (%)	RPD (%)	RPD Limit (16)
FB-MS			01	100€		80	120		
FB MS			0,1	99.0		80	120		
MB		<0.005							
MB		<0.005							
MS/MSD.	25817001		0.4	:106,0	97.2	75	125	9.1.	20
MS/MSD	26051001		0.6	101.0	94.2	75	125	1.8	.20
Thallium				Units: mg	/L				
ОС Туре	Original Sample (D	Blank Result	Spike Amount	Spike % Recovery	Spike Duplicate 16 Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (96)
FILMS			0.1	90.1		80	120		
10-M5			0.1	910		80	3.00		
will		sn.000s							
wa		<0.0005							
MS/MSD	25817001		W.A	94.4	90.0	75	125	49	20
MS/MSD	19021001		0.4	84.9	62.0	75	125	1.6	20
Mercury	1000000	616	200	Units; mg/		Verter	market A	111.00	
QC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery	Spike Duplicate % Recovery	Lower Control Limit (%)	Lipper Control Limit (%)	RPD (%)	RPD Limit (%)
.FB			0.002	98.5		85	115		

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Mercury				Units:	mg/L					
QC Type	Original Sample ID	Blank Result.	Spike Amount	Spike % Recovery		Spike Duplicate % Recovery	Lower Control Limit (16)	Lipper Control Limit (%)	RPD (%)	RPD Limit (%)
NS/MSD	26051007		0.002	94,6		101.0	70	130:	5.1	.20
is/MSD	26178001		0.002	1000		110.0	70	130	9.5	20
Н				Units:	units					
QC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery		Spike Ouplicate	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
UP.	26051006								0.7	70
Н				Units:	units					
IC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery		Spike Duplicate	Lower Control Limit (%)	Limit (%)	RPD (%)	RPD Limit (%)
RM-PH			6	199.7			98.33	101.67		
RM-PH			6	99.7			98.33	101.67		
luoride				Units:	mg/L					
СТуре	Original Sample ID	Blank Result.	Spike Amount	Spike % Recovery		Spike Duplicate % Recovery	Lower Control	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
RMY			3 39	97.5			53.6	111		
FO F			0.5	(06.1)			90	110		
B.F			0.5	106,0			90	110		
B F		\$0.1								
10+		≺0.\$								
MSD-F	26051005		0.5	90.0		92.0	40.	120	15	.20
otal Dissolve	ed Solids			Units:	mg/L					
С Туре	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery		Spike Duplicate % Recovery	Lower Control Limit (N)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
RM			7%	103.6			90.35	110.13		
10		\$10								



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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Workorder: MDU Heskett (26051) PO: 196081 OP

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

Certificate of Analysis

Approval

All data reported has been reviewed and approved by:



Claudette Carroll, Lab Manager Bismarck, ND

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

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

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

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Workorder Summary

Workorder Comments

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

Sample Comments

26051006 (Dup 1) - Sample

Time sampled was not supplied by the client.

26051007 (Field Blank (FB)) - Sample

Time sampled was not supplied by the client.

Analysis Results Comments

26051001 (MW13)

Target analyte detected in method blank at one half or greater of reporting limit. Reporting limit has been elevated.(Alkalinity, Total)

26051001 (MW13)

Sample analyzed beyond holding time.(pH)

26051002 (MW1-90)

Target analyte detected in method blank at one half or greater of reporting limit. Reporting limit has been elevated.(Alkalinity, Total)

26051002 (MW1-90)

Sample analyzed beyond holding time.(pH)

26051003 (MW2-90)

Target analyte detected in method blank at one half or greater of reporting limit. Reporting limit has been elevated.(Alkalinity, Total)

26051003 (MW2-90)

Sample analyzed beyond holding time.(pH)

26051004 (MW3-90)

Target analyte detected in method blank at one half or greater of reporting limit. Reporting limit has been elevated.(Alkalinity, Total)

26051004 (MW3-90)

Sample analyzed beyond holding time (pH)

26051005 (MW80R)

Target analyte detected in method blank at one half or greater of reporting limit. Reporting limit has been elevated.(Alkalinity, Total)

26051005 (MW80R)

Sample analyzed beyond holding time.(pH)

26051006 (Dup 1)

Target analyte detected in method blank at one half or greater of reporting limit. Reporting limit has been elevated.(Alkalinity, Total)

26051006 (Dup 1)

Sample analyzed beyond holding time.(pH)

26051007 (Field Blank (FB))

Sample analyzed beyond holding time.(pH)

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JSM

10:51

Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

Lab ID: 26051001 **Date Collected:** 08/28/2023 10:51 Matrix: Groundwater Sample ID: MW13 Date Received: 08/29/2023 13:55 MVTL Field Service Collector:

Temp @ Receipt (C): Received on Ice: 3.4 Yes

13.99

Method: 120.1										
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual		
Specific Conductance - Field	11664	umhos/cm	1	1	08/28/2023 10:51	08/28/2023 10:51	JSM			
Method: 150.2										
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual		
pH - Field	7.03	units	0.01	1	08/28/2023 10:51	08/28/2023 10:51	JSM			
Method: 170.1										
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual		
Tomporature Field C	12 00	dogroos C		1	08/28/2023	08/28/2023	ISM			

Method:	ACTM	DE4	C 40
weinoa:	ASIIVI	DOL	0-10

Temperature - Field C

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Sulfate	7490	mg/L	500	100	09/07/2023 10:46	09/07/2023 10:46	AMC	_

10:51

degrees C

Method: EPA 180.1

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Turbidity - Field	4.41	NTU	0.1	1	08/28/2023 10·51	08/28/2023 10:51	JSM	

Method: EPA 245.1

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Mercury, Dissolved	<0.0002	mg/L	0.0002	1	08/31/2023 14:20	09/01/2023 14:59	MDE	

Method: EPA 353.2

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Nitrate + Nitrite as N	15.7	mg/L	1	5	08/31/2023 11:19	08/31/2023 11:19	EJV	

Method: EPA 365.1

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Phosphorus as P	<0.1	mg/L	0.1	1	08/31/2023 16:42	09/01/2023 08:37	EJV	

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Report Date: Wednesday, September 13, 2023 12:50:25





Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

 Lab ID:
 26051001
 Date Collected:
 08/28/2023 10:51
 Matrix:
 Groundwater

 Sample ID:
 MW13
 Date Received:
 08/29/2023 13:55
 Collector:
 MVTL Field Service

Temp @ Receipt (C): 3.4 Received on Ice: Yes

Method: EPA 6010D

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Boron, Dissolved	<0.5	mg/L	0.5	5	08/30/2023 08:11	09/05/2023 15:56	SLZ	
Calcium	398	mg/L	5	5	08/29/2023 17:00	08/30/2023 11:47	MDE	
Iron, Dissolved	<0.5	mg/L	0.5	5	08/30/2023 08:11	09/06/2023 09:55	MDE	
Magnesium	785	mg/L	5	5	08/29/2023 17:00	08/30/2023 11:47	MDE	
Manganese, Dissolved	<0.25	mg/L	0.25	5	08/30/2023 08:11	09/06/2023 09:55	MDE	
Potassium	26.6	mg/L	5	5	08/29/2023 17:00	08/30/2023 11:47	MDE	
Sodium	2020	mg/L	5	5	08/29/2023 17:00	08/30/2023 11:47	MDE	

Method: EPA 6020B

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Arsenic, Dissolved	<0.002	mg/L	0.002	5	08/30/2023 08:11	09/12/2023 11:30	MDE	
Barium, Dissolved	0.0068	mg/L	0.002	5	08/30/2023 08:11	09/12/2023 11:30	MDE	
Cadmium, Dissolved	<0.0005	mg/L	0.0005	5	08/30/2023 08:11	09/12/2023 11:30	MDE	
Chromium, Dissolved	<0.002	mg/L	0.002	5	08/30/2023 08:11	09/12/2023 11:30	MDE	
Lead, Dissolved	<0.0005	mg/L	0.0005	5	08/30/2023 08:11	09/12/2023 11:30	MDE	
Molybdenum, Dissolved	<0.002	mg/L	0.002	5	08/30/2023 08:11	09/12/2023 11:30	MDE	
Selenium, Dissolved	0.3046	mg/L	0.01	10	08/30/2023 08:11	09/12/2023 12:15	MDE	
Silver, Dissolved	<0.0005	mg/L	0.0005	5	08/30/2023 08:11	09/12/2023 11:30	MDE	

Method: SM1030F

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Anion Summation	171	meq/L		1	09/12/2023 13:25	09/12/2023 13:25	CALC	
Cation Summation	173	meq/L		1	09/12/2023 13:25	09/12/2023 13:25	CALC	
Percent Difference	0.64	%		1	09/12/2023 13:25	09/12/2023 13:25	CALC	
TDS - Summation	11200	mg/L	12.5	1	09/12/2023 13:26	09/12/2023 13:26	CALC	

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13:25

Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

 Lab ID:
 26051001
 Date Collected:
 08/28/2023 10:51
 Matrix:
 Groundwater

 Sample ID:
 MW13
 Date Received:
 08/29/2023 13:55
 Collector:
 MVTL Field Service

Temp @ Receipt (C): 3.4 Received on Ice: Yes

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Alkalinity, Phenolphthalein	<20.5	mg/L as CaCO3	20.5	1	08/29/2023 16:59	08/29/2023 16:59	AMC	
Alkalinity, Total	523	mg/L as CaCO3	20.5	1	08/29/2023 16:59	08/29/2023 16:59	AMC	*
Bicarbonate	523	mg/L as CaCO3	20.5	1	08/29/2023 16:59	08/29/2023 16:59	AMC	
Carbonate	<20.5	mg/L as CaCO3	20.5	1	08/29/2023 16:59	08/29/2023 16:59	AMC	
Hydroxide	<20.5	mg/L as CaCO3	20.5	1	08/29/2023 16:59	08/29/2023 16:59	AMC	
Method: SM2340B-2011								
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Hardness - Total	4230	mg/L as CaCO3	6.62	1	09/12/2023 13:25	09/12/2023 13:25	CALC	
Method: SM2510 B-2011 EC								
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Specific Conductance	11000	umhos/cm	1	1	08/29/2023 16:59	08/29/2023 16:59	AMC	
Method: SM4500 H+ B-2011								
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
рН	7.1	units	0.1	1	08/29/2023 16:59	08/29/2023 16:59	AMC	*
Method: SM4500-CI-E 2011								
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Chloride	117	mg/L	2.0	1	09/06/2023 11:15	09/06/2023 11:15	AMC	
Method: SM4500-F-C-2011								
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Fluoride	0.74	mg/L	0.1	1	08/29/2023 16:59	08/29/2023 16:59	AMC	
Method: USDA 20b								
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Sodium Adsorption Ratio	13.5		0.17	1	09/12/2023	09/12/2023	CALC	

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

Lab ID: 26051002 **Date Collected:** 08/29/2023 12:37 Matrix: Groundwater MW1-90 Sample ID: Date Received: 08/29/2023 13:55 MVTL Field Service Collector:

Method: 120.1 Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Specific Conductance - Field	11627	umhos/cm		1	08/29/2023 12:37	08/29/2023 12:37	JSM	- Quui
Method: 150.2								
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
pH - Field	6.86	units	0.01	1	08/29/2023 12:37	08/29/2023 12:37	JSM	
Method: 170.1								
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Temperature - Field C	16.25	degrees C		1	08/29/2023 12:37	08/29/2023 12:37	JSM	
Method: ASTM D516-16								
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Sulfate	7710	mg/L	500	100	09/07/2023 10:47	09/07/2023 10:47	AMC	
Method: EPA 180.1								
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Turbidity - Field	4.31	NTU	0.1	1	08/29/2023 12:37	08/29/2023 12:37	JSM	
Method: EPA 245.1								
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Mercury, Dissolved	<0.0002	mg/L	0.0002	1	08/31/2023 14:20	09/01/2023 14:59	MDE	
Method: EPA 353.2								
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Nitrate + Nitrite as N	12.2	mg/L	1	5	08/31/2023 11:20	08/31/2023 11:20	EJV	
Method: EPA 365.1								
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

 Lab ID:
 26051002
 Date Collected:
 08/29/2023 12:37
 Matrix:
 Groundwater

 Sample ID:
 MW1-90
 Date Received:
 08/29/2023 13:55
 Collector:
 MVTL Field Service

Temp @ Receipt (C): 3.4 Received on Ice: Yes

Method: EPA 6010D

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Boron, Dissolved	<0.5	mg/L	0.5	5	08/30/2023 08:11	09/05/2023 15:58	SLZ	
Calcium	406	mg/L	5	5	08/29/2023 17:00	08/30/2023 11:50	MDE	
Iron, Dissolved	<0.5	mg/L	0.5	5	08/30/2023 08:11	09/06/2023 09:56	MDE	
Magnesium	953	mg/L	5	5	08/29/2023 17:00	08/30/2023 11:50	MDE	
Manganese, Dissolved	<0.25	mg/L	0.25	5	08/30/2023 08:11	09/06/2023 09:56	MDE	
Potassium	26.7	mg/L	5	5	08/29/2023 17:00	08/30/2023 11:50	MDE	
Sodium	1740	mg/L	5	5	08/29/2023 17:00	08/30/2023 11:50	MDE	

Method: EPA 6020B

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Arsenic, Dissolved	<0.002	mg/L	0.002	5	08/30/2023 08:11	09/12/2023 11:35	MDE	
Barium, Dissolved	0.0092	mg/L	0.002	5	08/30/2023 08:11	09/12/2023 11:35	MDE	
Cadmium, Dissolved	<0.0005	mg/L	0.0005	5	08/30/2023 08:11	09/12/2023 11:35	MDE	
Chromium, Dissolved	<0.002	mg/L	0.002	5	08/30/2023 08:11	09/12/2023 11:35	MDE	
Lead, Dissolved	<0.0005	mg/L	0.0005	5	08/30/2023 08:11	09/12/2023 11:35	MDE	
Molybdenum, Dissolved	<0.002	mg/L	0.002	5	08/30/2023 08:11	09/12/2023 11:35	MDE	
Selenium, Dissolved	0.0191	mg/L	0.005	5	08/30/2023 08:11	09/12/2023 11:35	MDE	
Silver, Dissolved	<0.0005	mg/L	0.0005	5	08/30/2023 08:11	09/12/2023 11:35	MDE	

Method: SM1030F

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Anion Summation	173	meq/L		1	09/08/2023 15:49	09/08/2023 15:49	CALC	
Cation Summation	175	meq/L		1	09/08/2023 15:49	09/08/2023 15:49	CALC	
Percent Difference	0.58	%		1	09/08/2023 15:49	09/08/2023 15:49	CALC	
TDS - Summation	11200	mg/L	12.5	1	09/08/2023 15:49	09/08/2023 15:49	CALC	

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

 Lab ID:
 26051002
 Date Collected:
 08/29/2023 12:37
 Matrix:
 Groundwater

 Sample ID:
 MW1-90
 Date Received:
 08/29/2023 13:55
 Collector:
 MVTL Field Service

Temp @ Receipt (C): 3.4 Received on Ice: Yes

Alkalinity, Phenolphthalein Alkalinity, Total Bicarbonate Carbonate Hydroxide Method: SM2340B-2011 Parameter	<20.5 466 466 <20.5 <20.5	mg/L as CaCO3 mg/L as	20.5 20.5 20.5 20.5 20.5	1 1 1 1	08/29/2023 17:16 08/29/2023 17:16 08/29/2023 17:16 08/29/2023 17:16 08/29/2023	08/29/2023 17:16 08/29/2023 17:16 08/29/2023 17:16 08/29/2023 17:16	AMC AMC AMC	*
Bicarbonate Carbonate Hydroxide Method: SM2340B-2011 Parameter	466 <20.5 <20.5	CaCO3 mg/L as CaCO3 mg/L as CaCO3 mg/L as	20.5	1	17:16 08/29/2023 17:16 08/29/2023 17:16	17:16 08/29/2023 17:16 08/29/2023	AMC	*
Carbonate Hydroxide Method: SM2340B-2011 Parameter	<20.5 <20.5	CaCO3 mg/L as CaCO3 mg/L as	20.5	1	17:16 08/29/2023 17:16	17:16 08/29/2023		
Hydroxide Method: SM2340B-2011 Parameter	<20.5	CaCO3 mg/L as			17:16		AMC	
Method: SM2340B-2011 Parameter			20.5	1	U8/30/3U33			
Parameter	Results				17:16	08/29/2023 17:16	AMC	
	Results							
Handres Takel		Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Hardness - Total	4940	mg/L as CaCO3	6.62	1	09/08/2023 15:49	09/08/2023 15:49	CALC	
Method: SM2510 B-2011 EC								
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Specific Conductance	10690	umhos/cm	1	1	08/29/2023 17:16	08/29/2023 17:16	AMC	
Method: SM4500 H+ B-2011								
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
рН	7.0	units	0.1	1	08/29/2023 17:16	08/29/2023 17:16	AMC	*
Method: SM4500-CI-E 2011								
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Chloride	90.7	mg/L	2.0	1	09/06/2023 11:16	09/06/2023 11:16	AMC	
Method: SM4500-F-C-2011								
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Fluoride	1.14	mg/L	0.1	1	08/29/2023 17:16	08/29/2023 17:16	AMC	
Method: USDA 20b								
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Sodium Adsorption Ratio	10.8		0.17	1	09/08/2023 15:49	09/08/2023 15:49	CALC	

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Report Date: Wednesday, September 13, 2023 12:50:25



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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

 Lab ID:
 26051003
 Date Collected:
 08/29/2023 10:24
 Matrix:
 Groundwater

 Sample ID:
 MW2-90
 Date Received:
 08/29/2023 13:55
 Collector:
 MVTL Field Service

Temp @ Receipt (C): 3.4 Received on Ice: Yes

13.57

Method: 120.1								
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Specific Conductance - Field	7999	umhos/cm	1	1	08/29/2023 10:24	08/29/2023 10:24	JSM	
Method: 150.2								
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
pH - Field	7.04	units	0.01	1	08/29/2023 10:24	08/29/2023 10:24	JSM	
Method: 170.1								
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual

Method: ASTM D516-16

Temperature - Field C

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Sulfate	4940	mg/L	250	50	09/07/2023 10:59	09/07/2023 10:59	AMC	

1

degrees C

08/29/2023

10:24

08/29/2023

10:24

JSM

Method: EPA 180.1

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Turbidity - Field	3.41	NTU	0.1	1	08/29/2023 10·24	08/29/2023 10·24	JSM	

Method: EPA 245.1

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Mercury, Dissolved	<0.0002	mg/L	0.0002	1	08/31/2023 14:20	09/01/2023 14:59	MDE	

Method: EPA 353.2

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Nitrate + Nitrite as N	30.0	mg/L	2	10	08/31/2023 11:21	08/31/2023 11:21	EJV	

Method: EPA 365.1

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Phosphorus as P	<0.1	mg/L	0.1	1	08/31/2023 16:42	09/01/2023 08:39	EJV	

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Report Date: Wednesday, September 13, 2023 12:50:25





Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

 Lab ID:
 26051003
 Date Collected:
 08/29/2023 10:24
 Matrix:
 Groundwater

 Sample ID:
 MW2-90
 Date Received:
 08/29/2023 13:55
 Collector:
 MVTL Field Service

Temp @ Receipt (C): 3.4 Received on Ice: Yes

Method: EPA 6010D

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Boron, Dissolved	<0.5	mg/L	0.5	5	08/30/2023 08:11	09/05/2023 16:00	SLZ	
Calcium	477	mg/L	5	5	08/29/2023 17:00	08/30/2023 11:52	MDE	
Iron, Dissolved	<0.5	mg/L	0.5	5	08/30/2023 08:11	09/06/2023 09:58	MDE	
Magnesium	766	mg/L	5	5	08/29/2023 17:00	08/30/2023 11:52	MDE	
Manganese, Dissolved	<0.25	mg/L	0.25	5	08/30/2023 08:11	09/06/2023 09:58	MDE	
Potassium	25.8	mg/L	5	5	08/29/2023 17:00	08/30/2023 11:52	MDE	
Sodium	808	mg/L	5	5	08/29/2023 17:00	08/30/2023 11:52	MDE	

Method: EPA 6020B

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Arsenic, Dissolved	<0.002	mg/L	0.002	5	08/30/2023 08:11	09/12/2023 11:39	MDE	
Barium, Dissolved	0.0091	mg/L	0.002	5	08/30/2023 08:11	09/12/2023 11:39	MDE	
Cadmium, Dissolved	<0.0005	mg/L	0.0005	5	08/30/2023 08:11	09/12/2023 11:39	MDE	
Chromium, Dissolved	<0.002	mg/L	0.002	5	08/30/2023 08:11	09/12/2023 11:39	MDE	
Lead, Dissolved	<0.0005	mg/L	0.0005	5	08/30/2023 08:11	09/12/2023 11:39	MDE	
Molybdenum, Dissolved	<0.002	mg/L	0.002	5	08/30/2023 08:11	09/12/2023 11:39	MDE	
Selenium, Dissolved	0.1425	mg/L	0.005	5	08/30/2023 08:11	09/12/2023 11:39	MDE	
Silver, Dissolved	<0.0005	mg/L	0.0005	5	08/30/2023 08:11	09/12/2023 11:39	MDE	

Method: SM1030F

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Anion Summation	118	meq/L		1	09/08/2023 15:50	09/08/2023 15:50	CALC	
Cation Summation	123	meq/L		1	09/08/2023 15:50	09/08/2023 15:50	CALC	
Percent Difference	1.75	%		1	09/08/2023 15:50	09/08/2023 15:50	CALC	
TDS - Summation	7460	mg/L	12.5	1	09/08/2023 15:50	09/08/2023 15:50	CALC	

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

 Lab ID:
 26051003
 Date Collected:
 08/29/2023 10:24
 Matrix:
 Groundwater

 Sample ID:
 MW2-90
 Date Received:
 08/29/2023 13:55
 Collector:
 MVTL Field Service

Temp @ Receipt (C): 3.4 Received on Ice: Yes

Alkalinity, Phenolphthalein Alkalinity, Total Bicarbonate Carbonate Hydroxide Method: SM2340B-2011 Parameter	<20.5 562 562 <20.5 <20.5	mg/L as CaCO3 CaCO3	20.5 20.5 20.5 20.5 20.5	1 1 1 1	08/29/2023 17:32 08/29/2023 17:32 08/29/2023 17:32 08/29/2023 17:32 08/29/2023 17:32	08/29/2023 17:32 08/29/2023 17:32 08/29/2023 17:32 08/29/2023 17:32 08/29/2023	AMC AMC AMC	*
Bicarbonate Carbonate Hydroxide Method: SM2340B-2011	562 <20.5 <20.5	CaCO3 mg/L as CaCO3 mg/L as CaCO3 mg/L as	20.5 20.5	1	17:32 08/29/2023 17:32 08/29/2023 17:32 08/29/2023	17:32 08/29/2023 17:32 08/29/2023 17:32 08/29/2023	AMC	*
Carbonate Hydroxide Method: SM2340B-2011	<20.5 <20.5	CaCO3 mg/L as CaCO3 mg/L as	20.5	1	17:32 08/29/2023 17:32 08/29/2023	17:32 08/29/2023 17:32 08/29/2023		
Hydroxide Method: SM2340B-2011	<20.5	CaCO3 mg/L as		-	17:32 08/29/2023	17:32 08/29/2023	AMC	
Method: SM2340B-2011		•	20.5	1				
	Posulto				17.02	17:32	AMC	
Parameter	Doculto							
	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Hardness - Total	4350	mg/L as CaCO3	6.62	1	09/08/2023 15:50	09/08/2023 15:50	CALC	
Method: SM2510 B-2011 EC								
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Specific Conductance	7460	umhos/cm	1	1	08/29/2023 17:32	08/29/2023 17:32	AMC	
Method: SM4500 H+ B-2011								
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
рН	7.2	units	0.1	1	08/29/2023 17:32	08/29/2023 17:32	AMC	*
Method: SM4500-CI-E 2011								
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Chloride	80.5	mg/L	2.0	1	09/06/2023 11:17	09/06/2023 11:17	AMC	
Method: SM4500-F-C-2011								
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Fluoride	1.03	mg/L	0.1	1	08/29/2023 17:32	08/29/2023 17:32	AMC	
Method: USDA 20b								
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Sodium Adsorption Ratio	5.33		0.17	1	09/08/2023 15:50	09/08/2023 15:50	CALC	

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

 Lab ID:
 26051004
 Date Collected:
 08/29/2023 08:44
 Matrix:
 Groundwater

 Sample ID:
 MW3-90
 Date Received:
 08/29/2023 13:55
 Collector:
 MVTL Field Service

Temp @ Receipt (C): 3.4 Received on Ice: Yes

Method: 120.1								
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Specific Conductance - Field	5046	umhos/cm	1	1	08/29/2023 08:44	08/29/2023 08:44	JSM	
Method: 150.2								
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
pH - Field	6.98	units	0.01	1	08/29/2023 08:44	08/29/2023 08:44	JSM	
Method: 170.1								
Baramatar	Populto	Unito	DDI	DE	Droporod	Analyzod	Dv.	Ougl

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Temperature - Field C	11.22	degrees	С	1	08/29/2023	08/29/2023	JSM	

Method: ASTM D516-16

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Sulfate	2660	mg/L	100	20	09/07/2023 10:49	09/07/2023 10:49	AMC	

Method: EPA 180.1

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Turbidity - Field	3.43	NTU	0.1	1	08/29/2023 08:44	08/29/2023 08:44	JSM	

Method: EPA 245.1

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Mercury, Dissolved	<0.0002	mg/L	0.0002	1	08/31/2023 14:20	09/01/2023 14:59	MDE	

Method: EPA 353.2

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Nitrate + Nitrite as N	0.88	mg/L	0.2	1	08/31/2023 11·28	08/31/2023 11·28	EJV	

Method: EPA 365.1

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Phosphorus as P	<0.1	mg/L	0.1	1	08/31/2023 16:42	09/01/2023 08:40	EJV	

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Report Date: Wednesday, September 13, 2023 12:50:25





Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

Lab ID:26051004Date Collected:08/29/2023 08:44Matrix:GroundwaterSample ID:MW3-90Date Received:08/29/2023 13:55Collector:MVTL Field Service

Temp @ Receipt (C): 3.4 Received on Ice: Yes

Method: EPA 6010D

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Boron, Dissolved	<0.1	mg/L	0.1	1	08/30/2023 08:11	09/05/2023 16:02	SLZ	
Calcium	470	mg/L	5	5	08/29/2023 17:00	08/30/2023 11:53	MDE	
Iron, Dissolved	<0.1	mg/L	0.1	1	08/30/2023 08:11	09/06/2023 09:59	MDE	
Magnesium	227	mg/L	5	5	08/29/2023 17:00	08/30/2023 11:53	MDE	
Manganese, Dissolved	<0.05	mg/L	0.05	1	08/30/2023 08:11	09/06/2023 09:59	MDE	
Potassium	12.7	mg/L	5	5	08/29/2023 17:00	08/30/2023 11:53	MDE	
Sodium	631	mg/L	5	5	08/29/2023 17:00	08/30/2023 11:53	MDE	

Method: EPA 6020B

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Arsenic, Dissolved	<0.002	mg/L	0.002	5	08/30/2023 08:11	09/12/2023 11:44	MDE	
Barium, Dissolved	0.0104	mg/L	0.002	5	08/30/2023 08:11	09/12/2023 11:44	MDE	
Cadmium, Dissolved	<0.0005	mg/L	0.0005	5	08/30/2023 08:11	09/12/2023 11:44	MDE	
Chromium, Dissolved	<0.002	mg/L	0.002	5	08/30/2023 08:11	09/12/2023 11:44	MDE	
Lead, Dissolved	<0.0005	mg/L	0.0005	5	08/30/2023 08:11	09/12/2023 11:44	MDE	
Molybdenum, Dissolved	<0.002	mg/L	0.002	5	08/30/2023 08:11	09/12/2023 11:44	MDE	
Selenium, Dissolved	0.2069	mg/L	0.005	5	08/30/2023 08:11	09/12/2023 11:44	MDE	
Silver, Dissolved	<0.0005	mg/L	0.0005	5	08/30/2023 08:11	09/12/2023 11:44	MDE	

Method: SM1030F

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Anion Summation	67.0	meq/L		1	09/08/2023 15:50	09/08/2023 15:50	CALC	
Cation Summation	69.8	meq/L		1	09/08/2023 15:50	09/08/2023 15:50	CALC	
Percent Difference	2.06	%		1	09/08/2023 15:50	09/08/2023 15:50	CALC	
TDS - Summation	4360	mg/L	12.5	1	09/08/2023 15:50	09/08/2023 15:50	CALC	

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Report Date: Wednesday, September 13, 2023 12:50:25

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CALC

15:50

Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

Lab ID:26051004Date Collected:08/29/2023 08:44Matrix:GroundwaterSample ID:MW3-90Date Received:08/29/2023 13:55Collector:MVTL Field Service

Temp @ Receipt (C): 3.4 Received on Ice: Yes

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Alkalinity, Phenolphthalein	<20.5	mg/L as CaCO3	20.5	1	08/29/2023 17:50	08/29/2023 17:50	AMC	
Alkalinity, Total	522	mg/L as CaCO3	20.5	1	08/29/2023 17:50	08/29/2023 17:50	AMC	*
Bicarbonate	522	mg/L as CaCO3	20.5	1	08/29/2023 17:50	08/29/2023 17:50	AMC	
Carbonate	<20.5	mg/L as CaCO3	20.5	1	08/29/2023 17:50	08/29/2023 17:50	AMC	
Hydroxide	<20.5	mg/L as CaCO3	20.5	1	08/29/2023 17:50	08/29/2023 17:50	AMC	
Method: SM2340B-2011								
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Hardness - Total	2110	mg/L as CaCO3	6.62	1	09/08/2023 15:50	09/08/2023 15:50	CALC	
Method: SM2510 B-2011 EC								
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Specific Conductance	4762	umhos/cm	1	1	08/29/2023 17:50	08/29/2023 17:50	AMC	
Method: SM4500 H+ B-2011								
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
рН	7.1	units	0.1	1	08/29/2023 17:50	08/29/2023 17:50	AMC	*
Method: SM4500-CI-E 2011								
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Chloride	39.5	mg/L	2.0	1	09/06/2023 11:18	09/06/2023 11:18	AMC	
Method: SM4500-F-C-2011								
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Fluoride	0.13	mg/L	0.1	1	08/29/2023 17:50	08/29/2023 17:50	AMC	
Method: USDA 20b								
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Sodium Adsorption Ratio	5.98		0 17	1	09/08/2023	09/08/2023	CALC	

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15:50

0.17

Report Date: Wednesday, September 13, 2023 12:50:25

5.98

PM

Sodium Adsorption Ratio



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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

 Lab ID:
 26051005
 Date Collected:
 08/28/2023 13:05
 Matrix:
 Groundwater

 Sample ID:
 MW80R
 Date Received:
 08/29/2023 13:55
 Collector:
 MVTL Field Service

Temp @ Receipt (C): 3.4 Received on Ice: Yes

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Specific Conductance - Field	7078	umhos/cm	1	1	08/28/2023 13:05	08/28/2023 13:05	JSM	
Method: 150.2								
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
pH - Field	7.01	units	0.01	1	08/28/2023 13:05	08/28/2023 13:05	JSM	
Method: 170.1								

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Temperature - Field C	12.81	degrees	С	1	08/28/2023 13:05	08/28/2023 13:05	JSM	

Method: ASTM D516-16

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Sulfate	4130	mg/L	200	40	09/07/2023 10:50	09/07/2023 10:50	AMC	

Method: EPA 180.1

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Turbidity - Field	2.41	NTU	0.1	1	08/28/2023 13:05	08/28/2023 13:05	JSM	

Method: EPA 245.1

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Mercury, Dissolved	<0.0002	mg/L	0.0002	1	08/31/2023 14:20	09/01/2023 14:59	MDE	

Method: EPA 353.2

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Nitrate + Nitrite as N	23.5	mg/L	1	5	08/31/2023 11·29	08/31/2023 11·29	EJV	

Method: EPA 365.1

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Phosphorus as P	<0.1	mg/L	0.1	1	08/31/2023 16:42	09/01/2023 08:41	EJV	

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Report Date: Wednesday, September 13, 2023 12:50:25





Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

 Lab ID:
 26051005
 Date Collected:
 08/28/2023 13:05
 Matrix:
 Groundwater

 Sample ID:
 MW80R
 Date Received:
 08/29/2023 13:55
 Collector:
 MVTL Field Service

Temp @ Receipt (C): 3.4 Received on Ice: Yes

Method: EPA 6010D

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Boron, Dissolved	<0.5	mg/L	0.5	5	08/30/2023 08:11	09/05/2023 16:07	SLZ	
Calcium	528	mg/L	5	5	08/29/2023 17:00	08/30/2023 11:53	MDE	
Iron, Dissolved	<0.5	mg/L	0.5	5	08/30/2023 08:11	09/06/2023 10:00	MDE	
Magnesium	685	mg/L	5	5	08/29/2023 17:00	08/30/2023 11:53	MDE	
Manganese, Dissolved	0.34	mg/L	0.25	5	08/30/2023 08:11	09/06/2023 10:00	MDE	
Potassium	5.61	mg/L	5	5	08/29/2023 17:00	08/30/2023 11:53	MDE	
Sodium	700	mg/L	5	5	08/29/2023 17:00	08/30/2023 11:53	MDE	

Method: EPA 6020B

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Arsenic, Dissolved	<0.002	mg/L	0.002	5	08/30/2023 08:11	09/12/2023 11:49	MDE	
Barium, Dissolved	0.0109	mg/L	0.002	5	08/30/2023 08:11	09/12/2023 11:49	MDE	
Cadmium, Dissolved	<0.0005	mg/L	0.0005	5	08/30/2023 08:11	09/12/2023 11:49	MDE	
Chromium, Dissolved	<0.002	mg/L	0.002	5	08/30/2023 08:11	09/12/2023 11:49	MDE	
Lead, Dissolved	<0.0005	mg/L	0.0005	5	08/30/2023 08:11	09/12/2023 11:49	MDE	
Molybdenum, Dissolved	0.0027	mg/L	0.002	5	08/30/2023 08:11	09/12/2023 11:49	MDE	
Selenium, Dissolved	0.0461	mg/L	0.005	5	08/30/2023 08:11	09/12/2023 11:49	MDE	
Silver, Dissolved	<0.0005	mg/L	0.0005	5	08/30/2023 08:11	09/12/2023 11:49	MDE	

Method: SM1030F

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Anion Summation	105	meq/L		1	09/08/2023 15:51	09/08/2023 15:51	CALC	
Cation Summation	113	meq/L		1	09/08/2023 15:51	09/08/2023 15:51	CALC	
Percent Difference	3.83	%		1	09/08/2023 15:51	09/08/2023 15:51	CALC	
TDS - Summation	6620	mg/L	12.5	1	09/08/2023 15:51	09/08/2023 15:51	CALC	

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Report Date: Wednesday, September 13, 2023 12:50:25

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

Lab ID: 26051005 **Date Collected:** 08/28/2023 13:05 Matrix: Groundwater Sample ID: MW80R MVTL Field Service Date Received: 08/29/2023 13:55 Collector:

Temp @ Receipt (C): 3.4 Received on Ice: Yes

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Alkalinity, Phenolphthalein	<20.5	mg/L as CaCO3	20.5	1	08/29/2023 18:29	08/29/2023 18:29	AMC	
Alkalinity, Total	592	mg/L as CaCO3	20.5	1	08/29/2023 18:29	08/29/2023 18:29	AMC	*
Bicarbonate	592	mg/L as CaCO3	20.5	1	08/29/2023 18:29	08/29/2023 18:29	AMC	
Carbonate	<20.5	mg/L as CaCO3	20.5	1	08/29/2023 18:29	08/29/2023 18:29	AMC	
Hydroxide	<20.5	mg/L as CaCO3	20.5	1	08/29/2023 18:29	08/29/2023 18:29	AMC	
Method: SM2340B-2011								
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Hardness - Total	4140	mg/L as CaCO3	6.62	1	09/08/2023 15:51	09/08/2023 15:51	CALC	
Method: SM2510 B-2011 EC								
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Specific Conductance	6585	umhos/cm	1	1	08/29/2023 18:29	08/29/2023 18:29	AMC	
Method: SM4500 H+ B-2011								
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
рН	7.4	units	0.1	1	08/29/2023 18:29	08/29/2023 18:29	AMC	*
Method: SM4500-CI-E 2011								
	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Parameter	Results							

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Sodium Adsorption Ratio	4.74		0.17	1	09/08/2023 15:51	09/08/2023 15:51	CALC	

RDL

0.1

Units

mg/L

Results

0.23

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DF

1

Prepared

18:29

08/29/2023

Analyzed

18:29

08/29/2023

Qual

Ву

AMC

Report Date: Wednesday, September 13, 2023 12:50:25

PM

Parameter

Method: USDA 20b

Fluoride



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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

Lab ID:26051006Date Collected:08/28/2023Matrix:GroundwaterSample ID:Dup 1Date Received:08/29/2023 13:55Collector:MVTL Field Service

Temp @ Receipt (C): 3.4 Received on Ice: Yes

Method: ASTM D516-16

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Sulfate	7840	mg/L	500	100	09/07/2023 10:51	09/07/2023 10:51	AMC	

Method: EPA 245.1

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Mercury, Dissolved	<0.0002	mg/L	0.0002	1	08/31/2023 14:20	09/01/2023 14:59	MDE	

Method: EPA 353.2

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Nitrate + Nitrite as N	15.4	mg/L	1	5	08/31/2023 11:30	08/31/2023 11:30	EJV	

Method: EPA 365.1

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Phosphorus as P	<0.1	mg/L	0.1	1	08/31/2023 16:42	09/01/2023 08:42	EJV	

Method: EPA 6010D

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Boron, Dissolved	<0.5	mg/L	0.5	5	08/30/2023 08:11	09/05/2023 16:09	SLZ	
Calcium	385	mg/L	5	5	08/29/2023 17:00	08/30/2023 11:54	MDE	
Iron, Dissolved	<0.5	mg/L	0.5	5	08/30/2023 08:11	09/06/2023 10:03	MDE	
Magnesium	762	mg/L	5	5	08/29/2023 17:00	08/30/2023 11:54	MDE	
Manganese, Dissolved	<0.25	mg/L	0.25	5	08/30/2023 08:11	09/06/2023 10:03	MDE	
Potassium	25.8	mg/L	5	5	08/29/2023 17:00	08/30/2023 11:54	MDE	
Sodium	1960	mg/L	5	5	08/29/2023 17:00	08/30/2023 11:54	MDE	

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Report Date: Wednesday, September 13, 2023 12:50:25





Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

 Lab ID:
 26051006
 Date Collected:
 08/28/2023
 Matrix:
 Groundwater

 Sample ID:
 Dup 1
 Date Received:
 08/29/2023 13:55
 Collector:
 MVTL Field Service

Temp @ Receipt (C): 3.4 Received on Ice: Yes

Method: EPA 6020B

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Arsenic, Dissolved	<0.002	mg/L	0.002	5	08/30/2023 08:11	09/12/2023 11:53	MDE	
Barium, Dissolved	0.0069	mg/L	0.002	5	08/30/2023 08:11	09/12/2023 11:53	MDE	
Cadmium, Dissolved	<0.0005	mg/L	0.0005	5	08/30/2023 08:11	09/12/2023 11:53	MDE	
Chromium, Dissolved	<0.002	mg/L	0.002	5	08/30/2023 08:11	09/12/2023 11:53	MDE	
Lead, Dissolved	<0.0005	mg/L	0.0005	5	08/30/2023 08:11	09/12/2023 11:53	MDE	
Molybdenum, Dissolved	<0.002	mg/L	0.002	5	08/30/2023 08:11	09/12/2023 11:53	MDE	
Selenium, Dissolved	0.2993	mg/L	0.01	10	08/30/2023 08:11	09/12/2023 12:20	MDE	
Silver, Dissolved	<0.0005	mg/L	0.0005	5	08/30/2023 08:11	09/12/2023 11:53	MDE	

Method: SM1030F

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Anion Summation	178	meq/L		1	09/12/2023 13:26	09/12/2023 13:26	CALC	
Cation Summation	168	meq/L		1	09/12/2023 13:26	09/12/2023 13:26	CALC	
Percent Difference	-2.84	%		1	09/12/2023 13:26	09/12/2023 13:26	CALC	
TDS - Summation	11400	mg/L	12.5	1	09/12/2023 13:26	09/12/2023 13:26	CALC	

Method: SM2320 B-2011

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Alkalinity, Phenolphthalein	<20.5	mg/L as CaCO3	20.5	1	08/29/2023 19:00	08/29/2023 19:00	AMC	
Alkalinity, Total	494	mg/L as CaCO3	20.5	1	08/29/2023 19:00	08/29/2023 19:00	AMC	*
Bicarbonate	494	mg/L as CaCO3	20.5	1	08/29/2023 19:00	08/29/2023 19:00	AMC	
Carbonate	<20.5	mg/L as CaCO3	20.5	1	08/29/2023 19:00	08/29/2023 19:00	AMC	
Hydroxide	<20.5	mg/L as CaCO3	20.5	1	08/29/2023 19:00	08/29/2023 19:00	AMC	

Method: SM2340B-2011

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Hardness - Total	4100	mg/L as CaCO3	6.62	1	09/12/2023 13:26	09/12/2023 13:26	CALC	

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

Lab ID:26051006Date Collected:08/28/2023Matrix:GroundwaterSample ID:Dup 1Date Received:08/29/2023 13:55Collector:MVTL Field Service

Temp @ Receipt (C): 3.4 Received on Ice: Yes

Method: SM2510 B-2011 EC

Parameter	Results	Units I	RDL	DF	Prepared	Analyzed	Ву	Qual
Specific Conductance	11000	umhos/cm	1	1	08/29/2023 19:00	08/29/2023 19:00	AMC	_

Method: SM4500 H+ B-2011

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
рН	7.2	units	0.1	1	08/29/2023 19:00	08/29/2023 19:00	AMC	*

Method: SM4500-CI-E 2011

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Chloride	117	mg/L	2.0	1	09/06/2023 11:21	09/06/2023 11:21	AMC	

Method: SM4500-F-C-2011

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Fluoride	0.74	mg/L	0.1	1	08/29/2023 19:00	08/29/2023 19:00	AMC	

Method: USDA 20b

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Sodium Adsorption Ratio	13.3		0.17	1	09/12/2023 13:26	09/12/2023 13:26	CALC	

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

Lab ID:26051007Date Collected:08/29/2023Matrix:GroundwaterSample ID:Field Blank (FB)Date Received:08/29/2023 13:55Collector:MVTL Field Service

Temp @ Receipt (C): 3.4 Received on Ice: Yes

Method: ASTM D516-16

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Sulfate	<5	mg/L	5	1	09/07/2023 10:52	09/07/2023 10:52	AMC	

Method: EPA 245.1

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Mercury, Dissolved	<0.0002	mg/L	0.0002	1	08/31/2023 14:20	09/01/2023 14:59	MDE	

Method: EPA 353.2

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Nitrate + Nitrite as N	<0.2	mg/L	0.2	1	08/31/2023 11:31	08/31/2023 11:31	EJV	

Method: EPA 365.1

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Phosphorus as P	<0.1	mg/L	0.1	1	08/31/2023 16·42	09/01/2023 08:43	EJV	

Method: EPA 6010D

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Boron, Dissolved	<0.1	mg/L	0.1	1	08/30/2023 08:11	09/05/2023 16:11	SLZ	
Calcium	<1	mg/L	1	1	08/29/2023 17:00	08/30/2023 11:55	MDE	
Iron, Dissolved	<0.1	mg/L	0.1	1	08/30/2023 08:11	09/06/2023 10:04	MDE	
Magnesium	<1	mg/L	1	1	08/29/2023 17:00	08/30/2023 11:55	MDE	
Manganese, Dissolved	<0.05	mg/L	0.05	1	08/30/2023 08:11	09/06/2023 10:04	MDE	
Potassium	<1	mg/L	1	1	08/29/2023 17:00	08/30/2023 11:55	MDE	
Sodium	<1	mg/L	1	1	08/29/2023 17:00	08/30/2023 11:55	MDE	

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

Lab ID:26051007Date Collected:08/29/2023Matrix:GroundwaterSample ID:Field Blank (FB)Date Received:08/29/2023 13:55Collector:MVTL Field Service

Temp @ Receipt (C): 3.4 Received on Ice: Yes

Method: EPA 6020B

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Arsenic, Dissolved	<0.002	mg/L	0.002	5	08/30/2023 08:11	09/12/2023 11:57	MDE	
Barium, Dissolved	<0.002	mg/L	0.002	5	08/30/2023 08:11	09/12/2023 11:57	MDE	
Cadmium, Dissolved	<0.0005	mg/L	0.0005	5	08/30/2023 08:11	09/12/2023 11:57	MDE	
Chromium, Dissolved	<0.002	mg/L	0.002	5	08/30/2023 08:11	09/12/2023 11:57	MDE	
Lead, Dissolved	<0.0005	mg/L	0.0005	5	08/30/2023 08:11	09/12/2023 11:57	MDE	
Molybdenum, Dissolved	<0.002	mg/L	0.002	5	08/30/2023 08:11	09/12/2023 11:57	MDE	
Selenium, Dissolved	<0.005	mg/L	0.005	5	08/30/2023 08:11	09/12/2023 11:57	MDE	
Silver, Dissolved	<0.0005	mg/L	0.0005	5	08/30/2023 08:11	09/12/2023 11:57	MDE	
Method: SM1030F								
_								

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
TDS - Summation	<12.5	mg/L	12.5	1	09/13/2023 12:38	09/13/2023 12:38	CALC	

Method: SM2320 B-2011

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Alkalinity, Phenolphthalein	<20.5	mg/L as CaCO3	20.5	1	08/30/2023 15:03	08/30/2023 15:03	AMC	
Alkalinity, Total	<20.5	mg/L as CaCO3	20.5	1	08/30/2023 15:03	08/30/2023 15:03	AMC	
Bicarbonate	<20.5	mg/L as CaCO3	20.5	1	08/30/2023 15:03	08/30/2023 15:03	AMC	
Carbonate	<20.5	mg/L as CaCO3	20.5	1	08/30/2023 15:03	08/30/2023 15:03	AMC	
Hydroxide	<20.5	mg/L as CaCO3	20.5	1	08/30/2023 15:03	08/30/2023 15:03	AMC	

Method: SM2340B-2011

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Hardness - Total	<6.62	mg/L as CaCO3	6.62	1	09/13/2023 12:38	09/13/2023 12:38	CALC	

Method: SM2510 B-2011 EC

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Specific Conductance	2	umhos/cm	1	1	08/31/2023 13:55	08/31/2023 13:55	AMC	

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

Lab ID:26051007Date Collected:08/29/2023Matrix:GroundwaterSample ID:Field Blank (FB)Date Received:08/29/2023 13:55Collector:MVTL Field Service

Temp @ Receipt (C): 3.4 Received on Ice: Yes

Method: SM4500 H+ B-2011

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
рH	7.0	units	0.1	1	08/29/2023 19:30	08/29/2023 19:30	AMC	*

Method: SM4500-CI-E 2011

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Chloride	<2.0	mg/L	2.0	1	09/06/2023 11:22	09/06/2023 11:22	AMC	_

Method: SM4500-F-C-2011

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Fluoride	<0.1	mg/L	0.1	1	08/29/2023 19:30	08/29/2023 19:30	AMC	

Method: USDA 20b

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Sodium Adsorption Ratio	<0.17		0.17	1	09/13/2023 12:38	09/13/2023 12:38	CALC	

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C Results	Summary	ary							WO #: 26051			
Sulfate QC Type	Original Sample 10	Blank Result.	Spike Amount	Units: Spike % Recovery	mg/L	Spike Duplicate % Recovery	Lower Control Limit (%)	Lipper Control Limit (%)	APD (%)	APD Limit (16)		
FB			100	98.0			RS	115				
i di			100	96.1			85	115				
Đ.			100	98.5			85	115				
i i			100	97.3			85	115				
ia.			100	96.0			65	115				
ū			100	98.5			25	115				
0			100	99.6			85	115				
				26.00								
90		35										
d		ך										
a		6										
à		35										
a		15										
15		d										
B		3										
5/MSD	26345003		500	81.2		8).0	as	115	0.0	-20		
S/MSD	26231009		1000	82.2		8/.1	85	115	0.0	20		
is/Msb	26333002		100	91.6		91.9	85	115	0.0	50		
S/MSD	26428004		2000	84.2		83.3	85	115	0.5	70		
IS/MSD	26649004		1000	94.8		95.3	85	115	0.8	20		
IS/MSD	27121006		500	69.5		76.7	85	115	1.9	25		
litrate + Nitrit	o as N			Units:	mg/L							
C Type	Original Sample ID	Blank Result	Spike Amount	Spike %	HIR/L	Spike Duplicate	Lower Control	Lipper Control Limit (%)	HPD (%)	RPD Limit (%)		
-B			0.5	Recovery 104.0		% Recovery	Limit (%)	Limit (%) 110				
8			0.5	104.0			50	110				
			0.5	102.0			90					
ŧ			0.5	102.0			30	110				
di .			0.5	102.0			90	110				
4			0.5	102.0			90	110				
d			0.5	102.0			90	110				
15/MSD	25661002		5	100.0		1900	60	210	0,0	3(1		



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Nitrate + Nitrite					mg/L					
QC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery		Spike Duplicate & Recovery	Lower Control Limit (%)	Limit (%)	RPD (%)	RPD Limit (%)
VIS/MSD	25787007		H	04.0		95.0	90	110:	0.8	- 20
MS/MSD	25817001		t.	96.0		99.0	90	110	3.1	20
voir on	Energy Control			- 20.7		5.7	15	200		
AS/MSD	26231003		1	96.0		97.0	90	iio	10	20
AS/MSD	26231010		1	81.0		81.0	90	110	00	20
AS/MSD	26231011		10	97.0		96.0	90	220	0.4	20
Phosphorus as P				Units:	mg/L					
QC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery		Spike Duplicate % Recovery	Lower Control Limit (N)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
FII			0.5	94.0			90	110		
n			0.5	94.0			90	110		
78			0.5	94.D			90	110		
As		<0.1								
All		id A								
AB		<0.1								
MS/MSD	2565500 t		11	91.0		1,02.0	90	3.20	3.8	50
AS/MSD	25791001			1110		112.0	90	230	0.9	20
AS/AASID	26220001			(05.0		114.0	99	310	2.1	20
AS/MSD	26306003		111	104.0		109.0	90.	130	45	30
MS/MSD	26317001		· F	100.0		105.h	90	110	0.1	10
Chloride				Units:	mg/L					
QC Type	Original Sample (D	Blank Result	Spike Amount	Spike %	mg/ L	Spike Duplicate	Lower Control	Upper Control	RPD (%)	RPD Limit (%)
Fil			30	Recovery 98.9	_	% Recovery	Limit (%) 90	Limit (%)	-	7.4
Fil			30	93.1			50	110		
řů.			80	96.6			90	iin		
FØ			30	98.1			.50	110		
Fü			90	96.7			90	iin		
			30	26.1			-	1.10		
FO			30	97.8			-90	110		
Fi.			ào	97.3			-90	220		
to.			30	96.5			90	110		
150				3.3						
							60	110		
			90	98.4						
en en		<7.0	90	98.4						





				Units: r	ng/L				
ос туре	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery	Spike Duplicate & Recovery	Lower Control Lond (%)	Lipper Control Limit (%)	RPD (%)	RPD Limit (%)
MB.		<2.0							
AB		<2.0							
Ally		<2.0							
48		<2.0							
is.		2.0							
48		<2,0							
10		×2.0							
MI/MSD	26231096		30	94.9	94.7	100	120	64	20
DIZMYZD	26333002		àΰ	34.7	98.5	40.	120	0.9	.20
IS/MSD	26533001		30000	122.0	125.2	.00	120	0.5	.20
I5/MSD	76560001		30	MG.E	12.0	80	120	0.5	20
toron, Dissolved	d			Units: r	mg/L				
СТуре	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery	Spire Duplicate % Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
H-DE			0.4	89.4		85	115		
la		<0.1							
Boron, Dissalve				Units: r	ng/L				
IC Type									
	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery	Spike Dupkcate % Recovery	Lower Control Limit (%)	Upper Control Limit (N.)	RPD (%)	RPD Limit (%)
DS/PDSD	Original Sample ID 26051001	Blank Result	Spike Amount	Spike % Recovery	Spike Duplicate % Recovery		Upper Control Limit (N)	RPD (%)	RFD Limit (W)
		Blank Result	Spike Amount	Spike % Recovery	Spike Dupkcate % Recovery 105.0		Upper Control Limit (N)		
PK/SPKD	26051001	Blänk Result		Recovery	% Recovery	Limit (N)	Limit (%)	0.3	.20
PX/SPXD	26051001	Blank Result Blank Result		106.0 Units: r	% Recovery 105.0 105.0 Spike DupState	Limit (%)	Limit (N)	0.3	.20
Calcium	-26051001 26051004		0.4	:106,0	% Recovery	Limit (%)	125	0.3	20
Calcium CType DS/PDSD	26051004 26051004 Original Sample ID		0.4 Spike Amnunt	106.0 Units: r	% Rivcovery 105.0 105.0 Spike Duplicate % Recovery	Lower Control Limit (%)	Limit (N)	0.3 0.6 RPD (%)	20 20 8PD Limit (%)
PK/SPKD Calcium CC Type DS/POSD	-26051001 26051004 Original Sample ID: 25544001		Spike Amount	Units: r Spike 16 Recovery	105.0 105.0 Spile DupKate Is Recovery	Lower Control Limit (%) 75	Limit (%) 125 Lipper Control Limit (%) 125	0.3 0.6 APD (%)	20 20 8PD Limit (%)
Calcium CCType DS/POSD DS/POSD DS/POSD	26051001 26051004 Driginal Sample ID 25544001		Spike Amount	Units: r Spike fi Recovery	% Recovery 105.0 105.0 Spike DupRiote % Recovery 104.0	Lower Control Limit (N) Lower Control Limit (N) 75	Limit (N) 125 Upper Control Limit (N) 125 125	0.3 0.6 RPD (%) 0.8	20 20 8PD Limit (M) 20 20 20
PR/SPKD Calcium CC Type DS/PDSD DS/PDSD DS/PDSD	26051004 - Original Sample ID - 25544001 - 25638001		500 100 100	Units: r Spike M. Recovery 104.0	N Recovery 105.0 105.0 105.0 105.0 106.0 106.0 106.0	Limit (N) 25 Lower Control Limit (N) 75	Limit (N) 125 Upper Control Limit (N) 125 125	0.3 0.6 890 (%) 0.8 0.4	20 20 8PD Limit (%) 20 20 20 20
PV/SPKD Calcium AC Type DS/PDSD DS/PDSD DS/PDSD DS/PDSD DS/PDSD DS/PDSD	26051004 Driginal Sample III 25544001 25544001 25591002		5pile Amount 500 100 100 500	Recovery 106.0 Units: Spike Recovery 104.0 105.0	N Recovery 105.0 Ing/L Spile DupRiore N Recovery 104.0 104.0 55.9 163.0	Limit (N) 25 Lower Control Limit (N) 75 75 75	Limit (N) 125 Lipper Control Limit (N) 125 125 125 125 125	0.3 0.8 0.8 0.8 0.4 0.2 0.5	20 20 app Unit (%)
PV/SPKD Calcium C Type DS/POSD DS/POSD DS/POSD DS/POSD DS/POSD DS/POSD	26051004 - Original Sample ID - 25544001 - 25544001 - 25791002 - 25791002 - 25891002		500 100 1000 1000 1000 1000 1000 1000 1	Recovery 100.0 Units: r Spie 6 Recovery 104.0 105.0 104.9 97.1 103.0	105.0 105.0	Limit (N)	Limit (N) 125 125 125 125 125 125 125	0.3 0.6 RPO(%) 0.8 0.4 0.2 0.6 0.5	20 20 20 20 20 20 20 20 20 20 20 20 20 2
PV/SPKD Calcium C Type DS/POSD DS/POSD DS/POSD DS/POSD DS/POSD DS/POSD	26051004 Driginal Sample III 25544001 25544001 25591002		5pile Amount 500 100 100 500	Recovery 106.0 Units: Spike Recovery 104.0 105.0	N Recovery 105.0 Ing/L Spile DupRiore N Recovery 104.0 104.0 55.9 163.0	Limit (N) 25 Lower Control Limit (N) 75 75 75	Limit (N) 125 Lipper Control Limit (N) 125 125 125 125 125	0.3 0.8 0.8 0.8 0.4 0.2 0.5	20 20 20 apo Unit (%)
PACSPAD Calcium DECTYPE DESPOSO TOTAL DESSOLVED	26051001 26051004 Original Sample ID 25544001 25544001 25544001 25791802 25791802 25881002 26051007	Donis Result	Spike Amaunt 500 100 100 100 100 100 100 100 100 100	### Recovery 106.0 Units: 1 Spike 16 Recovery 104.0 105.0 105.0 105.0 105.0 105.0 Units: 1	105.0 105.0 Spile DupRiote In Recovery 104.0 104.0 104.0 104.0 105.0 105.0	Limit (N) Limit (N) Limit (N) Limit (N) 75 75 75 76 76	Limit (N) 125 Upper Control Limit (N) 125 125 125 125 125 125 125	0.3 0.6 8PO(N) 0.8 0.4 0.2 0.5 0.5	20 20 20 20 20 20 20 20 20 20 20 20 20 2
PP/SPKD Calcium EC Type DS/PDSD	26051004 - Original Sample ID - 25544001 - 25544001 - 25791002 - 25791002 - 25891002	Dianis Result Blank Result	500 100 1000 1000 1000 1000 1000 1000 1	Recovery 106.0 Units: r Spice K Recovery 104.0 105.0 106.0 97.1 101.6 97.1	105.0 105.0 Spike DupRiote In Recovery 104.0 104.0 104.0 104.0 105.0	Limit (N)	Limit (N) 125 125 125 125 125 125 125	0.3 0.6 RPO(%) 0.8 0.4 0.2 0.6 0.5	20 20 20 20 20 20 20 20 20 20 20 20 20 2
DS/PDSD Calcium Calcium CC Type DS/PDSD DS/PDSD	26051001 26051004 Original Sample ID 25544001 25544001 25544001 25791802 25791802 25881002 26051007	Donis Result	Spike Amaunt 500 100 100 100 100 100 100 100 100 100	### Recovery 106.0 Units: Spike K Recovery 104.0 105.0 105.0	N Riscovery 105.0 Ing/L Spike DupRiore N Recovery 104.0 104.0 95.9 108.0 92.0 105.0	Lower Control Limit (%) Lower Control Limit (%) 75 75 75 75 6	Limit (N) 125 Upper Control Limit (N) 125 125 125 125 125 125 Upper Control	0.3 0.6 8PO(N) 0.8 0.4 0.2 0.5 0.5	20 20 20 20 20 20 20 20 20 20 20 20 20 2





ron, Dissolved	Oderal Control	Market 1	Park I service		mg/L	rain -	Language Control	(Barrier and Co.)	man mu	har the second
QC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery		Spike Duplicate % Recovery	Limit (%)	Lipper Control Limit (%)	RPD (%)	RPD Limit (%)
PK/SPKD	26231011		3	96.6		96.2	75	125	2.4	20
PK/SPKD	26428006		0.4	79.7		79.5	75	125	0.3	20
PK/SPKD	26428009		0.4	75.1		62.7	75	125	àù	20
Magnesium				Units:	mg/L					
СТуре	Original Sample ID	Blank Result	Spike Amount	Spike W Recovery		Spike Duplicate % Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
DS/PDSD	25544001		500	202.0		102.0	75	125	0.5	Sto
D5/PD50	25544001		100	103.0		101.0	75	125	14	3/0
DS/PDSD	25638001		100	100.0		100.0	75.	125	0.1	2D -
D5/PDSD	25791007		1000	99.7		15.6	75	125	0.0	20
D5/PD50	25791007		500	H1.7		m 5	75	125	0.9	20
05/P050	25881007		100	264		93.6	75	125	0.1	20
DS/PDS0	26051007		100	1010		101.0	75	125	13	20
Manganese, Dis	solved			Units:	mg/L					
IC Type	Original Sample III	Blank Result	Spike Amount	Spike %	- B/ L	Spike Duplicate	Lower Control	Upper Control	RPO (%)	RPD Limit (16)
8	The second of the	<0.05	Sections)	Recovery		76 Recovery	Limit (%)	Limit (%)	regami	2.5404100
N/SPND	26052005		111	190.0		93.4	75	125	2.4	20
PK/SPKD	26231011		11	92.7		90.A	75	125	2.5	20
PK/SPKD	26428006		(c)	/9.1		75.1	75	125	0.1	20
PK/SPKD	26428009		0,4	82.8		88,0	75	125	1.6	26
otassium				Units:	mg/L					
КС Туре	Original Sample ID	Blank Result	Spike Amount	Spike W		Spike Duplicate	Lower Control	Upper Control	RPD (%)	RPD Limit (%)
DS/PDSD	25544001		100	Recovery 105.0		№ Recovery 101.0	Limit (%) 75	Limit (%) 125	0.2	.20
D5/PD50	25544001		500	101.0		104.0	75	125	1.0	20
DS/PDSD	25638001		100	1010		103 0	75	125	0.4	50
05/P0S0	25791102		1000	102.0		102.0	75	125	0.6	20
OS/POSO	25791002		500	101.0		100.0	75	125	0.7	20
05/P050	25881002		100	95.1		751 O	75	125	0.6	201
05/POSO	26053007		100	102.0		201.0	75	125	1.6	20
				Units:	mg/L					
odium						25.60	Lower Control		RPD (%)	THE R. P. LEWIS CO., LANSING
	Original Sample ID	Blank Result	Spike Amount	Spike M. Recovery		Spike Duplicate % Recovery	Limit 2005	Lipper Control Limit (%)	esp (e)	RPD Limit (%)
odium IC Type DS/PDSD	Original Sample ID 25544061	Blank Result	Spike Amount	Spike % Recovery 92.2		% Recovery 69.1	Limit (%) 75	Limit (%)	0,0	20



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Sodium				Units:	mg/L					
QC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery		Spike Duplicate 8 Recovery	Lower Control	Lipper Control Limit (%)	RPD (%)	RPD Limit (%)
D5/PDSD	25638001		500	95.6		95.0	75	125	0.3	20
DS/PDSD	25791002		1000	94.1		95.9	75	125	10	20
05/P050	25791002		500	70.0		65.6	75	125	1.0	-20
05/PDS0	25881002		100	KZ.0		83.9	75	125	0.6	20
DS/PDSD	26051007		100	104.0		102.0	75	125	ia	20
rsenic, Diss	olved			Units:	mg/L					
C Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery		Spike Duplicate % Recovery	Lower Control	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
K.	25790001		0.1	97.8			75	125		
PK/SPKD	26051007		0.1	95.2		96.0	75	125	1.7	20
arium, Disso	plyed			Units:	mg/L					
С Туре	Öriginal Sample ID	Blank Result	Spice Amount	Spile % Recovery		Spike Duplicate % Recovery	Lower Control Limit (%)	Upper Control Dimit (%)	RPD (%)	RPD Limit (%)
100	25790001		0.1	74.9			75	125		
K/SPKD	26051007		0.1	95.5		95.3	75	125	0.2	20
admium, Di	ssolved			Units:	mg/L					
СТуре	Original Sample ID	Blank Nesult	Spike Amount	Spike % Recovery		Spike Duplicate	Lower Control	Upper Control Limit (%)	RPD (%)	APD Limit (%)
4	25790001		0.1	94.7			75	125		
×.	26051007		0.1	96.1			75	125		
K/SPKD	26051007		0.1	96.1		95.8	75	125	0.3	20
hromium, D	Dissolved			Units:	mg/L	-				
СТуре	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery		Spike Duplicate % Recovery	Lower Control Limit (%)	Lipper Control Limit (%)	RPD (%)	RPD Limit (%)
PK.	25790001		0.1	96.1			75	125		
W/SPKD	26051007		0.1	95.8		97.4	75	125	1.7	20
ead, Dissolv	ed			Units:	mg/L					
Стуре	Original Sample ID	Blank Result	Spike Amnunt	Spike to Recovery		Spire Duplicate % Recovery	Limit (%)	Upper Control Limit (%)	RPO (%)	RPD (mir (M)
PK.	25790001		0.1	87 a			75	125		
K/SPWD	26063007		0.1	97.4		97.9	75	125	0.5	50
Nolybdenum	a, Dissolved			Units:	mg/L					
C. Type	Original Sample ID	Blank Result	Spike Amount	Spike is Recovery		Spike Duplicate % Recovery	Lawer Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
K.	25790061		0.1	98.7			75	125		
K/SPKD	26051007		0.1	96.9		97.6	75	125	ři.	20
elenium, Di	ssolved			Units:	mg/L					
СТуре	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery		Spike Duplicate Si Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
K	26051007		01	101.0			75	125		
PK/SPKO	26051007		0.1	91.9		191.0	75	125	01	- 20



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Silver, Dissolved QC Type	Original Sample ID	Blank Result	Spike Amount	Units:	mg/L	Spike Duplicate	Lower Control	Upper Control	RPD (%)	RPD Limit (%)
		James recaust		Recovery		% Recovery	Limit (%)	Limit (%)	Service.	nen mur (m)
De.	25790001		0.1	93.7			75	125		
PK/SPKD	20051007		0.1	94.7		94.9	75	125	0.2	20
Calcium				Units:	mg/L					
дс туре	Original Sample III	Blank Result	Spike Amount	Spike % Recovery		Spike Duplicate % Recovery	Lower Control Limit (%)	Upper Control Limit (%)	REO (%)	RPD Limit (III)
TD-A/II			100	209.0			95	335		
dis		(30)								
nor .	25909001								Or .	20
OUP.	26051002								32	40
ron, Dissolved		_		Units:	mg/L					
ос туре	Original Sample ID	Blank Result	Spike Amount	Spike %		Spire Duplicate	Lower Control	Upper Control	RPD (%)	RPD Limit (15)
FB-DE			0.4	Recovery 106.0		% Recovery	Limit (%)	Limit (%)		
ASI		<0.1								
AS/MSD	25817001								1,6	50
Magnesium				Units:	mg/L					
ОС Туре	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery		Spike Duplicate	Lower Control Limit (%)	Upper Control Limit (%)	(RPD (%)	RPD Limit (%)
H-MI			100	106.0			8.5	115		
AD.		31								
SUF	25/900001								1.0	20
DUF	26051002								Zú	.20
Manganese, Diss	olved			Units:	mg/L					
ОС Туре	Original Sample ID	Blank Result.	Spike Amount	Spike % Recovery		Spike Duplicate S Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
FB-CIE			0.4	109.0			85	115		
Att		<0.05								
AS/MSD	25817001								2.5	30
Potassium				Units:	mg/L					
QC Type	Original Sample III	Blank Result	Spike Amount	Spike % Recovery		Spike Duplicate % Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RED (%)	RPD LEWIS (NO)
FB-MI			100	105.0			85.	115		
MB		<1								
SUP	25909001								14	20
NF	26051002								7.8	20
Sodium				Units:	mg/L					





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				Units:	mg/L					
QC Type	Original Sample 10	Blank Result	Spike Amount	Spike M Recovery		Spike Duplicate & Recovery	Lower Control Limit (%)	Lipper Control Limit (%)	RPD (%)	RPD Limit (%)
AB.		<1								
NIP	25909001								2.6	20
UP.	26051002								0.5	20
Arsenic, Diss	olved			Units:	mg/L					
дс Туре	Original Sample ID	Blank Result	Spike Amount	Spike W Recovery		Spike Duplicate % Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
F9-M5			0.2	96.9			30	120		
FB-MS			0.1	0000			80	330		
10		+0.002								
AO.		-0.002								
ASS/MIND	25817001		0.4	107.0		ED4.01	-G	175	3.0	30
IS/MSD	26051001		0.4	104.0		101.α	75	125	14	20
Barlum, Diss	Olved Original Sample ID	Blank Result	Spike Amount	Units:	mg/L	Snare Duntanto	(Date Control	Librate Control	RPG (%)	RPE Limit (%)
E IVDE	Original Sample ID	weare training	0.1	Recovery 99.4		% Recovery	Lower Control Limit (%)	Upper Control Limit (%)	Wate)	Part ring 1401
sh ws			01	- 10.0			90	120		
			9.5					120		
AB.		s0.007								
AEI.		<0.002								
ns/Msio	25817001		0.0	1010		97.6	a	125	3.4	:20
	25817001 26051001		0.4	101.0		97.0	n 8	125	3.6	2D 20
ns/mso Cadmium, D	26051001				mg/L					
	26051001	Blank Result		96.8	mg/L	93.8 Spike Dupitorre	15 Lower Control	125		
as/MSD Cadmium, O	20051001 issolved	Blank Result.	0.4	96.8 Units: Spike M	mg/L	93.8	8	125	3.1	20
AS/MSO Cadmium, Q CCType	20051001 issolved	Blank Result	0.4 Spike Amount	96.8 Units: Spike M. Recovery	mg/L	93 B Spike Dupitore	Lower Control Limit (K)	125 Upper Control Limit (%)	3.1	20
as/msb Cadmium, D C Type Fil-MS	20051001 issolved		0.4 Spike Amount	96.8 Units: Spike M. Recovery	mg/L	93 B Spike Dupitore	Lower Control Limit (K)	125 Upper Control Limit (%)	3.1	20
as/MSD Cadmium, O	26051001 issolved Original Sample 10 25817001		Spike Amount	96.8 Units: Spike W. Recovery 101.0	mg/L	Spire Duplicate % Recovery	Lower Control Unit (%)	Upper Control Limit (%)	\$1' RPD (%)	20 RPD Limit (%)
Cadmium, D. CType FELANS IS /MSD Chromium, L. CType	26051001 issolved Original Sample 10 25817001		Spike Amount 0.1 0.4 Spike Amount	96.8 Units: Spike M. Recovery 101.0 Units: Spike M. Recovery 105.0		Spire Duplicate # Recovery	Lower Control Limit (%) 80 Lower Control Limit (%)	Upper Control Limit (%) 126 Upper Control Limit (%)	\$1' RPD (%)	20 RPD Limit (%)
Cadmium, D. CType FELANS IS /MSD Chromium, L. CType	26051001 issolved Original Sample 10 . 25817001	<0.0005	Spike Amount 0-1 0-1	96.8 Units: Spike W. Recovery 101.0 105.9 Units: Soite is:		Spile Duplicate Spile Duplicate Spile Duplicate	Lower Control Limit (%) 80 75	Upper Control Unit (N) 126	RPO (N)	20 8PD Limit (%)
AS/MSD Cadmium, D CType Fil-MS Hs AS/MSD Chromium, L	26051001 issolved Original Sample 10 . 25817001	<0.0005	Spike Amount 0.1 0.4 Spike Amount	96.8 Units: Spike M. Recovery 101.0 Units: Spike M. Recovery 105.0		Spile Duplicate Spile Duplicate Spile Duplicate	Lower Control Limit (%) 80 Lower Control Limit (%)	Upper Control Limit (%) 126 Upper Control Limit (%)	RPO (N)	20 8PD Limit (%)
Cadmium, D CCType FB-MS 48 Chromium, I CCType FB-MS	26051001 issolved Original Sample 10 . 25817001	<0.0005	Spike Amount 0.1 0.4 Spike Amount 0.1	Units: Spike M. Recovery 108.0 Units: Spike M. Recovery 108.0		Spile Duplicate Spile Duplicate Spile Duplicate	Lower Control Limit (%) 80 75 Lower Control Limit (%) 80	Upper Control Limit (%) 126 Upper Control Limit (%)	RPO (N)	20 8PD Limit (%)
Cadmium, O Cadmium, O CType Fil-MS Its/MSD Chromium, E CType Fil-MS	26051001 issolved Original Sample 10 . 25817001	<0.0005	Spike Amount 0.1 0.4 Spike Amount 0.1	Units: Spike M. Recovery 108.0 Units: Spike M. Recovery 108.0		Spile Duplicate Spile Duplicate Spile Duplicate	Lower Control Limit (%) 80 75 Lower Control Limit (%) 80	Upper Control Limit (%) 126 Upper Control Limit (%)	RPO (N)	20 8PD Limit (%)
cadmium, O C Type C Type C Type Is/MSD Chromium, I C Type	26051001 issolved Original Sample 10 . 25817001	<0.0005 Blank Result	Spike Amount 0.1 0.4 Spike Amount 0.1	Units: Spike M. Recovery 108.0 Units: Spike M. Recovery 108.0		Spile Duplicate Spile Duplicate Spile Duplicate	Lower Control Limit (%) 80 75 Lower Control Limit (%) 80	Upper Control Limit (%) 126 Upper Control Limit (%)	RPO (N)	20 8PD Limit (%)





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Lead, Dissolv					ng/L				
QC Type	Original Sample ID	Blank Result	Spike Amount	Spike M Recovery	Spike Duplicate 8 Recovery	Limit (%)	Limit (%)	RPD (%)	RPD Limit (%)
F8I-MS			0.1	100.0		80	120		
FB-MS			0.1	914		80	120		
dis		<0.0005							
		*420005							
AR		<0.0005							
AS/MSD	25817001		0.4	46.9	92 3	75.	125	31	20
AS/MSD	26051001		0,8	87.0	83.1	75	125	3,4	20
шуний	4000000		.500	10.00	2014	18			30
Molybdenum	, Dissolved	55.5.5		Units: n	ng/L				20.1.1
QC Type	Original Sample (D	Blank Result	Spike Amount	Spike % Recovery	Spike Duplicate % Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
FB-M5			0.1	104.0		190	120		
FH-MS.			0.1	106.0		80	120		
Ass		<0.002							
7									
Air		20.002							
AS/MSD	2581700i		0.4	109.0	504-0	75	125	è2.	-20
AS/MSD	26051901		0.4	111.0	0.802		125	16	20
MS/MSU	50021801		0.4	111.0	500.0	75	125	4.6	20
Selenium, Dis	ssolved			Units: n	ng/L				
DC Type	Original Sample ID	Blank Result	Spike Amount	Spike %. Recovery	Spike Duplicate 16. Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
FB-M5			0.1	100.6		30	120		
FB-MS			0.1	99.9		80	120		
46		<0.005							
MB		<0.005							
AS/AASIX	25817001		-0.4	106.0	97.2	76	125	9.1	20
			7						
AS/MSD	26051001		0.4	101.0	94.2	75	125	1.0	ab.
Silver, Dissolv	ved			Units: n	ng/L				
QC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery	Spike Duplicate % Recovery	Lower Control	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
FB-MS			0.1	110.0		80	120		
FB-MS			0,3	106.0		30	120		
#B		<0.0005							
		<0.0005							
MB.									
	25817001		0.4	45.8	43.6	76	125	5.0	25
MB MS/MSD	25817001		0.4	45.8	A3.6	76	125	5.0	20





Account #: 2800

Mercury, Disso				Units:	mg/L					
QC Type	Original Sample ID	Blank Result	Spike Amount	Spike W Recovery		Spike Duplicate % Recovery	Lower Control Limit (16)	Lipper Control Limit (%)	RPD (%)	RPD Limit (96)
FEI			0.002	98.5			85	115		
nb		₹0.0002								
AS/MSD	26051007								0.0	20
Alkalinity, Tota		Blank Result	Color tonor	Units:	mg/L	Compa Developer	Lower Control	Upper Control	INDE (PE)	RPD Limit (%)
Type RM	Original Sample ID	Brank Hesult	Spike Amount	Spike W Recovery 91.2		Spike Duplicate % Recovery	Limit (%)	Limit (%)	RPD (%)	KPD LIMIT (VS)
			300	25.4				-40		
RM			501	92.3			30	12(1		
70			410	91.8			90	110		
rit.			410	95.8			90	110		
			320	444				5.600		
ra-			410	95.6			90	110		
řii.			410	95.7			90	ìtα		
FB			410	96.2			50	110		
10			A10	95.0			40	110		
18		520,5								
ia		<20.5								
把		<20.5								
10		<20.5								
NO.		₹20.5								
10		<140								
ASJMISUS.	26051004		410	93.8		81.6	90	320	5.6	20
IS/MSD:	26145001		410	97.1		96.0	950	120	0.0	20
NS/MSD	2623100s		410	82.5		80.7	180	120	1.0	20
rayw(SU)	4043 UA/3		410	82.3		DKL.F	- SAJ	120	1.0	24
pecific Condu				Units:	umhos					
C Type	Original Sample ID	Blank Result	Spike Amount	Spike M Recovery		Spive Dupvionte Secovery	Lower Control Limit (K)	Lypper Control Limit (%)	RPD (%)	RPD Limit (%)
RM-C			1409	100.1			95	195		
RM-C			1409	100.5			95	105		
RM-C			1409	1008-4			-95	105		
RM-L			1409	99.9			-95	105		
iH .				Units:	units					
IC Type	Original Sample ID	Blank Result	Spike Amount	Spike %		Spike Duplicate	Lower Control	Upper Control Limit (%)	RPD [%]	RPD Limit (%)





Specific Cond	uctance			Units: un	nhos/cm				
QC Type	Original Sample ID	Blank Result	Spike Amount	Spike M Recovery	Spike Duplicate ** Recovery	Lower Control Limit (%)	Lipper Control Limit (%)	RPD (%)	RPD Limit (96)
DUP	26051006							0.1	20
DUP	20051007							10.6	20
рН				Units: un	its				
ос туре	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery	Spike Ouplicate	Lower Control Limit (%)	Upper Control	RED (%)	RPD Liber (16)
CRIM-PH			5	99.2		98.33	101.67		
RM-PH			5	99.2		48.81	101.67		
Fluoride				Units: mg	y/L				
QC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery	Spike Duplicate % Recovery	Lower Control Limit (%)	Upper Control Umit (%)	KPD (%)	RPD Limit (%)
CRM-F			3.39	97.3		613	111		
182			0.5	105.0		90	310		
FBI			0.5	1060		-50	110		
MBE		<0.1							
All-F		×0.4							
MS/MSD-I	26051005		84	90.0	920	0.0	in	10	W





Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

MI	Minneso 2616 E. Br Bismarck, (701) 258-5	ries	5			WO	: 260	— Dakot 51		s	Chain of Custody Record				
Report To:	MDU			CC:				_				Project Na	me:		MDU Heskett
Attn: Address:	Todd Peterson 400 N. 4th St Bismarck, ND 58501									Event:			Fall 2023		
Phone: Email:	701-425-2427 Todd.Peterson@mdu.co	om									- 4	Sampled E		eren	the
	Sam	Sample (Containers			Field Readings					
Lab Number	Sample ID	Date	Time	Sample Type	1 Liter Raw	뒽	500 mL HNO3 (filtered)	250 mL H2504			Temp (*C)	Spec. Cond.	Н	Turbidity (NTU)	Analysis Required
001	MW13	28 Ay 23	1051	GW	X	X	X	x			13,99	11,664	7.03	4.41	
002	MW1-90	29 Ay 23	1237	GW	X	Х	X	x			16.25	11,627	6.86	4.31	
003	MW2-90	29 Ay 23	1024	GW	X	X	X	X			13.57	7,999	7.04	3.41	
004	MW3-90	29A423	0844	GW	X	X	X	X			11.22	5046	6.98	3.43	MDU Heskett List AA + C
005	MW80R	28 Aug 23	1305	GW	X	X	X	X			12.81	7078	7.01	2.41	INDO HESKELL LIST AN + C
006	Dup 1	28 Aug 23	-	GW	X	X	X	х			_	-	-	-	
007	Field Blank (FB)	29 Aug 23	-	GW	X	Х	х	х		\perp	NA	NA	NA	NA	
Comments:				1		_	Ш		Ш						

Sample Condition

Temp (°C)

Location
Log In
Walk In #2

Date/Time

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.

Report Date: Wednesday, September 13, 2023 12:50:25

Relinquished By



1126 North Front St. ~ New Ulm, MN 56073 ~ 800-782-3557 ~ Fax 507-359-2890
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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck



ne: (701) 258-9720

Field Datasheet

Groundwater Assessment

 Company:
 MDU Heskett

 Event:
 Fall 2023

 Sample ID:
 13

 Sampling Personal:
 3

Sunny / Partly Cloudy / Cloudy

Purge:

Recover: 28

Black Box

Sec.

Weather Conditions: Wind: Temp: WELL INFORMATION Well Locked? NO Well Labeled? NO NO Casing Strait? Not Visible Grout Seal Intact? Repairs Necessary? Casing Diameter: Water Level Before Purge: 28.3 Total Depth of Well: ft liters Well Volume: Depth to Top of Pump: ft 28.66 ft Electric Water Level Indicator Water Level After Sample: Measurement Method:

Purging Method: Bladder Sampling Method: Bladder Purging Method: Bladder Purging Method: Bladder Purging Method: Bladder Purging Method: Revenue Purgi

N @ 5-10

Duplicate Sample? (ES NO Duplicate Sample ID: Dup

Bottle List:

1 Liter Raw 1 Gal Nitric

500mL Nitric

500mL Nitric (filtered)

250mL Sulfuric

FIELD READINGS

Stabilization rara	meters	remp.	spec.	pH	1 00	ORP	Turblaity	Water Level	Fumping	l IIIC	Appearance or Comment
(3 Consecutiv	ve)	(°C)	Cond.	pn	(mg/L)	(mV)	(NTU)	water Level	Rate	Removed	Clarity, Color, Odor, Ect.
Purge Date	Time	±0.5° ±5% ±0.			±10%	±10		(ft)	mL/Min		clear, slightly turbid, turbid
28 Aug 23	0936	Start of Well	Purge								
16 Auges	1006			7.03	7.05	192.9	78,23	28,56	100.0	3000.0	Clean
	1016	13.89 11.819		7.02	6.93	194.8	103,30	28.61	100.0	1000.0	Clay
	1026	13,92 11,744		7.03	7.10	193.6	37.61	28.62	100.0	1000.0	Clex
	1036 14:05		11,688	7.04	7.20	192.3	11.24	78,64	100.0	(000.0	Clear
	1031	14.08	11.691	7.03	6.96	186.0	4.66	28.64	1000	SW-D	Clear
	1046	13.93	11,667	7.03	6.90	182.3	4.54	28.65	100.0	580:0	cliver
	1051	13,99	11.664	7.03	6.89	181,8	4.47	28.65	100.0	500.0	Cles
		1									
	Well Stabilized? YES NO							Total Vo	lume Purged:	7500.0	mL.

Sample Date	Time	Temp.	Spec.	pH		Turbidity			Appearance or Comment		
Sample Date	Time	(°C)	Cond.	рп		(NTU)			Clarity, Color, Odor, Ect.		
28 Au 23	1051	13.99	11,664	7.03		4.47			Cler		
-											

Comments:

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.

Report Date: Wednesday, September 13, 2023 12:50:25





Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

MVT			Fiel	d Da	atash	ieet		Company: Event:		MDU Hesk Fall	2023		
	4		G	roundwate	er Assessme	ent		Sample ID:			1-90,		
2616 E. Broadway Ave,	Bismarck, ND							Sampling P	ersonal:		Soch-		
Phone: (701) 25	8-9720												
Veather Condition		Temp:	70	°F	Wind:	Vind: \wp @ $\varsigma \neg \wp$ Precip:					Sunny / Partly Cloudy / Cloudy		
	WELL INFO	ORMATIO	N			SAMPLING INFORMATION							
ell Locked?	YES	ØØ	-		7	Purging Me	thod:	Bladder		Control Settings:			
/ell Labeled?	4ES	NO				Sampling M	ethod:	Bladder			Purge: 2 Se		
asing Strait?	AES.	NO				Dedicated E	quipment?	(YES)	NO		Recover: 58 Se		
rout Seal Intact?	YES)	NO	Not \	/isible							PSI: / 5		
epairs Necessary?					4	Duplicate Sa		YES	(NG)		BB		
	Casing Diameter: 2" Water Level Before Purge: 11, 19 ft				4	Duplicate Sa	ample ID:		·	J			
			1	ft	4		0-11	I- 11-1-		1			
	Total Depth of Well: ft Well Volume: liters				-	1 Liber Daw	Botti	le List:	1				
Depth to Top of Pump: ft				-	1 Liter Raw 1 Gal Nitric 500mL Nitric								
Water Level After Sample: (1,49 ft				-	500mL Nitric								
Measurement Method: Electric Water Leve			-	Soonie Miche				ı					
Measuren	nent Method:	Electric \	Water Level	Indicator	1	250mL Sulfur	ric			l			
Measuren	nent Method:	Electric	Water Level	Indicator		250mL Sulfur							
						LD READIN	IGS		Pumping	mL.	Appearance or Comment		
Measuren Stabilization Par (3 Consecut	ameters	Temp.	Spec.	Indicator	DO	LD READIN	IGS Turbidity	Water Level	Pumping Rate	mL Removed	Appearance or Comment Clarity, Color, Odor, Ect.		
Stabilization Par	ameters		Spec.			LD READIN	IGS	Water Level	Pumping Rate mL/Min		Appearance or Comment Clarity, Color, Odor, Ect. clear, slightly turbid, turbid		
Stabilization Par (3 Consecut Purge Date	ameters	Temp.	Spec. Cond. ±5%	pН	DO (mg/L) ±10%	D READIN ORP (mV)	IGS Turbidity (NTU)	(ft)	Rate		Clarity, Color, Odor, Ect. clear, slightly turbid, turbid		
Stabilization Par (3 Consecut	ameters tive)	Temp. (°C) ±0.5° Start of Wel	Spec. Cond. ±5% Purge	pН	DO (mg/L) ±10%	ORP (mV) ±10	Turbidity (NTU)	(ft)	Rate mL/Min	Removed	Clarity, Color, Odor, Ect. clear, slightly turbid, turbid		
Stabilization Par (3 Consecut Purge Date	Time 1157-1207-1217-	Temp. (°C) ±0.5° Start of Wel	Spec. Cond. ±5% Purge 1(,360	pH ±0.1	DO (mg/L) ±10%	ORP (mV) ±10	IGS Turbidity (NTU)	(ft)	Rate mL/Min	/000, 0	Clarity, Color, Odor, Ect. clear, slightly turbid, turbid		
Stabilization Par (3 Consecut Purge Date	Time 1157 1207 1217 1227	Temp. (°C) ±0.5° Start of Wel 15, 73 16,05	Spec. Cond. ±5% Purge 11, 360 11, 380 11, 398	pH ±0.1	DO (mg/L) ±10% /.49 /.59	ORP (mV) ±10	IGS Turbidity (NTU) 16-61 9.77 2.37	(ft) 11.34 11.40 11.42	Rate mL/Min	/000, 0	Clarity, Color, Odor, Ect. clear, slightly turbid, turbid Clear Clear Clear		
Stabilization Par (3 Consecut Purge Date	Time 1157 1207 1217 1227 1232	Temp. (°C) ±0.5° Start of Wel (5. ? 3) 16,05 16,60 16,32	Spec. Cond. ±5% Purge 360 380 1,395 	pH ±0.1	DO (mg/L) ±10% /.49 /.56 /.56	ORP (mV)	IGS Turbidity (NTU) (NTU) (NTU) (NTU)	(ft) 11,34 11,40 11,42 11,43	Rate mL/Min	1000,0 1000,0 1000,0 500,0	Clarity, Color, Odor, Ect. clear, slightly turbid, turbid Clear Clear Clear Clear		
Stabilization Par (3 Consecut Purge Date	Time 1157 1207 1217 1227	Temp. (°C) ±0.5° Start of Wel 15, 73 16,05	Spec. Cond. ±5% Purge 11, 360 11, 380 11, 398	pH ±0.1	DO (mg/L) ±10% /.49 /.59	ORP (mV) ±10	IGS Turbidity (NTU) 16-61 9.77 2.37	(ft) 11.34 11.40 11.42	Rate mL/Min	/000, 0	Clarity, Color, Odor, Ect. clear, slightly turbid, turbid Clear Clear Clear		
Stabilization Par (3 Consecut Purge Date	Time 1157 1207 1217 1227 1232	Temp. (°C) ±0.5° Start of Wel (5. ? 3) 16,05 16,60 16,32	Spec. Cond. ±5% Purge 360 380 1,395 	pH ±0.1	DO (mg/L) ±10% /.49 /.56 /.56	ORP (mV)	IGS Turbidity (NTU) (NTU) (NTU) (NTU)	(ft) 11,34 11,40 11,42 11,43	Rate mL/Min	1000,0 1000,0 1000,0 500,0	Clarity, Color, Odor, Ect. clear, slightly turbid, turbid Clear Clear Clear Clear		
Stabilization Par (3 Consecut Purge Date	Time 1157 1207 1217 1227 1232	Temp. (°C) ±0.5° Start of Wel (5. ? 3) 16,05 16,60 16,32	Spec. Cond. ±5% Purge 360 380 1,395 	pH ±0.1	DO (mg/L) ±10% /.49 /.56 /.56	ORP (mV)	IGS Turbidity (NTU) (NTU) (NTU) (NTU)	(ft) 11,34 11,40 11,42 11,43	Rate mL/Min	1000,0 1000,0 1000,0 500,0	Clarity, Color, Odor, Ect. clear, slightly turbid, turbid Clear Clear Clear Clear		
Stabilization Par (3 Consecut Purge Date	Time 1157 1207 1217 1227 1232	Temp. (°C) ±0.5° Start of Wel (5. ? 3) 16,05 16,60 16,32	Spec. Cond. ±5% Purge 360 380 1,395 	pH ±0.1	DO (mg/L) ±10% /.49 /.56 /.56	ORP (mV)	IGS Turbidity (NTU) (NTU) (NTU) (NTU)	(ft) 11,34 11,40 11,42 11,43	Rate mL/Min	1000,0 1000,0 1000,0 500,0	Clarity, Color, Odor, Ect. clear, slightly turbid, turbid Clear Clear Clear Clear		
Stabilization Par (3 Consecut Purge Date	Time 1157 1207 1217 1227 1232	Temp. (°C) ±0.5° Start of Wel (5. ? 3) 16,05 16,60 16,32	Spec. Cond. ±5% Purge 360 380 1,395 	pH ±0.1	DO (mg/L) ±10% /.49 /.56 /.56	ORP (mV)	IGS Turbidity (NTU) (NTU) (NTU) (NTU)	(ft) 11,34 11,40 11,42 11,43	Rate mL/Min	1000,0 1000,0 1000,0 500,0	Clarity, Color, Odor, Ect. clear, slightly turbid, turbid Clear Clear Clear Clear		
Stabilization Par (3 Consecut Purge Date	Time	Temp. (°C) ±0.5° Start of Wel (5. ? 3) 16,05 16,60 16,32	Spec. Cond. ±5% Purge 360 380 1,395 	pH ±0.1	DO (mg/L) ±10% /.49 /.56 /.56	ORP (mV)	IGS Turbidity (NTU) (NTU) (NTU) (NTU)	(ft) 11.34 11.40 11.42 11.43 11.44	Rate mL/Min	(0°0,0 0 1000.0 1000.0 500.0 500.0	Clarity, Color, Odor, Ect. clear, slightly turbid, turbid Clear Clear Clear Clear		
Stabilization Par (3 Consecut Purge Date 29 Ay 23	meters (ive) Time 11.57- 12.07- 12.17- 12.27- 12.37- Well St	Temp. (°C) ±0.5° Start of Wel (5.7 3) 16.05 16.60 16.32 16.125	Spec. Cond. ±5% Purge 11,360 11,380 11,395 11,426 11,673	pH ±0.1	DO (mg/L) ±10% /.49 /.56 /.56	ORP (mV)	IGS Turbidity (NTU) (NTU) (NTU) (NTU)	(ft) 11.34 11.40 11.42 11.43 11.44	Rate mL/Min 100.0	(0°0,0 0 1000.0 1000.0 500.0 500.0	Clarity, Color, Odor, Ect. clear, slightly turbid, turbid Clear Clear Clear Clear Clear Clear		
Stabilization Par (3 Consecut Purge Date	Time	Temp. (*C) ±0.5* Start of Wel (5, ? } b_0	Spec. Cond. ±5% Purge 11/360 11/396 11/396 11/426 11/677	pH ±0.1 5.68 5.68 6.66 6.66 6.66	DO (mg/L) ±10% /.49 /.56 /.56	ORP (mV)	IGS Turbidity (NTU)	(ft) 11.34 11.40 11.42 11.43 11.44	Rate mL/Min 100.0	(0°0,0 0 1000.0 1000.0 500.0 500.0	Clarity, Color, Odor, Ect. clear, Slightly turbid, turbid Clear		

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Report Date: Wednesday, September 13, 2023 12:50:25

PI





Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

	Field D				stack			Company:			MDU Heskett		
MVTL			LIGI	u Da	icasi	ieet		Event:		Fall	2023		
	4		G	roundwate	er Assessme	ent		Sample ID:			2-90		
2616 E. Broadway Ave, Bis	marck. ND							Sampling P	ersonal:		5.4.		
Phone: (701) 258-9	,												
Veather Conditions:		Temp:	65	°F	Wind:	N	@ 5-10	2	Precip:	Sunny / Pa	rtly Cloudy / Cloudy		
		· · · · · · · · · · · · · · · · · · ·					- 3						
		ORMATIO	N		7	Duralia - NA	Ale a ale	Bladder	FORMATION Control Settings:				
Vell Locked? Vell Labeled?	YES YES	NO			-	Purging Me Sampling M		Bladder		-	Purge: 2 Sec		
asing Strait?	YES	NO			-		quipment?		NO	1	Recover: SB Sec		
rout Seal Intact?	YES	NO	Not \	/isible	-	Dedicated	.quipment:	(15)	110	1	PSI: 20		
epairs Necessary?	163	- 110		10.014	1	Duplicate S	ample?	YES	(No	1			
	g Diameter:	2	2"		1	Duplicate S				1	BB		
	Water Level Before Purge: 201992 ft				1					-			
	Total Depth of Well: — ft				1		Bott	le List:					
W				liters		1 Liter Raw		1 Gal Nitric		1			
	Depth to Top of Pump: ft					500mL Nitrio							
Water Level After Sample: 21,34 ft					500mL Nitrio				1				
Measureme	nt Method:	Electric	Water Level	Indicator		250mL Sulfu	ric			J			
					FIE	LD READIN	IGS						
Stabilization Param		Temp.	Spec.	рН	DO	ORP	Turbidity	Water Level	Pumping	mL	Appearance or Comment		
(3 Consecutive		(°C)	Cond.		(mg/L)	(mV)	(NTU)		Rate	Removed	Clarity, Color, Odor, Ect.		
Purge Date	Time	±0.5°	±5%	±0.1	±10%	±10		(ft)	mL/Min		clear, slightly turbid, turbid		
28 Ay 23	0959	Start of Wel		15-0		T		1		1 1:22 -			
to my	1009	13,32	8053	7.04	5.69	508.3	6.56	21.25	1000	1000.0	Clear		
	1044	13.72	7903	7.05	5,70	207.5	0.15	2/130	100.0	500.0	Cler		
	1019	13.91	7949	7.04	5,44	213.1	0.28	21.33	100.0	500.0	Clear		
	1024	13,57	7779	7.04	5,12	209.60	3.41	21.35	100,0	300,0	Clin		
				-	+			-		+			
					_	_							
					1	1							
			1			-							
	Well St	abilized?	VES	NO		-		Total Vo	lume Purged	2500.0	mL		
Comple Data	Time	Temp.	Spec.	pH	Τ	T	Turbidity	T		T	Appearance or Comment		
Sample Date	Time	(°C)	Cond.	pn			(NTU)				Clarity, Color, Odor, Ect.		
				7.04							Cles		

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Client: Montana-Dakota Utilities - Bismarck Account #: 2800



Field Datasheet

Groundwater Assessment

Wind:

MDU Heskett Company: Event: Fall 2023 Sample ID: Sampling Personal:

Sunny / Partly Cloudy / Cloudy

Purge:

PSI: /D

Recover: 58

Black Box

Weather Conditions: Temp: WELL INFORMATION Well Locked? Well Labeled? NO NO Casing Strait? Not Visible Grout Seal Intact? Repairs Necessary? Casing Diameter: Water Level Before Purge: 16,39 Total Depth of Well: ft liters Well Volume: Depth to Top of Pump: ft ft Water Level After Sample: **Electric Water Level Indicator** Measurement Method:

SAMPLING INFORMATION Purging Method: Bladder Sampling Method: Bladder (ES) Dedicated Equipment?

N@5-10

(NO **Duplicate Sample?** YES Duplicate Sample ID:

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

FIELD READINGS

Stabilization Par	ameters	Temp.	Spec.	pH	1 00	OKP	Turbidity	Water Level	Pumping	l mr	Appearance or Comment	
(3 Consecut	tive)	(°C)	Cond.	pn	(mg/L)	(mV)	(NTU)	water Level	Rate	Removed	Clarity, Color, Odor, Ect.	
Purge Date	Time	±0.5°	±5%	±0.1	±10%	±10		(ft)	mL/Min		clear, slightly turbid, turbid	
29 Am 23	0814	Start of Wel	tart of Well Purge									
29 Ay 23	0624	11.13	5127	7.01	4.10	161.5	3.72	18.48	1000	1000-0	Clear	
	0629	11,33	5076	7.00	4.07	139.7	8.99	18.49	100.00	500.0	Clear	
	0834	11.34 5031		6,99	4.30	139.2	0.50	18.50	100.0	50.0	Clear	
	0839	11.17	5047	699	4.10	138.7	0.16	18.50	100.0	50.0	Clear	
	0844	11.22	5046	6.98	4.08	131.4	3.43	18:51	1000	500.0	Clear	
4												
	Well St	abilized?	(VES)	NO				Total Vo	lume Purged:	3000.0	mL.	

Sample Date	Time	Temp. (°C)	Spec. Cond.	pН	Turbidity (NTU)	Appearance or Comment Clarity, Color, Odor, Ect.
29 Ay23	0844	11.22	5046	6.98	3,43	Clear
Comments:	Collect	d Field	Blank	@ 063		

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.

Report Date: Wednesday, September 13, 2023 12:50:25



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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

MVT			Fiel	d Da	atask	neet		Company:		MDU Hesk			
VIVI								Event:		Fall	2023		
			G	roundwate	er Assessmo	ent		Sample ID:			BOR		
2616 E. Broadway Ave,	Bismarck, ND							Sampling P	ersonal:		200		
Phone: (701) 25	3-9720												
Weather Condition	s:	Temp:		°F	Wind:		@		Precip:	Sunny / Partly Cloudy / Cloudy			
	WELL INF	ORMATIO	N					SAN	IPLING IN	FORMATIO	RMATION		
Well Locked?	YES	ND				Purging Method: Bladder					Control Settings:		
Well Labeled?	XES	NO]	Sampling N		Bladder			Purge: 2 Sec.		
Casing Strait?	YES	NO				Dedicated I	Equipment?	VES	NO		Recover: 28 Sec.		
Grout Seal Intact?	YES	NO	Not \	/isible							PSI: 20		
Repairs Necessary?			-11		4	Duplicate S		YES	NB		Dlack Box		
	Casing Diameter: 2" Water Level Before Purge: 14,04 ft				4	Duplicate S	ample ID:			I			
	Water Level Before Purge: 14,09 ft Total Depth of Well: ft									1			
	Well Volume: Tt				4	4.11.	Bott	le List:	1				
	Depth to Top of Pump: — ft				-	1 Liter Raw 500mL Nitrio		1 Gal Nitric		i			
Water Level After Sample: 14,50 ft				-	500mL Nitrio								
Measurement Method: Electric Water Level Indicator			-	250mL Sulfu									
Wicosuren	iciic ivictiioo.									,			
Stabilization Par	ameters	Temp.	Spec.		DO	LD READIN	Turbidity		Pumping	mL	Appearance or Comment		
(3 Consecut		(°C)	Cond.	pН	(mg/L)	(mV)	(NTU)	Water Level	Rate	Removed	Clarity, Color, Odor, Ect.		
Purge Date	Time	±0.5°	±5%	±0.1	±10%	±10	()	(ft)	mL/Min		clear, slightly turbid, turbid		
20 1 22	1230	Start of Wel	ll Purge										
28 Ay 23	1240	12.60	6982	7.02	0.08	152.3	11.61	14.42	1000	100.0	Clear		
	1250	12.95	703Z	7.01	DISPO	123.5	0,50	14.47	1000	1000.0	der		
	1522	12.80	7064	7.01	0,27	126.1	0,62	14.48	100.0	50.0	Clear		
	(300	12.67	7065	7.01	0.20	125.5	25,	14.47	100.0	50.0	der		
	1305	12.81	7078	7.01	0.10	125.3	2,41	14.48	100.0	500.0	Clear		
	Well St	abilized?	(YES)	NO				Total Vo	lume Purged:	3500,0	mL		
6		abilized?	(YES) Spec.	T			Turbidity	Total Vo	lume Purged:	3500,0	mL Appearance or Comment		
Sample Date	Well St			NO pH			Turbidity (NTU)	Total Vo	lume Purged:	3500,0	-		

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Report Date: Wednesday, September 13, 2023 12:50:25





Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

MVTL
2616 E. Broadway Ave, Bismarck, ND

Field Datasheet

Surface water Assessment

Company: MDU Heskett
Event: Fall 2023

Sampling Personal:

ather Condition	s: Temp:		°F	Wind:	@	Precip:	Sunny / Partly Cloudy / Cloudy
Well ID	Date	Time	Casing Diameter	Water Level (ft)		Con	nments
MW70		1207	2"	19,30			
MW33	78 Ay 23	1345	2"	40.49			
MW101		1200	2"	35.78			
MW102		1205	2"	13.18			
MW103		1220	2"	29.89			
MW44R		1215	2"	24.18			
MW104		1350	2"	14.12			
MW105	7	1225	2"	12.20			
						×	

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Report Date: Wednesday, September 13, 2023 12:50:25

PN



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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Workorder: MDU Heskett (26054) PO: 196081 OP

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

Certificate of Analysis

Approval

All data reported has been reviewed and approved by:



Claudette Carroll, Lab Manager Bismarck, ND

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

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

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

Subcontracted Analyses

Analyzed By	Company	Address	Phone	Certification
SUBv	Energy Labs Casper	2393 Salt Creek Highway, Casper. WY 82601	307-235-0515	CERT

Workorder Comments

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

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Report Date: Monday, October 16, 2023 3:34:49 PM





Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Workorder Summary

Sample Comments

26054006 (Dup 1) - Sample

Time sampled was not supplied by the client.

26054007 (Field Blank (FB)) - Sample

Time sampled was not supplied by the client.



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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

Lab ID:26054001Date Collected:08/28/2023 10:51Matrix:GroundwaterSample ID:MW13Date Received:08/29/2023 13:55Collector:MVTL Field Service

10 111 111 7								
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Method: Contracted Result								
Radium 226	See Attached			1	10/04/2023 17:53	10/04/2023 17:53	SUBv	
Radium 228	See Attached			1	10/04/2023 17:53	10/04/2023 17:53	SUBv	



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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

 Lab ID:
 26054002
 Date Collected:
 08/29/2023 12:37
 Matrix:
 Groundwater

 Sample ID:
 MW1-90
 Date Received:
 08/29/2023 13:55
 Collector:
 MVTL Field Service

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Method: Contracted Result								
Radium 226	See Attached			1	10/04/2023 17:53	10/04/2023 17:53	SUBv	
Radium 228	See Attached			1	10/04/2023 17:53	10/04/2023 17:53	SUBv	





Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

 Lab ID:
 26054003
 Date Collected:
 08/29/2023 10:24
 Matrix:
 Groundwater

 Sample ID:
 MW2-90
 Date Received:
 08/29/2023 13:55
 Collector:
 MVTL Field Service

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Method: Contracted Result								
Radium 226	See Attached			1	10/04/2023 17:53	10/04/2023 17:53	SUBv	
Radium 228	See Attached			1	10/04/2023 17:53	10/04/2023 17:53	SUBv	



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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

 Lab ID:
 26054004
 Date Collected:
 08/29/2023 08:44
 Matrix:
 Groundwater

 Sample ID:
 MW3-90
 Date Received:
 08/29/2023 13:55
 Collector:
 MVTL Field Service

10 111 111 7								
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Method: Contracted Result								
Radium 226	See Attached			1	10/04/2023 17:53	10/04/2023 17:53	SUBv	
Radium 228	See Attached			1	10/04/2023 17:53	10/04/2023 17:53	SUBv	





Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

Lab ID:26054005Date Collected:08/28/2023 13:05Matrix:GroundwaterSample ID:MW80RDate Received:08/29/2023 13:55Collector:MVTL Field Service

10 111 111 7								
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Method: Contracted Result								
Radium 226	See Attached			1	10/04/2023 17:53	10/04/2023 17:53	SUBv	
Radium 228	See Attached			1	10/04/2023 17:53	10/04/2023 17:53	SUBv	



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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

 Lab ID:
 26054006
 Date Collected:
 08/28/2023
 Matrix:
 Groundwater

 Sample ID:
 Dup 1
 Date Received:
 08/29/2023 13:55
 Collector:
 MVTL Field Service

remp @ receipt (0).	•							
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Method: Contracted Result								
Radium 226	See Attached			1	10/04/2023 17:53	10/04/2023 17:53	SUBv	
Radium 228	See Attached			1	10/04/2023 17:53	10/04/2023 17:53	SUBv	





Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

Lab ID:26054007Date Collected:08/29/2023Matrix:GroundwaterSample ID:Field Blank (FB)Date Received:08/29/2023 13:55Collector:MVTL Field Service

10 111 111 7								
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Qual
Method: Contracted Result								
Radium 226	See Attached			1	10/04/2023 17:53	10/04/2023 17:53	SUBv	
Radium 228	See Attached			1	10/04/2023 17:53	10/04/2023 17:53	SUBv	





Date/Time

Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

MI	Minneso 2616 E. Br Bismarck, (701) 258-9	borato		WO:	2605	- Dakot 4	Chain of Custod Record					
Report To:	MDU Todd Peterson			CC:						Project Name:		MDU Heskett
Address:	400 N. 4th St Bismarck, ND 58501								Event:		Fall 2023	
Phone: Email:	701-425-2427 Todd.Peterson@mdu.co	om								Sampled By:	veny	Play
	Sam	ple Information				Sample (Containe	rs		Field Readings		
Lab Number	Sample ID	Date	Time	Sample Type	1 Gal Nitric							Analysis Required
001	MW13	28 Aug 23	1051	GW	x							7
002	MW1-90	29 Aug 23	1237	GW	x		\Box					
003	MW2-90	29 Aug 23	1024	GW	x		\Box		1			
004	MW3-90	29 Aug 23	0844	GW	x			\top				
005	MW80R	28 Aug 23	1305	GW	x							Rad 226 & 228
006	Dup 1	28 Aug 23	-	GW	x							
007	Field Blank (FB)	29 Aug 23	-	GW	х		\Box		1			
Comments:							Щ					

TM562 / HVI805

Date/Time

Location

Valk In #2





Account #: 2800 Client: Montana-Dakota Utilities - Bismarck



Field Datasheet

Groundwater Assessment

Company: MDU Heskett

Event: Fall 2023

Sample ID: 13

Sampling Personal:

Weather Conditions		Temp:	75	°F	Wind:	ν	@ 5-10		Precip:	Sunny / Pé	rtly Cloudy / Cloudy
	WELL INFO	DRMATIO	V					SAM	PLING IN	FORMATION	ON
Well Locked?	YES	NO			1	Purging Me	thod:	Bladder			Control Settings:
Well Labeled?	YES .	NO]	Sampling M	ethod:	Bladder			Purge: Z
Casing Strait?	YES	NO			1	Dedicated E	quipment?	(YES)	NO		Recover: 28
Grout Seal Intact?	YES)	NO	Not V	isible/]						PSI: 120
Repairs Necessary?]	Duplicate S	ample?	VE8	NO		Black Box
	g Diameter:					Duplicate S	ample ID:	Dup		1	
Water Level Be		28		ft							
	pth of Well:	_		ft			Bottl	e List:]	
	ell Volume:			liters		1 Liter Raw		1 Gal Nitric		1	
	op of Pump:			ft	1	500mL Nitrio					
Water Level A				ft	1	500mL Nitrio					
Measureme	nt Method:	Electric \	Nater Level	Indicator	_	250mL Sulfu	ric				
					FIE	LD READIN	IGS				
Stabilization Parar	neters	Temp.	Spec.	pH	DO	ORP	Turbidity		Pumping	mL	Appearance or Commen
(3 Consecutiv	e)	(°C)	Cond.	рн	(mg/L)	(mV)	(NTU)	Water Level	Rate	Removed	Clarity, Color, Odor, Ect.
Purge Date	Time	±0.5°	±5%	±0.1	±10%	±10		(ft)	mL/Min		clear, slightly turbid, turbi
28 Ay 23		Start of Well									
-0 H-20)	1006	14.13	11,716	7.03	7.05	192.9	78,23	28,56	100.0	30000	Cles
	1016	13.89	11,819	7.02	6.93	194.8	103,30	28.61	100.0	1000.0	Clear
	1026	13,92	11,746	7.03	7.10	193.6	37.61	28.62	100.0	1000.0	Clex
	1036	14:05	11,688	7.04	7,20	192.3	11.24	28,64	100.0	(0.000)	Clear
	1031	14108	11,691	7.03	6.96	186.0	4.66	28.64	1000	500.0	Clear
	1046	13.93	11,667	7.03	6,90	182.3	4.54	78.65	100.0	2800	clier
	1051	13,99	11,664	7.03	6.89	181,8	4.47	28.65	100.0	2000	Cles
			<u> </u>								
	Wall St.	bilized?	WEGO.							77	
	weirst	ounzeu:	YES	NO				Total Vol	ume Purged	7500.0	_mL
Sample Date	Time	Temp.	Spec.	pH			Turbidity				Appearance or Commen
		(°C)	Cond.				(NTU)				Clarity, Color, Odor, Ect.
26 Aug 23	1051	13.29	11,664	7.03	1	1	4.47				Clean
/10			1.100				1 1				- West

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Report Date: Monday, October 16, 2023 3:34:49 PM



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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

MVT			Fiel	d Da	atash	eet		Company: Event:		MDU Hesk	ett 2023
			G	roundwate	er Assessme	nt		Sample ID:		rali	1-90,
2616 E. Broadway Ave, B	Dismarck ND		0.	oundwat	ei Maacaaiile			Sampling P	orconali		[-19
								Sampling P	ersonai;		2766
Phone: (701) 258 Weather Conditions		Temp:	70	°E	Wind:	()	@ 5-10	5	Precip:	Cunny / Ba	irtly Cloudy / Cloudy
- Contaction				·	willu.		W 5-10				
Well Locked?	WELL INFO		N		7				PLING IN	FORMATIC	
Well Labeled?	YES	NO				Purging Me		Bladder			Control Settings:
Casing Strait?	MES	NO			-1	Sampling M Dedicated E		Bladder	NO		Purge: 2 Sec. Recover: 5g Sec.
Grout Seal Intact?	YES)	NO	Not \	/isible	-	Dedicated E	quipment?	TES	NO		Recover: Sec. Sec.
Repairs Necessary?		110			-	Duplicate Sa	ample?	YES	(NØ	1 '	
	ng Diameter:		2"		1	Duplicate Sa		123		1	BB
Water Level B		11,1		ft	-	Dupitote of	impic ib.			,	
Total D	epth of Well:		_	ft	7		Bott	e List:		1	
	Well Volume:			liters	1	1 Liter Raw		1 Gal Nitric		1	
Depth to 1	Top of Pump:			ft	7	500mL Nitric				1	
						Soonie Hitric					
Water Level A	After Sample:	(1,4	14	ft	1	500mL Nitric	(filtered)				
Water Level A		Electric		ft]		(filtered)				
Water Level A	After Sample:	Electric	선 Water Level	ft	FIE	500mL Nitric 250mL Sulfur	(filtered) ric				
Water Level A Measurem Stabilization Para	After Sample: eent Method: nmeters	Electric Temp.	Water Level	ft Indicator	FIE	500mL Nitric	(filtered) ric		Pumping	mL	Appearance or Comment
Water Level A Measurem	After Sample: eent Method: nmeters	Temp.	Water Level	ft	_	500mL Nitric 250mL Sulfur LD READIN	(filtered) ric	Water Level	Pumping Rate	mL Removed	Appearance or Comment Clarity, Color, Odor, Ect.
Water Level A Measurem Stabilization Para	After Sample: nent Method: nmeters ve)	Temp. (°C) ±0.5°	Spec. Cond. ±5%	ft Indicator	DO	500mL Nitric 250mL Sulfur LD READIN ORP	(filtered) ric IGS Turbidity	Water Level			Appearance or Comment Clarity, Color, Odor, Ect. clear, slightly turbid, turbid
Water Level A Measurem Stabilization Para (3 Consecuti	After Sample: nent Method: nmeters ve) Time	Temp. (°C) ±0.5° Start of Wel	Spec. Cond. ±5%	pH ±0.1	DO (mg/L) ±10%	500mL Nitric 250mL Sulfur LD READIN ORP (mV) ±10	(filtered) ric IGS Turbidity (NTU)	(ft)	Rate	Removed	Clarity, Color, Odor, Ect. clear, slightly turbid, turbid
Water Level A Measurem Stabilization Para (3 Consecuti	After Sample: nent Method: meters ve) Time 11.57 120.7	Temp. (°C) ±0.5° Start of Wel	Spec. Cond. ±5% Il Purge	pH ±0.1	DO (mg/L) ±10%	500mL Nitric 250mL Sulfur LD READIN ORP (mV) ±10	(filtered) ric IGS Turbidity (NTU)	(ft)	Rate mL/Min	Removed	Clarity, Color, Odor, Ect. clear, slightly turbid, turbid
Water Level A Measurem Stabilization Para (3 Consecuti	After Sample: Lent Method: Lent	Temp. (°C) ±0.5° Start of Wel	Spec. Cond. ±5% Il Purge (1,360) (3,80) (3,80)	pH ±0.1	DO (mg/L) ±10%	500mL Nitric 250mL Sulfur LD READIN ORP (mV) ±10	(filtered) ric IGS Turbidity (NTU)	(ft)	Rate mL/Min	/000, 0	Clarity, Color, Odor, Ect. clear, slightly turbid, turbid
Water Level A Measurem Stabilization Para (3 Consecuti	After Sample: Lent Method: Lent	Temp. (°C) ±0.5° Start of Wel 15.73 16.60	Spec. Cond. ±5% Purge	pH ±0.1	DO (mg/L) ±10% /.99 /.58	500mL Nitric 250mL Sulfur LD READIN ORP (mV) ±10 1/98. ** 1/96.0 1/90.2	(filtered) ric IGS Turbidity (NTU) 16.61 9.77 2.37	(ft) 11.34 11.40	Rate mL/Min	/000,0 /000.0	Clarity, Color, Odor, Ect. clear, slightly turbid, turbid Clear Clear
Water Level A Measurem Stabilization Para (3 Consecuti	After Sample: Lent Method: Ameters Lent Method: Time List- L	Temp. (°C) ±0.5° Start of Wel 15.73 16.60 16.32	Spec. Cond. ±5% Purge	pH ±0.1	DO (mg/L) ±10% /.49 /.58 /.58	500mL Nitric 250mL Sulfur LD READIN ORP (mV) ±10 1/96. 7 1/96.0 1/90.2 1/67.6	(filtered) ric IGS Turbidity (NTU) 16-61 9.77 2.37 4.56	(ft) 	Rate mL/Min		Clarity, Color, Odor, Ect. clear, slightly turbid, turbid Clear Clear Clear
Water Level A Measurem Stabilization Para (3 Consecuti	After Sample: Lent Method: Lent	Temp. (°C) ±0.5° Start of Wel 15.73 16.60	Spec. Cond. ±5% Purge	pH ±0.1	DO (mg/L) ±10% /.99 /.58	500mL Nitric 250mL Sulfur LD READIN ORP (mV) ±10 1/98. ** 1/96.0 1/90.2	(filtered) ric IGS Turbidity (NTU) 16.61 9.77 2.37	(ft) 11.34 11.40	Rate mL/Min	/000,0 /000.0	Clarity, Color, Odor, Ect. clear, slightly turbid, turbid Clear Clear
Water Level A Measurem Stabilization Para (3 Consecuti	After Sample: Lent Method: Ameters Lent Method: Time List- L	Temp. (°C) ±0.5° Start of Wel 15.73 16.60 16.32	Spec. Cond. ±5% Purge	pH ±0.1	DO (mg/L) ±10% /.49 /.58 /.58	500mL Nitric 250mL Sulfur LD READIN ORP (mV) ±10 1/96. 7 1/96.0 1/90.2 1/67.6	(filtered) ric IGS Turbidity (NTU) 16-61 9.77 2.37 4.56	(ft) 	Rate mL/Min		Clarity, Color, Odor, Ect. clear, slightly turbid, turbid Clear Clear Clear
Water Level A Measurem Stabilization Para (3 Consecuti	After Sample: Lent Method: Ameters Lent Method: Time LIST- L	Temp. (°C) ±0.5° Start of Wel 15.73 16.60 16.32	Spec. Cond. ±5% Purge	pH ±0.1	DO (mg/L) ±10% /.49 /.58 /.58	500mL Nitric 250mL Sulfur LD READIN ORP (mV) ±10 1/96. 7 1/96.0 1/90.2 1/67.6	(filtered) ric IGS Turbidity (NTU) 16-61 9.77 2.37 4.56	(ft) 	Rate mL/Min		Clarity, Color, Odor, Ect. clear, slightly turbid, turbid Clear Clear Clear
Water Level A Measurem Stabilization Para (3 Consecuti	After Sample: Lent Method: Ameters Lent Method: Time LIST- L	Temp. (°C) ±0.5° Start of Wel 15.73 16.60 16.32	Spec. Cond. ±5% Purge	pH ±0.1	DO (mg/L) ±10% /.49 /.58 /.58	500mL Nitric 250mL Sulfur LD READIN ORP (mV) ±10 1/96. 7 1/96.0 1/90.2 1/67.6	(filtered) ric IGS Turbidity (NTU) 16-61 9.77 2.37 4.56	(ft) 	Rate mL/Min		Clarity, Color, Odor, Ect. clear, slightly turbid, turbid Clear Clear Clear
Water Level A Measurem Stabilization Para (3 Consecuti	After Sample: Lent Method: Ameters Lent Method: Time LIST- L	Temp. (°C) ±0.5° Start of Wel 15.73 16.60 16.32	Spec. Cond. ±5% Purge	pH ±0.1	DO (mg/L) ±10% /.49 /.58 /.58	500mL Nitric 250mL Sulfur LD READIN ORP (mV) ±10 1/96. 7 1/96.0 1/90.2 1/67.6	(filtered) ric IGS Turbidity (NTU) 16-61 9.77 2.37 4.56	(ft) 	Rate mL/Min		Clarity, Color, Odor, Ect. clear, slightly turbid, turbid Clear Clear Clear
Water Level A Measurem Stabilization Para (3 Consecuti	After Sample: Lent Method: Lent Method: After Sample: After Sample: Lent Method: After Sample: After Sam	Temp. (°C) ±0.5° Start of Wel 15.73 16.60 16.32	Spec. Cond. ±5% Purge	pH ±0.1	DO (mg/L) ±10% /.49 /.58 /.58	500mL Nitric 250mL Sulfur LD READIN ORP (mV) ±10 1/96. 7 1/96.0 1/90.2 1/67.6	(filtered) ric IGS Turbidity (NTU) 16-61 9.77 2.37 4.56	(ft) 11.34 11.40 11.42 11.43 11.44	Rate mL/Min	(0°0), 0 1000, 0 1000, 0 500, 0 500, 0	Clarity, Color, Odor, Ect. clear, slightly turbid, turbid Clear Clear Clear
Water Level A Measurem Stabilization Para (3 Consecuti Purge Date 29 Ay 23	After Sample: lent Method: limeters ve) Time II 51- I2 0 7- I2 12- I2 32- I2 32- Well St.	Temp. (°C)	Spec. Spec. Cond. ±5% Purge	## Indicator ## ## ## ## ## ## ## ## ## ## ## ## ##	DO (mg/L) ±10% /.49 /.58 /.58	500mL Nitric 250mL Sulfur LD READIN ORP (mV) ±10 1/96. 7 1/96.0 1/90.2 1/67.6	(filtered) ric IGS Turbidity (NTU) 16-61 9.77 2.37 4.56	(ft) 11.34 11.40 11.42 11.43 11.44	Rate mL/Min //20.0 //20.0 //20.0 //20.0 //20.0	(0°0), 0 1000, 0 1000, 0 500, 0 500, 0	Clarity, Color, Odor, Ect. clear, slightly turbid, turbid Clear Clear Clear Clear Clear Clear Clear Clear
Water Level A Measurem Stabilization Para (3 Consecuti	After Sample: Lent Method: Lent Method: After Sample: After Sample: Lent Method: After Sample: After Sam	Temp. (°C) ±0.5° Start of Wel 15. 73 16.60 16.32 16.25	Spec. Cond. ±5% Purge	## Indicator ## #0.1	DO (mg/L) ±10% /.49 /.58 /.58	500mL Nitric 250mL Sulfur LD READIN ORP (mV) ±10 1/96. 7 1/96.0 1/90.2 1/67.6	(filtered) ric IGS Turbidity (NTU) (NTU) (16-6/ 9,7-7- 2,3-7- 4,5-6 4,3-1	(ft) 11.34 11.40 11.42 11.43 11.44	Rate mL/Min //20.0 //20.0 //20.0 //20.0 //20.0	(0°0), 0 1000, 0 1000, 0 500, 0 500, 0	Clarity, Color, Odor, Ect. clear, slightly turbid, turbid Clear Clear Clear Clear Clear Clear Clear

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.

Report Date: Monday, October 16, 2023 3:34:49 PM



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Client: Montana-Dakota Utilities - Bismarck Account #: 2800



Field Datasheet

MDU Heskett Company: Event: Fall 2023 2-90 Sample ID: Sampling Personal:

Weather Conditions: Wind: Temp: 75°F N@5-10 Precip: Sunny / Partly Cloudy / Cloudy WELL INFORMATION SAMPLING INFORMATION Well Locked? NO Purging Method: Bladder Control Settings: Purge: 2 Recover: 5 % Well Labeled? Casing Strait? YES Sampling Method: Bladde (YES NO Dedicated Equipment? (YES) NO Not Visible Grout Seal Intact? YES (NO) PSI: 20 Repairs Necessary? Duplicate Sample? NO BB Casing Diameter: Water Level Before Purge: Duplicate Sample ID: 70,98 Total Depth of Well fi Bottle List: liters Well Volume 1 Liter Raw 1 Gal Nitrio Depth to Top of Pump: 500mL Nitric Water Level After Sample 긴,3 년 ft Electric Water Level Indicator 500mL Nitric (filtered) Measurement Method 250mL Sulfuric FIELD READINGS Stabilization Parameters Temp. Spec. DO Turbidity Water Level Pumping nH

(3 Consecutive	ve)	(°C)	Cond.	рн	(mg/L)	(mV)	(NTU)	Water Level	Rate	Removed	Clarity, Color, Odor, Ect.
Purge Date	Time	±0.5°	±5%	±0.1	±10%	±10		(ft)	mL/Min		clear, slightly turbid, turbid
20123	0959	Start of Well	Purge								
28 Ay 23	1009	13,32	8053	7.04	5.69	208.3	6,56	21.25	100.0	1000.0	Clear
	1044	13,72	7903	7.05	5,70	207.5	0.15	2/130	100.0	500.0	Clear
	1019	13.91	7949	7.04	5,44	213.1	0.28	21.33	100.0	500.0	Clear
	1024	13,57	7999	7.04	5,12	209.6	3.41	21.35	100,0	500.0	Clar
		L						1			
	Well St	abilized?	MES	NO				Total Vo	ume Purged:	2500.0	mL

Sample Date	Time	(°C)	Cond.	pН	(NTU)	Clarity, Color, Odor, Ect.
28 Ay 23	1024	13,57	7999	7.04	3.41	Cles
Comments:						

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Report Date: Monday, October 16, 2023 3:34:49 PM



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Client: Account #: 2800 Montana-Dakota Utilities - Bismarck



MDU Heskett Field Datasheet Company: Event: Fall 2023 Groundwater Assessment Sample ID: 2616 E. Broadway Ave, Bismarck, ND Sampling Personal: Phone: (701) 258-9720 Weather Conditions: Wind: Temp: 60°F N@5-10 Precip: Sunny / Partly Cloudy / Cloudy WELL INFORMATION SAMPLING INFORMATION Well Locked? YES YES 940 Purging Method: Bladder Control Settings: Well Labeled NO Sampling Method: Bladder Purge: Casing Strait? Recover: 58 Dedicated Equipment? NO Sec. Not Visible Grout Seal Intact? YES NO PSI: 10 (NO) Black Box Repairs Necessary? Duplicate Sample? YES Casing Diameter: Duplicate Sample ID: Water Level Before Purge: 18,39 ft Total Depth of Well: ft Bottle List: Well Volume: liters 1 Liter Raw 1 Gal Nitric Depth to Top of Pump: ft 500mL Nitric Water Level After Sample ft 500mL Nitric (filtered) **Electric Water Level Indicator** Measurement Method: 250mL Sulfurio FIELD READINGS DO Spec. ORP Turbidity Pumping mL Appearance or Comment Water Leve (3 Consecutive) (°C) Cond (mg/L) ±10% (mV) (NTU) Rate Removed Clarity, Color, Odor, Ect. Purge Date Time +0.1 ±0.5 ±5% mL/Min clear, slightly turbid, turbid 0814 Start of Well Purge 29 Ay 23 11,13 18.48 512 4.10 7.01 1000 1600-0 8.99 0.50 0.16 3.43 5.00 6.99 6.99 0629 5076 139,7 18.49 11,33 4.07 Clear 100.0 50.0 0834 0839 0844 11.34 5031 4.30 18.50 18.50 100.0 138.7 100.0 500.0 11.22 5046 6.98 4.08 18:51 Cles 1000 Well St YES NO Total Volume Purged: 30000 Temp Spec. Turbidity **Sample Date** Appearance or Comment Time (°C) Cond (NTU) Clarity, Color, Odor, Ect 29 Aug 23 0844 11.22 5046 6.98 3,43 Clean Comments: Colle Blan 0820

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Monday, October 16, 2023 3:34:49 PM Report Date:



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Client: Account #: 2800 Montana-Dakota Utilities - Bismarck



MDU Heskett Field Datasheet Company: Event: Fall 2023 Groundwater Assessment Sample ID: 2616 E. Broadway Ave, Bismarck, ND Sampling Personal: Phone: (701) 258-9720 Weather Conditions: Wind: Temp: 60°F N@5-10 Precip: Sunny / Partly Cloudy / Cloudy WELL INFORMATION SAMPLING INFORMATION Well Locked? YES YES 940 Purging Method: Bladder Control Settings: Well Labeled NO Sampling Method: Bladder Purge: Casing Strait? Recover: 58 Dedicated Equipment? NO Sec. Not Visible Grout Seal Intact? YES NO PSI: 10 (NO) Black Box Repairs Necessary? Duplicate Sample? YES Casing Diameter: Duplicate Sample ID: Water Level Before Purge: 18,39 ft Total Depth of Well: ft Bottle List: Well Volume: liters 1 Liter Raw 1 Gal Nitric Depth to Top of Pump: ft 500mL Nitric Water Level After Sample ft 500mL Nitric (filtered) **Electric Water Level Indicator** Measurement Method: 250mL Sulfurio FIELD READINGS DO Spec. ORP Turbidity Pumping mL Appearance or Comment Water Leve (3 Consecutive) (°C) Cond (mg/L) ±10% (mV) (NTU) Rate Removed Clarity, Color, Odor, Ect. Purge Date Time +0.1 ±0.5 ±5% mL/Min clear, slightly turbid, turbid 0814 Start of Well Purge 29 Ay 23 11,13 18.48 512 4.10 7.01 1000 1600-0 8.99 0.50 0.16 3.43 5.00 6.99 6.99 0629 5076 139,7 18.49 11,33 4.07 Clear 100.0 50.0 0834 0839 0844 11.34 5031 4.30 18.50 18.50 100.0 138.7 100.0 500.0 11.22 5046 6.98 4.08 18:51 Cles 1000 Well St YES NO Total Volume Purged: 30000 Temp Spec. Turbidity **Sample Date** Appearance or Comment Time (°C) Cond (NTU) Clarity, Color, Odor, Ect 29 Aug 23 0844 11.22 5046 6.98 3,43 Clean Comments: Colle Blan 0820

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

MVTL	
16 E. Broadway Ave, Bismarc	k, NE

Field Datasheet

Surface water Assessment

Company: MDU Heskett
Event: Fall 2023

Sampling Personal:

eather Condition	s: Temp:		°F	Wind:	@	Precip:	Sunny / Partly Cloudy / Cloudy
Well ID	Date	Time	Casing Diameter	Water Level (ft)		Co	mments
MW70		1207	2"	19,30			4
MW33	78 Aug 23	1345	2"	40.49			
MW101		1200	2"	35.78		3	
MW102		1205	2"	13.18		*	
MW103		1220	2"	29.89			
MW44R		1215	2"	24.18			
MW104		1350	2"	14.12			
MW105		1225	2"	12.20			

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Report Date: Monday, October 16, 2023 3:34:49 PM



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Account #:

2800

Client: Montana-Dakota Utilities - Bismarck



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ANALYTICAL SUMMARY REPORT

September 28, 2023

Minnesota Valley Testing Laboratories 1126 N Front St

New Ulm, MN 56073-1176

Work Order: C23081299

Quote ID: C15480

Project Name: 26054

Energy Laboratories, Inc. Casper WY received the following 7 samples for Minnesota Valley Testing Laboratories on 8/31/2023 Lab ID Client Sample ID Collect Date Receive Date Matrix Test Radium 226, Total Radium 228, Total C23081299-001 26045001: MW13 08/28/23 10:51 08/31/23 Groundwater C23081299-002 26045002: MW 1-90 08/29/23 12:37 08/31/23 Groundwater Same As Above C23081299-003 26045003: MW2-90 08/29/23 10:24 08/31/23 Groundwater Same As Above C23081299-004 26045004; MW3-90 08/29/23 8:44 08/31/23 Groundwater Same As Above C23081299-005 26045005; MW80R 08/28/23 13:05 08/31/23 Groundwater Same As Above C23081299-006 26045006; Dup 1 08/28/23 8:44 08/31/23 Groundwater Same As Above C23081299-007 26045007; Field Blank 08/29/23 8:44 08/31/23 Groundwater Same As Above

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

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

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

Report Approved By:

Page 1 of 15



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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

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Gillette, WY 307.686,7175 + Helens. MT 406.442.0711

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

 Client:
 Minnesota Valley Testing Laboratories
 Report Date:
 09/28/23

 Project:
 26054
 Collection Date:
 08/28/23 10:51

 Lab ID:
 C23081299-001
 DateReceived:
 08/31/23

 Client Sample ID:
 26045001; MW13
 Matrix:
 Groundwater

Analyses	Result Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
	THE STATE OF THE S	4,20,110,0	114		memor	74.0.95.0 20.0.7.27
RADIONUCLIDES, TOTAL						
Radium 226	0.2 pCi/L				E903.0	09/18/23 12:25 / kdk
Radium 226 precision (±)	0.1 pCi/L				E903.0	09/18/23 12:25 / kdk
Radium 226 MDC	0.2 pCi/L				E903.0	09/18/23 12:25 / kdl
Radium 228	0.7 pCi/L	0			RA-05	09/12/23 13:28 / trs
Radium 228 precision (±)	0.5 pC//L				RA-05	09/12/23 13:28 / trs
Radium 228 MDC	0.8 pCi/L				RA-05	09/12/23 13:28 / trs

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

U - Not detected at Minimum Detectable Concentration

MCL - Maximum Contaminant Level

ND - Not detected at the Reporting Limit (RL)

Page 2 of 15



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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck



LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

 Client:
 Minnesota Valley Testing Laboratories
 Report Date: 09/28/23

 Project:
 26054
 Collection Date: 08/29/23 12:37

 Lab ID:
 C23081299-002
 DateReceived: 08/31/23

 Client Sample ID:
 26045002; MW1-90
 Matrix: Groundwater

Albania	4.35.35	2.00	de la	MCL	22.23	10.2.2.2.532
Analyses	Result Units	Qualifiers	RL	QCL	Method	Analysis Date / By
RADIONUCLIDES, TOTAL						
Radium 226	0.3 pCi/L				E903.0	09/18/23 12:25 / kdk
Radium 226 precision (±)	0.1 pCi/L				E903.0	09/18/23 12:25 / kdk
Radium 226 MDC	0.2 pCi/L				E903.0	09/18/23 12:25 / kdk
Radium 228	1.3 pCi/L				RA-05	09/12/23 13:28 / trs
Radium 228 precision (±)	0.5 pG//L				RA-05	09/12/23 13:28 / trs
Radium 228 MDC	0.7 pGi/L				RA-05	09/12/23 13:28 / trs

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

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

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

> LABORATORY ANALYTICAL REPORT Prepared by Casper, WY Branch

Client: Minnesota Valley Testing Laboratories

 Project:
 26054

 Lab ID:
 C23081299-003

 Client Sample ID:
 26045003; MW2-90

Report Date: 09/28/23 Collection Date: 08/29/23 10:24 DateReceived: 08/31/23 Matrix: Groundwater

				MCL		
Analyses	Result Units	Qualifiers	RL	QCL	Method	Analysis Date / By
RADIONUCLIDES, TOTAL						
Radium 226	0.05 pCi/L	0			E903.0	09/18/23 12:25 / kdk
Radium 226 precision (±)	0.1 pCi/L				E903.0	09/18/23 12:25 / kdk
Radium 226 MDC	0.2 pCi/L				E903.0	09/18/23 12:25 / kdk
Radium 228	0.8 pCi/L				RA-05	09/12/23 13:28 / trs
Radium 228 precision (±)	0.5 pC//L				RA-05	09/12/23 13:28 / trs
Radium 228 MDC	0.8 pCi/L				RA-05	09/12/23 13:28 / trs

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

U - Not detected at Minimum Detectable Concentration (MDC)

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

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck



LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

 Client:
 Minnesota Valley Testing Laboratories

 Project:
 26054

 Lab ID:
 C23081299-004

 Client Sample ID:
 26045004; MW3-90

Report Date: 09/28/23 Collection Date: 08/29/23 08:44 DateReceived: 08/31/23 Matrix: Groundwater

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
RADIONUCLIDES, TOTAL							
Radium 226	0.01	pCi/L	0			E903.0	09/18/23 12:25 / kdk
Radium 226 precision (±)	0.1	pCi/L				E903.0	09/18/23 12:25 / kdk
Radium 226 MDC	0.2	pCi/L				E903.0	09/18/23 12:25 / kdk
Radium 228	8.0	pCi/L	Ü			RA-05	09/12/23 13:28 / trs
Radium 228 precision (±)	0.5	pC//L				RA-05	09/12/23 13:28 / trs
Radium 228 MDC	0.8	pCi/L				RA-05	09/12/23 13:28 / trs

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

U - Not detected at Minimum Detectable Concentration (MDC)

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

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LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Minnesota Valley Testing Laboratories Report Date: 09/28/23 26054 Collection Date: 08/28/23 13:05 Project: C23081299-005 DateReceived: 08/31/23 Lab ID: Client Sample ID: 26045005; MW80R Matrix: Groundwater

				MCL		
Analyses	Result Units	Qualifiers	RL		Method	Analysis Date / By
RADIONUCLIDES, TOTAL						
Radium 226	0.06 pCi/L	0.0			E903.0	09/18/23 12:25 / kdk
Radium 226 precision (±)	0.1 pCi/L				E903.0	09/18/23 12:25 / kdk
Radium 226 MDC	0.2 pCi/L				E903.0	09/18/23 12:25 / kdk
Radium 228	0.8 pCi/L				RA-05	09/12/23 13:28 / trs
Radium 228 precision (±)	0.5 pCVL				RA-05	09/12/23 13:28 / trs
Radium 228 MDC	0.8 pCi/L				RA-05	09/12/23 13:28 / trs

Report Definitions

RL - Analyte Reporting Limit QCL - Quality Control Limit

U - Not detected at Minimum Detectable Concentration

MCL - Maximum Contaminant Level

ND - Not detected at the Reporting Limit (RL)

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LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Minnesota Valley Testing Laboratories Report Date: 09/28/23 26054 Collection Date: 08/28/23 08:44 Project: C23081299-006 DateReceived: 08/31/23 Lab ID: Client Sample ID: 26045006; Dup 1 Matrix: Groundwater

				MCL		
Analyses	Result Units	Qualifiers	RL	QCL N	Method	Analysis Date / By
RADIONUCLIDES, TOTAL						
Radium 226	0.2 pCi/L	0		E	E903.0	09/18/23 12:25 / kdk
Radium 226 precision (±)	0.1 pCi/L			E	E903.0	09/18/23 12:25 / kdk
Radium 226 MDC	0.2 pCi/L			E	E903.0	09/18/23 12:25 / kdk
Radium 228	1.3 pCi/L			F	RA-05	09/12/23 13:28 / trs
Radium 228 precision (±)	0.6 pC//L			F	RA-05	09/12/23 13:28 / trs
Radium 228 MDC	0.7 pGi/L			F	RA-05	09/12/23 13:28 / trs

Report Definitions

RL - Analyte Reporting Limit QCL - Quality Control Limit

U - Not detected at Minimum Detectable Concentration

MCL - Maximum Contaminant Level

ND - Not detected at the Reporting Limit (RL)

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LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Minnesota Valley Testing Laboratories Report Date: 09/28/23 26054 Collection Date: 08/29/23 08:44 Project: C23081299-007 DateReceived: 08/31/23 Lab ID: Client Sample ID: 26045007; Field Blank (FB) Matrix: Groundwater

				MCL		
Analyses	Result Units	Qualifiers	RL	QCL	Method	Analysis Date / By
RADIONUCLIDES, TOTAL						
Radium 226	-0.009 pCi/L	0			E903.0	09/18/23 12:25 / kdk
Radium 226 precision (±)	0.2 pCi/L				E903.0	09/18/23 12:25 / kdk
Radium 226 MDC	0.3 pCi/L				E903.0	09/18/23 12:25 / kdk
Radium 228	0.9 pCi/L				RA-05	09/12/23 13:28 / trs
Radium 228 precision (±)	0.6 pCl/L				RA-05	09/12/23 13:28 / trs
Radium 228 MDC	0.9 pCi/L				RA-05	09/12/23 13:28 / trs

Report Definitions

RL - Analyte Reporting Limit QCL - Quality Control Limit

U - Not detected at Minimum Detectable Concentration

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

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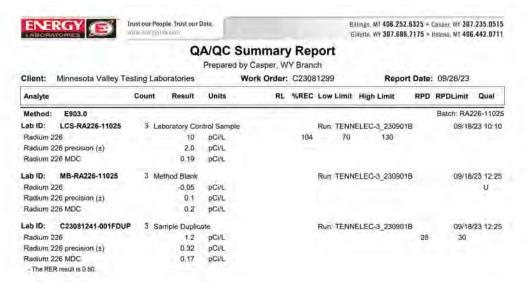


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Qualifiers:

RL - Analyte Reporting Limit

U - Not detected at Minimum Detectable Concentration (MDC)

ND - Not detected at the Reporting Limit (RL)

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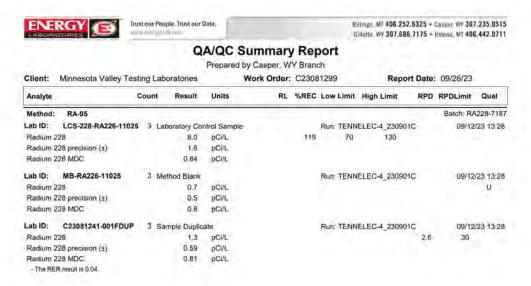


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Qualifiers:

RL - Analyte Reporting Limit

U - Not detected at Minimum Detectable Concentration (MDC)

ND - Not detected at the Reporting Limit (RL)

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Work Order Receipt Chec	cklist		
Minnesota Valley Testing Lab	oratories	C	23081299
Login completed by: Manford E. Hurley		Dat	te Received: 8/31/2023
Reviewed by: cjohnson		F	Received by: slr
Reviewed Date: 9/5/2023		C	arrier name: UPS
Shipping container/cooler in good condition?	Yes 🗸	No 🖂	Not Present
Custody seals intact on all shipping container(s)/cooler(s)?	Yes 🔲	No 🖂	Not Present ✓
Custody seals intact on all sample bottles?	Yes 🗌	No 🗀	Not Present ✓
Chain of custody present?	Yes 🗹	No 🔲	
Chain of custody signed when relinquished and received?	Yes 🔽	No 🗌	
Chain of custody agrees with sample labels?	Yes 🔽	No. 🗌	
Samples in proper container/bottle?	Yes 🗸	No 🗌	
Sample containers intact?	Yes 🗸	No 🖂	
Sufficient sample volume for indicated test?	Yes 🔽	No 🖂	
All samples received within holding time? (Exclude analyses that are considered field parameters such as pH. DO, Res Cl, Sulfite, Ferrous Iron, etc.)	Yes 🗸	No 🗍	
Temp Blank received in all shipping container(s)/cooler(s)?	Yes 🗸	No 🖂	Not Applicable
Container/Temp Blank temperature:	20.5°C No los		
Containers requiring zero headspace have no headspace or bubble (hat is <8mm (1/4°).	Yes 🗌	No 🗌	No VOA vials submitted
Water - pH acceptable upon receipt?	Yes 🗹	No 🗌	Not Applicable
Standard Reporting Procedures: Lab measurement of analytes considered field ppH, Dissolved Oxygen and Residual Chlorine, a Solid/soil samples are reported on a wet weight	re qualified as	being analy	zed outside of recommended holding time.
data units are typically noted as –dry. For agricu and ground prior to sample analysis.			
The reference date for Radon analysis is the sar analyses is the analysis date. Radiochemical pre			
Contact and Corrective Action Comm	ents:		
The collection time was not indicated on the Ch- samples were assigned the earliest collection tin			
The collection time was not indicated on the Chr samples were assigned the earliest collection tin 8/31/23 MEH			

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Toll Free:	Phone: (701) 800) 279-6885	258-9720 Fax: (701) 2	58-9724									WO #26054		
	ne and Address:	1 dx. (101) 2	50-5724		Account #:							Phone #: 701-2	58-972	0
	2616 E Bismarc	Broadway k, ND 58501			Contact: Name of Sa	Claud	ette					Fax #: For faxed report	check b	
Billing Addres	Address (indicate if different from above): PO Box 249			Quote Number				Date Submitted:	29-Aug-23					
1_		n, MN 56073			Project Nar	ne/Numbe						Purchase Order #: BL6742		
		Sample In	formation					В	ottle	Тур	e	A	nalysis	S
IML Lab Number	MVTL Lab Number	Client	Sample ID	Sample Type	Date Sampled	Time Sampled	Untreated	1 Gal HNO3	VOC Vials Umpreserved	Glass Jar	Other	Analys	sis Req	uired
	26045001	M	IW13	GW	28-Aug-23	1051		1				Ra22	26 & Ra	228
	26045002	MV	W1-90	GW	29-Aug-23	1237		1				Ra22	26 & Ra	228
	26045003	MV	N2-90	GW	29-Aug-23	1024		1				Ra22	26 & Ra	228
	26045004	MV	N3-90	GW	29-Aug-23	844		1				Ra22	26 & Ra	228
	26045005	M\	W80R	GW	28-Aug-23	1305		1			П	Ra22	26 & Ra	228
	26045006	D	Oup 1	GW	28-Aug-23			1			II,	Ra22	26 & Ra	228
	26045007	Field E	Blank (FB)	GW	29-Aug-23			1				Ra22	26 & Ra	228
		All	results mu	st be re	eported a	as a nur	ne	ric	al v	alu	e			
Trai	nsferred by:	Date:	Time:		Condition:				by:			Date:		Temp:
T. Olson		29-Aug-23	1700		- Indicate	Shell				ns		3-31-23		Tamp.
2.												1021		



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ī

Bismarck

Account #: 2800 HNO₃ Revision Date 24-Dec-2021 Do not breathe dustflumelijsahnistjivegorulijspray.

Wast flook, hands and any exposured skin 'thoroughy after francising.

Wast prolective gloveshyrotechive dochringhiye protection-floor prohectic
List only doctions or in a seed-resistantial arise at Institution. A his prolection-floor prohectic
List only doctions or in a seed-resistantial arise at Institution. A his prolection-floor prohection is a seed of the seed of th Client: nation

AHALED: Remove victim to friesh air and keep at rest in a position comfortable for breathing
edistely call a POISON CENTER or doctorphysician. Skin

F ON SKIN (or hair): Take off immediately all conteminated clothing. Rinse skin with water/phower
Wesh conteminated clothing before reuse. Montana-Dakota Utilities Eyes
IF IN EYES: Rinse cautiously with water for several minutes. Rem nove contact lenses, if present and easy to do. Continue imping Ingestion
IF SWALLOWED: Rinse mouth, DO NOT induce vomiting Five in case of fire: Use CO2, dry chemical, or folim for extinction Spills Absorb spillage to prevent material damage Alson's pillage to prevent material demage. Sternage during local processing and

3. Composition	n/Information on Ingred	lients
Component	CAS No	Weight %
Nitric acid% (C ≤ 70 %)	7697-37-2	65 - 70
Water	7732-18-5	30 - 35
4.1	First-aid measures	

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Thermo Fisher

SAFETY DATA SHEET

Creation Date 12-Mar-2009

Revision Date 24-Dec-2021

Revision Number 10

Nitric sold, Trace Metal Grade

1. Identification Nitric acid, Trace Metal Grade

Cat No. : A509-212; A509-500; A509P212; A509P500; A509SK212

CAS No 7697-37-2 Azolic acid, Engraver's acid, Aqua fortis

Laboratory chemicols.
Food, drug, pesticide or blockiel product use.

Details of the supplier of the safety data sheet

One Reagent Lame Fair Lewn, NJ 07410 Tel: (201) 795-7100

Emergency Telephone Number

CHEMTRECS, Inside the USA: 800-424-9300 CHEMTRECS, Outside the USA: 001-703-527-3887

2. Hazard(s) identification

Classification.
This chemical is considered hazantous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200) Oxidizing liquids Corposive to inectals Acute Inhalation Toxicity - Vapons Skin Corresion/Inflation Serious Eye Damage/Eye Imitation

Label Elements

Hazard Statements
May intensity fire; caldide:
May be compare to metals
Causes severe skin burns and eye damage

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Account #:

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Nitric acid, Trace Motal Grade

Physical Bate
Appearance
Oder
Oder
Oder
Description of the Control of Control

Page 5/9

Nitric acid, Trace Metal Grade				Revision I	Date 24-Dec-20
Irritation	Causas severe bu	ims by all exposure	e routes		
Sensitization	No information av	olable			
Carcinogenicity	The table below it	dicates whether a	ech agency has lis	ted any ingredient	as a carpinogen.
Component CAS No	IARC	NIP	ACGIN	OSHA	Mexico
Natic mod _ % IC < 70 7897-37-2		Mot Safed	Not threat	Not listed	Not listed
%]. Water 7732-18-5	Not resed	Not Peterd	Not listed	Not listed	Not listed
Mutapenic Effects	No information av		1 NOT TORSE	- NULLINGU	PACE TRANSPORT
Reproductive Effects	No information av	minble			
Developmental Effects	No information av				
Teratogenicity	No information av	stable.			
STOT - single exposure	None known				
STOT - repeated exposure	None known				
Aspiration hazard	No information av	nitebie			
Symptoms / effects,both acute a delayed	perforation: Produces contrained assets	ect is a contosive m	sterial. Use of gas	stric lavage or emer	sin is
Endocrine Disruptor Information	No information av	stable			
Other Adverse Effects	The texicological	properties have not	been fully investig	gated.	
	12. Ecol	ogical infor	mation		
Ecotoxicity Do not empty into drains. Large an	na He beits liw struct	d harm aquatic ore	artisms.		
Persistence and Degradability				tormation available.	
Bioaccumulation/ Accumulation	No information av				
Mobility	Will likely be mob	te in the environme	kut dne to uz wisse.	southerly,	
Compo	sort			log Pow	
Compos Nitric acid%	(C < 70 %)	-1		log Pow -2.3	
Compos Nitric acid %	[C < 70 %]	osal conside		log Pow -2.3	
Composition of the Composition o	13. Dispo Chemical waste g hazardous waste.	enerators must det Chemical waste o	erations umine whather a enerators must als	teg Pow -23 discarded chemica so consult local, re- ete and accurate di	pional, and
Nitric acid% Waste Disposal Methods	13. Dispo Character waste g hazardous waste, national hazardou	enerators must det Chemical waste o	erations armina whether a generators must all a to ensure comple	discarded chemical so consult local, no	pional, and
Waste Disposal Methods	13. Dispo Chemical waste of hazandous waste, national hazandous 14. Tran	enerators must del Chemical waste g s waste regulation	erations armina whether a generators must all a to ensure comple	discarded chemical so consult local, no	pional, and
Nitric acid % Waste Disposal Methods COT UNI-Mo	13. Dispo Chemical waste of hazandous waste, national hazandou 14. Tras	enerators must del Chemical waste g s waste regulation	erations armina whether a generators must all a to ensure comple	discarded chemical so consult local, no	pional, and
Nitro acid % Waste Dispesal Methods COT. UN-Mo Proper Shipping Name	13. Dispo Chemical waste of hazandous waste, national hazandous 14. Tran	enerators must del Chemical waste g s waste regulation	erations armina whether a generators must all a to ensure comple	discarded chemical so consult local, no	pional, and
Nitro acid % Waste Disposal Methods DUT. UNI-No Proper Shipping Name Hazard Class	13. Dispo Chemical ensite g hazandous weets national hazandous 14. Tras LIN2037 NTRIC ACID	enerators must del Chemical waste g s waste regulation	erations armina whether a generators must all a to ensure comple	discarded chemical so consult local, no	pional, and
Nitro acid % Waste Dispesal Methods COT. UN-Mo Proper Shipping Name	13. Dispo Chemical waste of hazardous waste, national hazardou 14. Trai UN2031 NITRIC ACID 8	enerators must del Chemical waste g s waste regulation	erations armina whether a generators must all a to ensure comple	discarded chemical so consult local, no	pional, and
Nitrit and % Waste Disposal Methods COT UN-No Proper Shipping Name Hazerd Criss Packlang Group Dig.	(5 < 70 %) 13. Dispe Chemical vesting intermediate the i	enerators must del Chemical waste g s waste regulation	erations armina whether a generators must all a to ensure comple	discarded chemical so consult local, no	pional, and
Neric acid% Waste Disposal Methods DUT. UN-Mo Proper Skipping Name Hazard Class Subsidiary Hazard Class Packing Growth	13. Dispo Chemical waste g hazardous waste, national hazardou 14. Tras UN2331 NTRIC ACID 8 5.1	enerators must del Chemical waste g s waste regulation	erations armina whether a generators must all a to ensure comple	discarded chemical so consult local, no	pional, and

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Report Date:



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Nitric acid, Trace Metal Grade

16. Other Information

Prepared By

Regulatory Affairs

Tentic Exists S. Addithermofisher nam

Creation late

12-Ma-2006

Revision Summary

SDS sections updated. 2, 10

Disclaimer

The information provided in this Safety Dala Shaet is correct to the best of our knowledge, information and belief at the date of the publication. The information given is designed only as a guideline for sufe handling, use, processing, storage, bransportation, disposal and release and is not to be considered a warranty or quelty specification. The information given is designed entry as a guideline for sufe handling, use, processing, storage, bransportation, disposal and release and is not to be considered a warranty or quelty specification. The information was a specification of the supplementation of the pay not be valid for such material used in conditions with any other materials of the public process, unless appealing in the test.

End of SDS

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Appendix B

Alternative Source Demonstration Reports

Appendix B Alternative Source Demonstration Reports



Alternative Source Demonstration: October 2022 Event

R.M. Heskett Station

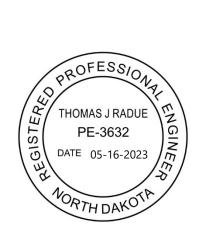
Prepared for Montana-Dakota Utilities Co.

May 2023

Certification

I hereby certify that I, or my agent, have examined this written demonstration and attest that this Coal Combustion Residuals Facility Alternative Source Demonstration (ASD) is accurate and has been prepared in accordance with good engineering practice, including consideration of applicable industry standards and the requirements of 40 CFR §257.94. I further certify that this report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the state of North Dakota.

Revision	Date	Summary of Revisions
0	May 16, 2023	October 2022 Event Alternative Source Demonstration



Thomas J. Radue

Alternative Source Demonstration: October 2022 Event May 2023

Contents

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Ash SPLP Laboratory Report (2011)

Aerial Photo (March 30, 1998)

Appendix C

Appendix D

Abbreviations

ASD Alternative Source Demonstration

CCR Coal Combustion Residuals

NDDEQ North Dakota Department of Environmental Quality

MDU Montana-Dakota Utilities Co.

SPLP Synthetic Precipitation Leaching Procedure

SSI Statistically Significant Increase

TDS Total Dissolved Solids

US EPA United States Environmental Protection Agency

1 Introduction

Montana-Dakota Utilities Co. (MDU) owns and operated R.M. Heskett Station (Site), a coal-fired generating station and a gas-fired turbine located in Mandan, Morton County, North Dakota (Figure 1). Coal unit operations at the Site ended in March 2022, and the generating station is now undergoing demolition. One CCR (coal combustion residual) unit, as defined by 40 CFR 257.53, is located on the property. The CCR unit contains coal combustion by-products, asbestos wastes generated from construction activity associated with MDU-owned facilities, and ash derived from burning tire-derived fuel at the facility.

The CCR Rule (US EPA, 2015) §257.94(e)(2) allows for an alternative source demonstration (ASD) in the event of an identified statistically significant increase (SSI) in a water quality parameter in a downgradient monitoring well over background levels:

The owner or operator may demonstrate that a source other than the CCR unit caused the statistically significant increase over background levels for a constituent or that the statistically significant increase resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. The owner or operator must complete the written demonstration within 90 days of detecting a statistically significant increase over background levels to include obtaining a certification from a qualified professional engineer verifying the accuracy of the information in the report.

The purpose of this work is to evaluate the data collected as part of the October 2022 monitoring event, along with historical data, to demonstrate if the SSIs are the results of a "source other than the CCR unit" or due to natural variation in groundwater quality or an error in sampling, analysis, or statistical evaluation. Nothing in the foregoing citation of the rule requires that the owner/operator disprove any and all potential counter-arguments that EPA or others may offer to refute this demonstration. Such arguments if valid, would need to follow requirements of the rule to show a basis in fact that includes rule requirements that they be based on site-specific infomormation, and must be certified by a North Dakota licensed professional engineer.

2 October 2022 SSIs

Sampling for the second detection monitoring event in 2022 was conducted October 17, 2022. One potential SSI over background was identified: chloride at MW-80R (see time series plots in Appendix A and prediction limit plots in Appendix B).

Evaluations were undertaken to review potential alternative sources for the SSI. These evaluations included comparing leaching tests of on-site CCR materials, regional (background) groundwater quality data, groundwater quality data from additional site wells, and groundwater quality data collected at the Site prior to construction of the CCR unit.

Several characteristics of the CCR unit, site geology, groundwater monitoring well locations, and historic groundwater quality data prompted consideration of potential alternative sources for the SSI, including elevated water quality parameters in pre-landfill and upgradient groundwater monitoring data.

A successful demonstration of alternative sources for the SSI are discussed in Section 3.

2.1 October 2022 Sampling Event

Concentrations for potential SSIs observed in October 2022 are presented in Table 1 and are consistent with those observed during the prior detection monitoring events. Trend analysis results indicate that chloride at MW-80R, though above the prediction limit, has a statistically significant decreasing trend.

Table 1 Detection Monitoring Results for Chloride at MW-80R

Date	Chloride, mg/L
Interwell Prediction Limit	95.9
April 2018	157
October 2018	165
April 2019	146
September 2019	146
April 2020	143
September 2020	147
March 2021	134
August 2021	155
May 2022	162
October 2022	149

Methods used to evaluate potential alternative sources as the basis for chloride concentrations over background from the October 2022 detection monitoring event are discussed in Section 3.

3 Alternative Source Demonstration

The purpose of this ASD Report is to evaluate whether the October 2022 SSI was due to a CCR unit release or due to another source or to error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. For each SSI, two hypotheses regarding the potential source of the SSI are assessed: (1) a release of leachate from the CCR unit and (2) natural variations in non-landfill or regional groundwater quality.

Successful demonstrations of alternative sources have previously been documented for chloride SSIs at MW-80R and locations within the previous monitoring network. The associated ASD Reports (included as appendices to Barr, 2019; Barr, 2020; Barr, 2021; Barr, 2022; Barr, 2023) documented that each of the SSIs could be explained by natural groundwater quality variability. Note that in this and previous ASDs the lines of evidence are intended to provide sufficient weight of evidence in demonstration of the ASD. This means that if one or more lines of evidence are refuted, sufficient evidence remains to support validity of the ASD.

3.1 Source Hypothesis #1: CCR Unit Release

To accept the hypothesis that a release of leachate from the CCR unit is the source of the SSI, it would be assumed that groundwater chemistry at the impacted well (MW-80R) would be geochemically similar to impacted water from the CCR unit represented by leach testing results. However, if these liquids are geochemically dissimilar, this indicates that a source "other than the CCR unit" may be responsible for the SSI. Therefore, major ion chemistry from the CCR groundwater monitoring locations (upgradient and downgradient) was compared to CCR Synthetic Precipitation Leaching Procedure (SPLP; EPA Method 1312) data collected July 2011 (Appendix C).

The SPLP results indicate that chloride is a relatively minor component of the ash leachate, accounting for 1% or less of total dissolved solids (TDS) by mass. In contrast, the chloride concentration in the groundwater sample from MW-80R accounted for over 2% of TDS and was measured at a level higher than those in the ash SPLP leachates. This finding is opposite what one would expect if impacted water from the CCR unit were being released and impacting groundwater because dilution and dispersion would tend to reduce the release concentrations between the CCR unit and the downgradient wells.

To further test the hypothesis of a source other than the CCR unit, a Piper diagram (Figure 2) was used to visually compare the CCR SPLP results (Appendix C) and the measured groundwater quality at the Site. Piper diagrams are plots of major ion chemistry of water samples (calcium, magnesium, potassium, sodium, chloride, sulfate, and [bi]carbonate) that are used to differentiate between water types and to identify potential mixing of water types. The Piper diagram provides a means to identify or "fingerprint" water samples by their common characteristics (major ions) to assess which types of water are similar or dissimilar to potential source water types (Helsel et al., 2020). On the Piper diagram depicted in Figure 2, downgradient well compositions are shown as circular points, CCR SPLP compositions as orange triangles, and the range of upgradient compositions as a yellow polygon.

Downgradient water quality (including the SSI parameter-well pair) is characterized as an intermediate-sulfate type water, whereas the ash SPLP results are sodium-sulfate type water. The major difference observed between the downgradient water quality and the SPLP results is the dominant cation composition (no cation strongly dominant vs. heavily dominant sodium). Because water quality data from SSI well-parameter pairs are clustered with data from that of the upgradient wells, which are intermediate-sulfate, rather than near the ash SPLP results, the results indicate that the water chemistry at those locations is more like upgradient groundwater than a potential release from the CCR unit. **Therefore, we reject the hypothesis that the CCR unit is the source of the chloride at MW-80R.**

The EPA has offered criticism of ASDs using Piper Plots, as part of its determinations under Part A and Part B of the CCR rule. In these determinations, the EPA has made the argument (without accompanying supporting evidence) that Piper Plots are not suitable for ASDs because of one or more of the following reasons:

- a. Leachate is not groundwater, and therefore different water types cannot be directly compared. Regardless, Piper Plots are a useful tool for comparing the dissolved constituents in analytical data for any solution chemistry. If the groundwater were influenced by a release of leachate it is unlikely that the change in equilibrium chemistry within the flow system would not show some influence on major ion compostion.
- b. There may be reactions in the subsurface that might influence the results and thereby reduce or add constituents to the downgradient groundwater. While this is certainly true at some scale for some parameters, major ions are highly mobile in general and not reactive in the subsurface, particularly chloride which is the specific parameter of interest for this ASD. As stated in the preamble to the rule EPA states that it has specifically selected Appendix III parameters as indicators of coal ash leachate because they are mobile (and hence not reactive) in the subsurface.
- c. Using a single leach test cannot represent the water quality found at a downgradient monitoring well. This may or may not be true; its dependent on the relative consistency of the CCR disposed over time, and likely other factors. In this ASD, several leach tests are used. However, even a single leach test is informative as one of several bases for evaluating an SSI. For example, all of the ash is from a similar coal source and combusted at the same facility, such that minor differences in chemistry between ash samples would be unlikely to influence the solution chemistry to the degree that they would not provide a contrast to groundwater.

3.2 Source Hypothesis #2: Natural Variations in Pre-Landfill and Site-Specific Background Water Quality

As Source Hypothesis #1 (CCR Unit Release) was rejected as a potential source of the SSI, a second hypothesis was evaluated to identify the potential source of concentrations of chloride and further reinforce the demonstration that the SSI was not related to the CCR unit. To do this, we evaluated the SSI by comparison to historical groundwater quality data, collected at the Site before the landfill was constructed.

Results from groundwater samples collected in 1986 were included in the 1989 Special Use Disposal Site Permit Application (Permit Application; MDU, 1989). The 1986 samples were collected prior to construction of the CCR unit; an aerial photograph from March 30, 1988, shows the area of the current CCR unit is undisturbed (Appendix D) on the date that this image was taken.

Discussion of pre-landfill groundwater samples in the Permit Application notes that high calcium, chloride, fluoride, TDS, and other parameters were observed at the Site. Pre-landfill chloride concentrations collected from groundwater at the Site were measured as high as 558 mg/L (Well 44, 1986), indicating that high upgradient chloride concentrations pre-date construction of the CCR unit. MW-44 was located near the location of MW-44R, shown on Figure 1, and is closer to a potential flow path that might carry the high chloride concentrations toward MW-80R than the existing network upgradient represented by upgradient well MW-13. Therefore an upgradient source originating from the vicinity of MW-44/MW-44R may not be fully represented in the background data set used to determine the SSI at MW-80R.

3.3 Source Hypothesis #3: Statistical Methods (use of MW-13 for upgradient background instead of MW-44R)

The data from upgradient MW-13 forms the interwell prediction limit used as the basis for the chloride SSI at MW-80R. While MW-13 serves as an adequate upgradient well for the majority of the Site, there is heterogeneity in all geologic environments that cannot be captured by a single upgradient well. Therefore a hypothesis for the SSI at MW-80R is that the exclusion of MW-44R from the background data set may have resulted in bias in the background data that under represents the stastistical variation in chloride concentrations.

In 2022, the Site received a new permit from the North Dakota Department of Environmental Quality (NDDEQ). Under the previous permit, the monitoring network included seven upgradient wells to define background rather than the one upgradient well (MW-13) included in the current network. The historical background concentrations from these six additional wells indicate a higher degree of heterogeneity than is represented stasticically by MW-13 alone. One well in particular (MW-44/MW-44R) has shown consistently high concentrations in chloride that indicate a bias toward lower chloride concentrations due to the selection of MW-13 as the lone background well.

In order to better understand the range of background concentrations, the maximum and median concentrations measured in the seven background wells while the previous groundwater monitoring system was operating are shown below in Table 2.

Table 2 Previously Measured Upgradient Concentration Results for Chloride

Parameter	Interwell Prediction Limi based on MW- 13 only	October 2022 SSI from MW-80R	Upgradient Maximum 2016-2021	Upgradient Median 2016-2021
Chloride (mg/L)	95.9	149	271 (MW-44R)	35.8

Based on 123 samples collected from seven upgradient/background wells (Barr, 2017) between 2016 and 2021 (Barr, 2018-2022).

The data in Table 2 indicate that higher chloride concentrations than that leading to the October 2022 SSI have been measured in upgradient/background wells at the Site. In addition, chloride concentrations near the location of upgradient MW-44 have historically ranged as high as 558 mg/L, which is higher than the maximum cited above for this location in the 2016-2021 data. The median value shows that pooling of the upgradient data hides the influence of higher upgradient chloride concentrations that have been documented at the Site in the background. Therefore, we accept the hypothesis that chloride concentrations observed at MW-80R are a statistical artifact related to the selection of MW-13 as an upgradient well which has shown lower concentrations of chloride than MW-44R.

4 Conclusions

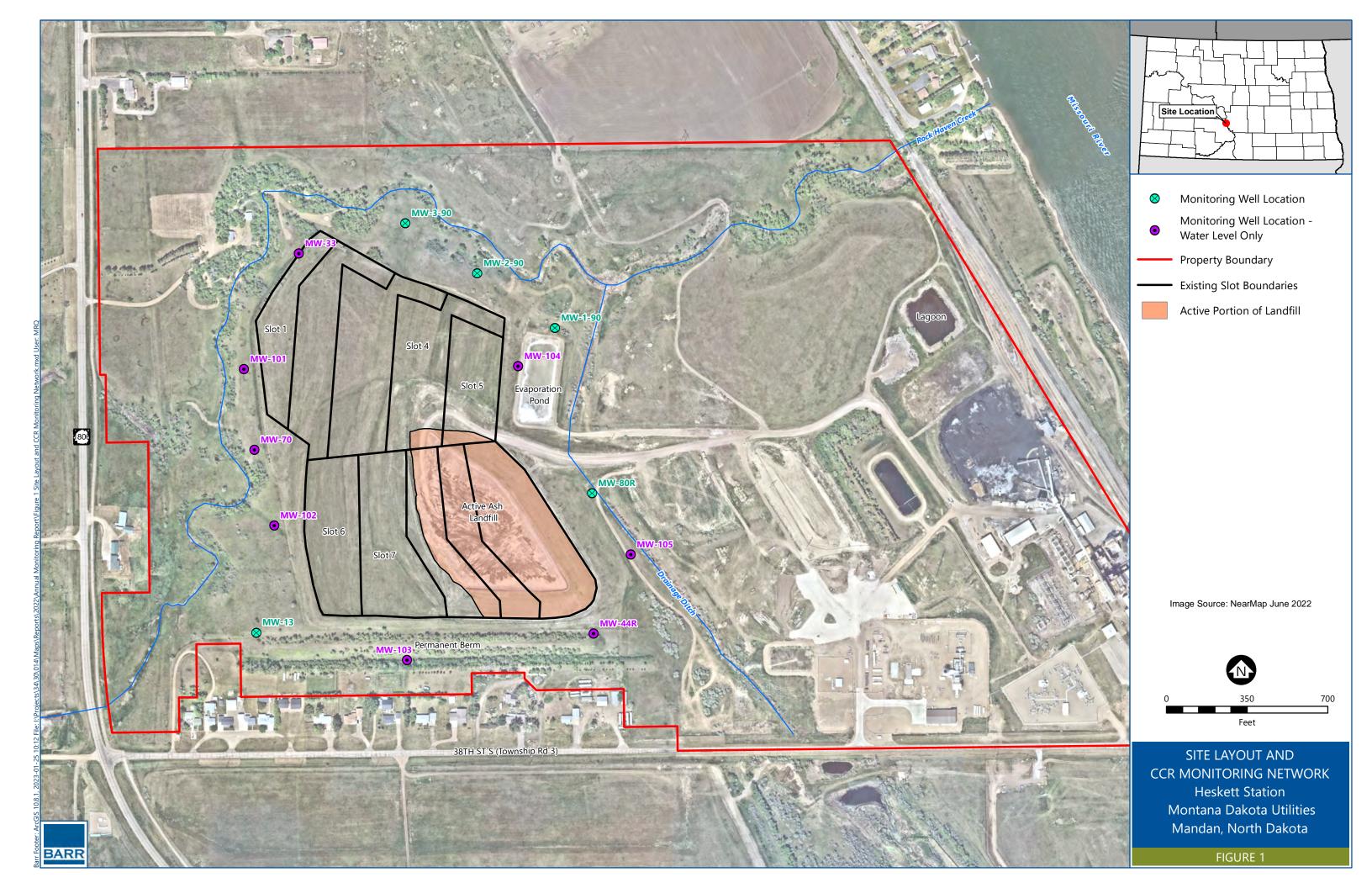
One SSI was identified from the October 2022 detection monitoring event: chloride at MW-80R. This report demonstrates that a "source other than the CCR unit" caused the SSI (natural variation in background and pre-landfill groundwater quality), as allowed by §257.94(e)(2).

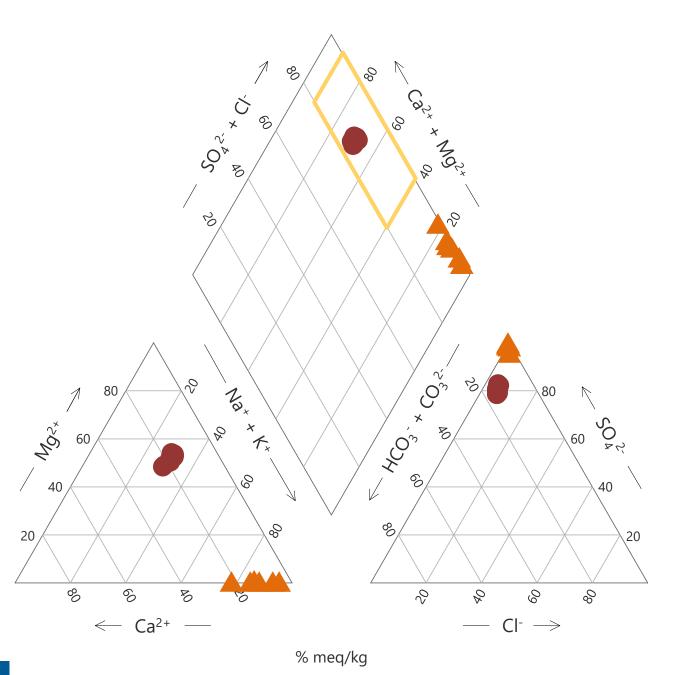
Based on the foregoing, the alternative source demonstration presented herein meets the requirements of CCR Rule §257.94(e)(2).

5 References

- Barr Engineering Co., 2017, Groundwater Monitoring System Documentation. R.M. Heskett Station. Prepared for Montana-Dakota Utilities Co. October 2017.
- Barr Engineering Co., 2018, 2017 Annual Groundwater Monitoring and Corrective Action Report. R.M. Heskett Station. Prepared for Montana-Dakota Utilities Co. January 2018.
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- Helsel, D.R., Hirsch, R.M., Ryberg, K.R., Archfield, S.A., and Gilroy, E.J., 2020, Statistical methods in water resources: U.S. Geological Survey Techniques and Methods, book 4, chapter A3, 458 p.
- Montana-Dakota Utilities Co. (MDU), 1989, R.M. Heskett Station Special Use Disposal Site Permit Application. Submitted to North Dakota State Department of Health, March 1, 1989.
- US EPA, 2015, Hazardous and Solid Waste Management Systems; Management of Coal Combustion Residuals from Electric Utility, CFR Parts 257 and 261, Federal Register, Vol. 80, No. 74, April 17, 2015.

Figures





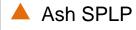






Figure 2
PIPER PLOT: ALTERNATIVE
SOURCE DEMONSTRATION
R.M. Heskett Station
Mandan, North Dakota

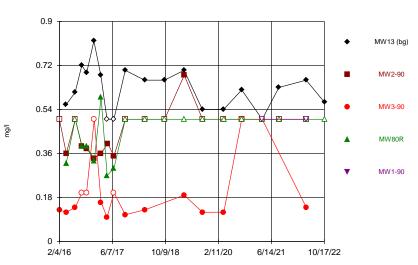


Appendices

Appendix A

Appendix III Time Series Plots

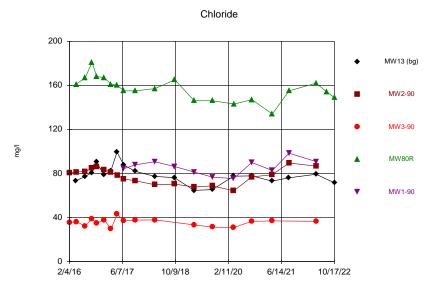




Time Series Analysis Run 12/19/2022 11:32 AM

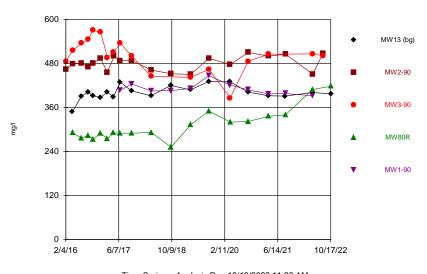
R.M. Heskett Station Client: Montana-Dakota Utilities Co. Data: Heskett_SanitasAppIII_new

Sanitas™ v.9.6.36 For the statistical analyses of ground water by Barr Engineering Company only. UG



Time Series Analysis Run 12/19/2022 11:33 AM
R.M. Heskett Station Client: Montana-Dakota Utilities Co. Data: Heskett SanitasAppIII_new

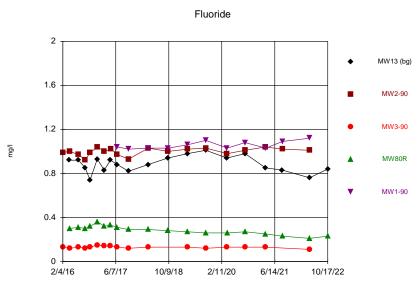
Calcium, Total



Time Series Analysis Run 12/19/2022 11:33 AM

R.M. Heskett Station Client: Montana-Dakota Utilities Co. Data: Heskett SanitasAppIII_new

Sanitas™ v.9.6.36 For the statistical analyses of ground water by Barr Engineering Company only. UG



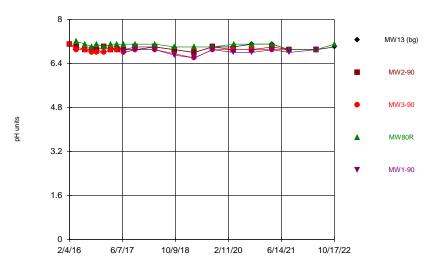
Time Series Analysis Run 12/19/2022 11:33 AM

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Sanitas™ v.9.6.36 For the statistical analyses of ground water by Barr Engineering Company only. UG





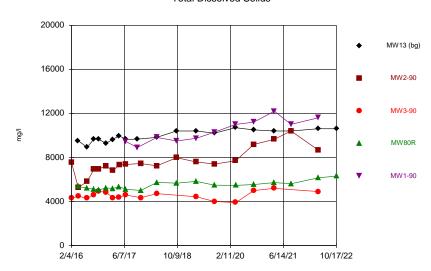


Time Series Analysis Run 12/19/2022 11:33 AM

R.M. Heskett Station Client: Montana-Dakota Utilities Co. Data: Heskett_SanitasAppIII_new

Sanitas™ v.9.6.36 For the statistical analyses of ground water by Barr Engineering Company only. UG

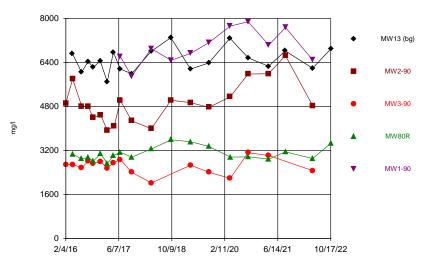
Total Dissolved Solids



Time Series Analysis Run 12/19/2022 11:33 AM

R.M. Heskett Station Client: Montana-Dakota Utilities Co. Data: Heskett_SanitasAppIII_new





Time Series Analysis Run 12/19/2022 11:33 AM

R.M. Heskett Station Client: Montana-Dakota Utilities Co. Data: Heskett SanitasAppIII_new

Appendix B

Prediction Limit Plots

 ${\it Sanitas}^{\it w}\,v.9.6.36\,{\it For the statistical analyses}\,{\it of ground water by Barr Engineering Company only}.\,{\it UG}\,{\it Hollow symbols indicate censored values}.$

Within Limit Boron

Interwell Parametric



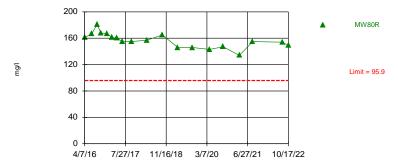
Background Data Summary (after Kaplan-Meier Adjustment): Mean=0.6095, Std. Dev.=0.09284, n=17, 17.65% NDs. Seasonality was not detected with 95% confidence. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9408, critical = 0.892. Kappa = 2.04 (c=7, w=4, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Individual comparison alpha = 0.00188. Assumes 3 future values.

Prediction Limit Analysis Run 12/19/2022 11:47 AM

R.M. Heskett Station Client: Montana-Dakota Utilities Co. Data: Heskett_SanitasAppIII_new

Sanitas™ v.9.6.36 For the statistical analyses of ground water by Barr Engineering Company only. UG





Background Data Summary: Mean=78.76, Std. Dev.=8.397, n=17. Seasonality was not detected with 95% confidence. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9338, critical = 0.892. Kappa = 2.04 (c=7, w=4, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Individual comparison alpha = 0.00188. Assumes 3 future values.

Prediction Limit Analysis Run 12/19/2022 11:47 AM

R.M. Heskett Station Client: Montana-Dakota Utilities Co. Data: Heskett_SanitasAppIII_new

Sanitas™ v.9.6.36 For the statistical analyses of ground water by Barr Engineering Company only. UG

Within Limit Calcium, Total

Interwell Parametric



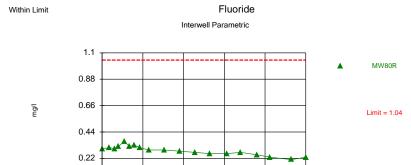
Background Data Summary: Mean=400.7, Std. Dev.=20.06, n=17. Seasonality was not detected with 95% confidence. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.8935, critical = 0.892. Kappa = 2.04 (c=7, w=4, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Individual comparison alpha = 0.00188. Assumes 3 future values.

Prediction Limit Analysis Run 12/19/2022 11:47 AM

R.M. Heskett Station Client: Montana-Dakota Utilities Co. Data: Heskett_SanitasAppIII_new

Sanitas™ v.9.6.36 For the statistical analyses of ground water by Barr Engineering Company only. UG

4/7/16



7/27/17 11/16/18 3/7/20

Background Data Summary: Mean=0.8953, Std. Dev.=0.06956, n=17. Seasonality was not detected with 95% confidence. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9654, critical = 0.892. Kappa = 2.04 (c=7, w=4, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Individual comparison alpha = 0.00188. Assumes 3 future values.

6/27/21 10/17/22

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Within Limits pH, Field
Interwell Non-parametric

7.3

MW80R

5.84

Limit = 7.1

4.38

2.92

1.46

4/7/16 7/27/17 11/16/18 3/7/20 6/27/21 10/17/22

Non-parametric test used in lieu of parametric prediction limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.05 alpha level. Limits are highest and lowest of 17 background values. Annual perconstituent alpha = 0.08687. Individual comparison alpha = 0.01107 (1 of 2). Assumes 3 future values. Seasonality was not detected with 95% confidence.

Prediction Limit Analysis Run 12/19/2022 11:47 AM

R.M. Heskett Station Client: Montana-Dakota Utilities Co. Data: Heskett_SanitasAppIII_new

Sanitas™ v.9.6.36 For the statistical analyses of ground water by Barr Engineering Company only. UG

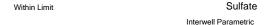
Within Limit Total Dissolved Solids
Interwell Parametric

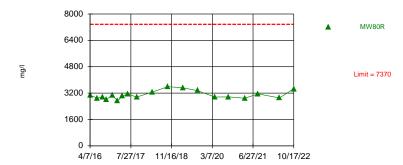
12000
9600
4800
4800
47/16 7/27/17 11/16/18 3/7/20 6/27/21 10/17/22

Background Data Summary: Mean=10276, Std. Dev.=332.5, n=9. Seasonality was not detected with 95% confidence. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.8605, critical = 0.829. Kappa = 2.447 (c=7, w=4, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Individual comparison alpha = 0.00188. Assumes 3 future values.

Prediction Limit Analysis Run 12/19/2022 11:47 AM

Sanitas™ v.9.6.36 For the statistical analyses of ground water by Barr Engineering Company only. UG





Background Data Summary: Mean=6474, Std. Dev.=437, n=17. Seasonality was not detected with 95% confidence. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9637, critical = 0.892. Kappa = 2.04 (c=7, w=4, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Individual comparison alpha = 0.00188. Assumes 3 future values.

Prediction Limit Analysis Run 12/19/2022 11:47 AM

Prediction Limit

		R.M. H	Heskett Stat	ion Client: M	ontana-Da	kota Utili	ties Co.	Data: Heskett_SanitasAp	ollI_new I	Printed 12/1	9/2022,	11:48 AM		
Constituent	<u>Well</u>	Upper L	<u>im. Lower Li</u>	m. Date	Observ.	Sig.	Bg N	Bg Wells	Bg Mean	Std. Dev.	%NDs	Transform	<u>Alpha</u>	Method
Boron (mg/l)	MW80R	0.799	n/a	10/17/2022	0.5ND	No	17	MW13	0.6095	0.09284	17.65	No	0.00188	Param Inter 1 of 2
Calcium, Total (mg/l)	MW80R	442	n/a	10/17/2022	418	No	17	MW13	400.7	20.06	0	No	0.00188	Param Inter 1 of 2
Chloride (mg/l)	MW80R	95.9	n/a	10/17/2022	149	Yes	17	MW13	78.76	8.397	0	No	0.00188	Param Inter 1 of 2
Fluoride (mg/l)	MW80R	1.04	n/a	10/17/2022	0.23	No	17	MW13	0.8953	0.06956	0	No	0.00188	Param Inter 1 of 2
pH, Field (pH_units)	MW80R	7.1	6.8	10/17/2022	7.1	No	17	MW13	n/a	n/a	0	n/a	0.01107	NP Inter (normality) 1 of 2
Sulfate (mg/l)	MW80R	7370	n/a	10/17/2022	3460	No	17	MW13	6474	437	0	No	0.00188	Param Inter 1 of 2
Total Dissolved Solids (mg/l)	MW80R	11100	n/a	10/17/2022	6310	No	9	MW13	10276	332.5	0	No	0.00188	Param Inter 1 of 2

Appendix C

Ash SPLP Laboratory Report (2011)



1126 North Front St. ~ New Ulm, MN 56073 ~ 800-782-3557 ~ Fax 507-359-2890 2616 East Broadway Ave. ~ Bismarck, ND 58501 ~ 800-279-6885 ~ Fax 701-258-9724 51 West Lincoln Way ~ Nevada, IA 50201 ~ 800-362-0855 ~ Fax 515-382-3885 www.mvtl.com



Page: 1 of 2

Report Date: 8 Sep 11 Lab Number: 11-M2450 Work Order #:81-818 Account #: 013479 Date Sampled:

Date Received: 28 Jun 11 9:00

PO #: 131460 OP

Duane Leingang Montana Dakota Utilities PO Box 40 Mandan ND 58554

Sample Description: Unit I Bottom Ash

Sample Site: MDU Heskett

	As Receive Result	ed	Method RL	Method Reference	Date Analyzed	Analyst
SPLP Extraction				1312	22 Jul 11	SS
рн	12.2	units	N/A	SM4500 H+ B	22 Jul 11 17:00	Claudette
Specific Conductance	8778	umhos/cm	N/A	SM2510-B	22 Jul 11 17:00	Claudette
Total Suspended Solids	3	mq/l	1	SM2540-D	22 Jul 11 14:00	CLB
Total Alkalinity	1120	mg/l CaCO3	4	SM2320-B	22 Jul 11 17:00	Claudette
Phenolphthalein Alk	1090	mg/l CaCO3	4	SM2320-B	22 Jul 11 17:00	Claudette
Bicarbonate	< 4	mg/l CaCO3	4	SM2320-B	22 Jul 11 17:00	Claudette
Carbonate	60	mg/l CaCO3	4	SM2320-B	22 Jul 11 17:00	Claudette
Hydroxide	1060	mg/l CaCO3	0	SM2320-B	22 Jul 11 17:00	Claudette
Tot Dis Solids (Summation)	4860	mg/1	NA	SM1030-F	3 Aug 11 8:40	Calculated
Total Hardness as CaCO3	524	mg/l	NA	SM2340-B	3 Aug 11 8:40	Calculated
Hardness in grains/gallon	30.7	gr/gal	NA	SM2340-B	3 Aug 11 8:40	Calculated
Cation Summation	74.3	meg/L	NA	SM1030-F	3 Aug 11 8:40	Calculated
Anion Summation	74.6	meq/L	NA	SM1030-F	28 Jul 11 14:30	Calculated
Percent Error	-0.24	स १	NA	SM1030-F	3 Aug 11 8:40	Calculated
Sodium Adsorption Ratio	27.1	·	NA	USDA 20b	3 Aug 11 8:40	Calculated
Gross Alpha Radiation	Attached	pCi/l			22 Aug 11 2:03	1
Radon 222	Attached	PO-7-			28 Jul 11 4:37	,
Radium 226	Attached	pCi/l			22 Aug 11 22:20)
Radium 228	Attached	pCi/l			16 Aug 11 16:50)
Total Organic Carbon	0.7	mg/1	0.5	SM5310-C	1 Aug 11 8:00) Eric
Fluoride	< 0.1	mg/l	0.10	SM4500-F-C	4 Aug 11 17:00) CLB
Sulfate	2440	mg/1	5.00	ASTM D516-02	27 Jul 11 9:00) KMP
Chloride	50.5	mg/l	1.0	SM4500-C1-E	27 Jul 11 14:00) KMP
Nitrate-Nitrite as N	0.21	mg/l	0.10	EPA 353.2	28 Jul 11 14:30) KMP
Ammonia-Nitrogen as N	0.32	mg/1	0.10	EPA 350.1	28 Jul 11 10:45	KMP
Phosphorus as P - Total	< 0.1	mg/l	0.10	EPA 365.1	28 Jul 11 13:00) KMP
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	28 Jul 11 8:00	Eric
Chemical Oxygen Demand	< 5	mg/l	5.0	HACH 8000	1 Aug 11 8:30) Wayne
Calcium - Total	210	mg/1	1.0	6010	3 Aug 11 8:40	Stacy
Magnesium - Total	< 2.5	mg/l	1.0	6010	3 Aug 11 8:40	Stacy
Sodium - Total	1440	mg/l	1.0	6010	3 Aug 11 8:40) Stacy
Potassium - Total	44.8	mg/l	1.0	6010	3 Aug 11 8:40	Stacy
Aluminum - Total	< 0.5	mg/l	0.10	6010	2 Aug 11 9:30	Stacy
Iron - Total	< 0.5	mg/l	0.10	6010	2 Aug 11 9:30	4
Strontium - Total	28.2	mg/l	0.10	6010	2 Aug 11 9:30	4
Titanium - Total	< 0.5	mg/l	0.10	6010	2 Aug 11 9:30	
Boron - Total	< 0.5	mg/l	0.10	6010	11 Aug 11 8:40	4
BOLOH - IOCAL	- 0.3	3/ -			3	-

RL = Method Reporting Limit

Elevated "Less Than Result" (<): @= Due to sample matrix != Due to sample quantity

= Due to sample concentration
+ = Due to extract volume

CERTIFICATION: MN LAB # 038-999-267



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Report Date: 8 Sep 11 Lab Number: 11-M2450 Work Order #:81-818 Account #: 013479

Date Sampled:

Date Received: 28 Jun 11 9:00

PO #: 131460 OP

Duane Leingang Montana Dakota Utilities PO Box 40 Mandan ND 58554

Sample Description: Unit I Bottom Ash

Sample Site: MDU Heskett

	As Receiv Result	ed	Method RL	Method Reference	Date Analyzed	Analyst
Antimony - Total	< 0.002	mg/l	0.0020	6020	25 Jul 11 16:18	Claudette
Arsenic - Total	0.0044	mg/l	0.0020	6020	25 Jul 11 16:18	Claudette
Barium - Total	0.1135	mg/l	0.0020	6020	25 Jul 11 16:18	Claudette
Beryllium - Total	< 0.001	mg/l	0.0010	6020	25 Jul 11 16:18	Claudette
Cadmium - Total	0.00164	mg/l	0.00100	6020	25 Jul 11 16:18	Claudette
Chromium - Total	0.0065	mg/l	0.0020	6020	25 Jul 11 16:18	Claudette
Cobalt - Total	< 0.002	mg/l	0.0020	6020	25 Jul 11 16:18	Claudette
Copper - Total	0.0213	mg/l	0.0020	6020	25 Jul 11 16:18	Claudette
Lead - Total	< 0.002	mg/l	0.0020	6020	25 Jul 11 16:18	Claudette
Manganese - Total	0.0027	mg/l	0.0010	6020	25 Jul 11 16:18	Claudette
Molybdenum - Total	0.6860	mg/l	0.0020	6020	26 Jul 11 12:46	Claudette
Nickel - Total	0.0074	mg/l	0.0020	6020	25 Jul 11 16:18	Claudette
Selenium - Total	0.0133	mg/l	0.0020	6020	26 Jul 11 9:46	Claudette
Silver - Total	< 0.001	mg/l	0.0010	6020	25 Jul 11 16:18	Claudette
Thallium - Total	< 0.002	mg/l	0.0020	6020	25 Jul 11 16:18	Claudette
Tin - Total	< 0.05	mg/l	0.0500	6020	25 Jul 11 16:18	Claudette
Vanadium - Total	0.0189	mg/l	0.0020	6020	25 Jul 11 16:18	Claudette
Zinc - Total	0.0151	mg/l	0.0100	6020	25 Jul 11 16:18	Claudette
Uranium	< 0.002	mg/l	0.002	6020	25 Jul 11 16:18	Claudette

All analyses were performed on the extract from Method 1312 (SPLP) with a modified solution to solids ratio of 4:1.

Approved by:

RL = Method Reporting Limit

= Due to sample concentration
+ = Due to extract volume

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Report Date: 8 Sep 11 Lab Number: 11-M2451 Work Order #:81-818 Account #: 013479

Date Sampled:

Date Received: 28 Jun 11 9:00

PO #: 131460 OP

Duane Leingang Montana Dakota Utilities PO Box 40 Mandan ND 58554

Sample Description: Unit II Sand Ash

Sample Site: MDU Heskett

	As Receive Result	ed	Method RL	Method Reference	Date Analyzed	Analyst
SPLP Extraction				1312	22 Jul 11	SS
рН	11.1	units	N/A	SM4500 H+ B	22 Jul 11 17:00	Claudette
Specific Conductance	20110	umhos/cm	N/A	SM2510-B	22 Jul 11 17:00	Claudette
Total Suspended Solids	21	mg/l	1	SM2540-D	22 Jul 11 14:00	CLB
Total Alkalinity	203	mg/l CaCO3	4	SM2320-B	22 Jul 11 17:00	
Phenolphthalein Alk	171	mg/l CaCO3	4	SM2320-B	22 Jul 11 17:00	
Bicarbonate	< 4	mg/l CaCO3	4	SM2320-B	22 Jul 11 17:00	Claudette
Carbonate	64	mg/l CaCO3	4	SM2320-B	22 Jul 11 17:00	
Hydroxide	139	mg/l CaCO3	0	SM2320-B	22 Jul 11 17:00	
Tot Dis Solids (Summation)	22500	mg/l	NA	SM1030-F	3 Aug 11 8:40	
Total Hardness as CaCO3	1200	mg/l	NA	SM2340-B	3 Aug 11 8:40	
Hardness in grains/gallon	70.2	gr/gal	NA	SM2340-B	3 Aug 11 8:40	
Cation Summation	318	meq/L	NA	SM1030-F	3 Aug 11 8:40	
Anion Summation	314	meq/L	NA	SM1030-F	28 Jul 11 14:30	
Percent Error	0.65	8	NA	SM1030-F	3 Aug 11 8:40	
Sodium Adsorption Ratio	80.9		NA	USDA 20b	3 Aug 11 8:40	
Gross Alpha Radiation	Attached	pCi/l			22 Aug 11 2:03	
Radon 222	See Attacl	hed			28 Jul 11 4:37	
Radium 226	Attached	pCi/l			22 Aug 11 22:20	
Radium 228	Attached	pCi/l			16 Aug 11 16:50	
Total Organic Carbon	< 0.5	mg/l	0.5	SM5310-C	1 Aug 11 8:00	
Fluoride	< 0.1	mg/l	0.10	SM4500-F-C	4 Aug 11 17:00	
Sulfate	14900	mg/l	5.00	ASTM D516-02	27 Jul 11 9:00	
Chloride	2.0	mg/l	1.0	SM4500-C1-E	27 Jul 11 14:00	
Nitrate-Nitrite as N	< 0.1	mg/l	0.10	EPA 353.2	28 Jul 11 14:30	KMP
Ammonia-Nitrogen as N	0.10	mg/l	0.10	EPA 350.1	28 Jul 11 10:45	
Phosphorus as P - Total	< 0.1	mg/l	0.10	EPA 365.1	28 Jul 11 13:00	
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	28 Jul 11 8:00	Eric
Chemical Oxygen Demand	< 5	mg/l	5.0	HACH 8000	1 Aug 11 8:30	4
Calcium - Total	481	mg/l	1.0	6010	3 Aug 11 8:40	4
Magnesium - Total	< 5	mg/l	1.0	6010	3 Aug 11 8:40	
Sodium - Total	6500	mg/l	1.0	6010	3 Aug 11 8:40	Stacy
Potassium - Total	459	mg/l	1.0	6010	3 Aug 11 8:40	Stacy
Aluminum - Total	1.09	mg/l	0.10	6010	2 Aug 11 9:30	Stacy
Iron - Total	< 1	mg/l	0.10	6010	2 Aug 11 9:30	Stacy
Strontium - Total	66.0	mg/l	0.10	6010	2 Aug 11 9:30	Stacy
Titanium - Total	< 1	mg/l	0.10	6010	2 Aug 11 9:30	Stacy
Boron - Total	5.96	mg/l	0.10	6010	11 Aug 11 8:40	Stacy

RL = Method Reporting Limit

Elevated "Less Than Result" (<): @= Due to sample matrix != Due to sample quantity

= Due to sample concentration
+ = Due to extract volume

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PO Box 40

Mandan ND 58554

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Report Date: 8 Sep 11 Lab Number: 11-M2451 Work Order #:81-818 Account #: 013479

Date Sampled:

Date Received: 28 Jun 11 9:00

PO #: 131460 OP

Sample Description: Unit II Sand Ash

Sample Site: MDU Heskett

	As Receiv Result	ed	Method RL	Method Reference	Date Analyzed	Analyst
	Result		ИЛ	Reference	zmary zea	THATYE
Antimony - Total	< 0.002	mg/l	0.0020	6020	25 Jul 11 16:18	Claudette
Arsenic - Total	0.0822	mg/l	0.0020	6020	25 Jul 11 16:18	Claudette
Barium - Total	0,0930	mg/l	0.0020	6020	25 Jul 11 16:18	Claudette
Beryllium - Total	< 0.001	mg/l	0.0010	6020	25 Jul 11 16:18	Claudette
Cadmium - Total	0.00182	mg/l	0.00100	6020	25 Jul 11 16:18	Claudette
Chromium - Total	0.0244	mg/l	0.0020	6020	25 Jul 11 16:18	Claudette
Cobalt - Total	< 0.002	mg/1	0.0020	6020	25 Jul 11 16:18	Claudette
Copper - Total	0.1108	mg/l	0.0020	6020	25 Jul 11 16:18	Claudette
Lead - Total	< 0.002	mg/l	0.0020	6020	25 Jul 11 16:18	Claudette
Manganese - Total	0.0052	mg/l	0.0010	6020	25 Jul 11 16:18	Claudette
Molybdenum - Total	0.1000	mg/l	0.0020	6020	26 Jul 11 12:46	Claudette
Nickel - Total	0.0136	mg/l	0.0020	6020	25 Jul 11 16:18	Claudette
Selenium - Total	0.0937	mg/l	0.0020	6020	26 Jul 11 9:46	Claudette
Silver - Total	< 0.001	mg/l	0.0010	6020	25 Jul 11 16:18	Claudette
Thallium - Total	< 0.002	mg/l	0.0020	6020	25 Jul 11 16:18	Claudette
Tin - Total	< 0.05	mg/l	0.0500	6020	25 Jul 11 16:18	Claudette
Vanadium - Total	0.3026	mg/l	0.0020	6020	25 Jul 11 16:18	Claudette
Zinc - Total	0.0327	mg/l	0.0100	6020	25 Jul 11 16:18	Claudette
Uranium	< 0.002	mg/l	0.002	6020	25 Jul 11 16:18	Claudette

All analyses were performed on the extract from Method 1312 (SPLP) with a modified solution to solids ratio of 4:1.

Approved by:

RL = Method Reporting Limit

Elevated "Less Than Result" (<): @ = Due to sample matrix ! = Due to sample quantity

= Due to sample concentration
+ = Due to extract volume

CERTIFICATION: MN LAB # 038-999-267



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Report Date: 8 Sep 11 Lab Number: 11-M2452 Work Order #:81-818 Account #: 013479 Date Sampled:

Date Received: 28 Jun 11 9:00

PO #: 131460 OP

Duane Leingang Montana Dakota Utilities PO Box 40 Mandan ND 58554

Sample Description: Unit I Fly Ash

Sample Site: MDU Heskett

	As Receive Result	ed	Method RL	Method Reference	Date Analyzed	Analyst
SPLP Extraction				1312	22 Jul 11	SS
рн	12.9	units	N/A	SM4500 H+ B	22 Jul 11 17:00	Claudette
Specific Conductance	50660	umhos/cm	N/A	SM2510-B	22 Jul 11 17:00	Claudette
Total Suspended Solids	30	mg/l	1	SM2540-D	22 Jul 11 14:00	CLB
Total Alkalinity	7020	mg/l CaCO3	4	SM2320-B	25 Jul 11 17:00	Claudette
Phenolphthalein Alk	6900	mg/l CaCO3	4	SM2320-B	25 Jul 11 17:00	
Bicarbonate	< 4	mg/l CaCO3	4	SM2320-B	25 Jul 11 17:00	Claudette
Carbonate	240	mg/l CaCO3	4	SM2320-B	25 Jul 11 17:00	
Hydroxide	6780	mg/l CaCO3	0	SM2320-B	25 Jul 11 17:00	
Tot Dis Solids (Summation)	42200	mg/l	NA	SM1030-F	3 Aug 11 8:40	
Total Hardness as CaCO3	1750	mg/l	NA	SM2340-B	3 Aug 11 8:40	
Hardness in grains/gallon	102	gr/gal	NA	SM2340-B	3 Aug 11 8:40	
Cation Summation	663	meg/L	NA	SM1030-F	3 Aug 11 8:40	
Anion Summation	613	meg/L	NA	SM1030-F	28 Jul 11 14:30	
Percent Error	3.99	8	NA	SM1030-F	3 Aug 11 8:40	
Sodium Adsorption Ratio	143		NA	USDA 20b	3 Aug 11 8:40	Calculated
Gross Alpha Radiation	Attached	pCi/l			22 Aug 11 2:03	
Radon 222	Attached	-			28 Jul 11 4:37	
Radium 226	Attached	pCi/l			22 Aug 11 22:20	
Radium 228	Attached	pCi/1			16 Aug 11 16:50	
Total Organic Carbon	1.5	mg/l	0.5	SM5310-C	1 Aug 11 8:00	
Fluoride	5.60	mg/l	0.10	SM4500-F-C	10 Aug 11 17:00	
Sulfate	22600	mg/l	5.00	ASTM D516-02	27 Jul 11 9:00	
Chloride	53.8	mg/l	1.0	SM4500-Cl-E	27 Jul 11 14:00	
Nitrate-Nitrite as N	0.68	mg/l	0.10	EPA 353.2	28 Jul 11 14:30	
Ammonia-Nitrogen as N	7.22	mg/l	0.10	EPA 350.1	28 Jul 11 10:45	
Phosphorus as P - Total	< 0.1	mg/l	0.10	EPA 365.1	28 Jul 11 13:00	
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	28 Jul 11 8:00	Eric
Chemical Oxygen Demand	22.4	mg/1	5.0	HACH 8000	1 Aug 11 8:30	Wayne
Calcium - Total	700	mg/l	1.0	6010	3 Aug 11 8:40	Stacy
Magnesium - Total	< 25	mg/l	1.0	6010	3 Aug 11 8:40	Stacy
Sodium - Total	14100	mg/l	1.0	6010	3 Aug 11 8:40	Stacy
Potassium - Total	580	mg/1	1.0	6010	3 Aug 11 8:40	Stacy
Aluminum - Total	< 5	mg/l	0.10	6010	2 Aug 11 9:30	Stacy
Iron - Total	< 5	mg/l	0.10	6010	2 Aug 11 9:30	Stacy
Strontium - Total	59.5	mg/l	0.10	6010	2 Aug 11 9:30	Stacy
Titanium - Total	< 5	mg/l	0.10	6010	2 Aug 11 9:30	Stacy
Boron - Total	1.89	mg/l	0.10	6010	11 Aug 11 8:40	Stacy

RL = Method Reporting Limit

Elevated "Less Than Result" (<): @ = Due to sample matrix ! = Due to sample quantity

Due to sample concentration
+ Due to extract volume

CERTIFICATION: MN LAB # 038-999-267



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Report Date: 8 Sep 11 Lab Number: 11-M2452 Work Order #:81-818 Account #: 013479

Date Sampled:

Date Received: 28 Jun 11 9:00

PO #: 131460 OP

Duane Leingang Montana Dakota Utilities PO Box 40 Mandan ND 58554

Sample Description: Unit I Fly Ash

Sample Site: MDU Heskett

	As Receive Result	ed	Method RL	Method Reference	Date Analyzed	Analyst
Antimony - Total	< 0.002	mg/l	0.0020	6020	25 Jul 11 16:18	Claudette
Arsenic - Total	0.1128	mg/l	0.0020	6020	25 Jul 11 16:18	Claudette
Barium - Total	0.0906	mg/l	0.0020	6020	25 Jul 11 16:18	Claudette
Beryllium - Total	< 0.001	mg/l	0.0010	6020	25 Jul 11 16:18	Claudette
Cadmium - Total	0.00244	mg/l	0.00100	6020	25 Jul 11 16:18	Claudette
Chromium - Total	0.0270	mg/l	0.0020	6020	25 Jul 11 16:18	Claudette
Cobalt - Total	< 0.002	mg/l	0.0020	6020	25 Jul 11 16:18	Claudette
Copper - Total	0.2934	mg/l	0.0020	6020	25 Jul 11 16:18	Claudette
Lead - Total	0.0161	mg/l	0.0020	6020	25 Jul 11 16:18	Claudette
Manganese - Total	0.0102	mg/l	0.0010	6020	25 Jul 11 16:18	Claudette
Molybdenum - Total	0.9246	mg/l	0.0020	6020	26 Jul 11 12:46	Claudette
Nickel - Total	0.0175	mg/l	0.0020	6020	25 Jul 11 16:18	Claudette
Selenium - Total	0.1959	mg/l	0.0020	6020	26 Jul 11 9:46	Claudette
Silver - Total	< 0.001	mg/l	0.0010	6020	25 Jul 11 16:18	Claudette
Thallium - Total	< 0.002	mg/l	0.0020	6020	25 Jul 11 16:18	Claudette
Tin - Total	< 0.05	mg/l	0.0500	6020	25 Jul 11 16:18	Claudette
Vanadium - Total	0.0158	mg/l	0.0020	6020	25 Jul 11 16:18	Claudette
Zinc - Total	0.3984	mg/l	0.0100	6020	25 Jul 11 16:18	Claudette
Uranium	< 0.002	mg/l	0.002	6020	25 Jul 11 16:18	Claudette

All analyses were performed on the extract from Method 1312 (SPLP) with a modified solution to solids ratio of 4:1.

Approved by:

RL = Method Reporting Limit

Elevated "Less Than Result" (<): @ = Due to sample matrix $\frac{1}{2}$ = Due to sample quantity

= Due to sample concentration
+ = Due to extract volume

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Report Date: 8 Sep 11 Lab Number: 11-M2453 Work Order #:81-818 Account #: 013479

Date Sampled:

Date Received: 28 Jun 11 9:00

PO #: 131460 OP

Duane Leingang Montana Dakota Utilities PO Box 40 Mandan ND 58554

Sample Description: Unit II Fly Ash

Sample Site: MDU Heskett

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
SPLP Extraction				1312	22 Jul 11	SS
Н	12.8	units	N/A	SM4500 H+ B	22 Jul 11 17:00	
Specific Conductance	27240	umhos/cm	N/A	SM2510-B	22 Jul 11 17:00	
Total Suspended Solids	13	mg/l	1	SM2540-D	22 Jul 11 14:00	
Total Alkalinity	4570	mg/l CaCO3	4	SM2320-B	22 Jul 11 17:00	
Phenolphthalein Alk	4520	mg/l CaCO3	4	SM2320-B	22 Jul 11 17:00	
Bicarbonate	< 4	mg/l CaCO3	4	SM2320-B	22 Jul 11 17:00	
Carbonate	100	mg/l CaCO3	4	SM2320-B	22 Jul 11 17:00	
Hydroxide	4470	mg/l CaCO3	0	SM2320-B	22 Jul 11 17:00	
Tot Dis Solids (Summation)	16000	mg/l	NA	SM1030-F	3 Aug 11 8:40	4
Total Hardness as CaCO3	1960	mg/l	NA	SM2340-B	3 Aug 11 8:40	
Hardness in grains/gallon	115	gr/gal	NA	SM2340-B	3 Aug 11 8:40	
Cation Summation	252	meg/L	NA	SM1030-F	9 Aug 11 9:09	
Anion Summation	247	meq/L	NA	SM1030-F	28 Jul 11 14:30	
Percent Error	1.00	8	NA	SM1030-F	9 Aug 11 9:09	
Sodium Adsorption Ratio	46.1		NA	USDA 20b	3 Aug 11 8:40	
Gross Alpha Radiation	Attached	pCi/l			22 Aug 11 2:03	
Radon 222	Attached	-			28 Jul 11 4:37	,
Radium 226	Attached	pCi/l			22 Aug 11 22:20)
Radium 228	Attached	pCi/l			16 Aug 11 16:50	
Total Organic Carbon	1.6	mg/l	0 . 5	SM5310-C	1 Aug 11 8:00	
Fluoride	3.60	mg/l	0.10	SM4500-F-C	4 Aug 11 17:00	CLB
Sulfate	7400	mg/l	5.00	ASTM D516-02	27 Jul 11 9:00	
Chloride	66.0	mg/l	1.0	SM4500-C1-E	27 Jul 11 14:00	
Nitrate-Nitrite as N	0.38	mg/l	0.10	EPA 353.2	28 Jul 11 14:30	
Ammonia-Nitrogen as N	15.0	mg/l	0.10	EPA 350.1	28 Jul 11 10:45	
Phosphorus as P - Total	< 0.1	mg/1	0.10	EPA 365.1	28 Jul 11 13:00	
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	28 Jul 11 8:00) Eric
Chemical Oxygen Demand	9.4	mg/l	5.0	HACH 8000	1 Aug 11 8:30) Wayne
Calcium - Total	785	mg/l	1.0	6010	3 Aug 11 8:40) Stacy
Magnesium - Total	< 5	mg/l	1.0	6010	3 Aug 11 8:40	Stacy
Sodium - Total	4720	mg/l	1.0	6010	3 Aug 11 8:40) Stacy
Potassium - Total	275	mg/l	1.0	6010	3 Aug 11 8:40) Stacy
Aluminum - Total	< 1	mg/l	0.10	6010	9 Aug 11 9:09	
Iron - Total	< 1	mg/l	0.10	6010	9 Aug 11 9:09	Stacy
Strontium - Total	85.0	mg/l	0.10	6010	9 Aug 11 9:09	Stacy
Titanium - Total	< 1	mg/l	0.10	6010	9 Aug 11 9:09	Stacy
Boron - Total	< 1	mg/l	0.10	6010	11 Aug 11 8:40	Stacy

RL = Method Reporting Limit

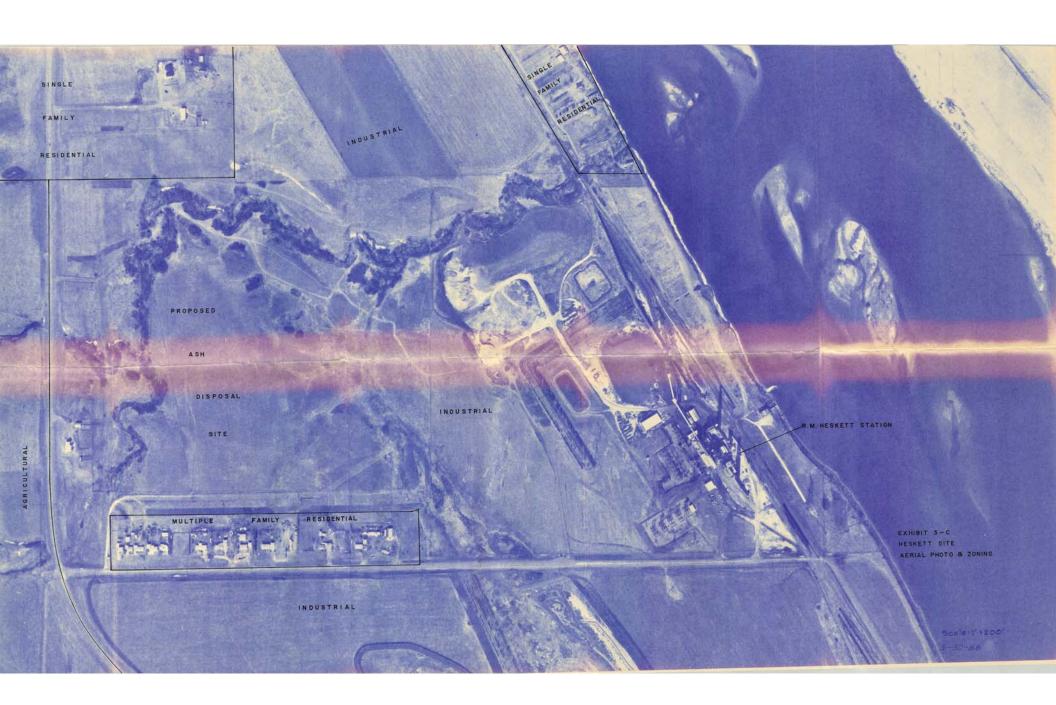
Elevated "Less Than Result" (<): @ = Due to sample matrix ! = Due to sample quantity

= Due to sample concentration + = Due to extract volume

CERTIFICATION: MN LAB # 038-999-267

Appendix D

Aerial Photo (March 30, 1998)





Alternative Source Demonstration: May 2023 Event

R.M. Heskett Station

Prepared for Montana-Dakota Utilities Co.

December 2023

Certification

I hereby certify that I, or my agent, have examined this written demonstration and attest that this Coal Combustion Residuals Facility Alternative Source Demonstration (ASD) is accurate and has been prepared in accordance with good engineering practice, including consideration of applicable industry standards and the requirements of 40 CFR § 257.94. I further certify that this report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the state of North Dakota.

native Source Demonstration



Alternative Source Demonstration: May 2023 Event

December 2023

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Abbreviations

ASD Alternative Source Demonstration

CCR Coal Combustion Residuals

NDDEQ North Dakota Department of Environmental Quality

MDU Montana-Dakota Utilities Co.

SPLP Synthetic Precipitation Leaching Procedure

SSI Statistically Significant Increase

TDS Total Dissolved Solids

US EPA United States Environmental Protection Agency

1 Introduction

Montana-Dakota Utilities Co. (MDU) owns and operated R.M. Heskett Station (Site), a coal-fired generating station and a gas-fired turbine located in Mandan, Morton County, North Dakota (Figure 1). Coal unit operations at the Site ended in March 2022, and the generating station is now demolished. One CCR (coal combustion residual) unit, as defined by 40 CFR 257.53, was located on the property. The CCR unit contains coal combustion by-products, asbestos wastes generated from construction activity associated with MDU-owned facilities, and ash derived from burning tire-derived fuel at the facility.

The CCR Rule (US EPA, 2015) § 257.94(e)(2) allows for an alternative source demonstration (ASD) in the event of an identified statistically significant increase (SSI) in a water quality parameter in a downgradient monitoring well over background levels:

The owner or operator may demonstrate that a source other than the CCR unit caused the statistically significant increase over background levels for a constituent or that the statistically significant increase resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. The owner or operator must complete the written demonstration within 90 days of detecting a statistically significant increase over background levels to include obtaining a certification from a qualified professional engineer verifying the accuracy of the information in the report.

The purpose of this work is to evaluate the data collected as part of the May 2023 monitoring event, along with historical data, to demonstrate if the SSIs are the results of a "source other than the CCR unit" or due to natural variation in groundwater quality or an error in sampling, analysis, or statistical evaluation. Nothing in the foregoing citation of the rule requires that the owner/operator disprove any and all potential counter-arguments that EPA or others may offer to refute this demonstration. Such arguments if valid, would need to follow requirements of the rule to show a basis in fact that includes rule requirements that they be based on site-specific infomormation, and must be certified by a North Dakota licensed professional engineer.

2 May 2023 SSIs

Sampling for the first detection monitoring event in 2023 was conducted May 17-18, 2023. Three potential SSIs over background were identified and verified as SSIs by resampling: calcium and chloride at MW-80R and fluoride at MW1-90 (see time series plots in Appendix A and prediction limit plots in Appendix B).

Evaluations were undertaken to review potential alternative sources for the SSI. These evaluations included comparing leaching tests of on-site CCR materials, leachate collected in the Evaporation Pond (non-CCR unit), regional (background) groundwater quality data, groundwater quality data from additional site wells, and groundwater quality data collected at the Site prior to construction of the CCR unit.

Several characteristics of the CCR unit, site geology, groundwater monitoring well locations, and historical groundwater quality data prompted consideration of potential alternative sources for the SSIs, including elevated water quality parameters in pre-landfill and upgradient groundwater monitoring data site-specific geologic conditions, and/or leakage from the Evaporation Pond (non-CCR unit).

A successful demonstration of alternative sources for the SSI are discussed in Section 3.

2.1 May 2023 Sampling Event

Concentrations for potential SSIs observed in May 2023 are presented in Table 1 and are consistent with those observed during the prior detection monitoring events.

Table 1 Detection Monitoring Results for Potential SSI Well-Parameter Pairs

		PL				Detection Monitoring Results (mg/L)							
Well	Parameter	(mg/L)	Apr. 2018	Oct. 2018	Apr. 2019	Sept. 2019	Apr. 2020	Sept. 2020	Mar. 2021	Aug. 2021	May 2022	Oct. 2022	May 2023
MW- 80R	Calcium	442	292	252	313	350	320	322	336	340	409	418	458
MW- 80R	Chloride	95.9	157	165	146	146	143	147	134	155	162	149	182
MW1- 90	Fluoride	1.04	1.03	1.03	1.06	1.1	1.03	1.08	1.03	1.09	1.12	dry	1.13

Bolded values indicate concentrations exceed the associated interwell prediction limits (PL). Dry: sample was not collected due to insufficient volume of water in well.

Trend analysis results indicate:

- that calcium at MW-80R has a statistically significant increasing trend
- that chloride at MW-80R, though above the prediction limit, does not have a statistically significant trend
- that fluoride at MW1-90 has a statistically significant increasing trend

Methods used to evaluate potential alternative sources as the basis for chloride concentrations over background from the May 2023 detection monitoring event are discussed in Section 3.

2.2 Verification Sampling

Verification resampling was conducted in August 2023 for three of the four well-parameter pairs with potential SSIs. The three potential SSIs were verified.

Table 2 Verification Resampling Results for Potential SSI Well-Parameter Pairs

Well	Parameter	Interwell Prediction Limit (mg/L)	May 2023 (mg/L)	August 2023 (mg/L)
MW2-90	Calcium	442	469	432
MW-80R	Calcium	442	479	458
MW-80R	Chloride	95.9	182	NA
MW1-90	Fluoride	1.04	1.21	1.13

Bolded values indicate concentrations exceed the associated interwell prediction limits (PL). NA: Chloride at MW-80R was not resampled based on results from previous ASDs.

3 Alternative Source Demonstration

The purpose of this ASD Report is to evaluate whether the May 2023 SSIs were due to a CCR unit release or due to another source or to error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. For each SSI, three hypotheses regarding the potential source of the SSI are assessed: (1) a release of leachate from the CCR unit and (2) natural variations in non-landfill or regional groundwater quality are the source of one or more of the SSIs, or (3) a release of leachate from the Evaporation Pond (a source other than a CCR unit) is the source of one or more of the SSIs.

Successful demonstrations of alternative sources have previously been documented for the three parameters with SSIs at locations within the previous monitoring network. The associated ASD Reports (included as appendices to Barr, 2019; Barr, 2020; Barr, 2021; Barr, 2022; and Barr, 2023) documented that each of the SSIs could be explained by natural groundwater quality variability based on concentrations that were either present at the Site before the landfill was constructed, consistent with regional groundwater quality data, and/or associated with a release from the Evaporation Pond (non-CCR unit). Note that in this and previous ASDs the lines of evidence are intended to provide sufficient weight of evidence in demonstration of the ASD. This means that if one or more lines of evidence are refuted, sufficient evidence remains to support validity of the ASD.

3.1 Source Hypothesis #1: CCR Unit Release

To accept the hypothesis that a release of leachate from the CCR unit is the source of the SSI, it would be assumed that groundwater chemistry at one or more potentially impacted wells (MW-80R and MW1-90) would be geochemically similar to impacted water from the CCR unit represented by leach testing results. However, if these liquids are geochemically dissimilar, this indicates that a source "other than the CCR unit" may be responsible for the SSI. Therefore, major ion chemistry from the CCR groundwater monitoring locations (upgradient and downgradient) was compared to CCR Synthetic Precipitation Leaching Procedure (SPLP; EPA Method 1312) data collected July 2011 (Appendix C).

The SPLP results indicate that chloride is a relatively minor component of the ash leachate, accounting for 1% or less of total dissolved solids (TDS) by mass. In contrast, the chloride concentration in the groundwater sample from MW-80R accounted for over 2% of TDS and was measured at a level higher than those in the ash SPLP leachates. This finding is opposite what one would expect if impacted water from the CCR unit were being released and impacting groundwater because dilution and dispersion would tend to reduce the release concentrations between the CCR unit and the downgradient wells.

To further test the hypothesis of a source other than the CCR unit, a Piper diagram (Figure 2) was used to visually compare the CCR SPLP results (Appendix C) and the measured groundwater quality at the Site. Piper diagrams are plots of major ion chemistry of water samples (calcium, magnesium, potassium, sodium, chloride, sulfate, and [bi]carbonate) that are used to differentiate between water types and to identify potential mixing of water types. The Piper diagram provides a means to identify or "fingerprint" water samples by their common characteristics (major ions) to assess which types of water are similar or dissimilar to potential source water types (Helsel et al., 2020). On the Piper diagram depicted in Figure 2,

downgradient well compositions are shown as circular points, CCR SPLP compositions as orange triangles, and the range of upgradient compositions as a yellow polygon.

Downgradient water quality (including the SSI parameter-well pair) is characterized as an intermediate-sulfate type water, whereas the ash SPLP results are sodium-sulfate type water. The major difference observed between the downgradient water quality and the SPLP results is the dominant cation composition (no cation strongly dominant vs. heavily dominant sodium). Because water quality data from SSI well-parameter pairs are clustered with data from that of the upgradient wells, which are intermediate-sulfate, rather than near the ash SPLP results, the results indicate that the water chemistry at those locations is more like upgradient groundwater than a potential release from the CCR unit. **Therefore, we reject the hypothesis that the CCR unit is the source of the calcium and chloride observed at MW-80R.**

The EPA has offered criticism of ASDs using Piper Plots, as part of its determinations under Part A and Part B exemptions under the CCR rule. In these determinations, the EPA has made the argument (without accompanying supporting evidence) that Piper Plots are not suitable for ASDs because of one or more of the following reasons:

a. Leachate is not groundwater, and therefore different water types cannot be directly compared. This position is inconsistent with the fundamental premise within the CCR Rule that SSIs are due to changes that occur in groundwater due to a release of leachate from a CCR unit. Statistical methods are a means of making this comparison, Piper Plots are another. Regardless, the utility of Piper Plots is that they are useful and are part of the professional standard of care for comparing the dissolved constituents in analytical data for any type of solution chemistry for any type of water. If the groundwater were influenced by a release of leachate it is likely that the change in equilibrium chemistry within the flow system would show some influence on major ion compostion. Therefore, Piper Plots are a valuable tool for comparing leachate and groundwater chemistry.

b. There may be reactions in the subsurface that might influence the results and thereby reduce or add constituents to the downgradient groundwater. While this may be true at some scale for some parameters, it is generally not true of Appendix III parameters which are major ions that are generally not reactive in the subsurface. Chloride addressed in this ASD has been widely considered a conservative "tracer" parameter in groundwater by professional hydrogeologists for decades. As stated in the preamble to the CCR Rule EPA states that it selected the Appendix III parameters as indicators of coal ash leachate because they are mobile (and hence not reactive) in the subsurface.

c. Using a single leach test cannot represent the water quality found at a downgradient monitoring well. The issue is whether a leach sample is representative of leachate as a distinct water type. As long as the leachate sample is sufficiently different from groundwater it is useful in assessing the potential effects of a release on downgradient groundwater. In this ASD, several leach tests are used and they are more similar to each other than they are to groundwater samples in terms of both the overall concentration of parameters (which can change due to dilution along the flow path) and the proportionate ratios of various parameters along the flow path (which generally do not change along the flow path due to dilution).

Therefore Piper Plots not only show the differences between the two water types, they can also demonstrate the effects of dilution that allows for assessment of a release.

3.2 Source Hypothesis #2: Natural Variations in Pre-Landfill and Site-Specific Background Water Quality

As Source Hypothesis #1 (CCR Unit Release) was rejected as a potential source of the SSIs, a second hypothesis was evaluated to identify the potential source of concentrations of SSI parameters and further reinforce the demonstration that the SSIs were not related to the CCR unit. To do this, we evaluated the SSIs by comparison to historical groundwater quality data, collected at the Site before the landfill was constructed (pre-landfill data), additional upgradient well data, and/or regional groundwater quality data from the Cannonball Formation and associated units to determine if natural variation is a potential alternative source for the SSIs.

Results from groundwater samples collected in 1986 were included in the 1989 Special Use Disposal Site Permit Application (Permit Application; MDU, 1989). The 1986 samples were collected prior to construction of the CCR unit; an aerial photograph from March 30, 1988, shows the area of the current CCR unit is undisturbed (Appendix D) on the date that this image was taken.

Discussion of pre-landfill groundwater samples in the Permit Application notes that high calcium, chloride, fluoride, TDS, and other parameters were observed at the Site.

3.2.1 Calcium at MW-80R

Pre-landfill calcium concentrations collected from groundwater at the Site were measured as high as 648 mg/L (Well 44, 1986), indicating that high calcium concentrations were present at the Site that predate construction of the CCR unit.

The mineralogy of the underlying Fort Union Group may yield an explanation for the elevated calcium concentrations. The dominant lithology observed at the Site is unconsolidated silt in a clay matrix with interspersed fine- to medium-grained sand (10% to 30%). Calcareous (calcium-carbonate-bearing) materials and small gypsum (hydrated calcium sulfate) crystals are documented discontinuously throughout the upper 30 feet of the surface materials, which have been presumed to be the result of diagenetic processes which occur above the water table during alternating wetting and drying cycles (Groenewold et al., 1983). The presence of these minerals can be a source of high calcium concentrations in groundwater.

The boring logs for CCR wells and pre-landfill wells note calcareous material and gypsum occurrences across the Site (Appendix E). As groundwater fluctuates and surface water infiltration occurs, periodic dissolution of these calcium-bearing minerals into the water column may occur, resulting in elevated calcium concentrations.

In 2022, the Site received a new permit from the North Dakota Department of Environmental Quality (NDDEQ). Under the previous permit, the monitoring network included seven upgradient wells to define background rather than the one upgradient well (MW-13) included in the current network. The high

degree of heterogeneity in historical background concentrations, including for calcium, means that the long-term monitoring record includes background data that may exceed statistically determined thresholds. The maximum and median concentrations measured in the seven background wells while the previous groundwater monitoring system was operating are shown below in Table 3.

Table 3 Previously Measured Upgradient Concentration Results for SSI Parameters

Parameter	Interwell Prediction Limit (mg/L)	May 2023 SSI (mg/L)	Maximum upgradient concentration, 2016-2021 (mg/L)	Median upgradient concentration, 2016-2021 (mg/L)
Calcium	442	479 (MW-80R)	600 (MW-103)	438
Chloride	95.9	182 (MW-80R)	271 (MW-44R)	35.8
Fluoride	1.04	1.21 (MW1-90)	1.01 (MW-13)	0.25

Based on 123 samples collected from seven upgradient/background wells (Barr, 2017) between 2016 and 2021 (Barr, 2018-2022).

The data in Table 3 indicate that higher calcium concentrations than those leading to the May 2023 SSI have been measured in upgradient/background wells at the Site. Therefore, the degree of natural variability in groundwater calcium concentrations at the Site encompasses the SSI at MW-80R.

The presence of soluble calcium-bearing minerals in native subsurface deposits and documentation of elevated calcium in pre-landfill and upgradient groundwater provide multiple lines of evidence substantiating the hypothesis that the SSI for calcium at MW-80R is due to natural variation in groundwater quality. Therefore, we accept the hypothesis that the calcium concentration at MW-80R is due to variability in natural conditions and is consistent with regional and Site background groundwater data.

3.2.2 Chloride at MW-80R

As with calcium, heterogeneity in chloride concentrations have been observed at the Site prior to landfill construction and within additional upgradient measurements. Pre-landfill chloride concentrations collected from groundwater at the Site and reported in the 1989 Permit Application were measured as high as 558 mg/L (Well 44, 1986), indicating that high chloride concentrations pre-date construction of the CCR unit. This conclusion is substantiated by concentrations measured in samples from the additional upgradient/background wells at the Site, which have been as high as 271 mg/L (MW-44R, Table 3), exceeding the 182 mg/L measured at MW-80R in May 2023. These results support the hypothesis that the SSI for chloride at MW-80R is due to natural variation in groundwater quality. **Therefore, we accept the hypothesis that chloride concentrations observed at MW-80R are due to variability in natural conditions and are consistent with regional and Site background groundwater data.**

3.2.3 Fluoride at MW1-90

Source Hypothesis #2 was tested by comparing fluoride concentrations collected as part of several regional groundwater quality studies on the Cannonball Formation and associated units. A summary of the range of fluoride concentrations in the Cannonball Formation and associated units is included in Table 4 below.

Table 4 Fluoride Concentrations in Morton County, North Dakota

Reference	Fluoride Conc. Range	Formation/Units	Data Source Location
Ackerman, D.J., 1980. Ground-Water Resources of Morton County, North Dakota. North Dakota Geological Survey Bulletin 72, Part III. 51 p.	0.0 to 4.0 mg/L	Cannonball and Ludlow formations, undifferentiated	Morton County
Crosby, O.A. and Klausing, R.L., 1984. Hydrology of Area 47, Northern Great Plains and Rocky Mountain Coal Provinces, North Dakota, South Dakota, and Montana. USGS Water-Resources Investigations Open-File Report 83-221, 93 p.	0.1 to 6.3 mg/L	Entire Fort Union Formation (includes Cannonball Formation)	Morton County

The Ackerman study provides summary statistics for the fluoride concentrations observed in Morton County. Forty-six samples were analyzed for fluoride; of those, 20 (or 43%) had concentrations greater than 1.3 mg/L (Ackerman, 1980). The fluoride concentration observed at MW1-90 in May 2023 (1.21 mg/L) is within the range of values consistent with naturally occurring concentrations of fluoride associated with the Cannonball Formation in Morton County. However, a statistically significant increasing trend for fluoride at MW1-90 was observed. Therefore, we accept the hypothesis that fluoride concentrations observed at MW1-90 are consistent with regional (background) groundwater data; however, additional source considerations were evaluated, as described in Section 3.3.

3.3 Source Hypothesis #3: Evaporation Pond Release

Two conditions are necessary to accept the hypothesis that a release of Evaporation Pond water is the source of one or more of the SSIs: (1) mechanism of release (such as an issue with the Evaporation Pond liner integrity) and (2) geochemically similar groundwater chemistry at one or more of the potentially impacted wells with water from the Evaporation Pond. Based on proximity, only the SSI observed at MW1-90 (fluoride) is being evaluated for this potential source.

3.3.1 Fluoride at MW1-90

A statistically significant increasing trend in fluoride was observed at MW1-90 following the May 2023 detection monitoring event. Past ASD Reports (Barr, 2020; Barr, 2021; Barr, 2022) attributed elevated TDS concentrations at MW-104 to either natural conditions or a release from the Evaporation Pond. MW-104 is located between the CCR unit and the Evaporation Pond (a non-CCR unit), approximately 225 feet southwest of MW1-90, which is located north of the Evaporation Pond. The Evaporation Pond was

designed and constructed to collect surface water run-off from the Site as well as leachate from the CCR Unit. It is not a CCR unit as defined in § 257.53. Due to the relative proximity of MW1-90 to the Evaporation Pond and MW-104, an evaluation was conducted to assess the Evaporation Pond liner integrity and potential impacts to downgradient wells and determine the geochemical feasibility of Evaporation Pond water contributing to the conditions observed at MW1-90.

Liner Integrity Evaluation

In the 2010 Annual Report for the Special Waste Disposal Permit (SP-087), it was noted that erosion was encountered at the Evaporation Pond. More specifically, "cuts in the banks of the pond ranged from 8 to 24-inches. Erosion was caused from storm water running into the evaporation pond from closed Slots and the haul road" (MDU, 2011). No repairs were made at that time due to standing water in the pond. Similar erosional features were noted in the 2011 and 2012 Annual Reports, citing erosion cuts of 8 to 48 inches (MDU, 2012; MDU, 2013). These erosion cuts were repaired in 2013 during the construction of Slot 10. Additionally, the 2013 Annual Report stated that "the west wall of the evaporation pond was raised and graded to reroute storm water that accumulates outside of the ash disposal area from the cover of Phase I ash disposal site away from the pond during rain events" (MDU, 2014).

These reports did not specify if the erosional cuts were 8 to 48 inches wide or 8 to 48 inches deep. Based on the Phase I Development "as-constructed" Plan Sheets (January and November 1990), the Evaporation Pond was built with a 3-foot-thick compacted clay liner (MDU, 1989, Exhibit 6-B). If the erosional cuts were up to 48 inches deep, then the cuts would extend through the entirety of the liner thickness, creating a conduit for Evaporation Pond water to enter the groundwater. Additionally, no details were provided on the materials used for repairing the Evaporation Pond (i.e., if the liner was impacted, whether the erosion cuts were filled in with a comparable clay liner material).

Additionally, the integrity of the Evaporation Pond liner may have been compromised due to cation exchange. Time series plots of groundwater quality at well MW1-90 (Appendix F) show an increase in sodium; this increase is most apparent at MW1-90 between 2012 and 2021. The Evaporation Pond liner may be composed of a clay with sodium as its main interlayer cation (e.g., sodium-montmorillonite and/or sodium-bentonite, which are common in the area (Groenewold et al., 1983)), and cation exchange processes can occur between the sodium in the clay and positively charged cations concentrated in the Evaporation Pond water (calcium, magnesium, potassium, and aluminum), increasing the concentration of dissolved sodium as it is released from the clay structure. Over time this exchange may decrease swelling potential and increase hydraulic conductivity of the clay constituting the pond liner, resulting in increased leakage of Evaporation Pond water.

Potential Downgradient Effects

The base of the Evaporation Pond sits at approximately 1675 feet above MSL, whereas historical groundwater elevations in MW-104 and MW1-90 remain below 1675 feet MSL. Therefore, any water leaking from the Evaporation Pond would move radially outward from the pond through the unsaturated zone downward into the groundwater, toward both MW-104 and MW1-90, reaching both wells downgradient of the Pond.

Groundwater monitoring data have consistently been collected from MW1-90 since 1990. As seen in the time series plots (Appendix F; 1990-2023), in approximately 2010 the concentrations of chloride, sulfate, TDS, magnesium, sodium, and specific conductance at MW1-90 began increasing more rapidly. To a lesser extent, changes in concentrations were observed around this same time for potassium, nitrogen, and total alkalinity. This timing corresponds to when the erosional cuts at the Evaporation Pond were first observed in the Annual Monitoring Reports. The increasing trends have continued, despite reports of the erosional cuts being repaired in 2013, except for chloride, which has since leveled off.

Geochemical Feasibility

A simple mixing model was developed in April 2019 (Barr, 2020) to determine the potential of producing a similar water quality to that observed at MW-104 and MW1-90 when mixing Evaporation Pond water with unimpacted upgradient water. This mixing model was conducted in Geochemist's Workbench® v.12.0, using data from water samples collected from the Evaporation Pond and upgradient monitoring well MW-103. The mixing model assumes a starting concentration equal to the upgradient groundwater concentrations and then iteratively mixes it with incremental amounts of Evaporation Pond water. The upgradient groundwater concentrations used in the model were from a sample from upgradient monitoring well MW-103 collected in April 2019, which is assumed to represent the long-term composition of groundwater in that vicinity due to the fairly stable concentrations of major ions exhibited in samples from MW-103 (Barr, 2020). The Evaporation Pond concentrations used in the model were from a sample collected from the pond in September 2014, which is assumed for the purposes of the model to represent a typical Evaporation Pond water composition during the period when the pond liner was compromised.

The results of the model are provided in Appendix G. Figure G.1 shows the results of the mixing model on a Piper diagram. Downgradient wells MW-104 and MW1-90 are shown as gray and green diamonds, respectively. The blue line represents the various possible outcomes when mixing the upgradient water (represented by a blue triangle) with the Evaporation Pond (represented by a red circle). The black circles represent specific proportions (1-part upgradient water to 0.01-, 0.05-, 0.1-, 0.5-, and 1-part Evaporation Pond water). Figure G.2 shows the results as Stiff plots. Table G.1 provides the numerical inputs and results of the various mixing proportions.

As shown on Figure G.1, the downgradient well compositions are similar to the chemistry anticipated if the Evaporation Pond is mixing with upgradient groundwater emanating from the proximity of monitoring well MW-103. The path of the mixing reaction from MW-103 to the Evaporation Pond transects MW1-90 when 1-part upgradient (MW-103) water is mixed with as little as 0.05-part Evaporation Pond water. Therefore, it appears plausible that a relatively small portion of Evaporation Pond water would be needed to "impact" groundwater from upgradient to get a similar chemistry as observed downgradient in MW1-90. The geometry of the Stiff plots in Figure G.2 shows the similarity in ionic composition in the mixing models.

Recorded measurements of fluoride concentrations in the Evaporation Pond have generally been low (<0.3 mg/L), and therefore a release from the Evaporation Pond is unlikely to be a direct source of fluoride to groundwater. However, the Evaporation Pond water has several characteristics that can lead to the

release of fluoride from clays and other minerals in aquifer sediments. The pH of the Evaporation Pond is high (≥10), meaning that the water has a high concentration of hydroxide ions. Hydroxide and fluoride have similar ionic radii and charge. Mineralogically, this means that fluoride can easily substitute for hydroxide within mineral structures. In addition, fluoride can sorb to clay, particularly in slightly acidic conditions. A release of high-pH water provides ample hydroxide that can replace fluoride in mineral structures and cause the desorption of fluoride from clay minerals, leading to an increase in fluoride concentrations in groundwater (Edmunds and Smedley, 2013; McMahon et al., 2020).

Based on the description of erosional features extending upwards of 48 inches into the liner of the Evaporation Pond in 2010-2013, corresponding with the increased concentrations of several parameters observed in downgradient monitoring well MW1-90, it is possible that a release from the Evaporation Pond occurred starting in approximately 2011. Furthermore, the results of the geochemical model along with the general proximity and hydraulic position of MW1-90 relative to the Evaporation Pond support the hypothesis that the SSI for fluoride at MW1-90 are due to a "source other than the CCR unit."

Therefore, we accept the hypothesis that the fluoride concentration observed at MW1-90 is consistent with a potential release from the Evaporation Pond, a non-CCR unit.

3.4 Source Hypothesis #4: Statistical Methods (bias due to use of MW-13 for upgradient background instead of MW-44R and MW-103)

The data from upgradient MW-13 forms the interwell prediction limit used as the basis for the chloride and calcium SSIs at MW-80R. While MW-13 serves as an adequate upgradient well for the majority of the Site, there is heterogeneity in all geologic environments that cannot be captured by a single upgradient well. Therefore a hypothesis for the SSI at MW-80R is that the exclusion of MW-44R and MW-103 from the background data set may have resulted in bias in the background data that under represents the stastistical variation in chloride and calcium concentrations.

In 2022, the Site received a new permit from the North Dakota Department of Environmental Quality (NDDEQ). Under the previous permit, the monitoring network included seven upgradient wells to define background rather than the one upgradient well (MW-13) included in the current network. The historical background concentrations from these six additional wells indicate a higher degree of heterogeneity than is represented stasticically by MW-13 alone. Two wells in particular (MW-44/MW-44R and MW-103) have shown consistently high concentrations in chloride and calcium that indicate a bias toward lower concentrations for both parameters due to the selection of MW-13 as the lone background well.

In order to better understand the range of background concentrations, the maximum and median concentrations measured in the seven background wells while the previous groundwater monitoring system was operating are shown above in Table 3.

The data in Table 3 indicate that higher chloride and calcium concentrations than that leading to the May 2023 SSI have been measured in upgradient/background wells at the Site. In addition, chloride concentrations near the location of upgradient MW-44 have historically ranged as high as 558 mg/L.

Similarly, calcium concentrations near MW-103 have historically ranged as high as 600 mg/L Both upgradient wells have higher concentrations than the maximum cited above for MW-80R in the 2016-2021 data. The median value shows that pooling of the upgradient data hides the influence of higher upgradient chloride concentrations that have been documented at the Site in the background. **Therefore, we accept the hypothesis that chloride and calcium concentrations observed at MW-80R are a statistical artifact related to the selection of MW-13 as an upgradient well which has shown lower concentrations of chloride than MW-44R and calcium than MW-103.**

4 Conclusions

Three SSIs were identified from the May 2023 detection monitoring event. This report demonstrates that a "source other than the CCR unit" caused the SSIs (natural variation in background and/or pre-landfill groundwater quality and the Evaporation Pond), as allowed by §257.94(e)(2). The results of this alternative source demonstration are summarized in Table 5 below.

Table 5 Summary of SSIs and Alternative Sources

Well	Parameter	Report Section	Evidence for Alternative Source
MW-80R	Calcium	3.2.1, 3.4	Natural variation (pre-landfill values, upgradient groundwater, and geologic background) and statistical methods
MW-80R	Chloride	3.2.2, 3.4	Natural variation (pre-landfill values, upgradient groundwater, and geologic background) and statistical methods
MW1-90	Fluoride	3.2.3, 3.3.1	Natural variation and/or Other (Evaporation Pond, a non-CCR unit)

Based on the foregoing, the alternative source demonstration presented herein meets the requirements of CCR Rule § 257.94(e)(2).

5 References

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- Montana-Dakota Utilities Co. (MDU), 1989, R.M. Heskett Station Special Use Disposal Site Permit Application. Submitted to North Dakota State Department of Health, March 1, 1989.
- US EPA, 2015, Hazardous and Solid Waste Management Systems; Management of Coal Combustion Residuals from Electric Utility, CFR Parts 257 and 261, Federal Register, Vol. 80, No. 74, April 17, 2015.

Figures

Figure 1 Site Layout and CCR Monitoring Well Network

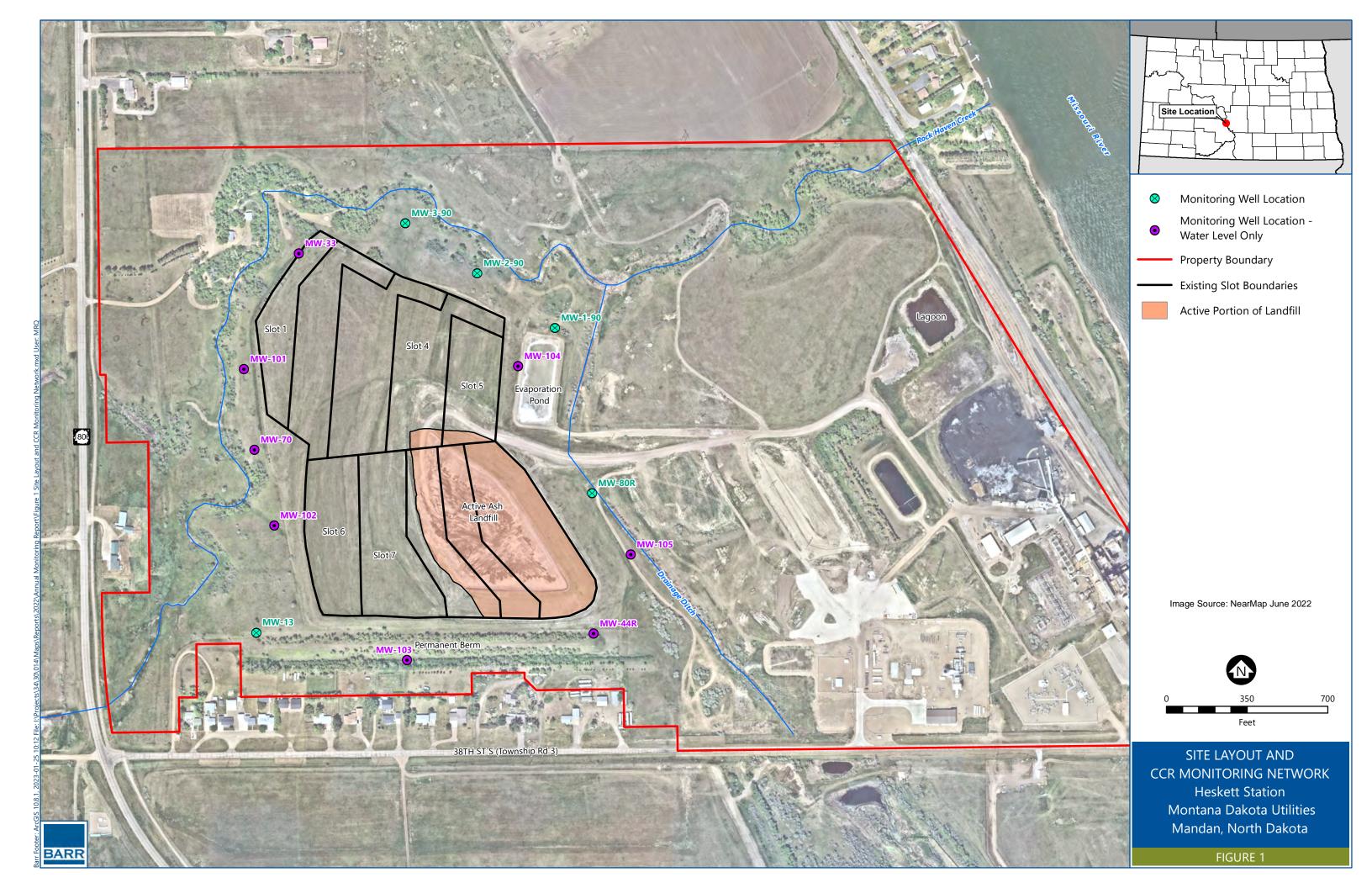
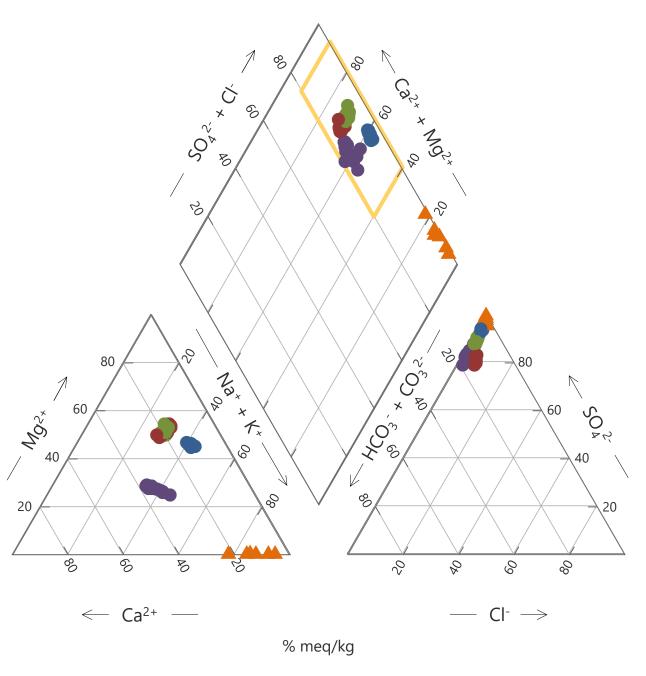
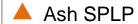


Figure 2 Piper Plot: Alternative Source Demonstration





- MW1-90
- MW2-90
- MW3-90
- MW80R
- Upgradient Range

Figure 2
PIPER PLOT: ALTERNATIVE
SOURCE DEMONSTRATION
R.M. Heskett Station
Mandan, North Dakota



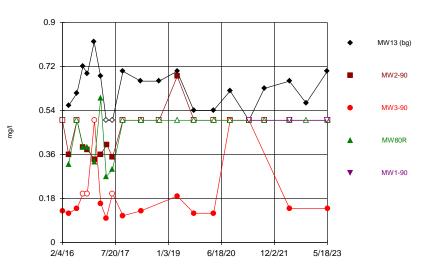
Appendices

Appendix A

Appendix III Time Series Plots

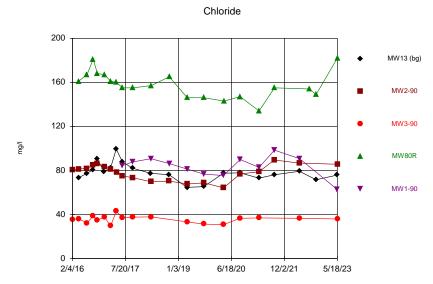
Appendix A Appendix III Time Series Plots





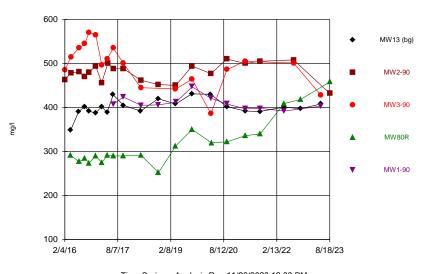
Time Series Analysis Run 11/20/2023 12:33 PM R.M. Heskett Station Client: Montana-Dakota Utilities Co. Data: Heskett_SanitasAppIII_new

$Sanitas^{\text{\tiny{IM}}} \text{ v.9.6.37 For the statistical analyses of ground water by Barr Engineering Company only. } \textbf{UG}$



Time Series Analysis Run 11/20/2023 12:33 PM
R.M. Heskett Station Client: Montana-Dakota Utilities Co. Data: Heskett_SanitasAppIII_new

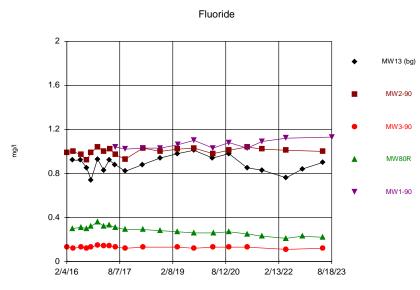
Calcium, Total



Time Series Analysis Run 11/20/2023 12:33 PM

R.M. Heskett Station Client: Montana-Dakota Utilities Co. Data: Heskett SanitasAppIII_new

Sanitas™ v.9.6.37 For the statistical analyses of ground water by Barr Engineering Company only. UG



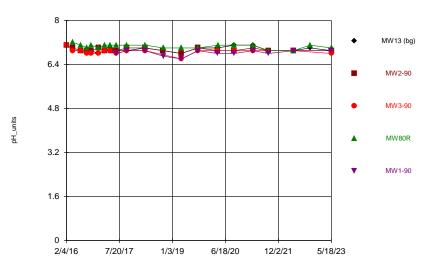
Time Series Analysis Run 11/20/2023 12:33 PM

R.M. Heskett Station Client: Montana-Dakota Utilities Co. Data: Heskett SanitasAppIII_new

Sanitas™ v.9.6.37 For the statistical analyses of ground water by Barr Engineering Company only. UG





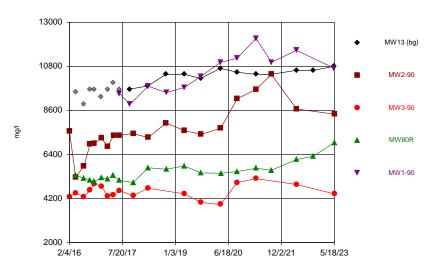


Time Series Analysis Run 11/20/2023 12:33 PM

R.M. Heskett Station Client: Montana-Dakota Utilities Co. Data: Heskett_SanitasApplII_new

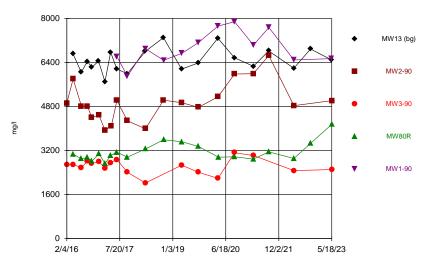
Sanitas™ v.9.6.37 For the statistical analyses of ground water by Barr Engineering Company only. UG

Total Dissolved Solids



Time Series Analysis Run 11/20/2023 12:33 PM
R.M. Heskett Station Client: Montana-Dakota Utilities Co. Data: Heskett_SanitasAppIII_new

Sulfate



Time Series Analysis Run 11/20/2023 12:33 PM

R.M. Heskett Station Client: Montana-Dakota Utilities Co. Data: Heskett SanitasAppIII_new

Appendix B

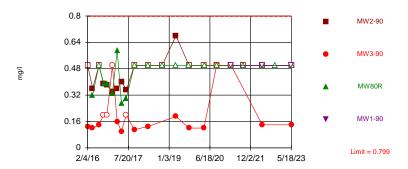
Prediction Limit Plots

Appendix B Prediction Limit Plots

 ${\it Sanitas}^{\it w}\,v.9.6.37\,{\it For the statistical analyses}\,{\it of ground water by Barr Engineering Company only}.\,{\it UG}\,{\it Hollow symbols indicate censored values}.$

Within Limit Boron

Interwell Parametric



Background Data Summary (after Kaplan-Meier Adjustment): Mean=0.6095, Std. Dev.=0.09284, n=17, 17.65% NDs. Seasonality was not detected with 95% confidence. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9408, critical = 0.892. Kappa = 2.04 (c=7, w=4, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Individual comparison alpha = 0.00188. Comparing 4 points to limit.

Prediction Limit Analysis Run 11/20/2023 12:35 PM

R.M. Heskett Station Client: Montana-Dakota Utilities Co. Data: Heskett_SanitasAppIII_new

Chloride

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2/4/16 7/20/17

Exceeds Limit: MW80R

Interwell Parametric 200 160 MW3-90 120 80 MW80R

1/3/19

Background Data Summary: Mean=78.76, Std. Dev.=8.397, n=17. Seasonality was not detected with 95% confidence. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9338, critical = 0.892. Kappa = 2.04 (c=7, w=4, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Individual comparison alpha = 0.00188. Comparing 4 points to limit.

12/2/21

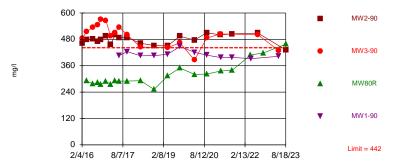
5/18/23

6/18/20

Limit = 95.9

Sanitas™ v.9.6.37 For the statistical analyses of ground water by Barr Engineering Company only. UG





Background Data Summary: Mean=400.7, Std. Dev.=20.06, n=17. Seasonality was not detected with 95% confidence. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.8935, critical = 0.892. Kappa = 2.04 (c=7, w=4, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Individual comparison alpha = 0.00188. Comparing 4 points to limit.

Prediction Limit Analysis Run 11/20/2023 12:35 PM

R.M. Heskett Station Client: Montana-Dakota Utilities Co. Data: Heskett_SanitasAppIII_new

Sanitas™ v.9.6.37 For the statistical analyses of ground water by Barr Engineering Company only. UG

2/4/16

8/7/17

2/8/19

Exceeds Limit: MW1-90

Fluoride
Interwell Parametric

MW2-90

MW3-90

MW80R

MW1-90

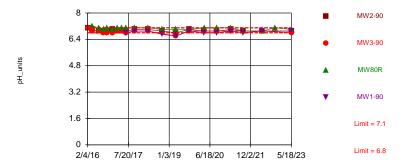
Limit = 1.04

Background Data Summary: Mean=0.8953, Std. Dev.=0.06956, n=17. Seasonality was not detected with 95% confidence. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9654, critical = 0.892. Kappa = 2.04 (c=7, w=4, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Individual comparison alpha = 0.00188. Comparing 4 points to limit.

8/12/20 2/13/22 8/18/23

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Within Limits pH, Field
Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.05 alpha level. Limits are highest and lowest of 17 background values. Annual perconstituent alpha = 0.08687. Individual comparison alpha = 0.01107 (1 of 2). Comparing 4 points to limit. Seasonality was not detected with 95% confidence.

Prediction Limit Analysis Run 11/20/2023 12:35 PM

R.M. Heskett Station Client: Montana-Dakota Utilities Co. Data: Heskett_SanitasAppIII_new

Total Dissolved Solids

Sanitas™ v.9.6.37 For the statistical analyses of ground water by Barr Engineering Company only. UG

2/4/16 7/20/17 1/3/19

Within Limit

16000 MW2-90
12000 MW8-90
14000 MW8-90

Background Data Summary: Mean=10276, Std. Dev.=332.5, n=9. Seasonality was not detected with 95% confidence. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.8605, critical = 0.829. Kappa = 2.447 (c=7, w=4, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Individual comparison alpha = 0.00188. Comparing 4 points to limit

6/18/20 12/2/21 5/18/23

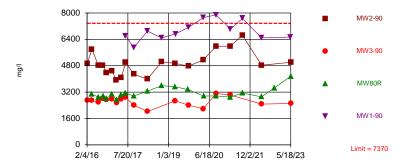
Limit = 11100

Prediction Limit Analysis Run 11/20/2023 12:36 PM

R.M. Heskett Station Client: Montana-Dakota Utilities Co. Data: Heskett SanitasAppIII new

Sanitas™ v.9.6.37 For the statistical analyses of ground water by Barr Engineering Company only. UG





Background Data Summary: Mean=6474, Std. Dev.=437, n=17. Seasonality was not detected with 95% confidence. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9637, critical = 0.892. Kappa = 2.04 (c=7, w=4, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Individual comparison alpha = 0.00188. Comparing 4 points to limit.

Prediction Limit Analysis Run 11/20/2023 12:35 PM

R.M. Heskett Station Client: Montana-Dakota Utilities Co. Data: Heskett_SanitasAppIII_new

Prediction Limit

R.M. Heskett Station Client: Montana-Dakota Utilities Co. Data: Heskett_SanitasAppIII_new Printed 11/20/2023, 12:37 PM

Constituent	Well	Upper Lim.	Lower Lim.	<u>Date</u>	Observ.	Sig.	<u>Bg 1</u>	N Bg Wells	Bg Mea	nStd. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
Boron (mg/l)	MW2-90	0.799	n/a	5/18/2023	0.5ND	No	17	MW13	0.6095	0.09284	17.65	Kapla	No	0.00188	Param Inter 1 of 2
Boron (mg/l)	MW3-90	0.799	n/a	5/18/2023	0.14	No	17	MW13	0.6095	0.09284	17.65	Kapla	No	0.00188	Param Inter 1 of 2
Boron (mg/l)	MW80R	0.799	n/a	5/18/2023	0.5ND	No	17	MW13	0.6095	0.09284	17.65	Kapla	No	0.00188	Param Inter 1 of 2
Boron (mg/l)	MW1-90	0.799	n/a	5/17/2023	0.5ND	No	17	MW13	0.6095	0.09284	17.65	Kapla	No	0.00188	Param Inter 1 of 2
Calcium, Total (mg/l)	MW2-90	442	n/a	8/18/2023	432	No	17	MW13	400.7	20.06	0	None	No	0.00188	Param Inter 1 of 2
Calcium, Total (mg/l)	MW3-90	442	n/a	5/18/2023	428	No	17	MW13	400.7	20.06	0	None	No	0.00188	Param Inter 1 of 2
Calcium, Total (mg/l)	MW80R	442	n/a	8/18/2023	458	Yes	17	MW13	400.7	20.06	0	None	No	0.00188	Param Inter 1 of 2
Calcium, Total (mg/l)	MW1-90	442	n/a	5/17/2023	403	No	17	MW13	400.7	20.06	0	None	No	0.00188	Param Inter 1 of 2
Chloride (mg/l)	MW2-90	95.9	n/a	5/18/2023	85.6	No	17	MW13	78.76	8.397	0	None	No	0.00188	Param Inter 1 of 2
Chloride (mg/l)	MW3-90	95.9	n/a	5/18/2023	35.9	No	17	MW13	78.76	8.397	0	None	No	0.00188	Param Inter 1 of 2
Chloride (mg/l)	MW80R	95.9	n/a	5/18/2023	182	Yes	17	MW13	78.76	8.397	0	None	No	0.00188	Param Inter 1 of 2
Chloride (mg/l)	MW1-90	95.9	n/a	5/17/2023	62.7	No	17	MW13	78.76	8.397	0	None	No	0.00188	Param Inter 1 of 2
Fluoride (mg/l)	MW2-90	1.04	n/a	5/18/2023	1	No	17	MW13	0.8953	0.06956	0	None	No	0.00188	Param Inter 1 of 2
Fluoride (mg/l)	MW3-90	1.04	n/a	5/18/2023	0.12	No	17	MW13	0.8953	0.06956	0	None	No	0.00188	Param Inter 1 of 2
Fluoride (mg/l)	MW80R	1.04	n/a	5/18/2023	0.22	No	17	MW13	0.8953	0.06956	0	None	No	0.00188	Param Inter 1 of 2
Fluoride (mg/l)	MW1-90	1.04	n/a	8/18/2023	1.13	Yes	17	MW13	0.8953	0.06956	0	None	No	0.00188	Param Inter 1 of 2
pH, Field (pH_units)	MW2-90	7.1	6.8	5/18/2023	6.9	No	17	MW13	n/a	n/a	0	n/a	n/a	0.01107	NP Inter (normality) 1 of 2
pH, Field (pH_units)	MW3-90	7.1	6.8	5/18/2023	6.8	No	17	MW13	n/a	n/a	0	n/a	n/a	0.01107	NP Inter (normality) 1 of 2
pH, Field (pH_units)	MW80R	7.1	6.8	5/18/2023	7	No	17	MW13	n/a	n/a	0	n/a	n/a	0.01107	NP Inter (normality) 1 of 2
pH, Field (pH_units)	MW1-90	7.1	6.8	5/17/2023	6.9	No	17	MW13	n/a	n/a	0	n/a	n/a	0.01107	NP Inter (normality) 1 of 2
Sulfate (mg/l)	MW2-90	7370	n/a	5/18/2023	5010	No	17	MW13	6474	437	0	None	No	0.00188	Param Inter 1 of 2
Sulfate (mg/l)	MW3-90	7370	n/a	5/18/2023	2510	No	17	MW13	6474	437	0	None	No	0.00188	Param Inter 1 of 2
Sulfate (mg/l)	MW80R	7370	n/a	5/18/2023	4150	No	17	MW13	6474	437	0	None	No	0.00188	Param Inter 1 of 2
Sulfate (mg/l)	MW1-90	7370	n/a	5/17/2023	6540	No	17	MW13	6474	437	0	None	No	0.00188	Param Inter 1 of 2
Total Dissolved Solids	MW2-90	11100	n/a	5/18/2023	8410	No	9	MW13	10276	332.5	0	None	No	0.00188	Param Inter 1 of 2
Total Dissolved Solids	MW3-90	11100	n/a	5/18/2023	4430	No	9	MW13	10276	332.5	0	None	No	0.00188	Param Inter 1 of 2
Total Dissolved Solids	MW80R	11100	n/a	5/18/2023	6990	No	9	MW13	10276	332.5	0	None	No	0.00188	Param Inter 1 of 2
Total Dissolved Solids	MW1-90	11100	n/a	5/17/2023	10700	No	9	MW13	10276	332.5	0	None	No	0.00188	Param Inter 1 of 2

Appendix C

Ash SPLP Laboratory Report (2011)

Appendix C Ash SPLP Laboratory Report (2011)



| MINNESOTA VALLEY TESTING LABORATORIES, INC.

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Page: 1 of 2

Report Date: 8 Sep 11 Lab Number: 11-M2450 Work Order #:81-818 Account #: 013479 Date Sampled:

Date Received: 28 Jun 11 9:00

PO #: 131460 OP

Duane Leingang Montana Dakota Utilities PO Box 40 Mandan ND 58554

Sample Description: Unit I Bottom Ash

Sample Site: MDU Heskett

	As Receive Result	ed	Method RL	Method Reference	Date Analyzed	Analyst
SPLP Extraction				1312	22 Jul 11	SS
рн	12.2	units	N/A	SM4500 H+ B	22 Jul 11 17:00	Claudette
Specific Conductance	8778	umhos/cm	N/A	SM2510-B	22 Jul 11 17:00	Claudette
Total Suspended Solids	3	mq/l	1	SM2540-D	22 Jul 11 14:00	CLB
Total Alkalinity	1120	mg/l CaCO3	4	SM2320-B	22 Jul 11 17:00	Claudette
Phenolphthalein Alk	1090	mg/l CaCO3	4	SM2320-B	22 Jul 11 17:00	Claudette
Bicarbonate	< 4	mg/l CaCO3	4	SM2320-B	22 Jul 11 17:00	Claudette
Carbonate	60	mg/l CaCO3	4	SM2320-B	22 Jul 11 17:00	Claudette
Hydroxide	1060	mg/l CaCO3	0	SM2320-B	22 Jul 11 17:00	Claudette
Tot Dis Solids (Summation)	4860	mg/1	NA	SM1030-F	3 Aug 11 8:40	Calculated
Total Hardness as CaCO3	524	mg/l	NA	SM2340-B	3 Aug 11 8:40	Calculated
Hardness in grains/gallon	30.7	gr/gal	NA	SM2340-B	3 Aug 11 8:40	Calculated
Cation Summation	74.3	meg/L	NA	SM1030-F	3 Aug 11 8:40	Calculated
Anion Summation	74.6	meq/L	NA	SM1030-F	28 Jul 11 14:30	Calculated
Percent Error	-0.24	स १	NA	SM1030-F	3 Aug 11 8:40	Calculated
Sodium Adsorption Ratio	27.1	·	NA	USDA 20b	3 Aug 11 8:40	Calculated
Gross Alpha Radiation	Attached	pCi/l			22 Aug 11 2:03	1
Radon 222	Attached	PO-7-			28 Jul 11 4:37	,
Radium 226	Attached	pCi/l			22 Aug 11 22:20)
Radium 228	Attached	pCi/l			16 Aug 11 16:50)
Total Organic Carbon	0.7	mg/1	0.5	SM5310-C	1 Aug 11 8:00) Eric
Fluoride	< 0.1	mg/l	0.10	SM4500-F-C	4 Aug 11 17:00	CLB
Sulfate	2440	mg/1	5.00	ASTM D516-02	27 Jul 11 9:00) KMP
Chloride	50.5	mg/1	1.0	SM4500-C1-E	27 Jul 11 14:00) KMP
Nitrate-Nitrite as N	0.21	mg/l	0.10	EPA 353.2	28 Jul 11 14:30) KMP
Ammonia-Nitrogen as N	0.32	mg/1	0.10	EPA 350.1	28 Jul 11 10:45	KMP
Phosphorus as P - Total	< 0.1	mg/l	0.10	EPA 365.1	28 Jul 11 13:00) KMP
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	28 Jul 11 8:00	Eric
Chemical Oxygen Demand	< 5	mg/l	5.0	HACH 8000	1 Aug 11 8:30) Wayne
Calcium - Total	210	mg/1	1.0	6010	3 Aug 11 8:40	Stacy
Magnesium - Total	< 2.5	mg/l	1.0	6010	3 Aug 11 8:40	Stacy
Sodium - Total	1440	mg/l	1.0	6010	3 Aug 11 8:40) Stacy
Potassium - Total	44.8	mg/l	1.0	6010	3 Aug 11 8:40	Stacy
Aluminum - Total	< 0.5	mg/1	0.10	6010	2 Aug 11 9:30	Stacy
Iron - Total	< 0.5	mg/l	0.10	6010	2 Aug 11 9:30	4
Strontium - Total	28.2	mg/l	0.10	6010	2 Aug 11 9:30	4
Titanium - Total	< 0.5	mg/l	0.10	6010	2 Aug 11 9:30	
Boron - Total	< 0.5	mg/l	0.10	6010	11 Aug 11 8:40	4
BOLOH - IOCAL	- 0.3	3/ -			3	-

RL = Method Reporting Limit

Elevated "Less Than Result" (<): @= Due to sample matrix != Due to sample quantity

= Due to sample concentration
+ = Due to extract volume

CERTIFICATION: MN LAB # 038-999-267

ND # ND-00016



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Report Date: 8 Sep 11 Lab Number: 11-M2450 Work Order #:81-818 Account #: 013479

Date Sampled:

Date Received: 28 Jun 11 9:00

PO #: 131460 OP

Duane Leingang Montana Dakota Utilities PO Box 40 Mandan ND 58554

Sample Description: Unit I Bottom Ash

Sample Site: MDU Heskett

	As Receiv Result	ed	Method RL	Method Reference	Date Analyzed	Analyst
Antimony - Total	< 0.002	mg/l	0.0020	6020	25 Jul 11 16:18	Claudette
Arsenic - Total	0.0044	mg/l	0.0020	6020	25 Jul 11 16:18	Claudette
Barium - Total	0.1135	mg/l	0.0020	6020	25 Jul 11 16:18	Claudette
Beryllium - Total	< 0.001	mg/l	0.0010	6020	25 Jul 11 16:18	Claudette
Cadmium - Total	0.00164	mg/l	0.00100	6020	25 Jul 11 16:18	Claudette
Chromium - Total	0.0065	mg/l	0.0020	6020	25 Jul 11 16:18	Claudette
Cobalt - Total	< 0.002	mg/l	0.0020	6020	25 Jul 11 16:18	Claudette
Copper - Total	0.0213	mg/l	0.0020	6020	25 Jul 11 16:18	Claudette
Lead - Total	< 0.002	mg/l	0.0020	6020	25 Jul 11 16:18	Claudette
Manganese - Total	0.0027	mg/l	0.0010	6020	25 Jul 11 16:18	Claudette
Molybdenum - Total	0.6860	mg/l	0.0020	6020	26 Jul 11 12:46	Claudette
Nickel - Total	0.0074	mg/l	0.0020	6020	25 Jul 11 16:18	Claudette
Selenium - Total	0.0133	mg/l	0.0020	6020	26 Jul 11 9:46	Claudette
Silver - Total	< 0.001	mg/l	0.0010	6020	25 Jul 11 16:18	Claudette
Thallium - Total	< 0.002	mg/l	0.0020	6020	25 Jul 11 16:18	Claudette
Tin - Total	< 0.05	mg/l	0.0500	6020	25 Jul 11 16:18	Claudette
Vanadium - Total	0.0189	mg/l	0.0020	6020	25 Jul 11 16:18	Claudette
Zinc - Total	0.0151	mg/l	0.0100	6020	25 Jul 11 16:18	Claudette
Uranium	< 0.002	mg/l	0.002	6020	25 Jul 11 16:18	Claudette

All analyses were performed on the extract from Method 1312 (SPLP) with a modified solution to solids ratio of 4:1.

Approved by:

RL = Method Reporting Limit

= Due to sample concentration
+ = Due to extract volume

CERTIFICATION: MN LAB # 038-999-267

ND # ND-00016



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Page:

1 of 2

Report Date: 8 Sep 11 Lab Number: 11-M2451 Work Order #:81-818 Account #: 013479

Date Sampled:

Date Received: 28 Jun 11 9:00

PO #: 131460 OP

Duane Leingang Montana Dakota Utilities PO Box 40 Mandan ND 58554

Sample Description: Unit II Sand Ash

Sample Site: MDU Heskett

	As Receive Result	ed	Method RL	Method Reference	Date Analyzed	Analyst
SPLP Extraction				1312	22 Jul 11	SS
рН	11.1	units	N/A	SM4500 H+ B	22 Jul 11 17:00	Claudette
Specific Conductance	20110	umhos/cm	N/A	SM2510-B	22 Jul 11 17:00	Claudette
Total Suspended Solids	21	mg/l	1	SM2540-D	22 Jul 11 14:00	CLB
Total Alkalinity	203	mg/l CaCO3	4	SM2320-B	22 Jul 11 17:00	
Phenolphthalein Alk	171	mg/l CaCO3	4	SM2320-B	22 Jul 11 17:00	
Bicarbonate	< 4	mg/l CaCO3	4	SM2320-B	22 Jul 11 17:00	Claudette
Carbonate	64	mg/l CaCO3	4	SM2320-B	22 Jul 11 17:00	
Hydroxide	139	mg/l CaCO3	0	SM2320-B	22 Jul 11 17:00	
Tot Dis Solids (Summation)	22500	mg/l	NA	SM1030-F	3 Aug 11 8:40	
Total Hardness as CaCO3	1200	mg/l	NA	SM2340-B	3 Aug 11 8:40	
Hardness in grains/gallon	70.2	gr/gal	NA	SM2340-B	3 Aug 11 8:40	
Cation Summation	318	meq/L	NA	SM1030-F	3 Aug 11 8:40	
Anion Summation	314	meq/L	NA	SM1030-F	28 Jul 11 14:30	
Percent Error	0.65	8	NA	SM1030-F	3 Aug 11 8:40	
Sodium Adsorption Ratio	80.9		NA	USDA 20b	3 Aug 11 8:40	
Gross Alpha Radiation	Attached	pCi/l			22 Aug 11 2:03	
Radon 222	See Attacl	hed			28 Jul 11 4:37	
Radium 226	Attached	pCi/l			22 Aug 11 22:20	
Radium 228	Attached	pCi/l			16 Aug 11 16:50	
Total Organic Carbon	< 0.5	mg/l	0.5	SM5310-C	1 Aug 11 8:00	
Fluoride	< 0.1	mg/l	0.10	SM4500-F-C	4 Aug 11 17:00	
Sulfate	14900	mg/l	5.00	ASTM D516-02	27 Jul 11 9:00	
Chloride	2.0	mg/l	1.0	SM4500-C1-E	27 Jul 11 14:00	
Nitrate-Nitrite as N	< 0.1	mg/l	0.10	EPA 353.2	28 Jul 11 14:30	KMP
Ammonia-Nitrogen as N	0.10	mg/l	0.10	EPA 350.1	28 Jul 11 10:45	
Phosphorus as P - Total	< 0.1	mg/l	0.10	EPA 365.1	28 Jul 11 13:00	
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	28 Jul 11 8:00	Eric
Chemical Oxygen Demand	< 5	mg/l	5.0	HACH 8000	1 Aug 11 8:30	4
Calcium - Total	481	mg/l	1.0	6010	3 Aug 11 8:40	4
Magnesium - Total	< 5	mg/l	1.0	6010	3 Aug 11 8:40	
Sodium - Total	6500	mg/l	1.0	6010	3 Aug 11 8:40	Stacy
Potassium - Total	459	mg/l	1.0	6010	3 Aug 11 8:40	Stacy
Aluminum - Total	1.09	mg/l	0.10	6010	2 Aug 11 9:30	Stacy
Iron - Total	< 1	mg/l	0.10	6010	2 Aug 11 9:30	Stacy
Strontium - Total	66.0	mg/l	0.10	6010	2 Aug 11 9:30	Stacy
Titanium - Total	< 1	mg/l	0.10	6010	2 Aug 11 9:30	Stacy
Boron - Total	5.96	mg/l	0.10	6010	11 Aug 11 8:40	Stacy

RL = Method Reporting Limit

Elevated "Less Than Result" (<): @= Due to sample matrix != Due to sample quantity

= Due to sample concentration
+ = Due to extract volume

CERTIFICATION: MN LAB # 038-999-267

ND # ND-00016



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PO Box 40

Mandan ND 58554

Page: 2 of 2

Report Date: 8 Sep 11 Lab Number: 11-M2451 Work Order #:81-818 Account #: 013479

Date Sampled:

Date Received: 28 Jun 11 9:00

PO #: 131460 OP

Sample Description: Unit II Sand Ash

Sample Site: MDU Heskett

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
	Result		KII	Reference	121017 200	12102/20
Antimony - Total	< 0.002	mg/l	0.0020	6020	25 Jul 11 16:18	Claudette
Arsenic - Total	0.0822	mg/l	0.0020	6020	25 Jul 11 16:18	Claudette
Barium - Total	0.0930	mg/l	0.0020	6020	25 Jul 11 16:18	Claudette
Beryllium - Total	< 0.001	mg/l	0.0010	6020	25 Jul 11 16:18	Claudette
Cadmium - Total	0.00182	mg/l	0.00100	6020	25 Jul 11 16:18	Claudette
Chromium - Total	0.0244	mg/l	0.0020	6020	25 Jul 11 16:18	Claudette
Cobalt - Total	< 0.002	mg/1	0.0020	6020	25 Jul 11 16:18	Claudette
Copper - Total	0.1108	mg/l	0.0020	6020	25 Jul 11 16:18	Claudette
Lead - Total	< 0.002	mg/l	0.0020	6020	25 Jul 11 16:18	Claudette
Manganese - Total	0.0052	mg/l	0.0010	6020	25 Jul 11 16:18	Claudette
Molybdenum - Total	0.1000	mg/l	0.0020	6020	26 Jul 11 12:46	Claudette
Nickel - Total	0.0136	mg/l	0.0020	6020	25 Jul 11 16:18	Claudette
Selenium - Total	0.0937	mg/l	0.0020	6020	26 Jul 11 9:46	Claudette
Silver - Total	< 0.001	mg/l	0.0010	6020	25 Jul 11 16:18	Claudette
Thallium - Total	< 0.002	mg/l	0.0020	6020	25 Jul 11 16:18	Claudette
Tin - Total	< 0.05	mg/l	0.0500	6020	25 Jul 11 16:18	Claudette
Vanadium - Total	0.3026	mg/l	0.0020	6020	25 Jul 11 16:18	Claudette
Zinc - Total	0.0327	mg/l	0.0100	6020	25 Jul 11 16:18	Claudette
Uranium	< 0.002	mg/l	0.002	6020	25 Jul 11 16:18	Claudette

All analyses were performed on the extract from Method 1312 (SPLP) with a modified solution to solids ratio of 4:1.

Approved by:

RL = Method Reporting Limit

Elevated "Less Than Result" (<): @ = Due to sample matrix ! = Due to sample quantity

= Due to sample concentration
+ = Due to extract volume

CERTIFICATION: MN LAB # 038-999-267



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Report Date: 8 Sep 11 Lab Number: 11-M2452 Work Order #:81-818 Account #: 013479 Date Sampled:

Date Received: 28 Jun 11 9:00

PO #: 131460 OP

Duane Leingang Montana Dakota Utilities PO Box 40 Mandan ND 58554

Sample Description: Unit I Fly Ash

Sample Site: MDU Heskett

	As Receive Result	ed	Method RL	Method Reference	Date Analyzed	Analyst
SPLP Extraction				1312	22 Jul 11	SS
рн	12.9	units	N/A	SM4500 H+ B	22 Jul 11 17:00	Claudette
Specific Conductance	50660	umhos/cm	N/A	SM2510-B	22 Jul 11 17:00	Claudette
Total Suspended Solids	30	mg/l	1	SM2540-D	22 Jul 11 14:00	CLB
Total Alkalinity	7020	mg/l CaCO3	4	SM2320-B	25 Jul 11 17:00	Claudette
Phenolphthalein Alk	6900	mg/l CaCO3	4	SM2320-B	25 Jul 11 17:00	
Bicarbonate	< 4	mg/l CaCO3	4	SM2320-B	25 Jul 11 17:00	Claudette
Carbonate	240	mg/l CaCO3	4	SM2320-B	25 Jul 11 17:00	
Hydroxide	6780	mg/l CaCO3	0	SM2320-B	25 Jul 11 17:00	
Tot Dis Solids (Summation)	42200	mg/l	NA	SM1030-F	3 Aug 11 8:40	
Total Hardness as CaCO3	1750	mg/l	NA	SM2340-B	3 Aug 11 8:40	
Hardness in grains/gallon	102	gr/gal	NA	SM2340-B	3 Aug 11 8:40	
Cation Summation	663	meg/L	NA	SM1030-F	3 Aug 11 8:40	
Anion Summation	613	meg/L	NA	SM1030-F	28 Jul 11 14:30	
Percent Error	3.99	8	NA	SM1030-F	3 Aug 11 8:40	
Sodium Adsorption Ratio	143		NA	USDA 20b	3 Aug 11 8:40	Calculated
Gross Alpha Radiation	Attached	pCi/l			22 Aug 11 2:03	
Radon 222	Attached	-			28 Jul 11 4:37	
Radium 226	Attached	pCi/l			22 Aug 11 22:20	
Radium 228	Attached	pCi/1			16 Aug 11 16:50	
Total Organic Carbon	1.5	mg/l	0.5	SM5310-C	1 Aug 11 8:00	
Fluoride	5.60	mg/l	0.10	SM4500-F-C	10 Aug 11 17:00	
Sulfate	22600	mg/l	5.00	ASTM D516-02	27 Jul 11 9:00	
Chloride	53.8	mg/l	1.0	SM4500-Cl-E	27 Jul 11 14:00	
Nitrate-Nitrite as N	0.68	mg/l	0.10	EPA 353.2	28 Jul 11 14:30	
Ammonia-Nitrogen as N	7.22	mg/l	0.10	EPA 350.1	28 Jul 11 10:45	
Phosphorus as P - Total	< 0.1	mg/l	0.10	EPA 365.1	28 Jul 11 13:00	
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	28 Jul 11 8:00	Eric
Chemical Oxygen Demand	22.4	mg/1	5.0	HACH 8000	1 Aug 11 8:30	Wayne
Calcium - Total	700	mg/l	1.0	6010	3 Aug 11 8:40	Stacy
Magnesium - Total	< 25	mg/l	1.0	6010	3 Aug 11 8:40	Stacy
Sodium - Total	14100	mg/l	1.0	6010	3 Aug 11 8:40	Stacy
Potassium - Total	580	mg/1	1.0	6010	3 Aug 11 8:40	Stacy
Aluminum - Total	< 5	mg/l	0.10	6010	2 Aug 11 9:30	Stacy
Iron - Total	< 5	mg/l	0.10	6010	2 Aug 11 9:30	Stacy
Strontium - Total	59.5	mg/l	0.10	6010	2 Aug 11 9:30	Stacy
Titanium - Total	< 5	mg/l	0.10	6010	2 Aug 11 9:30	Stacy
Boron - Total	1.89	mg/l	0.10	6010	11 Aug 11 8:40	Stacy

RL = Method Reporting Limit

Elevated "Less Than Result" (<): @ = Due to sample matrix ! = Due to sample quantity

Due to sample concentration
+ Due to extract volume

CERTIFICATION: MN LAB # 038-999-267



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Report Date: 8 Sep 11 Lab Number: 11-M2452 Work Order #:81-818 Account #: 013479

Date Sampled:

Date Received: 28 Jun 11 9:00

PO #: 131460 OP

Duane Leingang Montana Dakota Utilities PO Box 40 Mandan ND 58554

Sample Description: Unit I Fly Ash

Sample Site: MDU Heskett

	As Receive Result	ed	Method RL	Method Reference	Date Analyzed	Analyst
Antimony - Total	< 0.002	mg/l	0.0020	6020	25 Jul 11 16:18	Claudette
Arsenic - Total	0.1128	mg/l	0.0020	6020	25 Jul 11 16:18	Claudette
Barium - Total	0.0906	mg/l	0.0020	6020	25 Jul 11 16:18	Claudette
Beryllium - Total	< 0.001	mg/l	0.0010	6020	25 Jul 11 16:18	Claudette
Cadmium - Total	0.00244	mg/l	0.00100	6020	25 Jul 11 16:18	Claudette
Chromium - Total	0.0270	mg/l	0.0020	6020	25 Jul 11 16:18	Claudette
Cobalt - Total	< 0.002	mg/l	0.0020	6020	25 Jul 11 16:18	Claudette
Copper - Total	0.2934	mg/l	0.0020	6020	25 Jul 11 16:18	Claudette
Lead - Total	0.0161	mg/l	0.0020	6020	25 Jul 11 16:18	Claudette
Manganese - Total	0.0102	mg/l	0.0010	6020	25 Jul 11 16:18	Claudette
Molybdenum - Total	0.9246	mg/l	0.0020	6020	26 Jul 11 12:46	Claudette
Nickel - Total	0.0175	mg/l	0.0020	6020	25 Jul 11 16:18	Claudette
Selenium - Total	0.1959	mg/l	0.0020	6020	26 Jul 11 9:46	Claudette
Silver - Total	< 0.001	mg/l	0.0010	6020	25 Jul 11 16:18	Claudette
Thallium - Total	< 0.002	mg/l	0.0020	6020	25 Jul 11 16:18	Claudette
Tin - Total	< 0.05	mg/l	0.0500	6020	25 Jul 11 16:18	Claudette
Vanadium - Total	0.0158	mg/l	0.0020	6020	25 Jul 11 16:18	Claudette
Zinc - Total	0.3984	mg/l	0.0100	6020	25 Jul 11 16:18	Claudette
Uranium	< 0.002	mg/l	0.002	6020	25 Jul 11 16:18	Claudette

All analyses were performed on the extract from Method 1312 (SPLP) with a modified solution to solids ratio of 4:1.

Approved by:

RL = Method Reporting Limit

Elevated "Less Than Result" (<): @ = Due to sample matrix $\frac{1}{2}$ = Due to sample quantity

= Due to sample concentration
+ = Due to extract volume

CERTIFICATION: MN LAB # 038-999-267



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Report Date: 8 Sep 11 Lab Number: 11-M2453 Work Order #:81-818 Account #: 013479

Date Sampled:

Date Received: 28 Jun 11 9:00

PO #: 131460 OP

Duane Leingang Montana Dakota Utilities PO Box 40 Mandan ND 58554

Sample Description: Unit II Fly Ash

Sample Site: MDU Heskett

	As Receive Result	ed	Method RL	Method Reference	Date Analyzed	Analyst
SPLP Extraction				1312	22 Jul 11	SS
На	12.8	units	N/A	SM4500 H+ B	22 Jul 11 17:00	
Specific Conductance	27240	umhos/cm	N/A	SM2510-B	22 Jul 11 17:00	
Total Suspended Solids	13	mg/l	1	SM2540-D	22 Jul 11 14:00	
Total Alkalinity	4570	mg/l CaCO3	4	SM2320-B	22 Jul 11 17:00	
Phenolphthalein Alk	4520	mg/l CaCO3	4	SM2320-B	22 Jul 11 17:00	
Bicarbonate	< 4	mg/l CaCO3	4	SM2320-B	22 Jul 11 17:00	
Carbonate	100	mg/l CaCO3	4	SM2320-B	22 Jul 11 17:00	
Hydroxide	4470	mg/l CaCO3	0	SM2320-B	22 Jul 11 17:00	
Tot Dis Solids (Summation)	16000	mg/l	NA	SM1030-F	3 Aug 11 8:40	4
Total Hardness as CaCO3	1960	mg/l	NA	SM2340-B	3 Aug 11 8:40	
Hardness in grains/gallon	115	gr/gal	NA	SM2340-B	3 Aug 11 8:40	
Cation Summation	252	meq/L	NA	SM1030-F	9 Aug 11 9:09	
Anion Summation	247	meq/L	NA	SM1030-F	28 Jul 11 14:30	
Percent Error	1.00	8	NA	SM1030-F	9 Aug 11 9:09	
Sodium Adsorption Ratio	46.1		NA	USDA 20b	3 Aug 11 8:40	
Gross Alpha Radiation	Attached	pCi/l			22 Aug 11 2:03	
Radon 222	Attached				28 Jul 11 4:37	
Radium 226	Attached	pCi/l			22 Aug 11 22:20	
Radium 228	Attached	pCi/l			16 Aug 11 16:50	
Total Organic Carbon	1.6	mg/l	0.5	SM5310-C	1 Aug 11 8:00	
Fluoride	3.60	mg/l	0.10	SM4500-F-C	4 Aug 11 17:00	
Sulfate	7400	mg/1	5.00	ASTM D516-02	27 Jul 11 9:00	
Chloride	66.0	mg/l	1.0	SM4500-C1-E	27 Jul 11 14:00	
Nitrate-Nitrite as N	0.38	mg/l	0.10	EPA 353.2	28 Jul 11 14:30	
Ammonia-Nitrogen as N	15.0	mg/l	0.10	EPA 350.1	28 Jul 11 10:45	
Phosphorus as P - Total	< 0.1	mg/1	0.10	EPA 365.1	28 Jul 11 13:00	
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	28 Jul 11 8:00	
Chemical Oxygen Demand	9.4	mg/l	5.0	HACH 8000	1 Aug 11 8:30) Wayne
Calcium - Total	785	mg/l	1.0	6010	3 Aug 11 8:40	Stacy
Magnesium - Total	< 5	mg/l	1.0	6010	3 Aug 11 8:40	Stacy
Sodium - Total	4720	mg/l	1.0	6010	3 Aug 11 8:40	4
Potassium - Total	275	mg/l	1.0	6010	3 Aug 11 8:40	Stacy
Aluminum - Total	< 1	mg/l	0.10	6010	9 Aug 11 9:09	-
Iron - Total	< 1	mg/l	0.10	6010	9 Aug 11 9:09	
Strontium - Total	85.0	mg/l	0.10	6010	9 Aug 11 9:09	Stacy
Titanium - Total	< 1	mg/l	0.10	6010	9 Aug 11 9:09	
Boron - Total	< 1	mg/l	0.10	6010	11 Aug 11 8:40	Stacy

RL = Method Reporting Limit

Elevated "Less Than Result" (<): @ = Due to sample matrix ! = Due to sample quantity

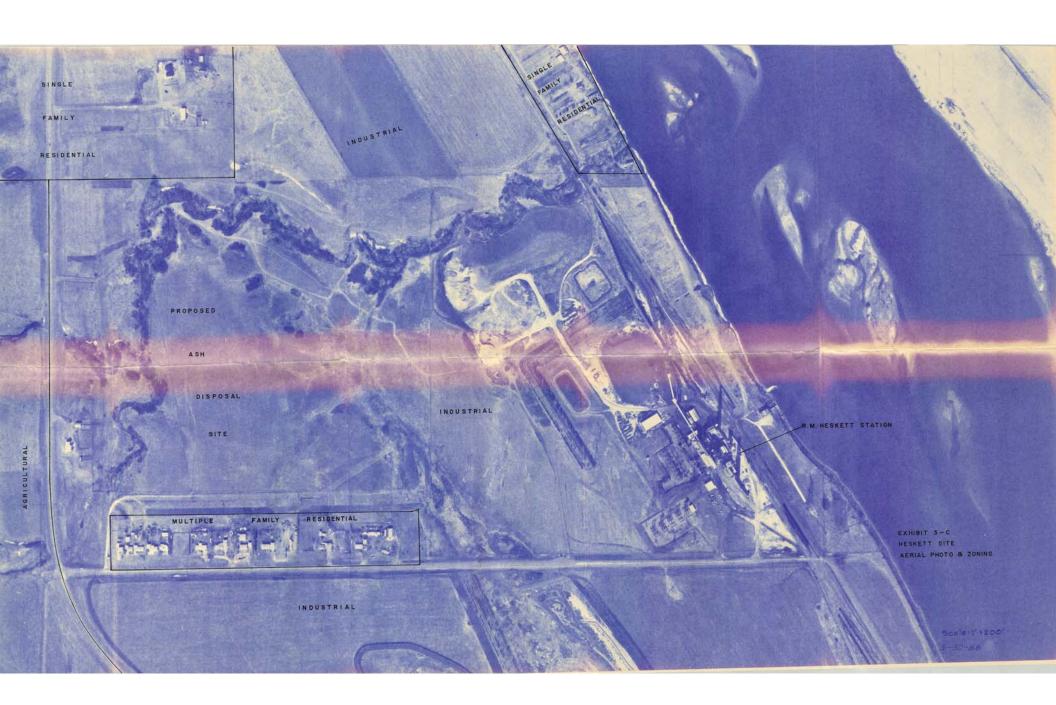
= Due to sample concentration + = Due to extract volume

CERTIFICATION: MN LAB # 038-999-267

Appendix D

Aerial Photo (March 30, 1998)

Appendix D Aerial Photo (March 30, 1998)



Appendix E

Boring Logs

Appendix E Boring Logs

EXHIBIT 5-E

LITHOLOGIC LOGS

- Wells 10, 11, 12 and 13

 O-1 Top soil, silty, clayey, sandy, brown, calcareous; with some limestone pebbles.
- 1-11 Silt, clayey, brownish-tan, slightly indurated, very dry, calcareous; with thin coarse-grained, clean silt lenses and a few small (less than .5 in.) iron oxide concretions. Abundant small gypsum crystals (less than .13 in. long). Some small, black flakes of organic plant material. Cannonball-Ludlow Formations.
- Silt, as above, with some (less than 20%) very fine- to fine-grained sand interspersed.
- Silt, as above, clayey, less sand than above interval, oxidized; with very fine-grained silty sand lenses and very few gypsum crystals.
- 30-41 Silt, very clayey, with some (less than 20%) very fine-grained sand interspersed, steel-gray (color change), moderately indurated; with fewer small gypsum crystals than above intervals.
- Silt, as above, very clayey, with some (less than 20%) fine- to medium-grained sand interspersed in a silt and clay matrix.
- 59-65 Silt, as above, with abundant (more than 20%) fine- to medium-grained sand interspersed.
- Silt, clayey, steel-gray to bluish, moderately indurated; with thin coarse-grained silt to very fine-grained sand lenses in an otherwise fine silt to clay matrix.
- 81-84 Clay, silty, steel-gray to bluish, moderately indurated, dense.
- Siltstone, sandy, clayey, steel-gray to bluish, slightly indurated; with small fine-grained sand lenses and abundant (more than 20%) sand interspersed in the matrix.
- 91-110 Silt, clayey, bluish-gray, moderately indurated; with thin (less than 1 foot) mudstone lenses.
- 110-120 Silt, very clayey, steel-gray to bluish, moderately indurated, very dense. Cannonball-Ludlow Formations.

Wells 20 and 21

- 0-1 Top soil, silty, sandy, clayey, dark-brown, calcareous; with some limestone and granite pebbles.
- Silt, clayey, with minor amounts (less than 10%) of very fine-grained sand interspersed, brownish-tan, slightly indurated, calcareous, oxidized; with small iron oxide concretions and abundant small gypsum crystals.

 Cannonball-Ludlow Formations.
- 21-26 Silt, as above, steel-gray (color change).
- Silt, clayey, with some (less than 20%) very fine- to medium-grained sand interspersed, steel-gray to bluish, slightly indurated; with very few small gypsum crystals and some thin (less than 1 foot) siltstone lenses.
- 49-53 Silt, as above, with abundant (more than 20%) fine- to medium-grained sand interspersed.
- 53-63 Silt, as above, clayey, less sand, with thin (less than 1 foot) siltstone to mudstone lenses.
- Silt, very clayey, steel-gray to bluish, moderately indurated, very dense.
 Cannonball-Ludlow Formations.

Wells 30, 31, 32 and 33

- 0-1 Top soil, silty, sandy, brownish, calcareous; with some granite and limestone pebbles.
- 1-2 Pebble-loam (glacial till), silty, sandy, clayey, yellowish-brown, dry, calcareous.
- 2-31 Silt, clayey, with minor amounts (less than 10%) of very fine-grained sand interspersed, brownish-tan, slightly indurated, calcareous, oxidized; with small iron oxide concretions.

 Some small, black flakes organic plant material. Cannonball-Ludlow Formations.
- Silt, clayey, steel-gray (color change), slightly indurated, calcareous; with small iron oxide concretions, thin coarse silt lenses, small gypsum crystals and gray to reddish-brown mottling.

- Silt, as above, with some (less than 20%) fineto medium-grained sand interspersed.
- 61-65 Silt, as above, with abundant (more than 20%) fine- to medium-grained sand interspersed, dense.
- Silt, as above, clayey, less sand, some thin (less than 1 foot) lenses of siltstone to mudstone.
- 76-80 Siltstone, sandy, clayey, steel-gray to bluish, slightly indurated; with small fine-grained sand lenses and abundant (more than 20%) fine-grained sand interspersed in the matrix.
- 80-92 Silt, clayey, steel-gray to bluish, moderately indurated, with some (less than 20%) very fine- to fine grained sand interspersed.
- 92-120 Silt, very clayey, steel-gray to bluish, moderately indurated, very dense. Cannonball-Ludlow Formations.
- Well 40 0-1 Top soil, sandy, silty, brownish-tan, calcareous; with some granite and limestone pebbles.
- Pebble-loam (glacial till), sandy, silty, with detrital lignite and organic matter, yellowish-brown, very dry, calcareous.
- 5-22 Sand, very fine- to medium-grained, unconsolidated, with thin lenses of clay and detrital lignite, brownish-yellow, calcareous.
- 22-40 Silt, clayey, with minor amounts (less than 10%) very fine-grained sand interspersed, brownish-tan, slightly indurated, calcareous, oxidized; with small iron oxide concretions and small gypsum crystals; Cannonball-Ludlow Formations.
- Silt, clayey, with minor amounts (less than 10%) of very fine-grained sand interspersed, steel-gray (color change), moderately indurated; with some reddish-brown mottling and some very thin (less than 6 inches) mudstone lenses.
- 51-58 Silt, as above, with abundant (more than 20%) fine-grained sand and thin silty-clay lenses.

- 58-62 Siltstone, sandy, clayey, steel-gray to bluish, moderately indurated; with small fine-grained sand lenses and abundant (more than 20%) sand interspersed in the matrix.
- Silt, clayey, with some (less than 20%) fine- to medium-grained sand interspersed, steel-gray to bluish, moderately indurated; with thin (less than 2 feet) sandy lenses.
- 70-80 Silt, as above, very clayey, some (less than 10%) fine-grained sand interspersed; less sand than above interval.
- 80-120 Silt, as above, dark-steel-gray. Cannonball-Ludlow Formations.

Wells 41, 42 and 43

- O-1 Top soil, sandy, silty, dark-brown, calcareous; with some granite and limestone pebbles.
- 1-4 Pebble-loam (glacial till), sandy, silty, clayey, yellowish-brown, very dry, calcareous.
- Silt, clayey, with some (less than 20%) very fine-grained sand interspersed, brownish-tan, unconsolidated, noncompacted, calcareous to 25 feet, oxidized; with small iron oxide concretions and abundant small gypsum crystals.

 Cannonball-Ludlow Formations.
- Silt, clayey, with minor amounts (less than 10%) of very fine-grained sand interspersed, steel-gray (color change), moderately indurated; with some reddish-brown mottling and some very thin (less than 6 inches) mudstone lenses.
- 51-58 Silt, as above, with abundant (more than 20%) fine-grained sand and thin silty-clay lenses.
- 58-62 Siltstone, sandy, clayey, steel-gray to bluish, moderately indurated; with small fine-grained sand lenses and abundant (more than 20%) sand interspersed in the matrix.
- Silt, clayey, with some (less than 20%) fine- to medium-grained sand interspersed, steel-gray to bluish, moderately indurated; with thin (less than 2 feet) sandy lenses.

70-80 Silt, as above, very clayey, some (less than 10%) fine-grained sand interspersed; less sand than above interval.

Wells 43 and 44

- O-2 Top soil, clayey, silty, some sand, brownish-tan to light-gray, calcareous.
- 2-20 Silt, clayey, with some (less than 20%) fine-grained sand interspersed, brownish-tan, slightly indurated, very dry, calcareous; with small iron oxide concretions, abundant small gypsum crystals and occasional thin silt lenses. Cannonball-Ludlow Formations.
- Silt, as above, very clayey, oxidized, with minor amounts (less than 10%) of fine-grained sand.
- 25-35 Silt, as above, dark-brownish-tan to bluish-gray (color change), with thin very fine-grained sand lenses.
- 35-60 Silt, clayey, with some (less than 20%) fine- to medium-grained sand interspersed, steel-gray to bluish, moderately indurated; with some indurated silty sand lenses. Cannonball-Ludlow Formations.

Wells 50, 51 and 52 0-4 Top soil, clayey, silty, very dark-brown.

- 4-10 Clay, silty, with some (less than 20%) fine-grained sand, dark-brownish-tan, soft, cohesive, wet, sticky; with some pebbles.
- Silt, very clayey, with some (less than 20%) very fine-grained sand interspersed, brownish-tan, slightly indurated, calcareous, dense; with abundant small gypsum crystals and very thin silt and sand lenses; Cannonball-Ludlow Formations.
- 22-23 Sandstone, fine-grained, silty, indurated, oxidized, dark-brown.
- Silt, very clayey, with some (less than 20%) very fine-grained sand interspersed, steel-gray (color change), moderately indurated; with thin medium grained sand lenses.

30-40 Silt, as above, very clayey, less sand than above interval, dark-steel-gray. Cannonball-Ludlow Formations.

Wells 53 and 54 0-4 Top soil, clayey, silty, very dark-brown, wet, sticky.

- 4-15 Clay, silty, with some (less than 20%) fine- to medium-grained sand interspersed, brownish-tan, slightly indurated, dry, calcareous; with small iron oxide concretions, small gypsum crystals and occasional reddish-brown mottling; Cannonball-Ludlow Formations.
- Sand, very fine-grained to medium-grained, silty, clayey, unconsolidated, yellowish-brown, oxidized.
- 20-30 Silt, clayey, with some (less than 20%) fine-grained sand interspersed, steel-gray (color change), slightly indurated; with clay and sand lenses, some small concretions and some small gypsum crystals.
- 30-45 Silt, as above, very clayey.
- 45-60 Silt, as above, clayey, brownish-gray, moderately indurated, some reddish-brown mottling.
 Cannonball-Ludlow Formations.

Wells 55 and 56

- O-5 Sandy-loam (glacial), with fine- to medium-grained sand, silty, calcareous; with small granite and limestone pebbles.
- Clay, silty, with minor amounts (less than 10%) of very fine-grained sand, dark-brownish-tan, moderately indurated, brittle, very dry, calcareous; with small iron oxide concretions, small gypsum crystals and occasional thin sandstone laminae. Some small, black flakes of organic plant material. Cannonball-Ludlow Formations.
- 26-35 Clay, as above, very silty, sandy, brownish-tan, oxidized.

- Silt, clayey, with some (less than 20%) very fine- to fine-grained sand interspersed, steel-gray (color change) moderately indurated; with small gypsum crystals and occasional clay lenses.
- Silt, as above, with minor amounts (less than 10%) of fine-grained sand interspersed.
- 60-85 Silt, as above, clayey, less sand than above interval.
- 85-100 Silt, as above, very clayey, with minor amounts (less than 10%) of sand interspersed, light-gray. Cannonball-Ludlow Formations.
- Wells 60, 61 and 62

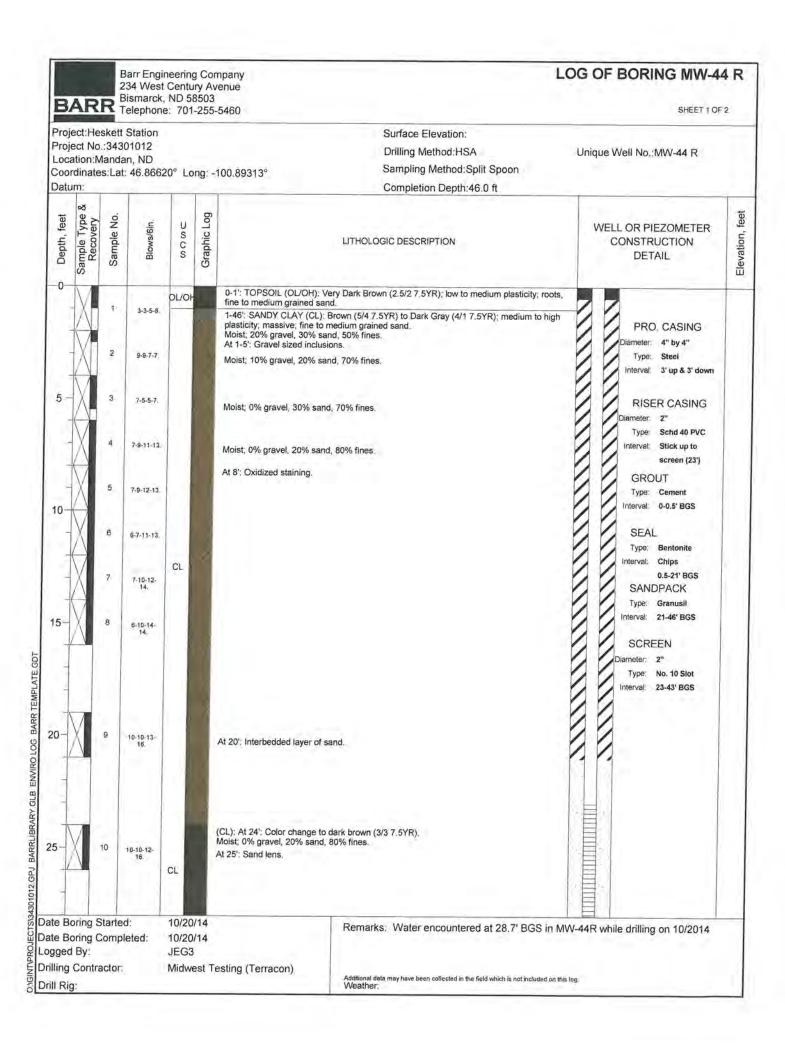
 Top soil, silty, clayey, dark-brown to tanish-brown, calcareous.
- 2-25 Silt, very clayey, with some minor amounts (less than 10%) of very fine- to fine-grained sand interspersed, brownish-tan, slightly indurated, dry, calcareous; with abundant small gypsum crystals and thin silt and sand lenses; Cannonball-Ludlow Formations.
- Silt, as above, with abundant (more than 20%) fine- to medium-grained sand interspersed.
- 29-36 Silt, as above, clayey, less sand than above interval, dark-brownish-tan, oxidized.
- 36-60 Silt, very clayey, with some (less than 20%) very fine-grained sand interspersed, steel-gray (color change), moderately indurated; with thin (less than 1 foot) sandy-silt lenses.

 Cannonball-Ludlow Formations.
- Well 70 0-2 Pebble-loam (glacial till), clayey, sandy, yellowish-brown, unconsolidated, damp, calcareous.
- 2-21 Silty, clayey, with some (less than 20%) fine-grained sand interspersed, brownish-tan, moderately indurated, very dry, calcareous, oxidized; with small iron oxide concretions and abundant small gypsum crystals. Cannonball-Ludlow Formations.

21-24	Shale, silty, steel- to dark-gray (color change), indurated, fissile, very dry; with occasional thin silt and sand lenses.
24-31	Silt, clayey, with abundant (more than 30%) sand, steel-gray, moderately indurated.
31-62	Silt, clayey, with some (less than 20%) very fine- to fine- grained sand interspersed, steel-gray, moderately indurated; with some small gypsum crystals and small iron oxide concretions.
62-76	Silt, as above, with some (less than 20%) fine-grained sand interspersed.
76-82	Silt, as above, with abundant (more than 20%) fine- to medium-grained sand.
82-100	Silt, as above, clayey, with some (less than 20%) fine-grained sand interspersed, dark-gray.

The lithologic logs for wells 1-4 were described by personal from Water Supply Incorporated (WS), Bismarck, North Dakota. The wells were installed during a previous ground water investigation at Heskett Station.

Well WS 2	
0-1	Top soil, silty, black.
1-4	Pebble-loam (glacial till), silty, clayey, some
	cobbles, yellowish-brown.
4-7	Gravel, sand and rocks.
7-21	Sand, fine- to coarse-grained, some pebbles.
21-39	Clay silty sandy vollowish brown to
39-52	Clay, silty, sandy, yellowish-brown to gray.
52-67	Clay, silty, sandy, gray.
32-07	Sand, fine-grained, bluish, with some clay
67-89	layers.
07-03	Clay, silty, sandy, brown to gray.
Wells WS 1, 1	A and ID
0-1	
1-4	Top soil, silty, black
1,74	Clay, (glacial), silty, with pebbles,
4 21	yellowish-brown.
4-21	Sand, fine- to medium-grained, yellowish-brown;
01 00	with clay and silt lenses.
21-25	Clay, silty, yellowish-brown.
25-30	Sand, fine-grained, yellowish-brown, some
7.	indurated layers.
30-35	Clay, silty, yellowish-brown.
35-45	Sand, fine-grained, yellowish-brown.
45-50	Clay, silty, sandy, gray, about 50 percent shale.
50-56	Sand, fine-grained, with clay layers.
56-73	Clay, silty, sandy, gray.
	3, 5 mm y 9, 3, 2, 3, 3, 3, 3, 3, 3, 3, 3, 3, 3, 3, 3, 3,
WE11s WS 4, 4/	Asand 4B
0-13	Pebble-loam (glacial till), silty, sandy, with
	some cobbles, yellowish-brown.
13-23	Sand, fine- to medium-grained, yellowish-brown.
23-25	Slay, silty, sandy, yellowish-brown.
25-27	Sandstone, indurated.
27-30	
30-36	Clay, sandy, silty, gray.
36-52	Sand, fine-grained, gray.
30-32	Clay, silty, sandy, gray; with some sand layers.
Wells WS 3 and	1.21
0-1	
	Top soil, silty, black.
1-12	Pebble-loam, clayey, silty, with some cobbles,
10.16	yellowish-brown.
12-16	Clay, silty, gray; with some shale layers.
16-18	Limestone, indurated.
18-23	Clay, silty, yellowish-brown; with some sand
Samuel Committee	layers.
23-44	Sand, fine- to medium-grained, gray; with some
	clay layers.
44-50	Clay, silty, medium-gray.



		2	Barr Engi	t Centi	ury Av	npany enue	L	OG OF	BORING MW-4
	AR	R	Bismarck Felephon	e: 70°	1-255	200			SHEET 2 OF
Proje Loca	ect No ation:N dinate	.:343 Manda	Station 01012 an, ND t: 46.866	20° Lo	ong: -	Dril 100.89313° Sar	rface Elevation: Iling Method:HSA mpling Method:Split Spoon mpletion Depth:46.0 ft	Unique	Well No.:MW-44 R
Depth, feet	Sample Type & Recovery	Sample No.	Blows/6in.	2000	Graphic Log	LITHOLOGIC	DESCRIPTION		LL OR PIEZOMETER CONSTRUCTION DETAIL
30-	-	11	8-12-14- 18. 8-13-16- 27.	CL		(CL): At 24': Color change to dark brown (3/3) Wet; 0% gravel, 20% sand, 80% fines. At 30.5': Sand lens. (CL): At 32': Color change to dark gray (4/1 7.)			PRO. CASING Diameter. 4" by 4" Type: Steet Interval: 3' up & 3' down RISER CASING Diameter. 2" Type: Schd 40 PVC Interval: Stick up to screen (23') GROUT Type: Cement Interval: 0-0.5' BGS
440-	X	13	11-19-25- 27- 14-18-27- 34.	CL \SC		(SC): At 45.8° Clayey Sand (SC), fine to mediu greenish gray (4/10G Gley 2).	um grained, low to medium plasticity, dark		SEAL Type: Bentonite Interval: Chips 0.5-21' BGS SANDPACK Type: Granusil Interval: 21-46' BGS SCREEN Diameter: 2" Type: No. 10 Slot Interval: 23-43' BGS
50-									
te Bo gged		Comp	oleted:	10/20 10/20 JEG:	0/14	Remarks: V	Water encountered at 28.7' BGS in M	W-44R wi	nile drilling on 10/2014

State of North Dakota

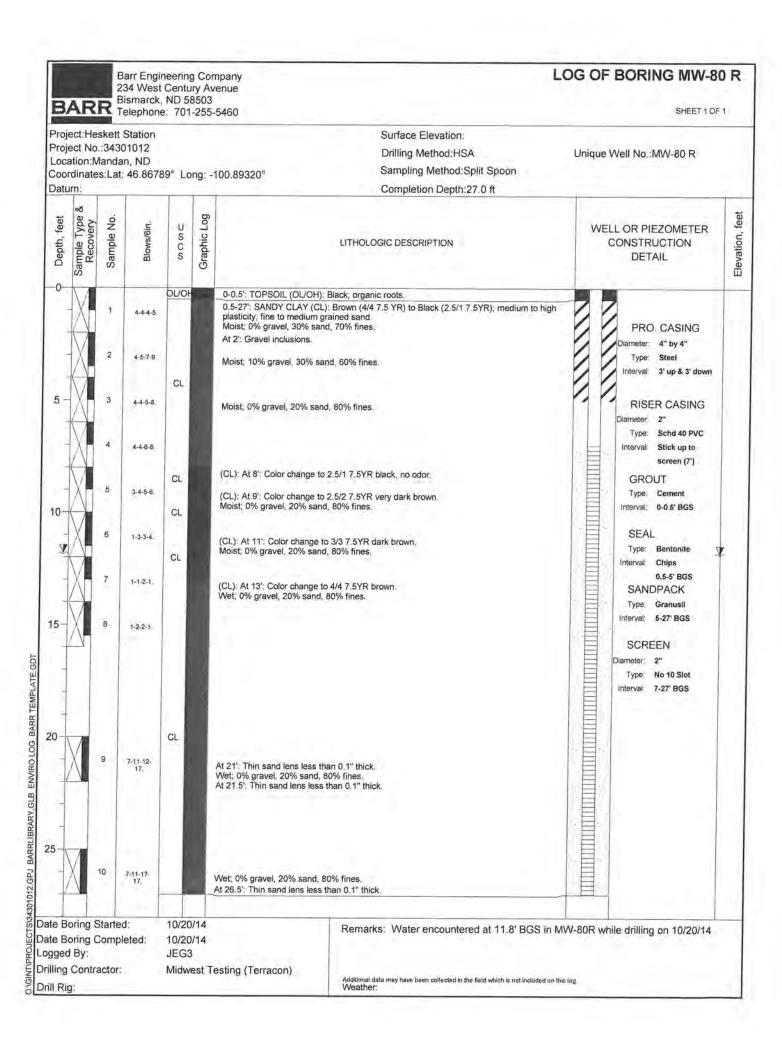
BOARD OF WATER WELL CONTRACTORS

900 E. BOULEVARD • BISMARCK, NORTH DAKOTA 58505

MONITORING WELL REPORT State law requires that this report be filed with the State Board of Water Well Contractors within 30 days after completion or abandonment of the well. 1. WELL OWNER Well head completion: 24" above grade _____ Other ____ x Name MDU-Heskett Station If other, specify 4" x 4" x 5' steel cover 2025 38th Street Address Was protective casing installed? ■ Yes □ No Mandan, North Dakota Was well disinfected upon completion? □ Yes ■ No 2. WELL LOCATION (MW-44R) Address (if in city) (see attached drawing) 5. WATER LEVEL Static water level 28.5 feet below surface If flowing: closed in pressure _____ psi or ft. above land surface Morton County _____ SE ¼ SE ¼ SW ¼ Sec. 10 Twp. 139 N. Rge. 81 W. 6. WELL LOG Depth (Ft.) Lat. 46.86620 Long.: -100.89313 Altitude:_____ Formation From To 3. METHOD DRILLED Topsoil 0.5 Auger Other 0.5 Sandy lean clay 5 4. WELL CONSTRUCTION 5 Sandy fat clay 46 Diameter of Hole 8 inches Depth 46 feet Riser: ■ PVC □ Other ■ Threaded □ Solvent □ Other Riser rating SDR _____ Schedule _____40 Diameter 2.0 inches From ____ +2 ___ ft. to ___ 23 ft. Was a well screen installed? ■ Yes □ No Material Schedule 40 PVC Diameter 2.0 inches Slot Size #10 set from 23 feet to 43 feet (Use separate sheet if necessary) Sand packed from 21 ft to 46 ft 7. WAS THE HOLE PLUGGED OR ABANDONED? Depth grouted from 1 ft to 21 ft □ Yes ■ No Grouting Material If so, how? _____ Bentonite ____x Other____ If other explain: One foot concrete collar at surface 8. REMARKS 3 steel bumpers installed around well head 9. DATE COMPLETED 10-21-14 10. CONTRACTOR CERTIFICATION This well was drilled under my jurisdiction and this report is true to the best of my knowledge. Midwest Testing Laboratory, Inc. Monitoring Well Contractor Certificate No. P.O. Box 2084, Bismarck, ND 58502-2084

Address

10-22-14



State of North Dakota

BOARD OF WATER WELL CONTRACTORS

900 E. BOULEVARD • BISMARCK, NORTH DAKOTA 58505

MONITORING WELL REPORT

State law requires that this report be filed with the State Board of Water Well Cont	
1. WELL OWNER	Well head completion:
Name MDU-Heskett Station	24" above grade Other x
Address 2025 38 th Street	If other, specify 4" x 4" x 5' steel cover
	Was protective casing installed? ■ Yes □ No
Mandan, North Dakota	Was well disinfected upon completion? ☐ Yes ■ No
2. WELL LOCATION (MW-80R)	
Address (if in city) (see attached drawing)	5. WATER LEVEL
	Static water level 12 feet below surface
County	If flowing: closed in pressure psi or ft. above land surface
NE ¼ SE ¼ SW ¼ Sec. 10 Twp. 139 N. Rge. 81 W.	6. WELL LOG Depth (Ft.)
Lat. <u>46.86789</u> Long.: <u>-100.89320</u>	!
Altitude:	Formation From To
3. METHOD DRILLED	Topsoil 0 0.5
■ Auger Other	Sandy lean clay 0.5 27
4. WELL CONSTRUCTION	Sality leaf clay 0.5 2/
Diameter of Hole 8 inches Depth 27 feet	
Riser: ■ PVC □ Other	
■ Threaded □ Solvent □ Other	
Riser rating SDR Schedule40	
Diameter 2.0 inches	
From+2.5	
Was a well screen installed? ■ Yes □ No	
Material Schedule 40 PVC Diameter 2.0 inches	
Slot Size #10 set from 7 feet to 27 feet	(Use compared about if accessing)
Sand packed from5ft toft	(Use separate sheet if necessary)
Depth grouted from 1 ft to 5 ft	7. WAS THE HOLE PLUGGED OR ABANDONED?
Grouting Material	□ Yes ■ No
Bentonitex Other	If so, how?
If other explain:	
One foot concrete collar at surface	8. REMARKS
	3 steel bumpers installed around well head
	9. DATE COMPLETED 10-21-14
	10. CONTRACTOR CERTIFICATION
	This well was drilled under my jurisdiction and this report is true to the
	best of my knowledge. Midwest Testing Laboratory, Inc. 444
	Monitoring Well Contractor Certificate No.
	P.O. Box 2084, Bismarck, ND 58502-2084
	Address
	MI aly 10-22-14
	Signature Date



LOG OF BORING MW-101 DRAFT

BARR Millineapons, Mil 50 .52 Telephone: 952-832-2600 SHEET 1 OF 3 Project:R.M. Haskett Station CCR Monitoring Network Surface Elevation:1716.6 ft Project No.:34300014.12 Drilling Method: HSA Unique Well No.: Location: Mandan, ND Sampling Method:SPT Coordinates:Lat: 438844.919° Long: 1868647.777° Datum:NAD 83 Completion Depth:58.0 ft feet Sample Type & Recovery Graphic Log feet Sample No U S C S WELL OR PIEZOMETER Blows/6in Elevation, Depth, LITHOLOGIC DESCRIPTION CONSTRUCTION **DETAIL** TOPSOIL: Brown (5/4 7.5YR). 4-4-4-6 SANDY LEAN CLAY WITH GRAVEL (CL): fine to medium grained; Brown (5/3 7.5YR); PRO. CASING 1715 moist; thinly laminated; some mottling; low plasticity; [Cannonball Formation]. iameter: 4" At 2': Start to see gravel inclusions. Type: Steel pipe 4-6-6-7 Interval: 3.5' ags - 1.5' bgs At 4': Oxidized staining. RISER CASING 5 7-9-14-16 At 5': Oxidized staining. Type: PVC SCH 80 Interval: 2.98' ags - 34' 1710⁻ bgs 8-9-12-15. At 7': Oxidized staining and white staining. **GROUT** Type: Neat cement Interval: 0 - 29' bgs 5 10-15-21-26. **SEAL** 10 Type: Bentonite chips Interval: 29 - 32' bgs CL 7-18-24-At 11': Oxidized staining. 1705 **SANDPACK** Type: Silica 40-70 8-12-19-23. Interval: 32 - 56' bgs **SCREEN** Diameter: 2"; No.6 slot JECTS/34300014.GPJ BARRLIBRARY.GLB ENVIRO LOG BARR TEMPLATE.GDT 15 8-14-18-23. At 15': Gypsum. Type: PVC SCH 80 Interval: 34 - 54' bgs 16-20': No recovery. 1700 20 At 20.5': Gypsum. 7-10-13-15. LEAN CLAY (CL): Dark Brown (3/2 7.5YR); oxidized staining, some mottling; medium to 1695⁻ high plasticity; [Cannonball Formation]. At 22': Color change to Brown (4/2 7.5YR). 10 7-9-13-15. CL At 24': Interbedded sand, fine grained. Date Boring Started: 8/18/15 Remarks: Hole caved in from 56 - 58' bgs Date Boring Completed: 8/19/15 DTW = 36.66' TOR on 9/23/2015 (elev. 1682.87) Logged By: JEG3 Drilling Contractor: Terracon Additional data may have been collected in the field which is not included on this log. Weather: Drill Rig: Rig mounted HSA



Drill Rig:

Rig mounted HSA

LOG OF BORING MW-101

BARR Millineapons, Mil 50 .52 Telephone: 952-832-2600 SHEET 2 OF 3 Project:R.M. Haskett Station CCR Monitoring Network Surface Elevation:1716.6 ft Project No.:34300014.12 Drilling Method: HSA Unique Well No.: Location: Mandan, ND Sampling Method:SPT Coordinates:Lat: 438844.919° Long: 1868647.777° Datum:NAD 83 Completion Depth:58.0 ft feet Sample Type & Recovery Graphic Log feet Sample No WELL OR PIEZOMETER USCS Blows/6in Elevation, Depth, 1 LITHOLOGIC DESCRIPTION CONSTRUCTION **DETAIL** LEAN CLAY (CL): Dark Brown (3/2 7.5YR); oxidized staining, some mottling; medium to high plasticity; [Cannonball Formation]. (continued) At 25' and 25.5': Gypsum. PRO. CASING 1690 At 26.5': Gypsum. 12 8-11-15-19. iameter: 4" Type: Steel pipe Interval: 3.5' ags - 1.5' bgs 13 8-11-13-15. RISER CASING At 29.5': Gypsum. 30 meter: 2" CL Type: PVC SCH 80 14 6-11-14-17. 2.98' ags - 34' Interval: 1685⁻ bgs **GROUT** 15 8-13-17-22. Type: Neat cement At 33': Gypsum. Interval: 0 - 29' bgs 1 At 34.5': Gypsum. **SEAL** 35 8-14-19-21. Type: Bentonite chips At 35.5-36': Color change to Black (2.5/1 7.5YR), turns back to brown. Interval: 29 - 32' bgs FAT CLAY (CH): Black (2.5/1 7.5YR); very stiff; hight plasticity; wet at 43'; [Cannonball 1680· Formation]. **SANDPACK** 17 11-16-20-27 Type: Silica 40-70 Interval: 32 - 56' bgs At 38': Oxidized staining. 18 9-13-20-25. **SCREEN** Diameter: 2"; No.6 slot JECTS/34300014.GPJ BARRLIBRARY.GLB ENVIRO LOG BARR TEMPLATE.GDT 40 Type: PVC SCH 80 Interval: 34 - 54' bgs 19 7-14-23-26. At 41': Oxidized staining. 1675 9-16-23-45 1670 Date Boring Started: 8/18/15 Remarks: Hole caved in from 56 - 58' bgs. Date Boring Completed: 8/19/15 DTW = 36.66' TOR on 9/23/2015 (elev. 1682.87) M:\GINT\PRO. Logged By: JEG3 Drilling Contractor: Terracon Additional data may have been collected in the field which is not included on this log. Weather:

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

M:\GINT\PROJECTS\34300014.GPJ BARRLIBRARY.GLB ENVIRO LOG BARR TEMPLATE.GDT

LOG OF BORING MW-101 DRAFT

BARR Telephone: 952-832-2600 SHEET 3 OF 3 Project:R.M. Haskett Station CCR Monitoring Network Surface Elevation:1716.6 ft Project No.:34300014.12 Drilling Method: HSA Unique Well No.: Location:Mandan, ND Sampling Method:SPT Coordinates:Lat: 438844.919° Long: 1868647.777° Datum:NAD 83 Completion Depth:58.0 ft Elevation, feet Sample Type & Recovery Graphic Log Depth, feet Sample No. U S C S WELL OR PIEZOMETER Blows/6in LITHOLOGIC DESCRIPTION CONSTRUCTION **DETAIL** -50 FAT CLAY (CH): Black (2.5/1 7.5YR); very stiff; hight plasticity; wet at 43'; [Cannonball Formation]. (continued) PRO. CASING 1665 Diameter: 4" Type: Steel pipe Interval: 3.5' ags - 1.5' bgs RISER CASING 55 Diameter: 2" Type: PVC SCH 80 Interval: 2.98' ags - 34' 1660· bgs **GROUT** Type: Neat cement End of boring 58.0 feet Interval: 0 - 29' bgs **SEAL** 60 Type: Bentonite chips Interval: 29 - 32' bgs SANDPACK Type: Silica 40-70 Interval: 32 - 56' bgs **SCREEN** Diameter: 2"; No.6 slot 65 Type: PVC SCH 80 Interval: 34 - 54' bgs 70 Date Boring Started: 8/18/15 Remarks: Hole caved in from 56 - 58' bgs. DTW = 36.66' TOR on 9/23/2015 (elev. 1682.87) Date Boring Completed: 8/19/15 Logged By: JEG3 **Drilling Contractor:** Terracon Additional data may have been collected in the field which is not included on this log. Weather: Drill Rig: Rig mounted HSA



LOG OF BORING MW-102

SHEET 1 OF 2

Project:R.M. Haskett Station CCR Monitoring Network

Project No.:34300014.12

Surface Elevation:1703.8 ft Drilling Method: HSA

Unique Well No.: Location: Mandan, ND Sampling Method:SPT Coordinates:Lat: 438161.145° Long: 1868782.871° Datum:NAD 83 Completion Depth:46.0 ft Elevation, feet Sample Type & Recovery Graphic Log feet ž WELL OR PIEZOMETER USCS Blows/6in Sample ! Depth, LITHOLOGIC DESCRIPTION CONSTRUCTION **DETAIL** TOPSOIL: Brown (5/4 7.5YR). 3-3-3-2 LEAN CLAY (CL): medium grained; Brown (4/3 7.5YR); moist; low to medium plasticity; PRO. CASING with gravel to 4'; [Cannonball Formation]. ameter: 4" Type: Steel pipe 3-2-2-3 Interval: 3.5' ags - 1.5' 1700bgs RISER CASING 3 CL 3-3-4-5 2" Type: PVC SCH 80 2.85' ags - 10' Interval: bgs 3-4-5-7 **GROUT** Type: None Interval: None 1695⁻ 4-8-7-4 SANDY SILT WITH GRAVEL (ML): Strong Brown (5/6 7.5YR); fine to coarse sand, fine to ML medium gravel, unconsolidated; [Cannonball Formation]. **SEAL** 10 LEAN CLAY WITH GRAVEL (CL): fine to medium grained; Brown (5/3 7.5YR); some Bentonite chips Type: mottling; medium plasticity; [Cannonball Formation]. Interval: 0 - 8' bgs CI 4-3-5-9 **SANDPACK** LEAN CLAY (CL): Dark Brown (3/2 7.5YR); medium to high plasticity; [Cannonball Type: Silica 40-70 Formation] Interval: 8 - 31' bgs 3-5-7-9 1690· **SCREEN** $\sqrt{}$ Diameter: 2"; No.6 slot JECTS/34300014.GPJ BARRLIBRARY.GLB ENVIRO LOG BARR TEMPLATE.GDT 15 6-8-12-14 Type: PVC SCH 80 Interval: 20 - 30' bas 6-10-12-16 CL 1685 10 5-9-14-16 20 5-12-15-18. At 21': Color changes to Black (2.5/1). 12 9-15-18-22. 1680-Date Boring Started: 8/18/15 Remarks: Lithological descriptions for a hole that was abandoned. Monitoring well Date Boring Completed: 8/18/15 blind drilled and installed next to abandoned hole. Logged By:

JEG3 Drilling Contractor: Terracon

Rig mounted HSA

Drill Rig:

DTW = 17.09' TOR on 8/21/2015 (elev. 1689.51

Additional data may have been collected in the field which is not included on this log. Weather:

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

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Drill Rig:

Rig mounted HSA

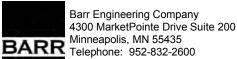
LOG OF BORING MW-102

BARR Millineapons, Mil 50 .52 Telephone: 952-832-2600 SHEET 2 OF 2 Project:R.M. Haskett Station CCR Monitoring Network Surface Elevation:1703.8 ft Project No.:34300014.12 Drilling Method: HSA Unique Well No.: Location:Mandan, ND Sampling Method:SPT Coordinates:Lat: 438161.145° Long: 1868782.871° Datum:NAD 83 Completion Depth:46.0 ft Elevation, feet Sample Type & Recovery Graphic Log Depth, feet Sample No. U S C S WELL OR PIEZOMETER Blows/6in LITHOLOGIC DESCRIPTION CONSTRUCTION **DETAIL** 9-14-19 LEAN CLAY (CL): Dark Brown (3/2 7.5YR); medium to high plasticity; [Cannonball Formation]. (continued) PRO. CASING 14 10-17-18-24. Diameter: 4" Type: Steel pipe Interval: 3.5' ags - 1.5' 1675 bgs 15 6-15-18-At 29': Gypsum. RISER CASING 30 Diameter: 2" Type: PVC SCH 80 16 7-14-18-22. Interval: 2.85' ags - 10' bgs **GROUT** 17 11-16-20-27. Type: None Interval: None At 33.5' and 34': Gypsum. 1670· CL **SEAL** 35 10-14-15-24 Type: Bentonite chips Interval: 0 - 8' bgs **SANDPACK** 19 13-19-25-35. Type: Silica 40-70 Interval: 8 - 31' bgs 1665⁻ 20 8-17-26-31. **SCREEN** Diameter: 2"; No.6 slot 40 Type: PVC SCH 80 Interval: 20 - 30' bgs 21 10-20-27-38. 22 13-20-27-37. 1660 SILTY SAND (SM): fine to medium grained; Dark Gray (4/1 7.5YR); wet; [Cannonball Formation1. 45 23 SM 15-27-27-32. End of boring 46.0 feet Date Boring Started: 8/18/15 Remarks: Lithological descriptions for a hole that was abandoned. Monitoring well Date Boring Completed: 8/18/15 blind drilled and installed next to abandoned hole. DTW = 17.09' TOR on 8/21/2015 (elev. 1689.51 Logged By: JEG3 Drilling Contractor: Terracon Additional data may have been collected in the field which is not included on this log. Weather:

Barr Engineering Company 4300 MarketPointe Drive Suite 200 Minneapolis, MN 55435 BARR Millineapons, Mil 50 .52 Telephone: 952-832-2600 Project No.:34300014.12

LOG OF BORING MW-103

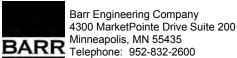
SHEET 1 OF 2 Project:R.M. Haskett Station CCR Monitoring Network Surface Elevation:1714.7 ft Drilling Method: HSA Unique Well No.: Location: Mandan, ND Sampling Method:SPT Coordinates:Lat: 437578.205° Long: 1869355.992° Datum:NAD 83 Completion Depth:44.0 ft feet Sample Type & Recovery Graphic Log feet Š WELL OR PIEZOMETER Blows/6in USCS Elevation, Sample ! Depth, LITHOLOGIC DESCRIPTION CONSTRUCTION **DETAIL** TOPSOIL (OL/OH): Brown (5/4 7.5YR). DL/OH 3-4-5-5 LEAN CLAY (CL): Very Dark Gray (3/1 7.5YR); moist; stiff; medium to high plasticity; PRO. CASING [Cannonball Formation]. iameter: 4" Type: Steel pipe 5-5-8-8 Interval: 3.5' ags - 1.5' bgs CL RISER CASING 1710 5-8-10-11 Type: PVC SCH 80 2.79' ags - 24' Interval: bgs 6-9-15-15. POORLY GRADED SAND WITH GRAVEL (SP): fine to coarse grained; Brown (5/4 **GROUT** 7.5YR); some oxidized staining, some mottling; [Cannonball Formation]. Type: Neat cement Interval: 0 - 19' bgs 5-6-5-4 SP **SEAL** 1705 10 Type: Bentonite chips Interval: 19 - 22' bgs 4-5-5-7 **SANDPACK** POORLY GRADED SAND WITH SILT (SP-SM): fine to medium grained; Brown (5/4 Type: Silica 40-70 7.5YR); [Cannonball Formation]. Interval: 22 - 44' bgs 2-2-2-3 SP-**SCREEN** SM 1700 Diameter: 2"; No.6 slot JECTS/34300014.GPJ BARRLIBRARY.GLB ENVIRO LOG BARR TEMPLATE.GDT 15 3-3-3-3 Type: PVC SCH 80 Interval: 24 - 44' bas NO RECOVERY (16 - 20'). 1695 20 SANDY LEAN CLAY (CL): fine to medium grained; Light Brown (6/4 7.5YR); wet; some mottling and oxidized staining, cohesive; low to medium plasticity; [Cannonball Formation]. 3-3-5-5 CL 1690· Date Boring Started: 8/19/15 Remarks: DTW = 33.24' TOR on 8/20/2015 (elev. 1684.29) Date Boring Completed: 8/20/15 Logged By: JEG3 Drilling Contractor: Terracon Additional data may have been collected in the field which is not included on this log. Weather: Drill Rig: Rig mounted HSA



JECTS/34300014.GPJ BARRLIBRARY.GLB ENVIRO LOG BARR TEMPLATE.GDT

LOG OF BORING MW-103

BARR Millineapons, Mil 50 .52 Telephone: 952-832-2600 SHEET 2 OF 2 Project:R.M. Haskett Station CCR Monitoring Network Surface Elevation:1714.7 ft Project No.:34300014.12 Drilling Method: HSA Unique Well No.: Location: Mandan, ND Sampling Method:SPT Coordinates:Lat: 437578.205° Long: 1869355.992° Datum:NAD 83 Completion Depth:44.0 ft Elevation, feet Sample Type & Recovery Graphic Log feet Sample No U S C S WELL OR PIEZOMETER Blows/6in Depth, 1 LITHOLOGIC DESCRIPTION CONSTRUCTION **DETAIL** SANDY LEAN CLAY (CL): fine to medium grained; Light Brown (6/4 7.5YR); wet; some mottling and oxidized staining, cohesive; low to medium plasticity; [Cannonball Formation]. (continued) 2-2-4-4 PRO. CASING Diameter: 4" CL Type: Steel pipe Interval: 3.5' ags - 1.5' bgs RISER CASING 1685 30-Diameter: 2" SILTY SAND WITH GRAVEL (SM): wet; [Cannonball Formation]. SM Type: PVC SCH 80 10-10-7-9. LEAN CLAY (CL): Brown (4/4 7.5YR); moist; oxidized staining; medium to high plasticity; Interval: 2.79' ags - 24' [Cannonball Formation]. bgs **GROUT** At 32.5': Sand lens, color changes to Black (2.5/1 7.5YR). 12 8-15-17-22. Type: Neat cement Interval: 0 - 19' bgs At 33.5': Sand lens. At 34': Interbedded sand with oxidized staining. **SEAL** 1680-35 13 7-19-15-Type: Bentonite chips Interval: 19 - 22' bgs At 36.5': Sand lens. **SANDPACK** 11-16-21-50 for 5". At 37': Sand lens. CI Type: Silica 40-70 At 37.5': Color change to Gray (5/1 7.5YR). Interval: 22 - 44' bgs At 38-38.5': 6" thick layer of hard material. 15 50 for 2"`-. **SCREEN** 1675 Diameter: 2"; No.6 slot 40 Type: PVC SCH 80 Interval: 24 - 44' bas 16 12-17-22-30. At 42-42.5': Silt layer. 9-18-24-50. At 43.5-44': Silt layer. End of boring 44.0 feet 45 Date Boring Started: 8/19/15 Remarks: DTW = 33.24' TOR on 8/20/2015 (elev. 1684.29) Date Boring Completed: 8/20/15 Logged By: JEG3 Drilling Contractor: Terracon Additional data may have been collected in the field which is not included on this log. Weather: Drill Rig: Rig mounted HSA



JECTS/34300014.GPJ BARRLIBRARY.GLB ENVIRO LOG BARR TEMPLATE.GDT

LOG OF BORING MW-104 DRAFT

BARR MILITINE PROPERTY SERVICE PROPERTY SHEET 1 OF 2 Project:R.M. Haskett Station CCR Monitoring Network Surface Elevation: 1681.5 ft Project No.:34300014.12 Drilling Method: HSA Unique Well No.: Location: Mandan, ND Sampling Method:SPT Coordinates:Lat: 438853.542° Long: 1869832.72° Datum:NAD 83 Completion Depth:32.0 ft feet Sample Type & Recovery Graphic Log feet Š WELL OR PIEZOMETER Blows/6in USCS Elevation, Sample ! Depth, LITHOLOGIC DESCRIPTION CONSTRUCTION **DETAIL** TOPSOIL: Brown (5/4 7.5YR). LEAN CLAY WITH SAND (CL): fine to medium grained; Brown (5/4 7.5YR); moist; gravel; 4-5-5-5 medium plasticity; [Cannonball Formation]. 1680· PRO. CASING ameter 4" CL Type: Steel pipe 3-5-6-8 Interval: 3.5' ags - 1.5' bgs LEAN CLAY (CL): Brown (4/4 7.5YR); oxidized staining and mottling; medium to high plasticity; with gypsum throughout; [Cannonball Formation]. RISER CASING 5 3 3-7-9-10 Type: PVC SCH 80 3.06' ags - 9' Interval: 1675 bgs 5-7-9-10. **GROUT** Type: None Interval: None 5 5-9-9-10. **SEAL** 10₹ Type: Bentonite chips Interval: 0 - 7' bgs 5-7-9-10. CL 1670⁻ **SANDPACK** At 12': Heavily oxidized. Type: Silica 40-70 5-8-8-12. Interval: 7 - 32' bgs **SCREEN** Diameter: 2"; No.6 slot 15 8 5-9-11-15. At 15': Start seeing black staining. Type: PVC SCH 80 Interval: 9 - 29' bas 1665 6-9-11-13. At 17': Heavily oxidized. SILTY SAND (SM): Strong Brown (5/6 7.5YR); wet; [Cannonball Formation]. 10 4-7-16-19 At 19.5': Color change to Brown (5/4 7.5YR). 20 SM 5-16-22-26 At 21': Oxidized layer. 1660· FAT CLAY (CH): Dark Gray (4/1 7.5YR); moist; stiff; high plasticity; with interbedded sand layers below 27'; [Cannonball Formation]. 12 7-11-14-CH Date Boring Started: 8/20/15 Remarks: DTW = 13.25' TOR on 8/21/2015 (elev. 1671.26) Date Boring Completed: 8/20/15 Logged By: JEG3 Drilling Contractor: Terracon Additional data may have been collected in the field which is not included on this log. Weather: Drill Rig: Rig mounted HSA



Drilling Contractor:

Drill Rig:

Terracon

Rig mounted HSA

LOG OF BORING MW-104

BARR Millineapons, Mil 50 .52 Telephone: 952-832-2600 SHEET 2 OF 2 Project:R.M. Haskett Station CCR Monitoring Network Surface Elevation: 1681.5 ft Project No.:34300014.12 Drilling Method: HSA Unique Well No.: Location:Mandan, ND Sampling Method:SPT Coordinates:Lat: 438853.542° Long: 1869832.72° Datum:NAD 83 Completion Depth:32.0 ft Elevation, feet Sample Type & Recovery Graphic Log Sample No. Depth, feet U S C S WELL OR PIEZOMETER Blows/6in LITHOLOGIC DESCRIPTION CONSTRUCTION **DETAIL** 6-12-16 17. FAT CLAY (CH): Dark Gray (4/1 7.5YR); moist; stiff; high plasticity; with interbedded sand layers below 27'; [Cannonball Formation]. (continued) 1655· PRO. CASING 14 8-12-16-21. Diameter: 4" CH Type: Steel pipe Interval: 3.5' ags - 1.5' bgs 15 8-12-16-20. RISER CASING 30 Diameter: 2" Driller notes: sluff. Type: PVC SCH 80 16 Interval: 3.06' ags - 9' 1650bgs End of boring 32.0 feet **GROUT** Type: None Interval: None **SEAL** 35 Type: Bentonite chips Interval: 0 - 7' bgs SANDPACK Type: Silica 40-70 Interval: 7 - 32' bgs **SCREEN** Diameter: 2"; No.6 slot M:\GINT\PROJECTS\34300014.GPJ BARRLIBRARY.GLB ENVIRO LOG BARR TEMPLATE.GDT 40 Type: PVC SCH 80 Interval: 9 - 29' bgs 45 _50____ Date Boring Started: 8/20/15 Remarks: DTW = 13.25' TOR on 8/21/2015 (elev. 1671.26) Date Boring Completed: 8/20/15 Logged By: JEG3

Additional data may have been collected in the field which is not included on this log. Weather:



JECTS/34300014.GPJ BARRLIBRARY.GLB ENVIRO LOG BARR TEMPLATE.GDT

LOG OF BORING MW-105

BARR Millineapons, Mil 50 .52 Telephone: 952-832-2600 SHEET 1 OF 2 Project:R.M. Haskett Station CCR Monitoring Network Surface Elevation: 1686.0 ft Project No.:34300014.12 Drilling Method: HSA Unique Well No.: Location: Mandan, ND Sampling Method:SPT Coordinates:Lat: 438042.079° Long: 1870325.657° Datum: NAD 83 Completion Depth:30.0 ft feet Sample Type & Recovery Graphic Log feet Š U S C S WELL OR PIEZOMETER Blows/6in Elevation, Sample ! Depth, LITHOLOGIC DESCRIPTION CONSTRUCTION **DETAIL** TOPSOIL: Brown (5/4 7.5YR). 1685⁻ 6-7-6-5 SANDY LEAN CLAY (CL): fine to medium grained; Brown (4/2 7.5YR); moist; gravel; PRO. CASING medium plasticity; [Cannonball Formation]. ameter: 4" Type: Steel pipe 5-5-5-6 Interval: 3.5' ags - 1.5' bgs CL RISER CASING 5 3 3-2-4-5 neter: 2" Type: PVC SCH 80 1680-3.16' ags - 10' Interval: bgs 4 2-2-2-3 **GROUT** Type: None LEAN CLAY (CL): Brown (4/2 7.5YR); soft; high plasticity; wet at 16'; [Cannonball Formation]. Interval: None 2-1-2-2. 10<u>⊣</u> **SEAL** Type: Bentonite chips At 10.5': Color change to Reddish-Yellow (6/6 7.5YR). Interval: 0 - 7' bgs 1675 2-1-2-1 **SANDPACK** Type: Silica 40-70 Interval: 7 - 30' bgs 2-1-1-3 **SCREEN** At 14.5-15.5': Gravel inclusions. Diameter: 2"; No.6 slot 15 CL 4-3-5-5 Type: PVC SCH 80 At 15.5': Color change to Brown (4/3 7.5YR). Interval: 10 - 30' bas 1670-7-9-11-13. At 18': Color change to Brown (5/3 7.5YR). 10 7-9-11-13 20 1665 11 7-9-13-15. POORLY GRADED SAND WITH SILT (SP-SM): medium to coarse grained; Brown (5/4 7.5YR); [Cannonball Formation]. 12 19-26-28-30. SP-SM Date Boring Started: 8/17/15 Remarks: DTW = 13.22' TOR on 8/21/2015 (elev. 1675.92) Date Boring Completed: 8/17/15 Logged By: JEG3 Drilling Contractor: Terracon Additional data may have been collected in the field which is not included on this log. Weather: Drill Rig: Rig mounted HSA

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

M:\GINT\PROJECTS\34300014.GPJ BARRLIBRARY.GLB ENVIRO LOG BARR TEMPLATE.GDT

LOG OF BORING MW-105

BARR Milineapone: 952-832-2600 SHEET 2 OF 2 Project:R.M. Haskett Station CCR Monitoring Network Surface Elevation: 1686.0 ft Project No.:34300014.12 Drilling Method: HSA Unique Well No.: Location: Mandan, ND Sampling Method:SPT Coordinates:Lat: 438042.079° Long: 1870325.657° Datum: NAD 83 Completion Depth:30.0 ft Elevation, feet Sample Type & Recovery Graphic Log Depth, feet Sample No. U S C S WELL OR PIEZOMETER Blows/6in LITHOLOGIC DESCRIPTION CONSTRUCTION **DETAIL** FAT CLAY (CL): Dark Brown (3/4 7.5YR); high plasticity; sand lens at 26.5'; [Cannonball 1660· At 26': Color change to Gray (5/1 7.5YR). PRO. CASING 14 10-15-18-30. Diameter: 4" CL Type: Steel pipe Interval: 3.5' ags - 1.5' bgs 11-16-22-32. RISER CASING 30 Diameter: 2" End of boring 30.0 feet Type: PVC SCH 80 Interval: 3.16' ags - 10' bgs **GROUT** Type: None Interval: None **SEAL** 35 Type: Bentonite chips Interval: 0 - 7' bgs SANDPACK Type: Silica 40-70 Interval: 7 - 30' bgs **SCREEN** Diameter: 2"; No.6 slot 40 Type: PVC SCH 80 Interval: 10 - 30' bgs 45 _50____ Date Boring Started: 8/17/15 Remarks: DTW = 13.22' TOR on 8/21/2015 (elev. 1675.92) Date Boring Completed: 8/17/15 Logged By: JEG3 **Drilling Contractor:** Terracon Additional data may have been collected in the field which is not included on this log. Weather: Drill Rig: Rig mounted HSA

STATE OF NORTH DAKOTA

BOARD OF WATER WELL CONTRACTORS

900 E. BOULEVARD . BISMARCK, NORTH DAKOTA 58501

WELL DRILLER'S REPORT

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

1. WELL OWNER	7. WATER LEVEL
Name <u>Montana Dakota Utilities</u>	Static water levelfeet below land surface If flowing: closed-in pressurepsi
AddressBismarck,_ND	GPM flowthroughinch pipe
2. WELL LOCATION	Controlled by: \[\] Valve \[\] Reducers \[\] Other
Sketch map location must agree with written location.	If other, specify
Heskett Ash Dispoal Site	8. WELL TEST DATA
#1-90	Description Pump Bailer Other
139-81-10CAD ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐	Pumping level below land surface:
1675.54	ft. afterhrs. pumpinggpm
Ground level Sec. [1 Mile] 1673 6 Morton	ft. afterhrs. pumpinggpm
SE 1/4 NE 1/4 SW 1/4 Sec. 10 Twp. 139 N. Rg. 81 W.	ft. afterhrs. pumpinggpm
	9. WELL LOG
3. PROPOSED USE ☐ Geothermal ☐ Monitoring ☐ Industrial	Depth (ft.)
Stock Municipal	Formation From To
	Clay, fill 0 3 Sand, fine to medium, yellowish
Cable Reverse Rotary Bored	brown
	Clay, silty, yellowish brown,
If other, specify	bedrock Clay, silty, medium gray 13 15
5. WATER QUALITY	
Was a water sample collected for: Chemical Analysis?	
Bacteriological Analysis? 🗌 Yes 🔲 No	
If so, to what laboratory was it sent	
6. WELL CONSTRUCTION	
Diameter of hole $\frac{5}{}$ inches. Depth $\frac{15}{}$ feet.	
Casing: Steel Nelded Other	
If other, specify	
Pipe Weight: Diameter: From: To:	
$SDR-21$ $lb\phi tk$. 2 inches ± 2.0 feet 5 feet	
lb/ftfeetfeet	
lb/ftinchesfeetfeet	
Was perforated pipe used?	
Perforated pipe set fromft tofeet	
Was casing left open end?	(Use separate sheet if necessary.)
	10. DATE COMPLETED 2/5/90
Material <u>PVC</u> Diameter 2 inches (stainless steel, bronze, etc.)	11. WAS WELL PLUGGED OR ABANDONED?
Slot size 10 set from 5 feet to 15 feet	☐ Yes [X] No
Slot sizeset fromfeet tofeet	If so, how
	12. REMARKS:
•	: :
	2" PVC cap on bottom of screen 160# of silica sand pack
Type of well: Straight screen Gravel packed X	
Depth grouted: From 3 To surface	42 DOLLIEDIC ACOTICIANTIANI
Ordany Material. CementOther	13. DRILLER'S CERTIFICATION This well was drilled under my jurisdiction and this report is
If other explain: <u>w/bentonite</u>	true to the best of my knowledge.
Well head completion: Pitless unit	Water Supply, Inc. 46
12" above grade XOther	Driller's or Firm's Name Certificate No
If other, specify	Box 1191 - Bismarck, ND 58502 Address
Was pump installed:	Address 2/5/90 2/5/90
Was well disinfected upon completion? Yes 🗵 No	Signed by Lewis Knutson Date

STATE OF NORTH DAKOTA

BOARD OF WATER WELL CONTRACTORS

900 E. BOULEVARD . BISMARCK, NORTH DAKOTA 58501

WELL DRILLER'S REPORT

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

1. WELL OWNER	7. WATER LEVEL
Name <u>Montana Dakota Utilities</u>	Static water level <u>dry</u> feet below land surface
AddressBismarck, ND	If flowing: closed-in pressurepsi
2. WELL LOCATION	GPM flowthroughinch pipe Controlled by: Ualve Reducers Other
Sketch map location must agree with written location.	If other, specify
Heskett Ash NORTH	
Disposal Site #2-90	8. WELL TEST DATA
139-81-10CAB1	Description Descri
Top of pipe	Pumping level below land surface:
1686.54 Cround level	ft. afterhrs. pumpinggpm
1684.3 Sec. [1 Mile]	ft. afterhrs. pumpinggpm
County Morton 10 - 130 21	ft. afterhrs. pumpinggpm
SW 1/4NE 1/4 NW 1/4 Sec. 10 Twp. 139 N. Rg. 81 W.	9. WELL LOG
3. PROPOSED USE Geothermal Monitoring	Depth (ft.)
☐ Domestic ☐ Irrigation ☐ Industrial	Formation From To
Stock [] Municipal [] Test Hole	Topsoil, silty, black 0 1
4. METHOD DRILLED	Sand, fine, yellowish gray 1 6.5
Cable Reverse Rotary Bored	Clay, silty, yellowish brown, 6.5 11
The Forward Rotary Jetted Auger Auger If other, specify The specific The specific	Clay, silty, medium gray 11 13
5. WATER QUALITY	Sand 15.5
Was a water sample collected for:	Clay, silty, medium gray, bedrock 15.5 23
Chemical Analysis?	
Bacteriological Analysis? Yes No	
If so, to what laboratory was it sent	
6. WELL CONSTRUCTION	
Diameter of hole $\frac{5}{2}$ inches. Depth $\frac{23}{2}$ feet. Casing: \Box Steel \Box Plastic \Box Concrete	
Casing: Steel Plastic Concrete Threaded Welded Other	
If other, specify	
Pipe Weight: Diameter: From: To:	
SDR-21 PS/CRt. 2 inches $+2.3$ feet 13 feet	
lb/ftfeetfeet	
lb/ftinchesfeetfeet	
Was perforated pipe used?	
Perforated pipe set fromft tofeet Was casing left open end? Yes No	(Use separate sheet if necessary.)
	10. DATE COMPLETED 2/5/90
Material PVCDiameter	11. WAS WELL PLUGGED OR ABANDONED?
Slot size 10 set from 13 feet to 23 feet	☐ Yes ☑ No
Slot sizeset fromfeet tofeet	If so, how
	12. REMARKS:
	2" PVC can on bottom of screen
If so, what materiacse bentonit pepth 11 to 12 Ft.	160# silica sand pack
Type of well: Straight screen Gravel packed X	
Depth grouted: From <u>11</u> To <u>surface</u>	
Grouting Material: Cement X Other Other	13. DRILLER'S CERTIFICATION
If other explain: <u>W/bentonite</u>	This well was drilled under my jurisdiction and this report is true to the best of my knowledge.
Well head completion: Pitless unit	
12'' above gradeXOther	Water Supply, Inc. 46 Driller's or Firm's Name Certificate No.
If other, specify	Box 1191 - Bismarck, ND 58502
Was pump installed:	Address
	2/5/90
Was well disinfected upon completion? Yes No	Signed by Lewis Knútson Date
VHITE-DRILLER'S CORY VELLOW-ROARD'S CORY PINK-CI	ISTOMER'S CORY

STATE OF NORTH DAKOTA

BOARD OF WATER WELL CONTRACTORS

900 E. BOULEVARD . BISMARCK, NORTH DAKOTA 58501

WELL DRILLER'S REPORT

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

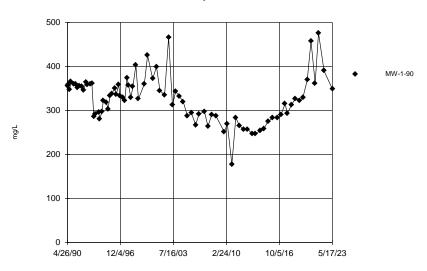
11. WELLOWNER	7. WATER LEVEL	
NameMontana Dakota Utilities	Static water level dry	
AddressBismarck, ND	If flowing: closed-in pressure GPM flowthrough_	
2. WELL LOCATION	Controlled by: [] Valve []	Reducers
Sketch map location must agree with written location.	If other, specify	
Heskett Ash Disposal Site		
#3-90	8. WELL TEST DATA	
139-81-10CAB2	Pump Bailer Oth	
Top of pipe ——————————————————————————————————	Pumping level below land surface:	
Ground level		pumpinggpm
1683.6 Sec. [1 Mile] County Morton		pumpinggpm
CountyMorton	ft. afterhrs.	pumpinggpm
	9. WELL LOG	
3. PROPOSED USE ☐ Geothermal ☒ Monitoring ☐ Domestic ☐ Irrigation ☐ Industrial		Depth (ft.)
Domestic Irrigation Industrial Stock Municipal Test Hole	Formation	From To
4. METHOD DRILLED	Topsoil, silty, black Clay, silty, yellowish brown,	
Reverse Rotary Bored	till	
Forward Rotary [] Jetted Auger	Sand, fine, yellowish brown	7
If other, specify	Clay, silty, medium gray, tili Clay, silty to sandy, medium	
5. WATER QUALITY	gray, abt 40% sand	15
Was a water sample collected for: Chemical Analysis?		
Bacteriological Analysis? Yes No		
If so, to what laboratory was it sent		
6. WELL CONSTRUCTION		
Diameter of hole5inches. Depth20feet.		
Casing: Steel Nastic Concrete		
Threaded Welded Other		
If other, specify		
Pipe Weight: Diameter: From: To: SDR-21 xqqqqq 2 inches ±2.3 feet 10 feet		
Ib/ftinchesfeetfeet		
lb/ftinchesfeetfeet		
Was perforated pipe used? Yes X No		
Perforated pipe set fromft tofeet	(Use separate sheet if n	ecessary.)
Was casing left open end? — Yes X No		
	10. DATE COMPLETED	2/5/90
Material <u>PVC</u> Diameter 2 inches (stainless steel, bronze, etc.)	11. WAS WELL PLUGGED OR ABAND	ONED?
Slot size 10 set from 10 feet to 20 feet		No
Slot sizeset fromfeet tofeet	If so, how	
	12. REMARKS:	
$\frac{\sqrt{2}}{\sqrt{2}} = \frac{1}{\sqrt{2}} = $	2" PVC cap on bottom of screen	
	160# silica sand pack	
Type of well: Straight screen Gravel packed		
Depth grouted: From 7.5 To surface	13. DRILLER'S CERTIFICATION	
Grouting Material: Cement X_Other	This well was drilled under my juris	ediction and this ranget is
If other explain: <u>W/bentonite</u>	true to the best of my knowledge.	
Well head completion: Pitless unit	Water Supply, Inc.	46
12" above gradeXOther	Driller's or Firm's Name	Certificate No.
If other, specify	Box 1191 - Bismarck, ND 58 Address	502
Was pump installed:	Address / /////////////////////////////////	2/5/90
Was well disinfected upon completion? 🗌 Yes 🖾 No	Signed-by Lewis Knutson	Date

Appendix F

MW1-90 Time Series Plots

Appendix F MW1-90 Time Series Plots

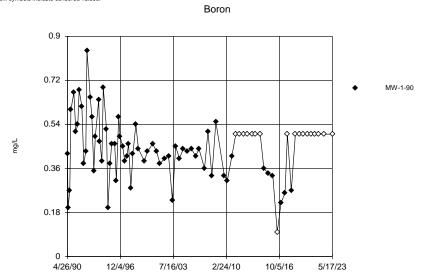
Alkalinity, bicarbonate



Time Series Analysis Run 12/4/2023 1:22 PM

R.M. Heskett Station Client: Montana-Dakota Utilities Co. Data: MDUHeskett_AMR_MW190

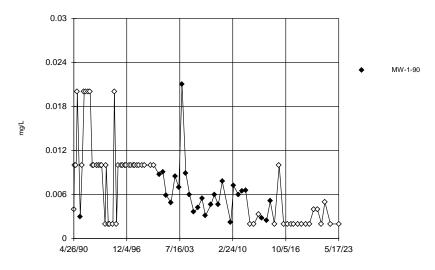
${\it Sanitas}^{\rm tw}\,v.9.6.37\,{\it For the statistical analyses of ground water by Barr Engineering Company only.\,UG\,Hollow symbols indicate censored values.}$



Time Series Analysis Run 12/4/2023 1:22 PM

R.M. Heskett Station Client: Montana-Dakota Utilities Co. Data: MDUHeskett_AMR_MW190

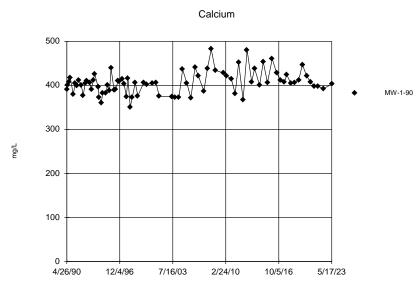
Arsenic



Time Series Analysis Run 12/4/2023 1:22 PM

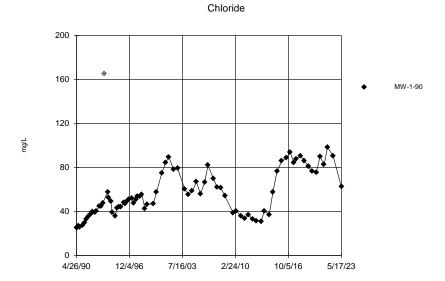
R.M. Heskett Station Client: Montana-Dakota Utilities Co. Data: MDUHeskett AMR MW190

Sanitas™ v.9.6.37 For the statistical analyses of ground water by Barr Engineering Company only. UG



Time Series Analysis Run 12/4/2023 1:22 PM

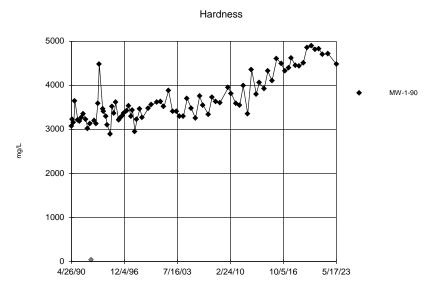
R.M. Heskett Station Client: Montana-Dakota Utilities Co. Data: MDUHeskett AMR MW190



Time Series Analysis Run 12/4/2023 1:22 PM

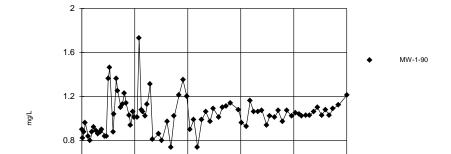
R.M. Heskett Station Client: Montana-Dakota Utilities Co. Data: MDUHeskett_AMR_MW190

Sanitas™ v.9.6.37 For the statistical analyses of ground water by Barr Engineering Company only. UG



Time Series Analysis Run 12/4/2023 1:22 PM

R.M. Heskett Station Client: Montana-Dakota Utilities Co. Data: MDUHeskett_AMR_MW190



Fluoride

Time Series Analysis Run 12/4/2023 1:22 PM

R.M. Heskett Station Client: Montana-Dakota Utilities Co. Data: MDUHeskett_AMR_MW190

2/24/10

10/5/16

5/17/23

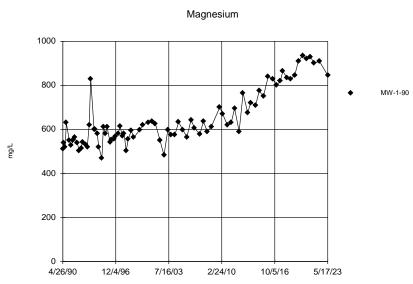
7/16/03

Sanitas™ v.9.6.37 For the statistical analyses of ground water by Barr Engineering Company only. UG

12/4/96

0.4

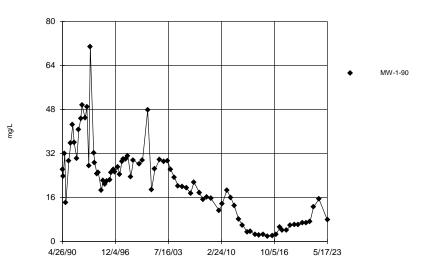
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Time Series Analysis Run 12/4/2023 1:22 PM

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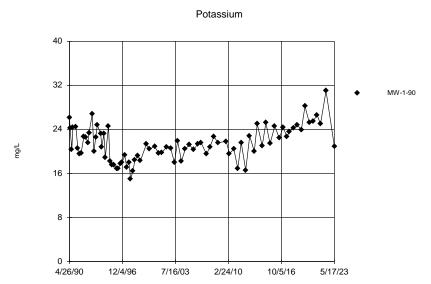




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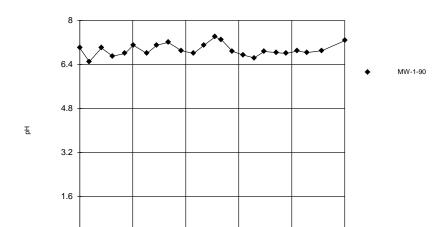
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Sanitas™ v.9.6.37 For the statistical analyses of ground water by Barr Engineering Company only. UG



Time Series Analysis Run 12/4/2023 1:22 PM

R.M. Heskett Station Client: Montana-Dakota Utilities Co. Data: MDUHeskett_AMR_MW190



Time Series Analysis Run 12/4/2023 1:22 PM

R.M. Heskett Station Client: Montana-Dakota Utilities Co. Data: MDUHeskett AMR MW190

7/21/18

12/17/20

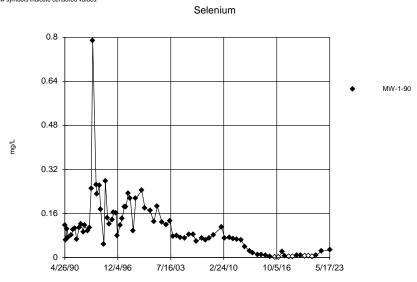
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2/21/16

$Sanitas^{\text{tw}}\,v.9.6.37\,For\,the\,statistical\,analyses\,of\,ground\,water\,by\,Barr\,Engineering\,Company\,only.\,UG\,Hollow\,symbols\,indicate\,censored\,values.$

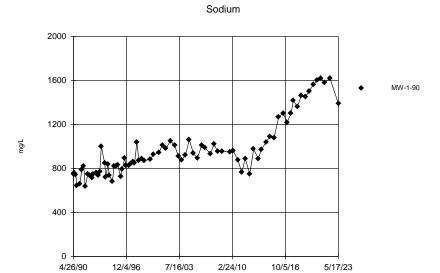
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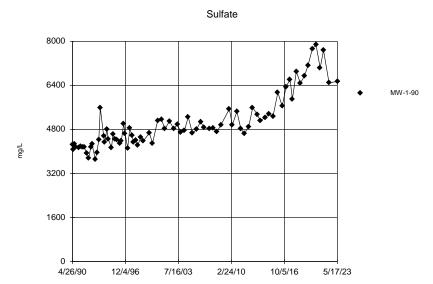
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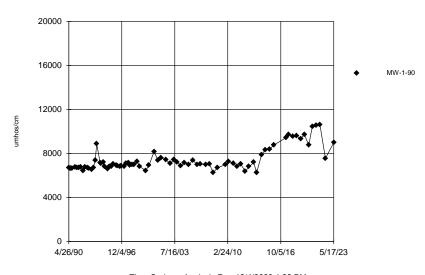
Sanitas™ v.9.6.37 For the statistical analyses of ground water by Barr Engineering Company only. UG



Time Series Analysis Run 12/4/2023 1:22 PM

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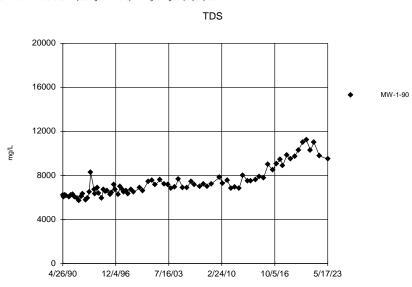
Specific conductance



Time Series Analysis Run 12/4/2023 1:22 PM

R.M. Heskett Station Client: Montana-Dakota Utilities Co. Data: MDUHeskett AMR MW190

Sanitas™ v.9.6.37 For the statistical analyses of ground water by Barr Engineering Company only. UG



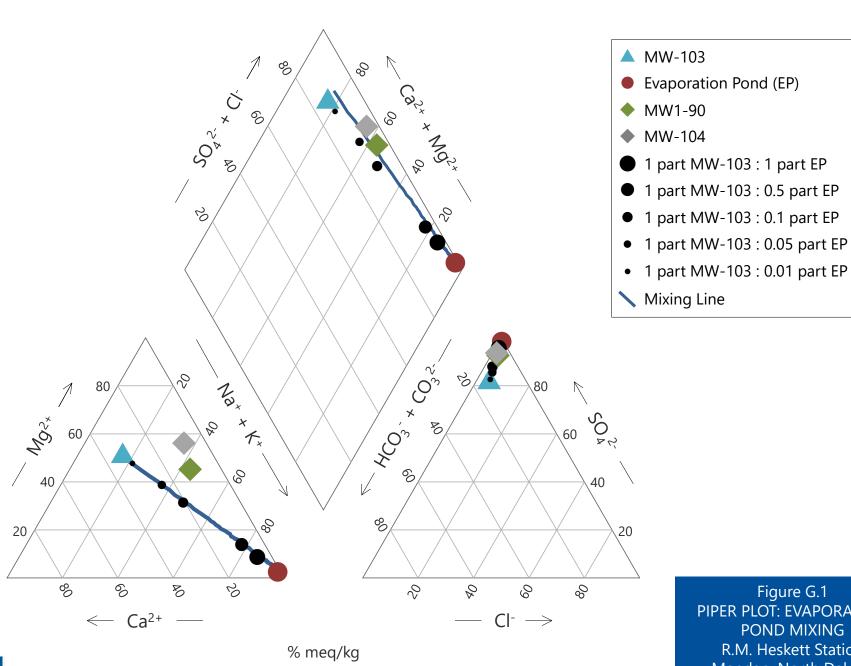
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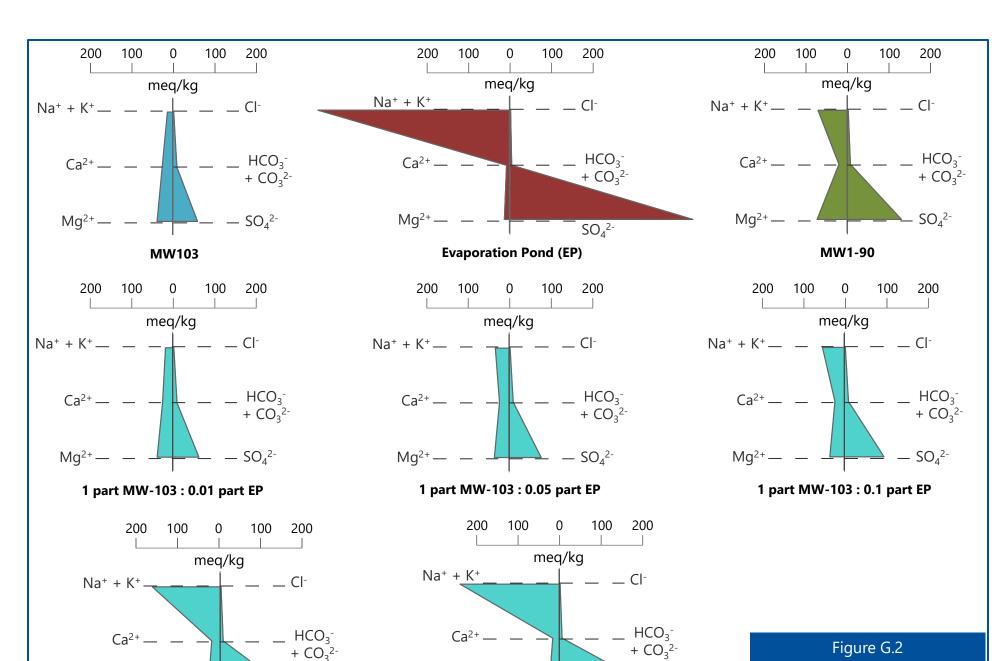
Appendix G

Geochemist's Workbench Results

Appendix G Geochemist's Workbench Results

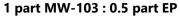


PIPER PLOT: EVAPORATION **POND MIXING** R.M. Heskett Station Mandan, North Dakota



1 part MW-103 : 1 part EP

STIFF PLOT: EVAPORATION **POND MIXING** R.M. Heskett Station Mandan, North Dakota



BARR

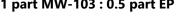


Table G.1
Geochemist's Workbench Mixing Model Results

Desci	ription	Upgradient	Evap Pond		Mixing Ev	ap Pond in	to MW 103		Downg	radient
Sample ID MW-103		Evap Pond	1:0.01	1:0.05	1:0.1	1:0.5	1:1	MW1 90	MW 104	
Samp	le Date	8/23/2021	9/16/2014			n/a			5/17/2023	8/24/2021
HCO3	mg/l	645	340	642	630	617	543	492	426	820
Ca++	mg/l	500	125	496	482	466	375	313	403	422
CI	mg/l	119	79.8	119	117	115	106	99	62.7	94.1
F	mg/l	0.30	0.1	0.30	0.29	0.28	0.23	0.20	1.21	0.54
Mg++	mg/l	464	165	461	450	437	364	315	845	1,640
K+	mg/l	20.0	734	27.1	54.0	84.9	258	377	20.9	34
Na+	mg/l	266	10,600	368	758	1,210	3,710	5,430	1,390	1,940
SO4	mg/l	3,000	22,100	3,190	3,910	4,740	9,370	12,500	6,540	11,600
рН	SU	6.6	10.7	6.6	6.7	6.7	7.4	8.9	6.9	6.9
TDS	mg/kg	4,950	34,100	5,240	6,350	7,610	14,700	19,600	10,700	16,500

Appendix C

Groundwater Elevation and Flow Rate

Appendix C Groundwater Elevation and Flow Rate

Appendix C **Groundwater Flow Rate** 2023 Annual Monitoring Report **Heskett CCR Groundwater Compliance**

Heskett Groundwater Velocity Calculation

Sampling Date	5/17/2023-5/18/2023
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Upgradient: MW13

Top of Casing Elevation	1724.27 ft amsl
Depth to Water	28.33 ft below TOC
Water Level Elevation	1695.94 ft amsl

Groundwater Monitoring System Report (Barr, 2016)

Downgradient: MW104

Top of Casing Elevation	1684.51	ft amsl	
Depth to Water	13.76	ft below TOC	
Water Level Elevation	1670.75	ft amsl	

Groundwater Monitoring System Report (Barr, 2016)

horizontal hydraulic	1.00E-04	
conductivity (Kh)	2.83E-01	ft/day
porosity (n)	0.25	
horizontal distance	1640	ft
WL elevation difference	25.19	
gradient (i)	0.015	ft/ft
linear velocity (V)	0.0174158	ft/day
V	6.4	ft/yr

Groundwater Monitoring System Documentation (Barr, 2017)

Groundwater Monitoring System Documentation (Barr, 2017)

Appendix C **Groundwater Flow Rate** 2023 Annual Monitoring Report **Heskett CCR Groundwater Compliance**

Heskett Groundwater Velocity Calculation

Sampling Date	8/28/2023-8/28/2023
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Upgradient: MW13

Top of Casing Elevation	1724.27 ft amsl
Depth to Water	28.33 ft below TOC
Water Level Elevation	1695.94 ft amsl

Groundwater Monitoring System Report (Barr, 2016)

Downgradient: MW104

Top of Casing Elevation	1684.51	ft amsl
Depth to Water	14.12	ft below TOC
Water Level Elevation	1670.39	ft amsl

Groundwater Monitoring System Report (Barr, 2016)

horizontal hydraulic	1.00E-04	
conductivity (Kh)	2.83E-01	ft/day
porosity (n)	0.25	
horizontal distance	1640	ft
WL elevation difference	25.55	ft
gradient (i)	0.016	ft/ft
linear velocity (V)	0.0176647	ft/day
V	6.5	ft/yr

Groundwater Monitoring System Documentation (Barr, 2017)

Groundwater Monitoring System Documentation (Barr, 2017)