2017 Annual Groundwater Monitoring and Corrective Action Report

CCR Landfill

R.M. Heskett Station
Mandan, North Dakota

Prepared for
Montana-Dakota Utilities Co.

January 2018

Barr Engineering Co.

2017 Annual Groundwater Monitoring and Corrective Action Report

CCR Landfill

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Mandan, North Dakota

January 2018

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Acronyms

Acronym	Description
CCR	Coal Combustion Residuals
CFR	Code of Federal Regulations
MDU	Montana Dakota Utilities
SSI	Statistically Significant Increase
TDF	Tire-derived fuel

1.0 Introduction

Montana-Dakota Utilities Co. (MDU) owns and operates R.M. Heskett Station, a coal-fired generating station and a gas fired turbine located in Mandan, North Dakota (Figure 1). One CCR (coal combustion residual) landfill, as defined by 40 CFR 257.53, is located on the property. Wastes contained in the CCR landfill primarily consist of coal combustion by-products, asbestos wastes generated from construction activity associated with MDU-owned facilities, and ash derived from burning of tire-derived fuel (TDF) at the facility.

This 2017 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).

1.1 Purpose

As stated in Section 257.90 (e), the purpose of the 2017 Annual Report is to:

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

1.2 CCR Rule Requirements

Baseline monitoring was completed prior to October 17, 2017. Detection monitoring was initiated by October 17, 2017. Information requirements for the Annual Report, as outlined in §257.90, paragraphs (e) the CCR Rule and this Site's compliance with the CCR Rule, are summarized in Table 1.

Table 1 CCR Rule Requirements and Compliance

CCR Rule Reference	Content Required in Report	Location
§257.90(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 Groundwater Monitoring System
§257.90(e)(3)	**Data and Collection Summary**: In addition to all the monitoring data obtained under §257.90 through §257.98, 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 Monitoring and Analytical Results
§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); and	Section 2.3 Monitoring and Analytical Results
§257.90(e)(5)	**Other Information**: Other information required to be included in the annual report as specified in §257.90 through §257.98. - Alternative Monitoring Frequency Demonstration (§257.94(d) and §257.95 (c)(3)) - Appendix III Alternative Source Demonstration Report (§257.94(e)(2)) Assessment Monitoring Results and Discussion (§257.95(d)(3)) - Appendix IV Alternative Source Demonstration Report (§257.95(g)(3)(ii)) - Demonstration for Additional Time for Assessment or Corrective Measures (§257.96(a))	Not applicable for reporting period.

2.0 Groundwater Monitoring Program

This section documents the status of the groundwater monitoring and corrective action program for the CCR unit from the effective date of the Rule through the end of 2017. The groundwater monitoring system is described 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 2018 are described in Section 2.4.

2.1 Groundwater Monitoring System

Figure 1 shows the six upgradient (MW-13, MW-33, MW-70, MW-101, MW-102, and MW-103), the one cross-gradient (MW-44R), and the five downgradient (MW-80R, MW-2-90, MW-3-90, MW-104, and MW-105) monitoring wells for the CCR unit groundwater monitoring system. All wells shown have unique well identification numbers.

No changes were made to the groundwater monitoring system in 2017.

2.2 Key Actions Completed/Problems Encountered

After the groundwater monitoring system was designed and constructed, and each well was developed so it could produce representative groundwater samples, the following key actions were completed through 2017:

- A QPE certified that the groundwater monitoring system was designed and constructed (Barr, 2017a) to meet the requirements of the CCR Rule (§257.91(f)).

- At least eight background samples were collected from each well in the CCR unit monitoring system by October 17, 2017; samples were analyzed for the constituents listed in Appendices III and IV of the CCR Rule (§257.94(b)).

- Groundwater samples for the first semiannual Detection Monitoring sampling event were collected from each well in the monitoring system by October 17, 2017; samples were analyzed for constituents listed in Appendix III of the CCR Rule (§257.94(c)).

No problems were encountered during the report period.

2.3 Monitoring and Analytical Results

CCR Rule provisions §257.90(e)(3) and §257.94(b) require collection of eight independent samples to establish background water quality for the detection monitoring program. A total of 96 (12 monitoring wells and eight sampling events) groundwater samples were collected and analyzed for the constituents listed in Appendices III and IV (Part 257) prior to October 17, 2017. Dates of sampling are reported on the field data sheets and analytical laboratory reports in Appendix A.

The monitoring program transitioned from baseline monitoring to detection monitoring by October 17, 2017.

2.4 Key Activities for Upcoming Year

The following key activities for groundwater monitoring and statistical evaluation of analytical results are planned for 2018:

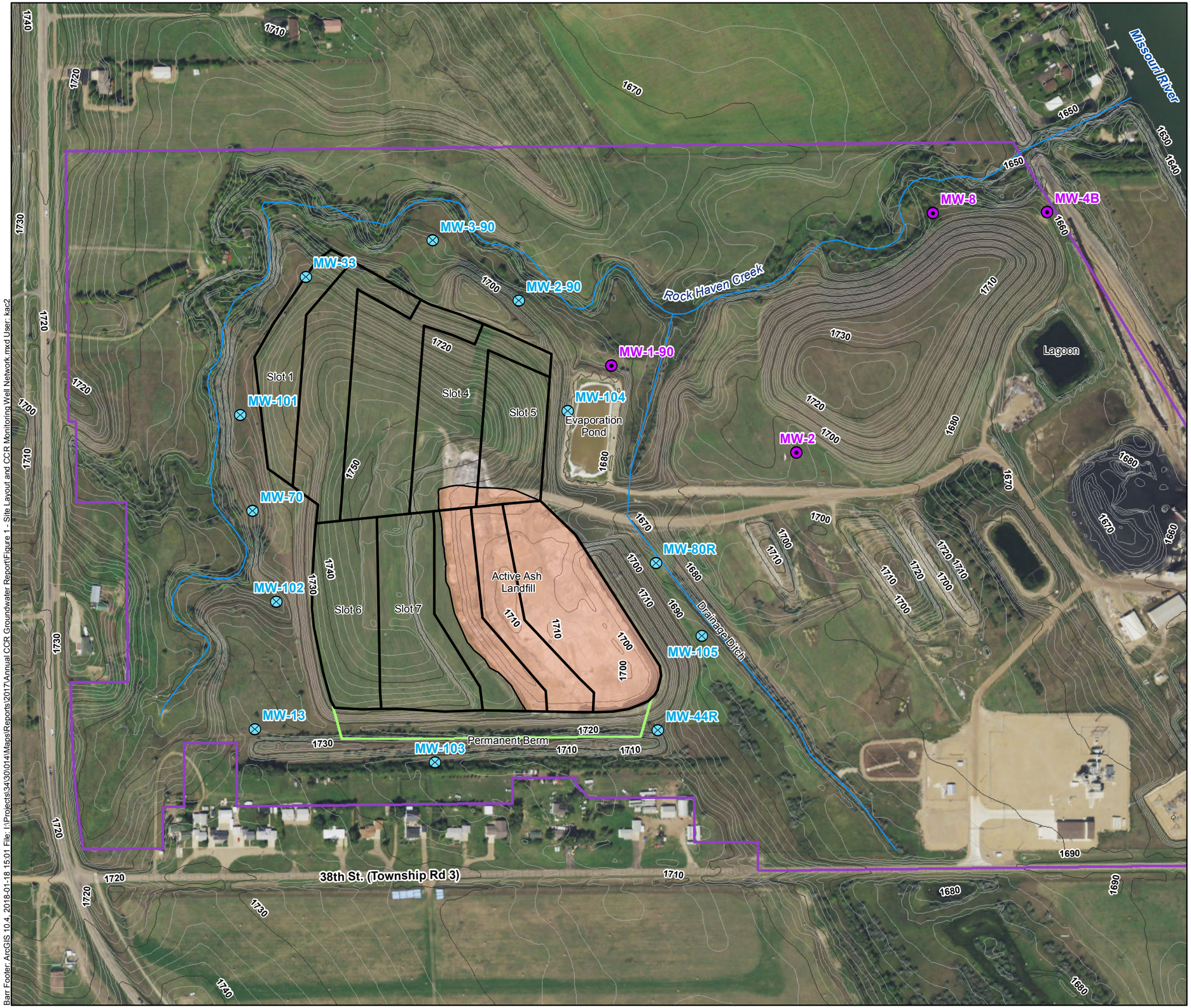
- Continue the groundwater monitoring program in accordance with the CCR rule.
- Complete Statistically Significant Increase (SSI) evaluation from the October 2017 semiannual detection monitoring event according to the Groundwater Statistical Method Selection Certification (Barr, 2017b).
- If one or more SSIs are detected and verified, implement an assessment monitoring program as prescribed by the CCR Rule (§257.95).

3.0 References

Barr Engineering Co. (Barr), 2017a, Groundwater Monitoring System Certification, October 2017.

Barr, 2017b, Statistical Method Selection Certification, October 2017.

Figures



- Monitoring Well Location
- Monitoring Well Location - Water Level Only
- Existing Slot Boundaries
- Streams
- Property Line
- Future Landfill Boundary
- 10ft Contours
- 2ft Contours
- Active Portion of Landfill

Image Source: 2017 Statewide Imagery (ND GIS Hub)

CAD Data Source: Slot Linework.dwg

Feet

350 0 350

BARR

Figure 1

SITE LAYOUT AND CCR
MONITORING WELL NETWORK
R. M. Heskett Station
2017 CCR Groundwater Monitoring Report
Montana Dakota Utilities
Mandan, North Dakota

Barr Footer: ArcGIS 10.4, 2018-01-18 15:01 File: I:\Projects\34\30\0014\Maps\Reports\2017\Annual CCR Groundwater Report\Figure 1 - Site Layout and CCR Monitoring Well Network.mxd User: kac2

Appendix A

Laboratory Reports and Field Sheets

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

CASE NARRATIVE – AMENDED 22 APRIL 2016

MVTL Lab Reference No/SDG: 201682-0284
IML Lab Reference No/SDG: S1602072

Client: Montana Dakota Utilities
Location: MDU Heskett Ash Site

Project Identification: CCR 1st Quarter 2016 (Radiochemistry)

MVTL Laboratory Identifications: 16-W201 through 16-W204
IML Laboratory Identifications: S1602072-001 through S1602072-004

MDU Sample Identification	MVTL Laboratory #	IML Laboratory #
Field Blank	16-W201	S1602072-001
Equipment Blank	16-W202	S1602072-002
104	16-W203	S1602072-003
105	16-W204	S1602072-004

I. RECEIPT

- All samples were received at the laboratory on 2 February 2016 at 1520.
- Samples were collected and hand delivered by MVTL Field Service personnel to the laboratory.
- Samples were received on ice and evidence of cooling had begun.
  - Temperature of samples upon receipt was 3.9°C.
- No other exceptions on sample receipt were encountered on this sample set unless noted here.
- All samples requiring radiochemistry analysis were sent via courier to Inter-Mountain Labs (IML) for analysis there. Samples were received at IML on 5 February 2016.
  - All samples were properly preserved unless noted on the individual analytical laboratory report or on the IML Case Narrative.

II. HOLDING TIMES

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

III. METHODS

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

IV. ANALYSIS

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

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Client: Montana Dakota Utilities
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Page 2 of 2

MDU Sample Identification	MVTL Laboratory #	IML Laboratory #
Field Blank	16-W201	S1602072-001
Equipment Blank	16-W202	S1602072-002
104	16-W203	S1602072-003
105	16-W204	S1602072-004

- Reporting limits were elevated higher than the reporting limits specified in the SAP. Higher reporting limits were due to smaller volumes of sample being collected for radiochemistry analyses.

V. REPORTING

- Per email from Barr Engineering dated 10 March 2016, IML reports were amended to report numerical values, including negative results for both the sample results and the method analyte precision.
- Per email from Samantha Marshall with MDU, MVTL was directed to report the radium 226 and radium 228 values individually and then MDU would calculate the summation result using their database tabulations.

All laboratory data has been approved by MVTL Laboratories.

SIGNED: Claudette Carroll DATE: 26 Apr 16
Claudette Carroll - MVTL Bismarck Laboratory Manager

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

MEMBER ACIL

Report Date: 26 Feb 16
Lab Number: 16-W201
Work Order #:82-0284
Account #: 002800
Date Sampled: 2 Feb 16 14:05
Date Received: 2 Feb 16 15:20
Sampled By: MVTL Field Services

Samantha Marshall
Montana Dakota Utilities
400 N. 4th
Bismarck ND 58501

Project Name: MDU Heskett Ash Site CCR Radiochem

PO #: 160249 OP

Sample Description: Field Blank (FB)

Temp at Receipt: 3.9C ROI

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
Radium 226	See Attached Report			17 Feb 16	OL
Radium 228	See Attached Report			20 Feb 16	OL

OL = Analysis performed by an Outside Laboratory.

Approved by: Claudette K. Carroll cc 26 Feb 16

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

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

CERTIFICATION: ND # ND-00016

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

Report Date: 26 Feb 16
Lab Number: 16-W202
Work Order #:82-0284
Account #: 002800
Date Sampled: 2 Feb 16 14:00
Date Received: 2 Feb 16 15:20
Sampled By: MVTL Field Services

Samantha Marshall
Montana Dakota Utilities
400 N. 4th
Bismarck ND 58501

Project Name: MDU Heskett Ash Site CCR Radiochem

PO #: 160249 OP

Sample Description: Equipment Blank (EB)

Temp at Receipt: 3.9C ROI

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
Radium 226	See Attached Report			17 Feb 16	OL
Radium 228	See Attached Report			20 Feb 16	OL

OL = Analysis performed by an Outside Laboratory.

Approved by: Claudette K. Carroll CC 26 Feb 16

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

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MEMBER ACIL

Report Date: 26 Feb 16
Lab Number: 16-W203
Work Order #:82-0284
Account #: 002800
Date Sampled: 2 Feb 16 13:48
Date Received: 2 Feb 16 15:20
Sampled By: MVTL Field Services

Samantha Marshall
Montana Dakota Utilities
400 N. 4th
Bismarck ND 58501

Project Name: MDU Heskett Ash Site CCR Radiochem

PO #: 160249 OP

Sample Description: 104

Temp at Receipt: 3.9C ROI

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	7.35	units	NA	SM 4500 H+ B	2 Feb 16 13:48	JSM
Temperature - Field	6.96	Degrees C	NA	SM 2550B	2 Feb 16 13:48	JSM
Conductivity - Field	13233	umhos/cm	1	EPA 120.1	2 Feb 16 13:48	JSM
Radium 226	See Attached Report				17 Feb 16	OL
Radium 228	See Attached Report				20 Feb 16	OL

OL = Analysis performed by an Outside Laboratory.

Approved by: Claudette K. Carroll 26 Feb 16

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

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

CERTIFICATION: ND # ND-00016

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MEMBER ACIL

Report Date: 26 Feb 16
Lab Number: 16-W204
Work Order #:82-0284
Account #: 002800
Date Sampled: 2 Feb 16 10:57
Date Received: 2 Feb 16 15:20
Sampled By: MVTL Field Services

Samantha Marshall
Montana Dakota Utilities
400 N. 4th
Bismarck ND 58501

Project Name: MDU Heskett Ash Site CCR Radiochem

PO #: 160249 OP

Sample Description: 105

Temp at Receipt: 3.9C ROI

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	7.13	units	NA	SM 4500 H+ B	2 Feb 16 10:57	JSM
Temperature - Field	6.36	Degrees C	NA	SM 2550B	2 Feb 16 10:57	JSM
Conductivity - Field	6191	umhos/cm	1	EPA 120.1	2 Feb 16 10:57	JSM
Radium 226	See Attached Report				17 Feb 16	OL
Radium 228	See Attached Report				20 Feb 16	OL

OL = Analysis performed by an Outside Laboratory.

Approved by: Claudette K. Carroll 26 Feb 16

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

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

CERTIFICATION: ND # ND-00016

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

Your Environmental Monitoring Partner

Date: 2/24/2016

CLIENT: MVTL Laboratories, Inc.
Project: 201682-0284
Lab Order: S1602072

CASE NARRATIVE

Report ID: S1602072001

Samples 16-W201 Field Blank (FB), 16-W202 Equipment Blank (EB), 16-W203 104, and 16-W204 105 were received on February 5, 2016.

All samples were received and analyzed within the EPA recommended holding times, except those noted below in this case narrative. Samples were analyzed using the methods outlined in the following references:

"Standard Methods For The Examination of Water and Wastewater", approved method versions
Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, 3rd Edition
40 CFR Parts 136 and 141
40 CFR Part 50, Appendices B, J, L, and O
Methods indicated in the Methods Update Rule published in the Federal Register Friday, May 18, 2012
ASTM approved and recognized standards

All Quality Control parameters met the acceptance criteria defined by EPA and Inter-Mountain Laboratories except as indicated in this case narrative.

Reviewed by:
Wade Nieuwsma, Assistant Laboratory Manager

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

Your Environmental Monitoring Partner

Sample Analysis Report

Company:	MVTL Laboratories, Inc. 2616 E Broadway Ave. Bismarck, ND 58501	**Date Reported** **Report ID**	4/6/2016 S1602072002 (Replaces S1602072001)
ProjectName:	201682-0284	**WorkOrder:**	S1602072
Lab ID:	S1602072-001	**CollectionDate:**	2/2/2016 2:05:00 PM
ClientSample ID:	16-W201 Field Blank (FB)	**DateReceived:**	2/5/2016 10:20:00 AM
COC:	201682-0284	**FieldSampler:**	
		Matrix:	Water

Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Radionuclides - Total							
Radium 226	0.01	pCi/L		0.4	SM 7500 Ra-B	02/17/2016 854	MB
Radium 226 Precision (±)	0.1	pCi/L			SM 7500 Ra-B	02/17/2016 854	MB
Radium 228	-5.8	pCi/L		2	Ga-Tech	02/20/2016 1002	MB
Radium 228 Precision (±)	2.0	pCi/L			Ga-Tech	02/20/2016 1002	MB

These results apply only to the samples tested.

RL - Reporting Limit

Qualifiers:

B	Analyte detected in the associated Method Blank	C	Calculated Value
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	L	Analyzed by another laboratory
M	Value exceeds Monthly Ave or MCL or is less than LCL	ND	Not Detected at the Reporting Limit
O	Outside the Range of Dilutions	S	Spike Recovery outside accepted recovery limits
X	Matrix Effect		

Reviewed by: _____
Wade Nieuwsma, Assistant Laboratory Manager

Sample Analysis Report

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

Date Reported 4/6/2016
Report ID S1602072002
(Replaces S1602072001)

ProjectName: 201682-0284
Lab ID: S1602072-002
ClientSample ID: 16-W202 Equipment Blank (EB)
COC: 201682-0284

WorkOrder: S1602072
CollectionDate: 2/2/2016 2:00:00 PM
DateReceived: 2/5/2016 10:20:00 AM
FieldSampler:
Matrix: Water

Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Radionuclides - Total							
Radium 226	-0.02	pCi/L		0.4	SM 7500 Ra-B	02/17/2016 854	MB
Radium 226 Precision (±)	0.1	pCi/L			SM 7500 Ra-B	02/17/2016 854	MB
Radium 228	-8.9	pCi/L		2	Ga-Tech	02/20/2016 1303	MB
Radium 228 Precision (±)	2.4	pCi/L			Ga-Tech	02/20/2016 1303	MB

These results apply only to the samples tested.

RL - Reporting Limit

Qualifiers:

B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
M	Value exceeds Monthly Ave or MCL or is less than LCL
O	Outside the Range of Dilutions
X	Matrix Effect
C	Calculated Value
H	Holding times for preparation or analysis exceeded
L	Analyzed by another laboratory
ND	Not Detected at the Reporting Limit
S	Spike Recovery outside accepted recovery limits

Reviewed by: _____
Wade Nieuwsma, Assistant Laboratory Manager

Sample Analysis Report

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

Date Reported 4/6/2016
Report ID S1602072002
(Replaces S1602072001)

ProjectName: 201682-0284
Lab ID: S1602072-003
ClientSample ID: 16-W203 104
COC: 201682-0284

WorkOrder: S1602072
CollectionDate: 2/2/2016 1:48:00 PM
DateReceived: 2/5/2016 10:20:00 AM
FieldSampler:
Matrix: Water

Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Radionuclides - Total							
Radium 226	-0.03	pCi/L		0.4	SM 7500 Ra-B	02/17/2016 854	MB
Radium 226 Precision (±)	-0.01	pCi/L			SM 7500 Ra-B	02/17/2016 854	MB
Radium 228	-4.8	pCi/L		2	Ga-Tech	02/20/2016 1604	MB
Radium 228 Precision (±)	2.1	pCi/L			Ga-Tech	02/20/2016 1604	MB

These results apply only to the samples tested.

RL - Reporting Limit

Qualifiers:

B	Analyte detected in the associated Method Blank	C	Calculated Value
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	L	Analyzed by another laboratory
M	Value exceeds Monthly Ave or MCL or is less than LCL	ND	Not Detected at the Reporting Limit
O	Outside the Range of Dilutions	S	Spike Recovery outside accepted recovery limits
X	Matrix Effect		

Reviewed by: _____
Wade Nieuwsma, Assistant Laboratory Manager

Sample Analysis Report

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

Date Reported 4/6/2016
Report ID S1602072002
(Replaces S1602072001)

ProjectName: 201682-0284
Lab ID: S1602072-004
ClientSample ID: 16-W204 105
COC: 201682-0284

WorkOrder: S1602072
CollectionDate: 2/2/2016 10:57:00 AM
DateReceived: 2/5/2016 10:20:00 AM
FieldSampler:
Matrix: Water

Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Radionuclides - Total							
Radium 226	0.2	pCi/L		0.4	SM 7500 Ra-B	02/17/2016 854	MB
Radium 226 Precision (±)	0.1	pCi/L			SM 7500 Ra-B	02/17/2016 854	MB
Radium 228	-1.6	pCi/L		2	Ga-Tech	02/20/2016 1905	MB
Radium 228 Precision (±)	2.0	pCi/L			Ga-Tech	02/20/2016 1905	MB

These results apply only to the samples tested.

RL - Reporting Limit

Qualifiers:

B	Analyte detected in the associated Method Blank	C	Calculated Value
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	L	Analyzed by another laboratory
M	Value exceeds Monthly Ave or MCL or is less than LCL	ND	Not Detected at the Reporting Limit
O	Outside the Range of Dilutions	S	Spike Recovery outside accepted recovery limits
X	Matrix Effect		

Reviewed by: _____
Wade Nieuwsma, Assistant Laboratory Manager

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

Your Environmental Monitoring Partner

ANALYTICAL QC SUMMARY REPORT

CLIENT: MVTL Laboratories, Inc.
Work Order: S1602072
Project: 201682-0284

Date: 2/24/2016
Report ID: S1602072001

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

MB-322 (02/19/16 15:57)	RunNo: 131412	PrepDate: 02/10/16 13:00			BatchID: 11429		
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Total Radium 228	ND	1					

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

LCS-322 (02/19/16 18:58)	RunNo: 131412	PrepDate: 02/10/16 13:00			BatchID: 11429		
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Total Radium 228	39	1	40.1		96.9	61.3 - 120	

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

MS-322 (02/20/16 00:59)	RunNo: 131412	PrepDate: 02/10/16 13:00			BatchID: 11429		
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Total Radium 228	34	1	40.1	ND	85.2	64.3 - 120	

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

MSD-322 (02/20/16 04:00)	RunNo: 131412	PrepDate: 02/10/16 13:00				BatchID: 11429	
Analyte	Result	RL	Conc	%RPD	%REC	% RPD Limits	Qual
Total Radium 228	37	1	34	8.50	92.8	20	

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

MB-1576 (02/17/16 08:54)	RunNo: 131239	PrepDate: 02/10/16 0:00			BatchID: 11410		
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Radium 226	ND	0.2					

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

LCS-1576 (02/17/16 08:54)	RunNo: 131239	PrepDate: 02/10/16 0:00			BatchID: 11410		
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Radium 226	5.1	0.2	5.54		91.4	67.1 - 122	

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

LCSD-1576 (02/17/16 08:54)	RunNo: 131239	PrepDate: 02/10/16 0:00				BatchID: 11410	
Analyte	Result	RL	Conc	%RPD	%REC	% RPD Limits	Qual
Radium 226	5.4	0.2	5.1	6.73	108	20	

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

S1602072-001A MS (02/17/16 08:54)	RunNo: 131239	PrepDate: 02/10/16 0:00			BatchID: 11410		
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Radium 226	11	1	11.1	ND	96.6	65 - 131	

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
L	Analyzed by another laboratory	ND	Not Detected at the Reporting Limit
O	Outside the Range of Dilutions	R	RPD outside accepted recovery limits
S	Spike Recovery outside accepted recovery limits	X	Matrix Effect

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

Chain of Custody Record

201682-0284

Company Name and Address: MVTL 2616 E Broadway Bismarck, ND 58501	Account #:	Phone #: 701-258-9720
	Contact: Claudette	Fax #: For faxed report check box ☐
	Name of Sampler:	E-mail: ccarroll@mvtl.com For e-mail report check box ☐
Billing Address (indicate if different from above): PO Box 249 New Ulm, MN 56073	Quote Number	Date Submitted: 2/3/2016
	Project Name/Number:	Purchase Order #: BL5510

Sample Information						Bottle Type						Analysis
S1602072 IML Lab Number	MVTL Lab Number	Client Sample ID	Sample Type	Date Sampled	Time Sampled	Untreated	1000 ml HNO3	VOC Vials Unpreserved	Glass Jar	Other		Analysis Required
001	16-W201	Field Blank (FB)	GW	2/2/2016	1405		2					Ra226, Ra228
002	16-W202	Equipment Blank (EB)	GW	2/2/2016	1400		2					Ra226, Ra228
003	16-W203	104	GW	2/2/2016	1348		2					Ra226, Ra228
004	16-W204	105	GW	2/2/2016	1057		2					Ra226, Ra228

Comments:

Transferred by:	Date:	Time:	Sample Condition:	Received by:	Date:		Temp:
T. Olson	2/3/2016	1700		Kathy Bap	2.5.16	10:20	4.7 C
2.							

MVTL

2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

Field Datasheet

Groundwater Assessment

Company: MDU Heskett - Ash Site

Sample ID: 104

Date: 2 Feb 16

Sampling Personal: Jeremy Myers

Field Measurements

SEQ #	Time	Temp	Cond.	pH	DO (mg/L)	ORP	Turb (NTU)	Water Level (ft)	mL Removed	Appearance
11	1228	6.99	13212	7.33	0.90	26.8	336.0	16.75	1100	Slightly Turbid
12	1238	7.10	13231	7.33	0.31	26.1	326.0	16.85	1100	Slightly Turbid
13	1248	7.05	13200	7.34	0.24	24.2	268.0	16.98	1100	Slightly Turbid
14	1258	7.06	13204	7.34	0.24	23.0	252.0	17.06	1100	Slightly Turbid
15	1308	6.83	13219	7.34	0.27	22.2	225.0	17.14	1100	Slightly Turbid
16	1318	6.90	13238	7.35	0.27	21.6	209.0	17.21	1100	Slightly Turbid
17	1328	6.91	13235	7.35	0.26	20.9	179.0	17.33	1100	Slightly Turbid
18	1338	6.90	13258	7.35	0.26	20.5	177.0	17.38	1100	Slightly Turbid
19	1348	6.96	13233	7.35	0.28	20.2	168.0	17.42	1100	Slightly Turbid
20										
21										
22										
23										
24										
25										
26										
27										
28										
29										
30										

Stabilized: (Yes) No

Total mL Removed: 15,400

Comments:

Field Datasheet

Groundwater Assessment

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

Company: MDU Heskett - Ash Site
Sample ID: 104
Date: 2 Feb 16
Sampling Personal: Jeremy Meyer

Weather Conditions: Temp: 30 °F Wind: S @5-10 Precip: Sunny / ~~Partly Cloudy~~ / Cloudy

Well Information

Well Locked?	Yes	(No)	
Well Labeled?	~~Yes~~	No	
Casing Straight?	~~Yes~~	No	
Grout Seal Intact?	~~Yes~~	No	Not Visible
Repairs Necessary:			
Casing Diameter:	2"		
Water Level Before Purge:	14.05	Ft	
Well Depth:	32.85	Ft	
Well Volume:	11.6	Liters	
Water Level After Sample:	17.45	Ft	
Measurement Method:	Electric Water Level Indicator		

Sampling Information

Sampling Method: Bladder

Dedicated Equipment?		Yes	(No)
Duplicate Sample?		Yes	(No) ID: —
Pumping Rate:	110	ml/min	
Time Purging Began:	1133	(am) / pm	
Time of Sampling:	1340	am / pm	
Well Purged Dry?		Yes	(No)
Time Purged Dry:	—	am / pm	
Sample Appearance:	Clear / ~~Slightly Turbid~~ / Turbid		Phase: —
Color:	—		Odor: —

Control Box Settings
Purge: 5 sec.
Rest: 55 sec.
PSI: 20

Field Measurements

SEQ #	Time	Temp	Cond.	pH	DO (mg/L)	ORP	Turb (NTU)	Water Level (ft)	mL Removed	Appearance
1	1138	7.02	13461	7.32	1.42	56.2	52.2	14.64	550	Slightly Turbid
2	1143	6.95	13501	7.31	0.90	49.7	59.7	15.31	550	Slightly Turbid
3	1148	7.34	13484	7.31	1.51	44.4	68.4	15.82	550	Slightly Turbid
4	1153	7.25	13485	7.31	0.52	41.5	87.9	16.05	550	Slightly Turbid
5	1158	7.06	13459	7.31	0.42	38.3	126.0	16.23	550	Slightly Turbid
6	1203	7.11	13449	7.31	0.32	35.5	190.0	16.42	550	Slightly Turbid
7	1208	6.93	13432	7.31	0.29	33.4	225.0	16.45	550	Slightly Turbid
8	1213	6.95	13337	7.32	0.26	31.0	283.0	16.58	550	Slightly Turbid
9	1215	7.03	13275	7.32	0.24	29.4	323.0	16.59	550	Slightly Turbid
10	1218	7.05	13228	7.33	0.24	27.4	338.0	16.74	550	Slightly Turbid

Stabilized: (Yes) No
~~Total~~ mL Removed: 5500

Bottles Collected
500 mL HNO_3
1 Liter Raw
2 - 1 Liter HNO3

Comments:
Continued on Next page
Switched to readings every 10 min due to high turbidity.

MVTL

2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

Field Datasheet

Groundwater Assessment

Company: MDU Heskett - Ash Site

Sample ID: 105

Date: 2 feb 16

Sampling Personal: Jeremy May

Field Measurements

SEQ #	Time	Temp	Cond.	pH	DO (mg/L)	ORP	Turb (NTU)	Water Level (ft)	mL Removed	Appearance
11	1032	6.35	5394	7.17	0.55	33.3	162.0	14.32	550	Slightly Turbid
12	1037	6.36	5599	7.16	0.67	32.3	147.0	14.37	550	Slightly Turbid
13	1042	6.38	5777	7.15	0.34	31.0	141.0	14.34	550	Slightly Turbid
14	1047	6.38	5926	7.15	0.53	30.0	131.0	14.38	550	Slightly Turbid
15	1052	6.28	6058	7.13	0.57	29.6	123.0	14.40	550	Slightly Turbid
16	1057	6.36	6191	7.13	0.68	27.8	120.0	14.39	550	Slightly Turbid
17										
18										
19										
20										
21										
22										
23										
24										
25										
26										
27										
28										
29										
30										

Stabilized: (Yes) No

Total mL Removed: 3300

Comments:

MVTL

2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

Field Datasheet

Groundwater Assessment

Company: MDU Heskett - Ash Site

Sample ID: 105

Date: 2 Feb 16

Sampling Personal: Jeremy Thayer

Weather Conditions: Temp: 25 °F Wind: S @ 5-10 Precip: Sunny / Partly Cloudy / Cloudy

Well Information

Well Locked?	Yes	(No)	
Well Labeled?	(Yes)	No	
Casing Straight?	(Yes)	No	
Grout Seal Intact?	(Yes)	No	Not Visible
Repairs Necessary:			
Casing Diameter:	2"		
Water Level Before Purge:	13.27	Ft	
Well Depth:	32.39	Ft	
Well Volume:	11.8	Liters	
Water Level After Sample:	14.32	Ft	
Measurement Method:	Electric Water Level Indicator		

Sampling Information

Sampling Method: Bladder

Dedicated Equipment?	Yes	(No)	
Duplicate Sample?	Yes	(No)	ID: —
Pumping Rate:	110	ml/min	
Time Purging Began:	0937	(am) / pm	
Time of Sampling:	1057	am / pm	
Well Purged Dry?	Yes	(No)	
Time Purged Dry:	—	am / pm	
Sample Appearance:	Clear / (Slightly Turbid) / Turbid		Phase: —
Color:	—		Odor: —

Control Box Settings

Purge: 5 sec.

Rest: 55 sec.

PSI: 20

Field Measurements

SEQ #	Time	Temp	Cond.	pH	DO (mg/L)	ORP	Turb (NTU)	Water Level (ft)	mL Removed	Appearance
1	0942	5.55	2414	7.42	6.77	48.2	204.0	13.59	550	Slightly Turbid
2	0947	6.17	2397	7.33	3.02	42.5	172.0	14.00	550	Slightly Turbid
3	0952	6.28	2403	7.36	0.78	41.6	191.0	14.27	550	Slightly Turbid
4	0957	6.23	2578	7.33	0.57	40.1	204.0	14.30	550	Slightly Turbid
5	1002	6.21	2954	7.30	0.75	39.3	232.0	14.32	550	Slightly Turbid
6	1007	6.18	3537	7.26	1.03	38.7	225.0	14.30	550	Slightly Turbid
7	1012	6.28	3941	7.23	1.14	37.8	222.0	14.35	550	Slightly Turbid
8	1017	6.29	4490	7.21	1.82	36.6	222.0	14.36	550	Slightly Turbid
9	1022	6.23	4766	7.20	0.80	35.6	183.0	14.20	550	Slightly Turbid
10	1027	6.26	5111	7.18	1.37	34.2	180.0	14.34	550	Slightly Turbid

Stabilized: (Yes) No

Total mL Removed: —

Bottles Collected

500 mL HNO_3

1 Liter Raw

2 - 1 Liter HNO3

Comments:

Continued on next page

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

Chain of Custody Record

Project Name: MDU Heskett - Ash Site CCR Radiochemistry	**Name of Sampler(s):** Jeremy Meyer
Report To: Montana Dakota Utilities Attn: Samantha Marshall Address: 400 N. 4th St Bismarck, ND 58501 Phone: 701-222-7829	**Carbon Copy:** Attn: Address:
	Work Order Number: 82-0284

Sample Information						Bottle Type							Field Parameters			Analysis
Lab Number	Sample ID	Date	Time	Sample Type	Sample Location	500 ml HNO_3	250 ml H_2SO_4	1 liter	1L HNO_3	VOC's (HCl)	1 liter H_2SO_4	1liter Amber HCL	Field Temperature °C	Field Spec. Cond.	Field pH	Analysis Required
W201	Field Blank (FB)	2Feb16	1405						2				—	—	—	MDU CCR Radiochemistry
W202	Equipment Blank (EB)	2Feb16	1400						2				—	—	—	
W203	104	2Feb16	1348						2				6.96	13233	7.35	
W204	105	2Feb16	1057						2				6.36	6191	7.13	

Comments:

	Transferred by:	Sample Condition	Date/Time	Received by:	Sample Condition	Date/Time	°C
1		Logic	2 Feb 16 1520			2 FEB 2016 1520	3.9°C ROI
2							TM588
3							

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MEMBER ACIL

CASE NARRATIVE – AMENDED 13 MAY 2016

MVTL Lab Reference No/SDG: **201682-0286**
Client: **Montana Dakota Utilities**
Location: **MDU Heskett Ash Site**
Project Identification: **CCR 1st Quarter 2016 Groundwater**

MVTL Laboratory Identifications: **16-W205** through **16-W212**
Page 1 of 2

MDU Sample Identification	MVTL Laboratory #
Field Blank	16-W205
Equipment Blank	16-W206
Duplicate 2	16-W207
13	16-W208
103	16-W209
44R	16-W210
102	16-W211
70	16-W212

I. RECEIPT

- All samples were received at the laboratory on 4 February 2016 at 0800.
- Samples were collected and hand delivered by MVTL Field Service personnel to the laboratory.
- Samples were received on ice and evidence of cooling had begun.
  - Temperature of samples upon receipt was 5.4°C.
- All samples were properly preserved unless noted here and/or flagged on the individual analytical laboratory report.
- No other exceptions on sample receipt were encountered on this sample set unless noted here.
  - MVTL Field Services department inadvertently used the 2015 MDU Heskett SAP/quotation to collect samples during the February 2016 event. Per email from Barr Engineering dated 10 March 2016, analysis of alkalinity, magnesium, sodium, and potassium were added to the samples in order to meet the specifications of the 2015 MDU Heskett SAP.

II. HOLDING TIMES

- With the exception of laboratory pH, all holding times were met for both preparation and analysis unless noted here.
  - Alkalinity exceeded holding time due to use of incorrect SAP being used at sample collection. Alkalinity analysis was performed beyond hold time at the request of Barr Engineering per email dated 18 March 2016.

III. METHODS

- Approved methodology was followed for all sample analyses.
  - Methods 6010D and Method 6020B were used to analyze the metals.

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CASE NARRATIVE – AMENDED 13 MAY 2016

MVTL Lab Reference No/SDG: **201682-0286**
Client: **Montana Dakota Utilities**
Location: **MDU Heskett Ash Site**
Project Identification: **CCR 1st Quarter 2016 Groundwater**

MVTL Laboratory Identifications: **16-W205** through **16-W212**
Page 2 of 2

MDU Sample Identification	MVTL Laboratory #
Field Blank	16-W205
Equipment Blank	16-W206
Duplicate 2	16-W207
13	16-W208
103	16-W209
44R	16-W210
102	16-W211
70	16-W212

IV. ANALYSIS

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

All laboratory data has been approved by MVTL Laboratories.

SIGNED: C. Carroll **DATE:** 13 May 16
Claudette Carroll - MVTL Bismarck Laboratory Manager

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www.mvtl.com

Amended 18Mar16 (Alk, Na, Mg, K)

Samantha Marshall
Montana Dakota Utilities
400 N. 4th
Bismarck ND 58501

Report Date: 16 Feb 16
Lab Number: 16-W205
Work Order #:82-0286
Account #: 002800
Date Sampled: 3 Feb 16
Date Received: 4 Feb 16 8:00
Sampled By: MVTL Field Services

PO #: 160249 OP

Temp at Receipt: 5.4C ROI

Project Name: MDU Heskett-Ash Site CCR

Sample Description: Field Blank(FB)

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	4 Feb 16	KMD
pH	* 7.0	units	N/A	SM4500 H+ B	4 Feb 16 17:00	ML
Total Alkalinity	* < 20	mg/l CaCO3	20	SM2320-B	18 Mar 16 17:00	ML
Fluoride	< 0.1	mg/l	0.10	SM4500-F-C	4 Feb 16 17:00	ML
Sulfate	< 5	mg/l	5.00	ASTM D516-07	5 Feb 16 16:04	EMS
Chloride	< 1	mg/l	1.0	SM4500-Cl-E	11 Feb 16 8:56	EMS
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	9 Feb 16 11:22	EV
Total Dissolved Solids	< 5	mg/l	5	I1750-85	4 Feb 16 11:40	ML
Calcium - Total	< 1	mg/l	1.0	6010	8 Feb 16 13:09	KMD
Magnesium - Total	< 1	mg/l	1.0	6010	8 Feb 16 12:09	KMD
Sodium - Total	< 1	mg/l	1.0	6010	8 Feb 16 12:09	KMD
Potassium - Total	< 1	mg/l	1.0	6010	8 Feb 16 12:09	KMD
Lithium - Total	< 0.1	mg/l	0.10	6010	10 Feb 16 13:54	SZ
Boron - Total	< 0.1	mg/l	0.10	6010	8 Feb 16 15:47	SZ
Antimony - Total	< 0.001	mg/l	0.0010	6020	15 Feb 16 15:05	CC
Arsenic - Total	< 0.005 ^	mg/l	0.0020	6020	15 Feb 16 15:05	CC
Barium - Total	< 0.002	mg/l	0.0020	6020	15 Feb 16 15:05	CC
Beryllium - Total	< 0.001 ^	mg/l	0.0005	6020	15 Feb 16 15:05	CC
Cadmium - Total	< 0.0005	mg/l	0.0005	6020	15 Feb 16 15:05	CC
Chromium - Total	< 0.025 ^	mg/l	0.0020	6020	15 Feb 16 15:05	CC
Cobalt - Total	< 0.002	mg/l	0.0020	6020	15 Feb 16 15:05	CC
Lead - Total	< 0.0005	mg/l	0.0005	6020	15 Feb 16 15:05	CC
Molybdenum - Total	< 0.01 ^	mg/l	0.0020	6020	15 Feb 16 15:05	CC
Selenium - Total	< 0.002	mg/l	0.0020	6020	16 Feb 16 9:35	CC
Thallium - Total	< 0.001 ^	mg/l	0.0005	6020	15 Feb 16 15:05	CC

* Holding time exceeded

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

CC

Approved by: Claudette K Carroll 21 Apr 16

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

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

CERTIFICATION: ND # ND-00016

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MEMBER ACIL

Amended 18Mar16 (Alk, Na, Mg, K)

Samantha Marshall
Montana Dakota Utilities
400 N. 4th
Bismarck ND 58501

Report Date: 16 Feb 16
Lab Number: 16-W206
Work Order #:82-0286
Account #: 002800
Date Sampled: 3 Feb 16
Date Received: 4 Feb 16 8:00
Sampled By: MVTL Field Services

PO #: 160249 OP

Temp at Receipt: 5.4C ROI

Project Name: MDU Heskett-Ash Site CCR

Sample Description: Equipment Blank(EB)

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	4 Feb 16	KMD
pH	* 6.0	units	N/A	SM4500 H+ B	4 Feb 16 17:00	ML
Total Alkalinity	* < 20	mg/l CaCO3	20	SM2320-B	18 Mar 16 17:00	ML
Fluoride	< 0.1	mg/l	0.10	SM4500-F-C	4 Feb 16 17:00	ML
Sulfate	< 5	mg/l	5.00	ASTM D516-07	5 Feb 16 16:04	EMS
Chloride	< 1	mg/l	1.0	SM4500-Cl-E	11 Feb 16 8:56	EMS
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	9 Feb 16 11:22	EV
Total Dissolved Solids	< 5	mg/l	5	I1750-85	4 Feb 16 11:40	ML
Calcium - Total	< 1	mg/l	1.0	6010	8 Feb 16 13:09	KMD
Magnesium - Total	< 1	mg/l	1.0	6010	8 Feb 16 12:09	KMD
Sodium - Total	< 1	mg/l	1.0	6010	8 Feb 16 12:09	KMD
Potassium - Total	< 1	mg/l	1.0	6010	8 Feb 16 12:09	KMD
Lithium - Total	< 0.1	mg/l	0.10	6010	10 Feb 16 13:54	SZ
Boron - Total	< 0.1	mg/l	0.10	6010	8 Feb 16 15:47	SZ
Antimony - Total	< 0.001	mg/l	0.0010	6020	15 Feb 16 15:05	CC
Arsenic - Total	< 0.005 ^	mg/l	0.0020	6020	15 Feb 16 15:05	CC
Barium - Total	< 0.002	mg/l	0.0020	6020	15 Feb 16 15:05	CC
Beryllium - Total	< 0.001 ^	mg/l	0.0005	6020	15 Feb 16 15:05	CC
Cadmium - Total	< 0.0005	mg/l	0.0005	6020	15 Feb 16 15:05	CC
Chromium - Total	< 0.025 ^	mg/l	0.0020	6020	15 Feb 16 15:05	CC
Cobalt - Total	< 0.002	mg/l	0.0020	6020	15 Feb 16 15:05	CC
Lead - Total	< 0.0005	mg/l	0.0005	6020	15 Feb 16 15:05	CC
Molybdenum - Total	< 0.01 ^	mg/l	0.0020	6020	15 Feb 16 15:05	CC
Selenium - Total	< 0.002	mg/l	0.0020	6020	16 Feb 16 9:35	CC
Thallium - Total	< 0.001 ^	mg/l	0.0005	6020	15 Feb 16 15:05	CC

* Holding time exceeded

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

CC

Approved by: Claudette K. Carroll 21 Apr 16

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

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

CERTIFICATION: ND # ND-00016

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www.mvtl.com
MEMBER ACIL

Amended 18Mar16 (alk, Na, Mg, K)

Samantha Marshall
Montana Dakota Utilities
400 N. 4th
Bismarck ND 58501

Report Date: 16 Feb 16
Lab Number: 16-W207
Work Order #:82-0286
Account #: 002800
Date Sampled: 3 Feb 16 9:35
Date Received: 4 Feb 16 8:00
Sampled By: MVTL Field Services

Project Name: MDU Heskett-Ash Site CCR

PO #: 160249 OP

Sample Description: Duplicate 2

Temp at Receipt: 5.4C ROI

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	4 Feb 16	KMD
pH	* 6.9	units	N/A	SM4500 H+ B	4 Feb 16 17:00	ML
pH - Field	7.16	units	NA	SM 4500 H+ B	3 Feb 16 9:35	DJN
Temperature - Field	6.60	Degrees C	NA	SM 2550B	3 Feb 16 9:35	DJN
Total Alkalinity	* 462	mg/l CaCO3	20	SM2320-B	18 Mar 16 17:00	ML
Conductivity - Field	10820	umhos/cm	1	EPA 120.1	3 Feb 16 9:35	DJN
Fluoride	0.92	mg/l	0.10	SM4500-F-C	4 Feb 16 17:00	ML
Sulfate	6610	mg/l	5.00	ASTM D516-07	5 Feb 16 16:04	EMS
Chloride	82.2	mg/l	1.0	SM4500-Cl-E	11 Feb 16 8:56	EMS
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	9 Feb 16 11:22	EV
Total Dissolved Solids	10000	mg/l	5	I1750-85	4 Feb 16 11:40	ML
Calcium - Total	365	mg/l	1.0	6010	8 Feb 16 13:09	KMD
Magnesium - Total	575	mg/l	1.0	6010	8 Feb 16 12:09	KMD
Sodium - Total	1790	mg/l	1.0	6010	8 Feb 16 12:09	KMD
Potassium - Total	24.3	mg/l	1.0	6010	8 Feb 16 12:09	KMD
Lithium - Total	0.71	mg/l	0.10	6010	10 Feb 16 13:54	SZ
Boron - Total	0.56	mg/l	0.10	6010	8 Feb 16 15:47	SZ
Antimony - Total	< 0.001	mg/l	0.0010	6020	15 Feb 16 15:05	CC
Arsenic - Total	0.0094	mg/l	0.0020	6020	15 Feb 16 15:05	CC
Barium - Total	0.0479	mg/l	0.0020	6020	15 Feb 16 15:05	CC
Beryllium - Total	< 0.001 ^	mg/l	0.0005	6020	15 Feb 16 15:05	CC
Cadmium - Total	< 0.0005	mg/l	0.0005	6020	15 Feb 16 15:05	CC
Chromium - Total	< 0.025 ^	mg/l	0.0020	6020	15 Feb 16 15:05	CC
Cobalt - Total	0.0030	mg/l	0.0020	6020	15 Feb 16 15:05	CC
Lead - Total	0.0016	mg/l	0.0005	6020	15 Feb 16 15:05	CC
Molybdenum - Total	< 0.01 ^	mg/l	0.0020	6020	15 Feb 16 15:05	CC
Selenium - Total	0.0544	mg/l	0.0020	6020	16 Feb 16 9:35	CC
Thallium - Total	< 0.001 ^	mg/l	0.0005	6020	15 Feb 16 15:05	CC

* Holding time exceeded

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

CC

Approved by: Claudette K. Carroll 21 Apr 16

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

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

CERTIFICATION: ND # ND-00016

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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

Amended 18Mar16 (Alk, Na, Mg, K)

Samantha Marshall
Montana Dakota Utilities
400 N. 4th
Bismarck ND 58501

Report Date: 16 Feb 16
Lab Number: 16-W208
Work Order #:82-0286
Account #: 002800
Date Sampled: 3 Feb 16 9:35
Date Received: 4 Feb 16 8:00
Sampled By: MVTL Field Services

Project Name: MDU Heskett-Ash Site CCR

PO #: 160249 OP

Sample Description: 13

Temp at Receipt: 5.4C ROI

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	4 Feb 16	KMD
pH	* 6.8	units	N/A	SM4500 H+ B	4 Feb 16 17:00	ML
pH - Field	7.16	units	NA	SM 4500 H+ B	3 Feb 16 9:35	DJN
Temperature - Field	6.60	Degrees C	NA	SM 2550B	3 Feb 16 9:35	DJN
Total Alkalinity	* 464	mg/l CaCO3	20	SM2320-B	18 Mar 16 17:00	ML
Conductivity - Field	10820	umhos/cm	1	EPA 120.1	3 Feb 16 9:35	DJN
Fluoride	0.92	mg/l	0.10	SM4500-F-C	4 Feb 16 17:00	ML
Sulfate	7010	mg/l	5.00	ASTM D516-07	5 Feb 16 16:04	EMS
Chloride	81.7	mg/l	1.0	SM4500-Cl-E	11 Feb 16 8:56	EMS
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	9 Feb 16 11:22	EV
Total Dissolved Solids	9990	mg/l	5	I1750-85	4 Feb 16 11:40	ML
Calcium - Total	352	mg/l	1.0	6010	8 Feb 16 13:09	KMD
Magnesium - Total	550	mg/l	1.0	6010	8 Feb 16 12:09	KMD
Sodium - Total	1790	mg/l	1.0	6010	8 Feb 16 12:09	KMD
Potassium - Total	22.9	mg/l	1.0	6010	8 Feb 16 12:09	KMD
Lithium - Total	0.72	mg/l	0.10	6010	10 Feb 16 13:54	SZ
Boron - Total	0.58	mg/l	0.10	6010	8 Feb 16 16:47	SZ
Antimony - Total	< 0.001	mg/l	0.0010	6020	15 Feb 16 15:05	CC
Arsenic - Total	0.0088	mg/l	0.0020	6020	15 Feb 16 15:05	CC
Barium - Total	0.0423	mg/l	0.0020	6020	15 Feb 16 15:05	CC
Beryllium - Total	< 0.001 ^	mg/l	0.0005	6020	15 Feb 16 15:05	CC
Cadmium - Total	< 0.0005	mg/l	0.0005	6020	15 Feb 16 15:05	CC
Chromium - Total	< 0.025 ^	mg/l	0.0020	6020	15 Feb 16 15:05	CC
Cobalt - Total	0.0028	mg/l	0.0020	6020	15 Feb 16 15:05	CC
Lead - Total	0.0014	mg/l	0.0005	6020	15 Feb 16 15:05	CC
Molybdenum - Total	< 0.01 ^	mg/l	0.0020	6020	15 Feb 16 15:05	CC
Selenium - Total	0.0539	mg/l	0.0020	6020	16 Feb 16 9:35	CC
Thallium - Total	< 0.001 ^	mg/l	0.0005	6020	15 Feb 16 15:05	CC

* Holding time exceeded

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

Approved by: Claudette K. Carroll 21 Apr 16

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

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

Amended 18Mar16 (Alk, Na, Mg, K)

Samantha Marshall
Montana Dakota Utilities
400 N. 4th
Bismarck ND 58501

Report Date: 16 Feb 16
Lab Number: 16-W209
Work Order #:82-0286
Account #: 002800
Date Sampled: 3 Feb 16 11:31
Date Received: 4 Feb 16 8:00
Sampled By: MVTL Field Services

Project Name: MDU Heskett-Ash Site CCR

PO #: 160249 OP

Sample Description: 103

Temp at Receipt: 5.4C ROI

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	4 Feb 16	KMD
pH	* 6.7	units	N/A	SM4500 H+ B	4 Feb 16 17:00	ML
pH - Field	6.98	units	NA	SM 4500 H+ B	3 Feb 16 11:31	DJN
Temperature - Field	6.83	Degrees C	NA	SM 2550B	3 Feb 16 11:31	DJN
Total Alkalinity	* 412	mg/l CaCO3	20	SM2320-B	18 Mar 16 17:00	ML
Conductivity - Field	5080	umhos/cm	1	EPA 120.1	3 Feb 16 11:31	DJN
Fluoride	0.22	mg/l	0.10	SM4500-F-C	4 Feb 16 17:00	ML
Sulfate	2650	mg/l	5.00	ASTM D516-07	5 Feb 16 16:04	EMS
Chloride	133	mg/l	1.0	SM4500-Cl-E	11 Feb 16 8:56	EMS
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	9 Feb 16 11:22	EV
Total Dissolved Solids	4730	mg/l	5	I1750-85	4 Feb 16 11:40	ML
Calcium - Total	490	mg/l	1.0	6010	8 Feb 16 13:09	KMD
Magnesium - Total	427	mg/l	1.0	6010	8 Feb 16 12:09	KMD
Sodium - Total	255	mg/l	1.0	6010	8 Feb 16 12:09	KMD
Potassium - Total	18.2	mg/l	1.0	6010	8 Feb 16 12:09	KMD
Lithium - Total	0.61	mg/l	0.10	6010	10 Feb 16 13:54	SZ
Boron - Total	< 0.5	mg/l	0.10	6010	8 Feb 16 16:47	SZ
Antimony - Total	< 0.001	mg/l	0.0010	6020	15 Feb 16 15:05	CC
Arsenic - Total	0.0163	mg/l	0.0020	6020	15 Feb 16 15:05	CC
Barium - Total	0.0098	mg/l	0.0020	6020	15 Feb 16 15:05	CC
Beryllium - Total	< 0.001 ^	mg/l	0.0005	6020	15 Feb 16 15:05	CC
Cadmium - Total	< 0.0005	mg/l	0.0005	6020	15 Feb 16 15:05	CC
Chromium - Total	< 0.025 ^	mg/l	0.0020	6020	15 Feb 16 15:05	CC
Cobalt - Total	0.0026	mg/l	0.0020	6020	15 Feb 16 15:05	CC
Lead - Total	< 0.0005	mg/l	0.0005	6020	15 Feb 16 15:05	CC
Molybdenum - Total	< 0.01 ^	mg/l	0.0020	6020	15 Feb 16 15:05	CC
Selenium - Total	0.1928	mg/l	0.0020	6020	16 Feb 16 9:35	CC
Thallium - Total	< 0.001 ^	mg/l	0.0005	6020	15 Feb 16 15:05	CC

* Holding time exceeded

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

Approved by: Claudette K. Carroll CC 21 Apr 16

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

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CERTIFICATION: ND # ND-00016

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www.mvtl.com

MEMBER ACIL

Amended 18Mar16 (Alk, Na, Mg, K)

Samantha Marshall
Montana Dakota Utilities
400 N. 4th
Bismarck ND 58501

Report Date: 16 Feb 16
Lab Number: 16-W210
Work Order #:82-0286
Account #: 002800
Date Sampled: 3 Feb 16 13:19
Date Received: 4 Feb 16 8:00
Sampled By: MVTL Field Services

Project Name: MDU Heskett-Ash Site CCR

PO #: 160249 OP

Sample Description: 44R

Temp at Receipt: 5.4C ROI

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	4 Feb 16	KMD
pH	* 6.6	units	N/A	SM4500 H+ B	4 Feb 16 17:00	ML
pH - Field	6.84	units	NA	SM 4500 H+ B	3 Feb 16 13:19	DJN
Temperature - Field	6.53	Degrees C	NA	SM 2550B	3 Feb 16 13:19	DJN
Total Alkalinity	* 418	mg/l CaCO3	20	SM2320-B	18 Mar 16 17:00	ML
Conductivity - Field	9214	umhos/cm	1	EPA 120.1	3 Feb 16 13:19	DJN
Fluoride	0.69	mg/l	0.10	SM4500-F-C	4 Feb 16 17:00	ML
Sulfate	5680	mg/l	5.00	ASTM D516-07	5 Feb 16 16:04	EMS
Chloride	265	mg/l	1.0	SM4500-Cl-E	11 Feb 16 9:11	EMS
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	9 Feb 16 11:22	EV
Total Dissolved Solids	9570	mg/l	5	I1750-85	4 Feb 16 11:40	ML
Calcium - Total	408	mg/l	1.0	6010	8 Feb 16 13:09	KMD
Magnesium - Total	970	mg/l	1.0	6010	8 Feb 16 12:09	KMD
Sodium - Total	990	mg/l	1.0	6010	8 Feb 16 12:09	KMD
Potassium - Total	32.2	mg/l	1.0	6010	8 Feb 16 12:09	KMD
Lithium - Total	1.32	mg/l	0.10	6010	10 Feb 16 13:54	SZ
Boron - Total	< 0.5	mg/l	0.10	6010	8 Feb 16 16:47	SZ
Antimony - Total	< 0.001	mg/l	0.0010	6020	15 Feb 16 15:05	CC
Arsenic - Total	0.0093	mg/l	0.0020	6020	15 Feb 16 15:05	CC
Barium - Total	0.0607	mg/l	0.0020	6020	15 Feb 16 15:05	CC
Beryllium - Total	< 0.001 ^	mg/l	0.0005	6020	15 Feb 16 15:05	CC
Cadmium - Total	< 0.0005	mg/l	0.0005	6020	15 Feb 16 15:05	CC
Chromium - Total	< 0.025 ^	mg/l	0.0020	6020	15 Feb 16 15:05	CC
Cobalt - Total	0.0025	mg/l	0.0020	6020	15 Feb 16 15:05	CC
Lead - Total	0.0018	mg/l	0.0005	6020	15 Feb 16 15:05	CC
Molybdenum - Total	< 0.01 ^	mg/l	0.0020	6020	15 Feb 16 15:05	CC
Selenium - Total	0.0829	mg/l	0.0020	6020	16 Feb 16 9:35	CC
Thallium - Total	< 0.001 ^	mg/l	0.0005	6020	15 Feb 16 15:05	CC

* Holding time exceeded

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

Approved by: Claudette K. Carrep CC 21 Apr 16

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

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

Amended 18Mar16 (Alk, Na, Mg, K)

Samantha Marshall
Montana Dakota Utilities
400 N. 4th
Bismarck ND 58501

Report Date: 16 Feb 16
Lab Number: 16-W211
Work Order #:82-0286
Account #: 002800
Date Sampled: 3 Feb 16 15:00
Date Received: 4 Feb 16 8:00
Sampled By: MVTL Field Services

Project Name: MDU Heskett-Ash Site CCR

PO #: 160249 OP

Sample Description: 102

Temp at Receipt: 5.4C ROI

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	4 Feb 16	KMD
pH	* 6.8	units	N/A	SM4500 H+ B	4 Feb 16 17:00	ML
pH - Field	7.04	units	NA	SM 4500 H+ B	3 Feb 16 15:00	DJN
Temperature - Field	7.41	Degrees C	NA	SM 2550B	3 Feb 16 15:00	DJN
Total Alkalinity	* 507	mg/l CaCO3	20	SM2320-B	18 Mar 16 17:00	ML
Conductivity - Field	9448	umhos/cm	1	EPA 120.1	3 Feb 16 15:00	DJN
Fluoride	0.25	mg/l	0.10	SM4500-F-C	4 Feb 16 17:00	ML
Sulfate	4770	mg/l	5.00	ASTM D516-07	5 Feb 16 16:04	EMS
Chloride	8.4	mg/l	1.0	SM4500-Cl-E	11 Feb 16 9:11	EMS
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	9 Feb 16 11:22	EV
Total Dissolved Solids	7780	mg/l	5	I1750-85	4 Feb 16 11:40	ML
Calcium - Total	477	mg/l	1.0	6010	8 Feb 16 13:09	KMD
Magnesium - Total	386	mg/l	1.0	6010	8 Feb 16 12:09	KMD
Sodium - Total	1420	mg/l	1.0	6010	8 Feb 16 12:09	KMD
Potassium - Total	21.4	mg/l	1.0	6010	8 Feb 16 12:09	KMD
Lithium - Total	0.80	mg/l	0.10	6010	10 Feb 16 14:54	SZ
Boron - Total	1.28	mg/l	0.10	6010	8 Feb 16 16:47	SZ
Antimony - Total	< 0.001	mg/l	0.0010	6020	15 Feb 16 15:05	CC
Arsenic - Total	< 0.005 ^	mg/l	0.0020	6020	15 Feb 16 15:05	CC
Barium - Total	0.0355	mg/l	0.0020	6020	15 Feb 16 15:05	CC
Beryllium - Total	< 0.001 ^	mg/l	0.0005	6020	15 Feb 16 15:05	CC
Cadmium - Total	< 0.0005	mg/l	0.0005	6020	15 Feb 16 15:05	CC
Chromium - Total	< 0.025 ^	mg/l	0.0020	6020	15 Feb 16 15:05	CC
Cobalt - Total	0.0044	mg/l	0.0020	6020	15 Feb 16 15:05	CC
Lead - Total	< 0.0005	mg/l	0.0005	6020	15 Feb 16 15:05	CC
Molybdenum - Total	< 0.01 ^	mg/l	0.0020	6020	15 Feb 16 15:05	CC
Selenium - Total	< 0.002	mg/l	0.0020	6020	16 Feb 16 9:35	CC
Thallium - Total	< 0.001 ^	mg/l	0.0005	6020	15 Feb 16 15:05	CC

* Holding time exceeded

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

CC

Approved by: Claudette K. Carroll 21 Apr 16

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

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CERTIFICATION: ND # ND-00016

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

Amended 18Mar16 (Alk, Na, Mg, K)

Samantha Marshall
Montana Dakota Utilities
400 N. 4th
Bismarck ND 58501

Report Date: 16 Feb 16
Lab Number: 16-W212
Work Order #:82-0286
Account #: 002800
Date Sampled: 3 Feb 16 16:25
Date Received: 4 Feb 16 8:00
Sampled By: MVTL Field Services

Project Name: MDU Heskett-Ash Site CCR

PO #: 160249 OP

Sample Description: 70

Temp at Receipt: 5.4C ROI

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	4 Feb 16	KMD
pH	* 6.9	units	N/A	SM4500 H+ B	4 Feb 16 17:00	ML
pH - Field	7.25	units	NA	SM 4500 H+ B	3 Feb 16 16:25	DJN
Temperature - Field	7.30	Degrees C	NA	SM 2550B	3 Feb 16 16:25	DJN
Total Alkalinity	* 383	mg/l CaCO3	20	SM2320-B	18 Mar 16 17:00	ML
Conductivity - Field	3816	umhos/cm	1	EPA 120.1	3 Feb 16 16:25	DJN
Fluoride	0.36	mg/l	0.10	SM4500-F-C	4 Feb 16 17:00	ML
Sulfate	2000	mg/l	5.00	ASTM D516-07	12 Feb 16 14:01	KMD
Chloride	32.3	mg/l	1.0	SM4500-Cl-E	11 Feb 16 9:11	EMS
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	9 Feb 16 11:22	EV
Total Dissolved Solids	3250	mg/l	5	I1750-85	4 Feb 16 11:40	ML
Calcium - Total	331	mg/l	1.0	6010	8 Feb 16 13:09	KMD
Magnesium - Total	146	mg/l	1.0	6010	8 Feb 16 12:09	KMD
Sodium - Total	459	mg/l	1.0	6010	8 Feb 16 12:09	KMD
Potassium - Total	13.3	mg/l	1.0	6010	8 Feb 16 12:09	KMD
Lithium - Total	0.29	mg/l	0.10	6010	10 Feb 16 14:54	SZ
Boron - Total	0.45	mg/l	0.10	6010	8 Feb 16 16:47	SZ
Antimony - Total	< 0.001	mg/l	0.0010	6020	15 Feb 16 15:05	CC
Arsenic - Total	< 0.005 ^	mg/l	0.0020	6020	15 Feb 16 15:05	CC
Barium - Total	0.1138	mg/l	0.0020	6020	15 Feb 16 15:05	CC
Beryllium - Total	< 0.001 ^	mg/l	0.0005	6020	15 Feb 16 15:05	CC
Cadmium - Total	< 0.0005	mg/l	0.0005	6020	15 Feb 16 15:05	CC
Chromium - Total	< 0.025 ^	mg/l	0.0020	6020	15 Feb 16 15:05	CC
Cobalt - Total	0.0041	mg/l	0.0020	6020	15 Feb 16 15:05	CC
Lead - Total	0.0027	mg/l	0.0005	6020	15 Feb 16 15:05	CC
Molybdenum - Total	< 0.01 ^	mg/l	0.0020	6020	15 Feb 16 15:05	CC
Selenium - Total	0.0090	mg/l	0.0020	6020	16 Feb 16 9:35	CC
Thallium - Total	< 0.001 ^	mg/l	0.0005	6020	15 Feb 16 15:05	CC

* Holding time exceeded

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

CC

Approved by: Claudette K. Carroll 21 Apr 16

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

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

CERTIFICATION: ND # ND-00016

MVTL

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Quality Control Report

Lab IDs: 16-W205 to 16-W212 **Project:** MDU Heskett-Ash Site CCR **Work Order:** 201682-0286

Analyte	LCS Spike Amt	LCS Rec %	LCS % Rec Limits	Matrix Spike Amt	Matrix Spike ID	Matrix Spike Orig Result	Matrix Spike Result	Matrix Spike Rec %	Matrix Spike % Rec Limits	MSD/ Dup Orig Result	MSD/ Dup Result	MSD Rec %	MSD/ Dup RPD	MSD/ Dup RPD Limit (<)	Known Rec (%)	Known % Rec Limits	Method Blank
Antimony - Total mg/l	0.0800	100	80-120	0.400	16-W186	< 0.001	0.3982	100	75-125	0.3982	0.4036	101	1.3	20	-	-	< 0.001
				0.400	16-W212	< 0.001	0.3956	99	75-125	0.3956	0.3972	99	0.4	20	-	-	
				0.400	16-W245	< 0.001	0.4084	102	75-125	0.4084	0.3942	99	3.5	20	-	-	
Arsenic - Total mg/l	0.0800	101	80-120	0.400	16-W186	0.0071	0.4162	102	75-125	0.4162	0.4092	101	1.7	20	-	-	< 0.002
				0.400	16-W212	< 0.005	0.4162	104	75-125	0.4162	0.4116	103	1.1	20	-	-	
				0.400	16-W245	0.0126	0.4154	101	75-125	0.4154	0.3990	97	4.0	20	-	-	
Barium - Total mg/l	0.0800	99	80-120	0.400	16-W186	0.1102	0.5166	102	75-125	0.5166	0.5192	102	0.5	20	-	-	< 0.002
				0.400	16-W212	0.1138	0.5144	100	75-125	0.5144	0.5086	99	1.1	20	-	-	
				0.400	16-W245	0.0100	0.3956	96	75-125	0.3956	0.3834	93	3.1	20	-	-	
Beryllium - Total mg/l	0.0800	108	80-120	0.400	16-W186	< 0.0005	0.4222	106	75-125	0.4222	0.4224	106	0.0	20	-	-	< 0.0005
				0.400	16-W212	< 0.0005	0.4196	105	75-125	0.4196	0.4118	103	1.9	20	-	-	
				0.400	16-W245	< 0.0005	0.4074	102	75-125	0.4074	0.3892	97	4.6	20	-	-	
Boron - Total mg/l	0.40	100	80-120	2.00	16-D591	1.62	3.52	95	75-125	3.52	3.54	96	0.6	20	-	-	< 0.1
	0.40	102	80-120	2.00	16-M199	< 0.5	2.17	108	75-125	2.17	2.10	105	3.3	20	-	-	< 0.1
	0.40	100	80-120	2.00	16-W186	< 0.5	2.42	121	75-125	2.42	2.36	118	2.5	20	-	-	< 0.1
	0.40	102	80-120	0.400	16-W212	0.45	0.83	95	75-125	0.83	0.83	95	0.0	20	-	-	< 0.1
															-	-	< 0.1
															-	-	< 0.1
Cadmium - Total mg/l	0.0800	100	80-120	0.400	16-W186	< 0.0005	0.3988	100	75-125	0.3988	0.4046	101	1.4	20	-	-	< 0.0005
				0.400	16-W212	< 0.0005	0.3922	98	75-125	0.3922	0.3928	98	0.2	20	-	-	
				0.400	16-W245	< 0.0005	0.3904	98	75-125	0.3904	0.3774	94	3.4	20	-	-	
Calcium - Total mg/l	20.0	92	80-120	100	16-W187	131	214	83	75-125	214	225	94	5.0	20	-	-	< 1
															-	-	< 1
Chloride mg/l	30.0	98	80-120	30.0	16-W184	< 1	29.2	97	80-120	29.2	28.6	95	2.1	20	-	-	< 1
	30.0	100	80-120	30.0	16-W239	< 1	29.3	98	80-120	29.3	31.0	103	5.6	20	-	-	< 1
				30.0	16-W165	18.0	44.2	87	80-120	44.2	43.2	84	2.3	20	-	-	< 1
															-	-	< 1

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

MEMBER
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Quality Control Report

Lab IDs: 16-W205 to 16-W212 **Project:** MDU Heskett-Ash Site CCR **Work Order:** 201682-0286

Analyte	LCS Spike Amt	LCS Rec %	LCS % Rec Limits	Matrix Spike Amt	Matrix Spike ID	Matrix Spike Orig Result	Matrix Spike Result	Matrix Spike Rec %	Matrix Spike % Rec Limits	MSD/ Dup Orig Result	MSD/ Dup Result	MSD Rec %	MSD/ Dup RPD	MSD/ Dup RPD Limit (<)	Known Rec (%)	Known % Rec Limits	Method Blank
Chromium - Total mg/l	0.0800	103	80-120	0.400	16-W186	0.0102	0.3994	97	75-125	0.3994	0.4044	99	1.2	20	-	-	< 0.002
				0.400	16-W212	0.0100	0.4032	98	75-125	0.4032	0.4002	98	0.7	20	-	-	
				0.400	16-W245	< 0.025	0.3938	98	75-125	0.3938	0.3810	95	3.3	20	-	-	
Cobalt - Total mg/l	0.0800	102	80-120	0.400	16-W186	0.0083	0.3906	96	75-125	0.3906	0.3952	97	1.2	20	-	-	< 0.002
				0.400	16-W212	0.0041	0.3958	98	75-125	0.3958	0.3904	97	1.4	20	-	-	
				0.400	16-W245	< 0.002	0.3900	98	75-125	0.3900	0.3692	92	5.5	20	-	-	
Fluoride mg/l	0.50	108	90-110	0.500	16-W211	0.25	0.72	94	80-120	0.72	0.72	94	0.0	20	-	-	< 0.1
	0.50	106	90-110												-	-	< 0.1
Lead - Total mg/l	0.0800	96	80-120	0.400	16-W186	0.0024	0.3736	93	75-125	0.3736	0.3808	95	1.9	20	-	-	< 0.0005
				0.400	16-W212	0.0027	0.3866	96	75-125	0.3866	0.3804	94	1.6	20	-	-	
				0.400	16-W245	< 0.0005	0.3790	95	75-125	0.3790	0.3728	93	1.6	20	-	-	
Lithium - Total mg/l	0.40	108	85-115	2.00	16-W186	0.90	2.85	97	75-125	2.85	2.78	94	2.5	20	-	-	< 0.1
	0.40	108	85-115	0.400	16-W212	0.29	0.69	100	75-125	0.69	0.70	102	1.4	20	-	-	< 0.1
	0.40	108	85-115	2.00	16-W245	1.02	2.96	97	75-125	2.96	2.90	94	2.0	20	-	-	< 0.1
															-	-	< 0.1
															-	-	< 0.1
Magnesium - Total mg/l	20.0	100	80-120	100	16-W187	54.3	154	100	75-125	154	154	100	0.0	20	-	-	< 1
															-	-	< 1
Mercury - Total mg/l	0.0020	105	85-115	0.002	A3038	< 0.0002	0.0021	105	70-130	0.0021	0.0021	105	0.0	20	-	-	< 0.0002
				0.002	16-M199	< 0.0002	0.0017	85	70-130	0.0017	0.0017	85	0.0	20	-	-	
				0.002	16-W207	< 0.0002	0.0020	100	70-130	0.0020	0.0020	100	0.0	20	-	-	
				0.002	16-W243	< 0.0002	0.0020	100	70-130	0.0020	0.0020	100	0.0	20	-	-	
Molybdenum - Total mg/l	0.0800	85	80-120	0.400	16-W186	< 0.01	0.3420	86	75-125	0.3420	0.3516	88	2.8	20	-	-	< 0.002
				0.400	16-W212	< 0.01	0.3278	82	75-125	0.3278	0.3380	84	3.1	20	-	-	
				0.400	16-W245	< 0.01	0.3270	82	75-125	0.3270	0.3318	83	1.5	20	-	-	
pH units	-	-	-	-	-	-	-	-	-	7.5	7.6	-	1.3	20	-	-	-
	-	-	-	-	-	-	-	-	-	8.0	8.2	-	2.5	20	-	-	-

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1201 Lincoln Highway ~ Nevada, IA 50201 ~ 800-362-0855 ~ Fax 515-382-3885
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Quality Control Report

Lab IDs: 16-W205 to 16-W212 **Project:** MDU Heskett-Ash Site CCR **Work Order:** 201682-0286

Analyte	LCS Spike Amt	LCS Rec %	LCS % Rec Limits	Matrix Spike Amt	Matrix Spike ID	Matrix Spike Orig Result	Matrix Spike Result	Matrix Spike Rec %	Matrix Spike % Rec Limits	MSD/ Dup Orig Result	MSD/ Dup Result	MSD Rec %	MSD/ Dup RPD	MSD/ Dup RPD Limit (<)	Known Rec (%)	Known % Rec Limits	Method Blank
Potassium - Total mg/l	10.0 10.0	93 90	80-120 80-120	20.0	16-W187	5.2	25.3	100	75-125	25.3	25.7	102	1.6	20	- -	- -	< 1 < 1
Selenium - Total mg/l	0.1000	110	80-120	0.400 0.400 0.400	16-M199 16-W186 16-W212	0.0391 0.0030 0.0090	0.5384 0.4506 0.4596	125 112 113	75-125 75-125 75-125	0.5384 0.4506 0.4596	0.5198 0.4500 0.4592	120 112 113	3.5 0.1 0.1	20 20 20	- - -	- - -	< 0.002
Sodium - Total mg/l	20.0	100	80-120	100	16-W187	85.9	186	100	75-125	186	189	103	1.6	20	- -	- -	< 1 < 1
Sulfate mg/l	100 100	100 109	90-110 90-110	100 500	16-W205 16-W236	< 5 429	98.4 924	98 99	80-120 80-120	98.4 924	98.0 931	98 100	0.4 0.8	20 20	- -	- -	< 5 < 5
Thallium - Total mg/l	0.0800	96	80-120	0.400 0.400 0.400	16-W186 16-W212 16-W245	< 0.001 < 0.001 < 0.001	0.3684 0.3844 0.3740	92 96 94	75-125 75-125 75-125	0.3684 0.3844 0.3740	0.3816 0.3738 0.3704	95 93 93	3.5 2.8 1.0	20 20 20	- - -	- - -	< 0.0005
Total Alkalinity mg/l CaCO3	410	94	90-110	410 410	16-W209 16-W243	412 437	793 802	93 89	80-120 80-120	415 383	419 386	93 90	1.0 0.8	20 20	99	80-120	< 20 < 20
Total Dissolved Solids mg/l	- -	- -	- -	- -	- -	- -	- -	- -	- -	1340 9570	1330 9530	- -	0.7 0.4	20 20	- -	- -	< 5

Approved by: Amended: C Gantt 13 May 16

Field Datasheet

Groundwater Assessment

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

Company: MDU Heskett - Ash Site
Sample ID: 13
Date: 3 Feb 16
Sampling Personal: Darren Wiswasy

Weather Conditions: Temp: 15 °F Wind: Light Precip: Sunny / Partly Cloudy / Cloudy

Well Information

Well Locked?	Yes	(No)	
Well Labeled?	(Yes)	No	
Casing Straight?	(Yes)	No	
Grout Seal Intact?	(Yes)	No	Not Visible
Repairs Necessary:	—		
Casing Diameter:	2"		
Water Level Before Purge:	31.09	Ft	
Well Depth:	41.20	Ft	
Well Volume:	6.3	Liters	
Water Level After Sample:	32.42	Ft	
Measurement Method:	Electric Water Level Indicator		

Sampling Information

Sampling Method: Bladder

Dedicated Equipment?	Yes	(No)	
Duplicate Sample?	(Yes)	No	ID: Dup 2
Pumping Rate:	100	ml/min	
Time Purging Began:	0854	(am) / pm	
Time of Sampling:	0935	(am) / pm	
Well Purged Dry?	Yes	(No)	
Time Purged Dry:	—	am / pm	
Sample Appearance:	(Clear) / Slightly Turbid / Turbid		Phase: —
Color: —			Odor: —

Control Box Settings
Purge: 3 sec.
Rest: 55 sec.
PSI: 30

Field Measurements

SEQ #	Time	Temp	Cond.	pH	DO (mg/L)	ORP	Turb (NTU)	Water Level (ft)	mL Removed	Appearance
1	0859	7.36	11142	7.22	1.20	111.4	>1000	31.73	500	Turbid
2	0904	6.70	11127	7.21	0.91	92.6	402	31.73	500	slightly turbid
3	0909	7.13	11032	7.18	0.61	82.1	159	31.75	500	clear
4	0914	7.15	11001	7.17	0.55	73.8	81.9	31.96	500	clear
5	0919	6.92	10995	7.16	0.59	66.5	53.3	32.02	500	clear
6	0924	6.52	10954	7.16	0.57	59.5	35.9	32.02	500	Clear
7	0929	6.48	10905	7.15	0.61	55.8	35.5	32.03	500	clear
8	0934	6.60	10820	7.16	0.61	52.9	37.8	32.10	500	clear
9										
10										

Bottles Collected
~~250 mL H_2SO_4~~
1 - 500 mL HNO_3
~~500 mL HNO_3 (Filtered)~~
1 - 1 Liter Raw
2 - 1 Liter HNO3

Stabilized: (Yes) No
Total mL Removed: 4000

Comments:

Field Datasheet

Groundwater Assessment

2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

Company: **MDU Heskett - Ash Site**

Sample ID: **103**

Date: 3 Feb. 16

Sampling Personal: Darren Nieswaag

Weather Conditions: Temp: 20 °F Wind: S 5 Precip: Sunny / Partly Cloudy / (Cloudy)

Well Information

Well Locked?	Yes	(No)	
Well Labeled?	(Yes)	No	
Casing Straight?	(Yes)	No	
Grout Seal Intact?	(Yes)	No	Not Visible
Repairs Necessary:	—		
Casing Diameter:	2"		
Water Level Before Purge:	34.32	Ft	
Well Depth:	47.10	Ft	
Well Volume:	7.9	Liters	
Water Level After Sample:	37.14	Ft	
Measurement Method:	Electric Water Level Indicator		

Sampling Information

Sampling Method: Bladder

Dedicated Equipment?	Yes	(No)	
Duplicate Sample?	Yes	(No)	ID: —
Pumping Rate:	100	ml/min	
Time Purging Began:	1055	(am) / pm	
Time of Sampling:	1131	(am) / pm	
Well Purged Dry?	Yes	(No)	
Time Purged Dry:	—	am / pm	
Sample Appearance:	(Clear) / Slightly Turbid / Turbid		Phase: —
Color:	—		Odor: —

Control Box Settings

Purge: 5 sec.

Rest: 55 sec.

PSI: 30

Field Measurements

SEQ #	Time	Temp	Cond.	pH	DO (mg/L)	ORP	Turb (NTU)	Water Level (ft)	mL Removed	Appearance
1	1100	6.93	5069	6.94	4.30	92.9	43.2	34.91	500	clear
2	1105	6.27	5071	6.97	4.00	78.4	17.5	35.17	500	clear
3	1110	6.76	5081	6.95	3.01	72.8	11.8	35.25	500	clear
4	1115	6.82	5063	6.96	1.21	63.5	12.0	35.36	500	clear
5	1120	6.51	5076	6.96	1.11	61.9	11.1	35.46	500	clear
6	1125	6.97	5066	6.96	1.07	57.8	12.0	35.59	500	clear
7	1130	6.83	5080	6.98	1.05	54.5	11.3	35.79	500	clear
8										
9										
10										

Bottles Collected

500 mL HNO_3

1 Liter Raw

2 - 1 Liter HNO_3

500 mL HNO_3 Filtered

500 mL HNO_3 Filtered

Stabilized: (Yes) No

Total mL Removed: 3500

Comments:

Field Datasheet

Groundwater Assessment

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

Company: MDU Heskett - Ash Site
Sample ID: 44R
Date: 3 Feb 16
Sampling Personal: Darren Nieswaag

Weather Conditions: Temp: 25 °F Wind: W 10 Precip: Sunny / Partly Cloudy / Cloudy

Well Information

Well Locked?	Yes	(No)	
Well Labeled?	(Yes)	No	
Casing Straight?	(Yes)	No	
Grout Seal Intact?	(Yes)	No	Not Visible
Repairs Necessary:	—		
Casing Diameter:	2"		
Water Level Before Purge:	29.27	Ft	
Well Depth:	45.85	Ft	
Well Volume:	10.3	Liters	
Water Level After Sample:	29.45	Ft	
Measurement Method:	Electric Water Level Indicator		

Sampling Information

Sampling Method: Bladder

Dedicated Equipment?	Yes	(No)	
Duplicate Sample?	Yes	(No)	ID: —
Pumping Rate:	100	ml/min	
Time Purging Began:	1239	am / (pm)	
Time of Sampling:	1320	am / (pm)	
Well Purged Dry?	Yes	(No)	
Time Purged Dry:	—	am / pm	
Sample Appearance:	(Clear) / Slightly Turbid / Turbid		Phase: —
Color:	—		Odor: —

Control Box Settings
Purge: 5 sec.
Rest: 55 sec.
PSI: 30

Field Measurements

SEQ #	Time	Temp	Cond.	pH	DO (mg/L)	ORP	Turb (NTU)	Water Level (ft)	mL Removed	Appearance
1	1244	6.09	9218	6.88	0.33	68.2	563	29.30	500	Turbid
2	1249	6.15	9238	6.87	0.33	60.0	162	29.34	500	clear
3	1254	6.17	9207	6.85	1.46	55.1	106	29.35	500	clear
4	1259	6.57	9207	6.85	0.65	51.1	72.2	29.35	500	Clear
5	1304	6.35	9221	6.85	0.56	48.3	74.1	29.38	500	Clear
6	1309	6.39	9210	6.85	0.53	45.6	59.0	29.39	500	Clear
7	1314	6.46	9221	6.88	0.53	43.6	62.1	29.41	500	clear
8	1319	6.53	9214	6.84	0.49	42.1	58.3	29.41	500	clear
9										
10										

Stabilized: (Yes) No
Total mL Removed: ~~4500~~ 4000
Comments:

Bottles Collected
500 mL HNO_3
2 - 1 Liter Raw
2 - 1 Liter HNO3
500mL HNO_3 Filtered

MVTL

2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

Field Datasheet

Groundwater Assessment

Company: MDU Heskett - Ash Site

Sample ID: 102

Date: 3 Feb 16

Sampling Personal: Darren Nieswaag

Weather Conditions: Temp: 29 °F Wind: Light Precip: Sunny / Partly Cloudy / Cloudy

Well Information

Well Locked?	Yes	(No)	
Well Labeled?	(Yes)	No	
Casing Straight?	(Yes)	No	
Grout Seal Intact?	(Yes)	No	Not Visible
Repairs Necessary:	—		
Casing Diameter:	2"		
Water Level Before Purge:	18.06	Ft	
Well Depth:	33.23	Ft	
Well Volume:	9.4	Liters	
Water Level After Sample:	20.96	Ft	
Measurement Method:	Electric Water Level Indicator		

Sampling Information

Sampling Method: Bladder

Dedicated Equipment?	Yes	(No)	
Duplicate Sample?	Yes	(No)	ID: —
Pumping Rate:	100	ml/min	
Time Purging Began:	1425	am / (pm)	
Time of Sampling:	1501	am / (pm)	
Well Purged Dry?	Yes	(No)	
Time Purged Dry:	—	am / pm	
Sample Appearance:	(Clear) / Slightly Turbid / Turbid		Phase: —
Color:	—		Odor: —

Control Box Settings

Purge: 5 sec.

Rest: 55 sec.

PSI: 20

Field Measurements

SEQ #	Time	Temp	Cond.	pH	DO (mg/L)	ORP	Turb (NTU)	Water Level (ft)	mL Removed	Appearance
1	1430	7.13	10091	6.91	0.06	2.8	3.79	18.58	500	clear
2	1435	7.03	10082	6.95	0.04	-9.7	3.87	18.68	500	clear
3	1440	7.20	10064	6.99	0.03	-18.9	4.21	18.88	500	Clear
4	1445	7.30	9986	7.01	0.03	-24.0	3.65	19.30	500	clear
5	1450	7.51	9860	7.02	0.03	-25.6	4.14	19.39	500	clear
6	1455	7.67	9682	7.03	0.03	-25.3	4.41	19.54	500	clear
7	1500	7.41	9448	7.04	0.03	-23.7	4.37	19.64	500	clear
8										
9										
10										

Stabilized: (Yes) No

Total mL Removed: 3500

Comments:

Bottles Collected

500 mL HNO_3

2 Liter Raw

2 - 1 Liter HNO3

500 mL HNO_3 (Filtered)

MVTL

2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

Field Datasheet

Groundwater Assessment

Company: MDU Heskett - Ash Site

Sample ID: 70

Date: 3 Feb. 16

Sampling Personal: Darren Nieswand

Weather Conditions: Temp: 33 °F Wind: W 5 Precip: Sunny / (Partly Cloudy) / Cloudy

Well Information

Well Locked?	Yes	(No)	
Well Labeled?	(Yes)	No	
Casing Straight?	(Yes)	No	
Grout Seal Intact?	(Yes)	No	Not Visible
Repairs Necessary:	—		
Casing Diameter:	2"		
Water Level Before Purge:	21.78		Ft
Well Depth:	~~38~~ 35.75		Ft
Well Volume:	8.6		Liters
Water Level After Sample:	25.14		Ft
Measurement Method:	Electric Water Level Indicator		

Sampling Information

Sampling Method: Bladder

Dedicated Equipment?	Yes	(No)	
Duplicate Sample?	Yes	(No)	ID: —
Pumping Rate:	100	ml/min	
Time Purging Began:	1550	am (pm)	
Time of Sampling:	1626	am (pm)	
Well Purged Dry?	Yes	(No)	
Time Purged Dry:	—	am / pm	
Sample Appearance:	Clear / (Slightly Turbid) / Turbid		Phase: —
Color:	Tan		Odor: —

Control Box Settings

Purge: 5 sec.

Rest: 55 sec.

PSI: 27

Field Measurements

SEQ #	Time	Temp	Cond.	pH	DO (mg/L)	ORP	Turb (NTU)	Water Level (ft)	mL Removed	Appearance
1	1555	7.49	3863	7.25	0.09	-25.0	901	21.97	500	Turbid
2	~~15~~1600	7.11	3852	7.24	0.05	-16.1	619	22.19	500	Turbid
3	1605	7.14	3849	7.23	0.06	-9.3	363	22.52	500	Slightly Turbid
4	1610	7.41	3837	7.23	0.04	-3.0	255	22.80	500	Slightly Turbid
5	1615	7.38	3826	7.24	0.05	0.7	228	22.98	500	Slightly Turbid
6	1620	7.38	3815	7.24	0.06	5.2	220	23.18	500	Slightly Turbid
7	1625	7.30	3816	7.25	0.06	7.8	222	23.34	500	Slightly Turbid
8										
9										
10										

Total mL Removed: 3500

Stabilized: (Yes) No

Comments: There is a lot of mud at the bottom of well

Bottles Collected

- ~~250 mL H_2SO_4~~
- 1 @ - 500 mL HNO_3
- 500 mL HNO_3 (Filtered)
- 2 - 1 Liter Raw
- 2 - 1 Liter HNO3

Chain of Custody Record

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

Project Name: MDU Heskett - Ash Site CCR

Name of Sampler(s): Darren Nieswaag

Report To: Montana Dakota Utilities
Attn: Samantha Marshall
Address: 400 N. 4th St
Bismarck, ND 58501
Phone: 701-222-7829

Carbon Copy:
Attn:
Address:

Work Order Number: 82-0256

Sample Information						Bottle Type							Field Parameters			Analysis
Lab Number	Sample ID	Date	Time	Sample Type	Sample Location	500 ml HNO_3	250 ml H_2SO_4	1 liter	1L HNO_3	VOC's (HCl)	1 liter H_2SO_4	1liter Amber HCL	Field Temperature °C	Field Spec. Cond.	Field pH	Analysis Required
W205	Field Blank (FB)	3 Feb16	—			X		X					—	—	—	MDU CCR Rule
W206	Equipment Blank (EB)	3 Feb16	—			X		X					—	—	—	
W207	Duplicate 2	3 Feb16	0935	GW		X		X					6.60	10820	7.16	
W208	13	3 Feb16	0935	GW		X		X					6.60	10820	7.16	
W209	103	3 Feb16	1131	GW		X		X					6.83	5080	6.98	
W210	44R	3 Feb16	1319	GW		X		X					6.53	~~9214~~ 9214 4 Feb16	6.84	
W211	102	3 Feb16	1500	GW		X		X					7.41	9448	7.04	
W212	70	3 Feb16	1625	GW		X		X					7.30	3816	7.25	

Comments:

	Transferred by:	Sample Condition	Date/Time	Received by:	Sample Condition	Date/Time	°C
1	Darren Nieswaag	Walk in 2	3 Feb16 1748	C. Jackson		4 Feb 16 0800	5.4 ROI
2							TM588
3							

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www.mvtl.com
MEMBER ACIL

CASE NARRATIVE – AMENDED 26 APRIL 2016

MVTL Lab Reference No/SDG: **201682-0289**
IML Lab Reference No/SDG: **S1602078**

Client: **Montana Dakota Utilities**
Location: **MDU Heskett Ash Site**

Project Identification: **CCR 1st Quarter 2016 (Radiochemistry)**

MVTL Laboratory Identifications: **16-W219** through **16-W226**
IML Laboratory Identifications: **S1602078-001** through **S1602078-008**

MDU Sample Identification	MVTL Laboratory #	IML Laboratory #
Field Blank	16-W219	S1602078-001
Equipment Blank	16-W220	S1602078-002
Duplicate 2	16-W221	S1602078-003
13	16-W222	S1602078-004
103	16-W223	S1602078-005
44R	16-W224	S1602078-006
102	16-W225	S1602078-007
70	16-W226	S1602078-008

I. RECEIPT

- All samples were received at the laboratory on 4 February 2016 at 0800.
- Samples were collected and hand delivered by MVTL Field Service personnel to the laboratory.
- Samples were received on ice and evidence of cooling had begun.
    - Temperature of samples upon receipt was 5.4°C.
- No other exceptions on sample receipt were encountered on this sample set unless noted here.
- All samples requiring radiochemistry analysis were sent via courier to Inter-Mountain Labs (IML) for analysis there. Samples were received at IML on 8 February 2016.
    - All samples were properly preserved unless noted on the individual analytical laboratory report or on the IML Case Narrative.

II. HOLDING TIMES

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

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CASE NARRATIVE – AMENDED 26 APRIL 2016

MVTL Lab Reference No/SDG: 201682-0289
IML Lab Reference No/SDG: S1602078

Client: Montana Dakota Utilities
Location: MDU Heskett Ash Site

Project Identification: CCR 1st Quarter 2016 (Radiochemistry)

MVTL Laboratory Identifications: 16-W219 through 16-W226
IML Laboratory Identifications: S1602078-001 through S1602078-008

MDU Sample Identification	MVTL Laboratory #	IML Laboratory #
Field Blank	16-W219	S1602078-001
Equipment Blank	16-W220	S1602078-002
Duplicate 2	16-W221	S1602078-003
13	16-W222	S1602078-004
103	16-W223	S1602078-005
44R	16-W224	S1602078-006
102	16-W225	S1602078-007
70	16-W226	S1602078-008

III. METHODS

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

IV. ANALYSIS

- All acceptance criteria was met for calibration, method blanks, laboratory control samples, laboratory fortified matrix/matrix duplicates unless noted on the individual analytical laboratory report or on the IML Case Narrative.
- Reporting limits were elevated higher than the reporting limits specified in the SAP. Higher reporting limits were due to smaller volumes of sample being collected for radiochemistry analyses.

V. REPORTING

- Per email from Barr Engineering dated 10 March 2016, IML reports were amended to report numerical values, including negative results for both the sample results and the method analyte precision.
- Per email from Samantha Marshall with MDU, MVTL was directed to report the radium 226 and radium 228 values individually and then MDU would calculate the summation result using their database tabulations.

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CASE NARRATIVE – AMENDED 26 APRIL 2016

MVTL Lab Reference No/SDG: 201682-0289
IML Lab Reference No/SDG: S1602078

Client: Montana Dakota Utilities
Location: MDU Heskett Ash Site

Project Identification: CCR 1st Quarter 2016 (Radiochemistry)

MVTL Laboratory Identifications: 16-W219 through 16-W226
IML Laboratory Identifications: S1602078-001 through S1602078-008
Page 3 of 3

MDU Sample Identification	MVTL Laboratory #	IML Laboratory #
Field Blank	16-W219	S1602078-001
Equipment Blank	16-W220	S1602078-002
Duplicate 2	16-W221	S1602078-003
13	16-W222	S1602078-004
103	16-W223	S1602078-005
44R	16-W224	S1602078-006
102	16-W225	S1602078-007
70	16-W226	S1602078-008

All laboratory data has been approved by MVTL Laboratories.

SIGNED: Claudette Carroll DATE: 26 Apr 16
Claudette Carroll - MVTL Bismarck Laboratory Manager

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MEMBER ACIL

Report Date: 26 Feb 16
Lab Number: 16-W219
Work Order #:82-0289
Account #: 002800
Date Sampled: 3 Feb 16
Date Received: 4 Feb 16 8:00
Sampled By: MVTL Field Services

Samantha Marshall
Montana Dakota Utilities
400 N. 4th
Bismarck ND 58501

PO #: 160249 OP

Temp at Receipt: 5.4C ROI

Project Name: MDU Heskett-Ash Site CCR Radiochem

Sample Description: Field Blank(FB)

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
Radium 226	See Attached Report			17 Feb 16	OL
Radium 228	See Attached Report			20 Feb 16	OL

OL = Analysis performed by an Outside Laboratory.

Approved by: Claudette K. Carroll CC 26 Feb 16

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

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

CERTIFICATION: ND # ND-00016

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MEMBER ACIL

Report Date: 26 Feb 16
Lab Number: 16-W220
Work Order #:82-0289
Account #: 002800
Date Sampled: 3 Feb 16
Date Received: 4 Feb 16 8:00
Sampled By: MVTL Field Services

Samantha Marshall
Montana Dakota Utilities
400 N. 4th
Bismarck ND 58501

PO #: 160249 OP

Temp at Receipt: 5.4C ROI

Project Name: MDU Heskett-Ash Site CCR Radiochem

Sample Description: Equipment Blank(EB)

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
Radium 226	See Attached Report			17 Feb 16	OL
Radium 228	See Attached Report			21 Feb 16	OL

OL = Analysis performed by an Outside Laboratory.

Approved by: Claudette K. Carroll CC 26 Feb 16

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

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

CERTIFICATION: ND # ND-00016

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MEMBER ACIL

Report Date: 26 Feb 16
Lab Number: 16-W221
Work Order #:82-0289
Account #: 002800
Date Sampled: 3 Feb 16 9:35
Date Received: 4 Feb 16 8:00
Sampled By: MVTL Field Services

Samantha Marshall
Montana Dakota Utilities
400 N. 4th
Bismarck ND 58501

Project Name: MDU Heskett-Ash Site CCR Radiochem

PO #: 160249 OP

Sample Description: Duplicate 2

Temp at Receipt: 5.4C ROI

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	7.16	units	NA	SM 4500 H+ B	3 Feb 16 9:35	DJN
Temperature - Field	6.60	Degrees C	NA	SM 2550B	3 Feb 16 9:35	DJN
Conductivity - Field	10820	umhos/cm	1	EPA 120.1	3 Feb 16 9:35	DJN
Radium 226	See Attached Report				17 Feb 16	OL
Radium 228	See Attached Report				21 Feb 16	OL

OL = Analysis performed by an Outside Laboratory.

Approved by: Claudette K. Carroll 26 Feb 16

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

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

CERTIFICATION: ND # ND-00016

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MEMBER ACIL

Report Date: 26 Feb 16
Lab Number: 16-W222
Work Order #:82-0289
Account #: 002800
Date Sampled: 3 Feb 16 9:35
Date Received: 4 Feb 16 8:00
Sampled By: MVTL Field Services

Samantha Marshall
Montana Dakota Utilities
400 N. 4th
Bismarck ND 58501

PO #: 160249 OP

Project Name: MDU Heskett-Ash Site CCR Radiochem

Sample Description: 13

Temp at Receipt: 5.4C ROI

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	7.16	units	NA	SM 4500 H+ B	3 Feb 16 9:35	DJN
Temperature - Field	6.60	Degrees C	NA	SM 2550B	3 Feb 16 9:35	DJN
Conductivity - Field	10820	umhos/cm	1	EPA 120.1	3 Feb 16 9:35	DJN
Radium 226	See Attached Report				17 Feb 16	OL
Radium 228	See Attached Report				21 Feb 16	OL

OL = Analysis performed by an Outside Laboratory.

cc
26 Feb 16

Approved by: Claudette K. Carroll

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

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

CERTIFICATION: ND # ND-00016

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MEMBER ACIL

Report Date: 26 Feb 16
Lab Number: 16-W223
Work Order #:82-0289
Account #: 002800
Date Sampled: 3 Feb 16 11:31
Date Received: 4 Feb 16 8:00
Sampled By: MVTL Field Services

Samantha Marshall
Montana Dakota Utilities
400 N. 4th
Bismarck ND 58501

Project Name: MDU Heskett-Ash Site CCR Radiochem

PO #: 160249 OP

Sample Description: 103

Temp at Receipt: 5.4C ROI

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	6.98	units	NA	SM 4500 H+ B	3 Feb 16 11:31	DJN
Temperature - Field	6.83	Degrees C	NA	SM 2550B	3 Feb 16 11:31	DJN
Conductivity - Field	5080	umhos/cm	1	EPA 120.1	3 Feb 16 11:31	DJN
Radium 226	See Attached Report				17 Feb 16	OL
Radium 228	See Attached Report				21 Feb 16	OL

OL = Analysis performed by an Outside Laboratory.

Approved by: Claudette K. Carroll lc 26 Feb 16

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

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

CERTIFICATION: ND # ND-00016

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MEMBER ACIL

Report Date: 26 Feb 16
Lab Number: 16-W224
Work Order #:82-0289
Account #: 002800
Date Sampled: 3 Feb 16 13:19
Date Received: 4 Feb 16 8:00
Sampled By: MVTL Field Services

Samantha Marshall
Montana Dakota Utilities
400 N. 4th
Bismarck ND 58501

Project Name: MDU Heskett-Ash Site CCR Radiochem

PO #: 160249 OP

Sample Description: 44R

Temp at Receipt: 5.4C ROI

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	6.84	units	NA	SM 4500 H+ B	3 Feb 16 13:19	DJN
Temperature - Field	6.53	Degrees C	NA	SM 2550B	3 Feb 16 13:19	DJN
Conductivity - Field	6214	umhos/cm	1	EPA 120.1	3 Feb 16 13:19	DJN
Radium 226	See Attached Report				17 Feb 16	OL
Radium 228	See Attached Report				21 Feb 16	OL

OL = Analysis performed by an Outside Laboratory.

Approved by: Claudette K. Carroll CC 26 Feb 16

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

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

CERTIFICATION: ND # ND-00016

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Report Date: 26 Feb 16
Lab Number: 16-W225
Work Order #:82-0289
Account #: 002800
Date Sampled: 3 Feb 16 15:00
Date Received: 4 Feb 16 8:00
Sampled By: MVTL Field Services

Samantha Marshall
Montana Dakota Utilities
400 N. 4th
Bismarck ND 58501

Project Name: MDU Heskett-Ash Site CCR Radiochem

PO #: 160249 OP

Sample Description: 102

Temp at Receipt: 5.4C ROI

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	7.04	units	NA	SM 4500 H+ B	3 Feb 16 15:00	DJN
Temperature - Field	7.41	Degrees C	NA	SM 2550B	3 Feb 16 15:00	DJN
Conductivity - Field	9448	umhos/cm	1	EPA 120.1	3 Feb 16 15:00	DJN
Radium 226	See Attached Report				17 Feb 16	OL
Radium 228	See Attached Report				21 Feb 16	OL

OL = Analysis performed by an Outside Laboratory.

Approved by: Claudette K. Carroll cc 26 feb 16

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

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

CERTIFICATION: ND # ND-00016

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Report Date: 26 Feb 16
Lab Number: 16-W226
Work Order #:82-0289
Account #: 002800
Date Sampled: 3 Feb 16 16:25
Date Received: 4 Feb 16 8:00
Sampled By: MVTL Field Services

Samantha Marshall
Montana Dakota Utilities
400 N. 4th
Bismarck ND 58501

PO #: 160249 OP

Temp at Receipt: 5.4C ROI

Project Name: MDU Heskett-Ash Site CCR Radiochem

Sample Description: 70

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	7.25	units	NA	SM 4500 H+ B	3 Feb 16 16:25	DJN
Temperature - Field	7.30	Degrees C	NA	SM 2550B	3 Feb 16 16:25	DJN
Conductivity - Field	3816	umhos/cm	1	EPA 120.1	3 Feb 16 16:25	DJN
Radium 226	See Attached Report				17 Feb 16	OL
Radium 228	See Attached Report				21 Feb 16	OL

OL = Analysis performed by an Outside Laboratory.

Approved by: Claudette K. Carroll CC 26 Feb 16

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

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

CERTIFICATION: ND # ND-00016

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

Your Environmental Monitoring Partner

Date: 2/24/2016

CLIENT: MVTL Laboratories, Inc.
Project: 201682-0289
Lab Order: S1602078

CASE NARRATIVE

Report ID: S1602078001

Samples 16-W219 Field Blank, 16-W220 Equipment Blank, 16-W221 Duplicate 2, 16-W222 13, 16-W223 103, 16-W224 44R, 16-W225 102, and 16-W226 70 were received on February 8, 2016.

All samples were received and analyzed within the EPA recommended holding times, except those noted below in this case narrative. Samples were analyzed using the methods outlined in the following references:

"Standard Methods For The Examination of Water and Wastewater", approved method versions
Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, 3rd Edition
40 CFR Parts 136 and 141
40 CFR Part 50, Appendices B, J, L, and O
Methods indicated in the Methods Update Rule published in the Federal Register Friday, May 18, 2012
ASTM approved and recognized standards

All Quality Control parameters met the acceptance criteria defined by EPA and Inter-Mountain Laboratories except as indicated in this case narrative.

Reviewed by:

Wade Nieuwsma, Assistant Laboratory Manager

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

Your Environmental Monitoring Partner

Sample Analysis Report

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

Date Reported 4/6/2016
Report ID S1602078002
(Replaces S1602078001)

ProjectName: 201682-0289
Lab ID: S1602078-001
ClientSample ID: 16-W219 Field Blank
COC: 201682-0289

WorkOrder: S1602078
CollectionDate: 2/3/2016
DateReceived: 2/8/2016 9:25:00 AM
FieldSampler:
Matrix: Water

Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Radionuclides - Total							
Radium 226	0.1	pCi/L		0.4	SM 7500 Ra-B	02/17/2016 854	MB
Radium 226 Precision (±)	0.1	pCi/L			SM 7500 Ra-B	02/17/2016 854	MB
Radium 228	-1.2	pCi/L		2	Ga-Tech	02/20/2016 2206	MB
Radium 228 Precision (±)	1.5	pCi/L			Ga-Tech	02/20/2016 2206	MB

These results apply only to the samples tested.

RL - Reporting Limit

Qualifiers:

B	Analyte detected in the associated Method Blank	C	Calculated Value
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	L	Analyzed by another laboratory
M	Value exceeds Monthly Ave or MCL or is less than LCL	ND	Not Detected at the Reporting Limit
O	Outside the Range of Dilutions	S	Spike Recovery outside accepted recovery limits
X	Matrix Effect		

Reviewed by: _____
Wade Nieuwsma, Assistant Laboratory Manager

Sample Analysis Report

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

Date Reported 4/6/2016
Report ID S1602078002
(Replaces S1602078001)

ProjectName: 201682-0289
Lab ID: S1602078-002
ClientSample ID: 16-W220 Equipment Blank
COC: 201682-0289

WorkOrder: S1602078
CollectionDate: 2/3/2016
DateReceived: 2/8/2016 9:25:00 AM
FieldSampler:
Matrix: Water

Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Radionuclides - Total							
Radium 226	0.04	pCi/L		0.4	SM 7500 Ra-B	02/17/2016 854	MB
Radium 226 Precision (±)	0.1	pCi/L			SM 7500 Ra-B	02/17/2016 854	MB
Radium 228	-3.8	pCi/L		2	Ga-Tech	02/21/2016 106	MB
Radium 228 Precision (±)	2.2	pCi/L			Ga-Tech	02/21/2016 106	MB

These results apply only to the samples tested.

RL - Reporting Limit

Qualifiers:

B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
M	Value exceeds Monthly Ave or MCL or is less than LCL
O	Outside the Range of Dilutions
X	Matrix Effect
C	Calculated Value
H	Holding times for preparation or analysis exceeded
L	Analyzed by another laboratory
ND	Not Detected at the Reporting Limit
S	Spike Recovery outside accepted recovery limits

Reviewed by: _____
Wade Nieuwsma, Assistant Laboratory Manager

Sample Analysis Report

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

Date Reported 4/6/2016
Report ID S1602078002
(Replaces S1602078001)

ProjectName: 201682-0289
Lab ID: S1602078-003
ClientSample ID: 16-W221 Duplicate 2
COC: 201682-0289

WorkOrder: S1602078
CollectionDate: 2/3/2016 9:35:00 AM
DateReceived: 2/8/2016 9:25:00 AM
FieldSampler:
Matrix: Water

Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Radionuclides - Total							
Radium 226	0.3	pCi/L		0.4	SM 7500 Ra-B	02/17/2016 854	MB
Radium 226 Precision (±)	0.1	pCi/L			SM 7500 Ra-B	02/17/2016 854	MB
Radium 228	-3.0	pCi/L		2	Ga-Tech	02/21/2016 407	MB
Radium 228 Precision (±)	2.0	pCi/L			Ga-Tech	02/21/2016 407	MB

These results apply only to the samples tested.

RL - Reporting Limit

Qualifiers:

B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
M	Value exceeds Monthly Ave or MCL or is less than LCL
O	Outside the Range of Dilutions
X	Matrix Effect
C	Calculated Value
H	Holding times for preparation or analysis exceeded
L	Analyzed by another laboratory
ND	Not Detected at the Reporting Limit
S	Spike Recovery outside accepted recovery limits

Reviewed by: _____
Wade Nieuwsma, Assistant Laboratory Manager

Sample Analysis Report

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

Date Reported 4/6/2016
Report ID S1602078002
(Replaces S1602078001)

ProjectName: 201682-0289
Lab ID: S1602078-004
ClientSample ID: 16-W222 13
COC: 201682-0289

WorkOrder: S1602078
CollectionDate: 2/3/2016 9:35:00 AM
DateReceived: 2/8/2016 9:25:00 AM
FieldSampler:
Matrix: Water

Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Radionuclides - Total							
Radium 226	0.18	pCi/L		0.4	SM 7500 Ra-B	02/17/2016 854	MB
Radium 226 Precision (±)	0.1	pCi/L			SM 7500 Ra-B	02/17/2016 854	MB
Radium 228	-3.3	pCi/L		2	Ga-Tech	02/21/2016 708	MB
Radium 228 Precision (±)	2.1	pCi/L			Ga-Tech	02/21/2016 708	MB

These results apply only to the samples tested.

RL - Reporting Limit

Qualifiers:

B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
M	Value exceeds Monthly Ave or MCL or is less than LCL
O	Outside the Range of Dilutions
X	Matrix Effect
C	Calculated Value
H	Holding times for preparation or analysis exceeded
L	Analyzed by another laboratory
ND	Not Detected at the Reporting Limit
S	Spike Recovery outside accepted recovery limits

Reviewed by: _____
Wade Nieuwsma, Assistant Laboratory Manager

Sample Analysis Report

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

Date Reported 4/6/2016
Report ID S1602078002
(Replaces S1602078001)

ProjectName: 201682-0289
Lab ID: S1602078-005
ClientSample ID: 16-W223 103
COC: 201682-0289

WorkOrder: S1602078
CollectionDate: 2/3/2016 11:31:00 AM
DateReceived: 2/8/2016 9:25:00 AM
FieldSampler:
Matrix: Water

Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Radionuclides - Total							
Radium 226	0.4	pCi/L		0.4	SM 7500 Ra-B	02/17/2016 854	MB
Radium 226 Precision (±)	0.1	pCi/L			SM 7500 Ra-B	02/17/2016 854	MB
Radium 228	-5.2	pCi/L		2	Ga-Tech	02/21/2016 1009	MB
Radium 228 Precision (±)	2.0	pCi/L			Ga-Tech	02/21/2016 1009	MB

These results apply only to the samples tested. **RL - Reporting Limit**

Qualifiers:

B	Analyte detected in the associated Method Blank	C	Calculated Value
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	L	Analyzed by another laboratory
M	Value exceeds Monthly Ave or MCL or is less than LCL	ND	Not Detected at the Reporting Limit
O	Outside the Range of Dilutions	S	Spike Recovery outside accepted recovery limits
X	Matrix Effect		

Reviewed by: _____
Wade Nieuwsma, Assistant Laboratory Manager

Sample Analysis Report

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

Date Reported 4/6/2016
Report ID S1602078002
(Replaces S1602078001)

ProjectName: 201682-0289
Lab ID: S1602078-006
ClientSample ID: 16-W224 44R
COC: 201682-0289

WorkOrder: S1602078
CollectionDate: 2/3/2016 1:19:00 PM
DateReceived: 2/8/2016 9:25:00 AM
FieldSampler:
Matrix: Water

Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Radionuclides - Total							
Radium 226	0.6	pCi/L		0.4	SM 7500 Ra-B	02/17/2016 854	MB
Radium 226 Precision (±)	0.1	pCi/L			SM 7500 Ra-B	02/17/2016 854	MB
Radium 228	-3.4	pCi/L		2	Ga-Tech	02/21/2016 1310	MB
Radium 228 Precision (±)	2.1	pCi/L			Ga-Tech	02/21/2016 1310	MB

These results apply only to the samples tested. **RL - Reporting Limit**

Qualifiers:

B	Analyte detected in the associated Method Blank	C	Calculated Value
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	L	Analyzed by another laboratory
M	Value exceeds Monthly Ave or MCL or is less than LCL	ND	Not Detected at the Reporting Limit
O	Outside the Range of Dilutions	S	Spike Recovery outside accepted recovery limits
X	Matrix Effect		

Reviewed by: _____
Wade Nieuwsma, Assistant Laboratory Manager

Sample Analysis Report

Company:	MVTL Laboratories, Inc. 2616 E Broadway Ave. Bismarck, ND 58501	**Date Reported** **Report ID**	4/6/2016 S1602078002 (Replaces S1602078001)
ProjectName:	201682-0289	**WorkOrder:**	S1602078
Lab ID:	S1602078-007	**CollectionDate:**	2/3/2016 3:00:00 PM
ClientSample ID:	16-W225 102	**DateReceived:**	2/8/2016 9:25:00 AM
COC:	201682-0289	**FieldSampler:**	
		Matrix:	Water

Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Radionuclides - Total							
Radium 226	0.3	pCi/L		0.4	SM 7500 Ra-B	02/17/2016 854	MB
Radium 226 Precision (±)	0.1	pCi/L			SM 7500 Ra-B	02/17/2016 854	MB
Radium 228	-3.0	pCi/L		2	Ga-Tech	02/21/2016 1611	MB
Radium 228 Precision (±)	2.0	pCi/L			Ga-Tech	02/21/2016 1611	MB

These results apply only to the samples tested. **RL - Reporting Limit**

Qualifiers:

B	Analyte detected in the associated Method Blank	C	Calculated Value
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	L	Analyzed by another laboratory
M	Value exceeds Monthly Ave or MCL or is less than LCL	ND	Not Detected at the Reporting Limit
O	Outside the Range of Dilutions	S	Spike Recovery outside accepted recovery limits
X	Matrix Effect		

Reviewed by: _____
Wade Nieuwsma, Assistant Laboratory Manager

Sample Analysis Report

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

Date Reported 4/6/2016
Report ID S1602078002
(Replaces S1602078001)

ProjectName: 201682-0289
Lab ID: S1602078-008
ClientSample ID: 16-W226 70
COC: 201682-0289

WorkOrder: S1602078
CollectionDate: 2/3/2016 4:25:00 PM
DateReceived: 2/8/2016 9:25:00 AM
FieldSampler:
Matrix: Water

Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Radionuclides - Total							
Radium 226	0.4	pCi/L		0.4	SM 7500 Ra-B	02/17/2016 854	MB
Radium 226 Precision (±)	0.1	pCi/L			SM 7500 Ra-B	02/17/2016 854	MB
Radium 228	-3.1	pCi/L		2	Ga-Tech	02/21/2016 1912	MB
Radium 228 Precision (±)	2.1	pCi/L			Ga-Tech	02/21/2016 1912	MB

These results apply only to the samples tested.

RL - Reporting Limit

Qualifiers:

B	Analyte detected in the associated Method Blank	C	Calculated Value
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	L	Analyzed by another laboratory
M	Value exceeds Monthly Ave or MCL or is less than LCL	ND	Not Detected at the Reporting Limit
O	Outside the Range of Dilutions	S	Spike Recovery outside accepted recovery limits
X	Matrix Effect		

Reviewed by: _____
Wade Nieuwsma, Assistant Laboratory Manager

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

Your Environmental Monitoring Partner

ANALYTICAL QC SUMMARY REPORT

CLIENT: MVTL Laboratories, Inc.
Work Order: S1602078
Project: 201682-0289

Date: 2/24/2016
Report ID: S1602078001

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

MB-322 (02/19/16 15:57)	RunNo: 131412	PrepDate: 02/10/16 13:00			BatchID: 11429		
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Total Radium 228	ND	1					

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

LCS-322 (02/19/16 18:58)	RunNo: 131412	PrepDate: 02/10/16 13:00			BatchID: 11429		
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Total Radium 228	39	1	40.1		96.9	61.3 - 120	

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

MS-322 (02/20/16 00:59)	RunNo: 131412	PrepDate: 02/10/16 13:00			BatchID: 11429		
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Total Radium 228	34	1	40.1	ND	85.2	64.3 - 120	

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

MSD-322 (02/20/16 04:00)	RunNo: 131412	PrepDate: 02/10/16 13:00			BatchID: 11429		
Analyte	Result	RL	Conc	%RPD	%REC	% RPD Limits	Qual
Total Radium 228	37	1	34	8.50	92.8	20	

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

MB-1576 (02/17/16 08:54)	RunNo: 131239	PrepDate: 02/10/16 0:00			BatchID: 11410		
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Radium 226	ND	0.2					

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

LCS-1576 (02/17/16 08:54)	RunNo: 131239	PrepDate: 02/10/16 0:00			BatchID: 11410		
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Radium 226	5.1	0.2	5.54		91.4	67.1 - 122	

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

LCSD-1576 (02/17/16 08:54)	RunNo: 131239	PrepDate: 02/10/16 0:00			BatchID: 11410		
Analyte	Result	RL	Conc	%RPD	%REC	% RPD Limits	Qual
Radium 226	5.4	0.2	5.1	6.73	108	20	

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

S1602072-001A MS (02/17/16 08:54)	RunNo: 131239	PrepDate: 02/10/16 0:00			BatchID: 11410		
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Radium 226	11	1	11.1	ND	96.6	65 - 131	

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
L	Analyzed by another laboratory	ND	Not Detected at the Reporting Limit
O	Outside the Range of Dilutions	R	RPD outside accepted recovery limits
S	Spike Recovery outside accepted recovery limits	X	Matrix Effect

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

Chain of Custody Record

201682-0289

Company Name and Address: MVTL 2616 E Broadway Bismarck, ND 58501	Account #:	Phone #: 701-258-9720
	Contact: Claudette	Fax #: For faxed report check box ☐
Billing Address (indicate if different from above): PO Box 249 New Ulm, MN 56073	Name of Sampler:	E-mail: ccarroll@mvtl.com For e-mail report check box ☐
	Quote Number	Date Submitted: 2/4/2016
	Project Name/Number:	Purchase Order #: BL5511

Sample Information						Bottle Type						Analysis
IML Lab Number (516020 78)	MVTL Lab Number	Client Sample ID	Sample Type	Date Sampled	Time Sampled	Untreated	1000 ml HNO3	VOC Vials Unpreserved	Glass Jar	Other		Analysis Required
001	16-W219	Field Blank		2/3/2016								Ra226 & Ra228 on all
002	16-W220	Equipment Blank		2/3/2016								
003	16-W221	Duplicate 2		2/3/2016	935							
004	16-W222	13		2/3/2016	935							
005	16-W223	103		2/3/2016	1131							
006	16-W224	44R		2/3/2016	1319							
007	16-W225	102		2/3/2016	1500							
008	16-W226	70		2/3/2016	1625							

Comments:

Transferred by:	Date:	Time:	Sample Condition:	Received by:	Date:		Temp:
C. Jackson	2/4/2016	1700		Kathy Boyd	2.8.16	9:25	7.0
2.							

MVTL

2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

Field Datasheet

Groundwater Assessment

Company: MDU Heskett - Ash Site

Sample ID: 13

Date: 3 Feb 16

Sampling Personal: Darren Wiswell

Weather Conditions: Temp: 15 °F Wind: Light Precip: Sunny / (Partly Cloudy) / Cloudy

Well Information

Well Locked?	Yes	(No)	
Well Labeled?	(Yes)	No	
Casing Straight?	(Yes)	No	
Grout Seal Intact?	(Yes)	No	Not Visible
Repairs Necessary:	—		
Casing Diameter:	2"		
Water Level Before Purge:	31.09	Ft	
Well Depth:	41.20	Ft	
Well Volume:	6.3	Liters	
Water Level After Sample:	32.42	Ft	
Measurement Method:	Electric Water Level Indicator		

Sampling Information

Sampling Method: Bladder

Dedicated Equipment?	Yes	(No)	
Duplicate Sample?	(Yes)	No	ID: Dup 2
Pumping Rate:	100	ml/min	
Time Purging Began:	0854	(am) / pm	
Time of Sampling:	0935	(am) / pm	
Well Purged Dry?	Yes	(No)	
Time Purged Dry:	—	am / pm	
Sample Appearance:	(Clear) / Slightly Turbid / Turbid		Phase: —
Color: —			Odor: —

Control Box Settings

Purge: 3 sec.

Rest: 55 sec.

PSI: 30

Field Measurements

SEQ #	Time	Temp	Cond.	pH	DO (mg/L)	ORP	Turb (NTU)	Water Level (ft)	mL Removed	Appearance
1	0859	7.36	11142	7.22	1.20	111.4	>1000	31.73	500	Turbid
2	0904	6.70	11127	7.21	0.91	92.6	402	31.73	500	Slightly turbid
3	0909	7.13	11032	7.18	0.61	82.1	159	31.75	500	clear
4	0914	7.15	11001	7.17	0.55	73.8	81.9	31.96	500	clear
5	0919	6.92	10995	7.16	0.59	66.5	53.3	32.02	500	clear
6	0924	6.52	10954	7.16	0.57	59.5	35.9	32.02	500	Clear
7	0929	6.48	10905	7.15	0.61	55.8	35.5	32.03	500	clear
8	0934	6.60	10820	7.16	0.61	52.9	37.8	32.10	500	clear
9										
10										

Stabilized: (Yes) No

Total mL Removed: 4000

Comments:

Bottles Collected

~~250 mL H_2SO_4~~

1 - 500 mL HNO_3

~~500 mL HNO_3 (Filtered)~~

1 - 1 Liter Raw

2 - 1 Liter HNO3

MVTL

2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

Field Datasheet

Groundwater Assessment

Company: MDU Heskett - Ash Site

Sample ID: 103

Date: 3 Feb. 16

Sampling Personal: Darren Nieswaag

Weather Conditions: Temp: 20 °F Wind: S 5 Precip: Sunny / Partly Cloudy / (Cloudy)

Well Information

Well Locked?	Yes	(No)	
Well Labeled?	(Yes)	No	
Casing Straight?	(Yes)	No	
Grout Seal Intact?	(Yes)	No	Not Visible
Repairs Necessary:	—		
Casing Diameter:	2"		
Water Level Before Purge:	34.32	Ft	
Well Depth:	47.10	Ft	
Well Volume:	7.9	Liters	
Water Level After Sample:	37.14	Ft	
Measurement Method:	Electric Water Level Indicator		

Sampling Information

Sampling Method:	Bladder		
Dedicated Equipment?	Yes	(No)	
Duplicate Sample?	Yes	(No)	ID: —
Pumping Rate:	100	ml/min	
Time Purging Began:	1055	(am) / pm	
Time of Sampling:	1131	(am) / pm	
Well Purged Dry?	Yes	(No)	
Time Purged Dry:	—	am / pm	
Sample Appearance:	(Clear) / Slightly Turbid / Turbid		Phase: —
Color:	—		Odor: —

Control Box Settings

Purge: 5 sec.

Rest: 55 sec.

PSI: 30

Field Measurements

SEQ #	Time	Temp	Cond.	pH	DO (mg/L)	ORP	Turb (NTU)	Water Level (ft)	mL Removed	Appearance
1	1100	6.93	5069	6.94	4.30	92.9	43.2	34.91	500	clear
2	1105	6.27	5071	6.97	4.00	78.4	17.5	35.17	500	clear
3	1110	6.76	5081	6.95	3.01	72.8	11.8	35.25	500	clear
4	1115	6.82	5063	6.96	1.21	63.5	12.0	35.36	500	clear
5	1120	6.51	5076	6.96	1.11	61.9	11.1	35.46	500	clear
6	1125	6.97	5066	6.96	1.07	57.8	12.0	35.59	500	clear
7	1130	6.83	5080	6.98	1.05	54.5	11.3	35.79	500	clear
8										
9										
10										

Stabilized: (Yes) No

Total mL Removed: 3500

Comments:

Bottles Collected

500 mL HNO_3

1 Liter Raw

2 - 1 Liter HNO_3

500 mL HNO_3 (F. Hg)

500 mL HNO_3

MVTL

2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

Field Datasheet

Groundwater Assessment

Company: MDU Heskett - Ash Site

Sample ID: 44R

Date: 3 Feb 16

Sampling Personal: Darren Nieswaag

Weather Conditions: Temp: 25 °F Wind: W 10 Precip: Sunny / Partly Cloudy / Cloudy

Well Information

Well Locked?	Yes	(No)	
Well Labeled?	(Yes)	No	
Casing Straight?	(Yes)	No	
Grout Seal Intact?	(Yes)	No	Not Visible
Repairs Necessary:	—		
Casing Diameter:	2"		
Water Level Before Purge:	29.27	Ft	
Well Depth:	45.85	Ft	
Well Volume:	10.3	Liters	
Water Level After Sample:	29.45	Ft	
Measurement Method:	Electric Water Level Indicator		

Sampling Information

Sampling Method: Bladder

Dedicated Equipment?	Yes	(No)	
Duplicate Sample?	Yes	(No)	ID: —
Pumping Rate:	100	ml/min	
Time Purging Began:	1239	am / (pm)	
Time of Sampling:	1320	am / (pm)	
Well Purged Dry?	Yes	(No)	
Time Purged Dry:	—	am / pm	
Sample Appearance:	(Clear) / Slightly Turbid / Turbid		Phase: —
Color:	—		Odor: —

Control Box Settings

Purge: 5 sec.

Rest: 55 sec.

PSI: 30

Field Measurements

SEQ #	Time	Temp	Cond.	pH	DO (mg/L)	ORP	Turb (NTU)	Water Level (ft)	mL Removed	Appearance
1	1244	6.09	9218	6.88	0.33	68.2	563	29.30	500	Turbid
2	1249	6.15	9238	6.87	0.33	60.0	162	29.34	500	clear
3	1254	6.17	9207	6.85	1.46	55.1	106	29.35	500	clear
4	1259	6.57	9207	6.85	0.65	51.1	72.2	29.35	500	Clear
5	1304	6.35	9221	6.85	0.56	48.3	74.1	29.38	500	Clear
6	1309	6.39	9210	6.85	0.53	45.6	59.0	29.39	500	clear
7	1314	6.46	9221	6.88	0.53	43.6	62.1	29.41	500	clear
8	1319	6.53	9214	6.84	0.49	42.1	58.3	29.41	500	clear
9										
10										

Stabilized: (Yes) No

Total mL Removed: ~~4500~~ 4000

Comments:

Bottles Collected

500 mL HNO_3

2-1 Liter Raw

2 - 1 Liter HNO3

500mL HNO_3 Filtered

Field Datasheet

Groundwater Assessment

2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

Company: MDU Heskett - Ash Site

Sample ID: 102

Date: 3 Feb 16

Sampling Personal: Darren Nieswagg

Weather Conditions: Temp: 29 °F Wind: Light Precip: Sunny / Partly Cloudy / Cloudy

Well Information

Well Locked?	Yes	(No)	
Well Labeled?	(Yes)	No	
Casing Straight?	(Yes)	No	
Grout Seal Intact?	(Yes)	No	Not Visible
Repairs Necessary:	—		
Casing Diameter:	2"		
Water Level Before Purge:	18.06	Ft	
Well Depth:	33.23	Ft	
Well Volume:	9.4	Liters	
Water Level After Sample:	20.96	Ft	
Measurement Method:	Electric Water Level Indicator		

Sampling Information

Sampling Method: Bladder

Dedicated Equipment?	Yes	(No)	
Duplicate Sample?	Yes	(No)	ID: —
Pumping Rate:	100	ml/min	
Time Purging Began:	1425	am / (pm)	
Time of Sampling:	1501	am / (pm)	
Well Purged Dry?	Yes	(No)	
Time Purged Dry:	—	am / pm	
Sample Appearance:	(Clear) / Slightly Turbid / Turbid		Phase: —
Color:	—		Odor: —

Control Box Settings

Purge: 5 sec.

Rest: 55 sec.

PSI: 20

Field Measurements

SEQ #	Time	Temp	Cond.	pH	DO (mg/L)	ORP	Turb (NTU)	Water Level (ft)	mL Removed	Appearance
1	1430	7.13	10091	6.91	0.06	2.8	3.79	18.58	500	clear
2	1435	7.03	10082	6.95	0.04	-9.7	3.87	18.68	500	clear
3	1440	7.20	10064	6.99	0.03	-18.9	4.21	18.88	500	Clear
4	1445	7.30	9986	7.01	0.03	-24.0	3.65	19.30	500	clear
5	1450	7.51	9860	7.02	0.03	-25.6	4.14	19.39	500	clear
6	1455	7.67	9682	7.03	0.03	-25.3	4.41	19.54	500	Clear
7	1500	7.41	9448	7.04	0.03	-23.7	4.37	19.64	500	clear
8										
9										
10										

Stabilized: (Yes) No

Total mL Removed: 3500

Comments:

Bottles Collected

500 mL HNO_3

2 1 Liter Raw

2 - 1 Liter HNO3

500 mL HNO_3 (Filtered)

MVTL

2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

Field Datasheet

Groundwater Assessment

Company: MDU Heskett - Ash Site

Sample ID: 70

Date: 3 Feb. 16

Sampling Personal: Darren Nieswand

Weather Conditions: Temp: 33 °F Wind: W 5 Precip: Sunny / (Partly Cloudy) / Cloudy

Well Information

Well Locked?	Yes	(No)	
Well Labeled?	(Yes)	No	
Casing Straight?	(Yes)	No	
Grout Seal Intact?	(Yes)	No	Not Visible
Repairs Necessary:	—		
Casing Diameter:	2"		
Water Level Before Purge:	21.78		Ft
Well Depth:	~~38~~ 35.75		Ft
Well Volume:	8.6		Liters
Water Level After Sample:	25.14		Ft
Measurement Method:	Electric Water Level Indicator		

Sampling Information

Sampling Method: Bladder

Dedicated Equipment?	Yes	(No)	
Duplicate Sample?	Yes	(No)	ID: —
Pumping Rate:	100	ml/min	
Time Purging Began:	1550	am (pm)	
Time of Sampling:	1626	am (pm)	
Well Purged Dry?	Yes	(No)	
Time Purged Dry:	—	am / pm	
Sample Appearance:	Clear / (Slightly Turbid) / Turbid		Phase: —
Color:	Tan		Odor:

Control Box Settings

Purge: 5 sec.

Rest: 55 sec.

PSI: 27

Field Measurements

SEQ #	Time	Temp	Cond.	pH	DO (mg/L)	ORP	Turb (NTU)	Water Level (ft)	mL Removed	Appearance
1	1555	7.49	3863	7.25	0.09	-25.0	901	21.97	500	Turbid
2	~~1600~~ 1600	7.11	3852	7.24	0.05	-16.1	619	22.19	500	Turbid
3	1605	7.14	3849	7.23	0.06	-9.3	363	22.52	500	Slightly Turbid
4	1610	7.41	3837	7.23	0.04	-3.0	255	22.80	500	Slightly Turbid
5	1615	7.38	3826	7.24	0.05	0.7	228	22.98	500	Slightly Turbid
6	1620	7.38	3815	7.24	0.06	5.2	220	23.18	500	Slightly Turbid
7	1625	7.30	3816	7.25	0.06	7.8	222	23.34	500	Slightly Turbid
8										
9										
10										

Total mL Removed: 3500

Stabilized: (Yes) No

Comments: There is a lot of mud at the bottom of well

Bottles Collected

- ~~250 mL H_2SO_4~~
- 1 - 500 mL HNO_3
- 500 mL HNO_3 (Filtered)
- 2 - 1 Liter Raw
- 2 - 1 Liter HNO3

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

Chain of Custody Record

Project Name: MDU Heskett - Ash Site CCR Radiochemistry

Name of Sampler(s): Darren Nieswaag

Report To:	Montana Dakota Utilities	**Carbon Copy:**
Attn:	Samantha Marshall	Attn:
Address:	400 N. 4th St Bismarck, ND 58501	Address:
Phone:	701-222-7829	

Work Order Number: 82-0289

Sample Information						Bottle Type							Field Parameters			Analysis
Lab Number	Sample ID	Date	Time	Sample Type	Sample Location	500 ml HNO_3	250 ml H_2SO_4	1 liter	1L HNO_3	VOC's (HCl)	1 liter H_2SO_4	1liter Amber HCL	Field Temperature °C	Field Spec. Cond.	Field pH	Analysis Required
W219	Field Blank (FB)	3 Feb16	—	—					2				—	—	—	MDU CCR Radiochemistry
W220	Equipment Blank (EB)	3 Feb16	—	—					2				—	—	—	
W221	Duplicate 2	3 Feb16	0935	GW					2				6.60	10820	7.16	
W222	13	3 Feb16	0935	GW					2				6.60	10820	7.16	
W223	103	3 Feb16	1131	GW					2				6.83	5080	6.98	
W224	44R	3 Feb16	1319	GW					2				6.53	9214	6.84	
W225	102	3 Feb16	1500	GW					2				7.41	9448	7.04	
W226	70	3 Feb16	1625	GW					2				7.30	3816	7.25	

Comments:

	Transferred by:	Sample Condition	Date/Time	Received by:	Sample Condition	Date/Time	°C
1	Darren Nieswaag	Walk in 2	3 Feb 16 1748	C. Jackson		4 Feb 16 0500	5.4 ROI
2							TM588
3							

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www.mvtl.com
MEMBER ACIL

CASE NARRATIVE – AMENDED 13 MAY 2016

MVTL Lab Reference No/SDG: **201682-0298**
Client: **Montana Dakota Utilities**
Location: **MDU Heskett Ash Site**
Project Identification: **CCR 1st Quarter 2016 Groundwater**

MVTL Laboratory Identifications: **16-W239** through **16-W246**
Page 1 of 2

MDU Sample Identification	MVTL Laboratory #
Field Blank	16-W239
Equipment Blank	16-W240
Duplicate 1	16-W241
101	16-W242
33	16-W243
3-90	16-W244
2-90	16-W245
80R	16-W246

I. RECEIPT

- All samples were received at the laboratory on 5 February 2016 at 0800.
- Samples were collected and hand delivered by MVTL Field Service personnel to the laboratory.
- Samples were received on ice and evidence of cooling had begun.
  - Temperature of samples upon receipt was 3.1°C.
- All samples were properly preserved unless noted here and/or flagged on the individual analytical laboratory report.
- No other exceptions on sample receipt were encountered on this sample set unless noted here.
  - MVTL Field Services department inadvertently used the 2015 MDU Heskett SAP/quotation to collect samples during the February 2016 event. Per email from Barr Engineering dated 10 March 2016, analysis of alkalinity, magnesium, sodium, and potassium were added to the samples in order to meet the specifications of the 2015 MDU Heskett SAP.

II. HOLDING TIMES

- With the exception of laboratory pH, all holding times were met for both preparation and analysis unless noted here.
  - Alkalinity exceeded holding time due to use of incorrect SAP being used at sample collection. Alkalinity analysis was performed beyond hold time at the request of Barr Engineering per email dated 18 March 2016.

III. METHODS

- Approved methodology was followed for all sample analyses.
  - Methods 6010D and Method 6020B were used to analyze the metals.

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CASE NARRATIVE – AMENDED 13 MAY 2016

MVTL Lab Reference No/SDG: **201682-0298**
Client: **Montana Dakota Utilities**
Location: **MDU Heskett Ash Site**
Project Identification: **CCR 1st Quarter 2016 Groundwater**

MVTL Laboratory Identifications: **16-W239** through **16-W246**
Page 2 of 2

MDU Sample Identification	MVTL Laboratory #
Field Blank	16-W239
Equipment Blank	16-W240
Duplicate 1	16-W241
101	16-W242
33	16-W243
3-90	16-W244
2-90	16-W245
80R	16-W246

IV. ANALYSIS

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

All laboratory data has been approved by MVTL Laboratories.

SIGNED: C. Carroll **DATE:** 13 May 16
Claudette Carroll - MVTL Bismarck Laboratory Manager

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MEMBER ACIL

Amended 18Mar16 (Alk, Na, Mg, K)

Samantha Marshall
Montana Dakota Utilities
400 N. 4th
Bismarck ND 58501

Report Date: 16 Feb 16
Lab Number: 16-W239
Work Order #:82-0298
Account #: 002800
Date Sampled: 4 Feb 16
Date Received: 5 Feb 16 8:00
Sampled By: MVTL Field Services

PO #: 160249 OP

Temp at Receipt: 3.1C ROI

Project Name: MDU Heskett-Ash Site CCR

Sample Description: Field Blank(FB)

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	5 Feb 16	ML
pH	* 5.7	units	N/A	SM4500 H+ B	5 Feb 16 17:00	ML
Total Alkalinity	* < 20	mg/l CaCO3	20	SM2320-B	18 Mar 16 17:00	ML
Fluoride	< 0.1	mg/l	0.10	SM4500-F-C	5 Feb 16 17:00	ML
Sulfate	< 5	mg/l	5.00	ASTM D516-07	12 Feb 16 15:01	KMD
Chloride	< 1	mg/l	1.0	SM4500-Cl-E	11 Feb 16 9:11	EMS
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	9 Feb 16 11:22	EV
Total Dissolved Solids	< 5	mg/l	5	I1750-85	5 Feb 16 14:09	ML
Calcium - Total	< 1	mg/l	1.0	6010	8 Feb 16 14:09	KMD
Magnesium - Total	< 1	mg/l	1.0	6010	8 Feb 16 12:09	KMD
Sodium - Total	< 1	mg/l	1.0	6010	8 Feb 16 12:09	KMD
Potassium - Total	< 1	mg/l	1.0	6010	8 Feb 16 12:09	KMD
Lithium - Total	< 0.1	mg/l	0.10	6010	10 Feb 16 14:54	SZ
Boron - Total	< 0.1	mg/l	0.10	6010	8 Feb 16 16:47	SZ
Antimony - Total	< 0.001	mg/l	0.0010	6020	15 Feb 16 15:05	CC
Arsenic - Total	< 0.005 ^	mg/l	0.0020	6020	15 Feb 16 15:05	CC
Barium - Total	< 0.002	mg/l	0.0020	6020	15 Feb 16 15:05	CC
Beryllium - Total	< 0.001 ^	mg/l	0.0005	6020	15 Feb 16 15:05	CC
Cadmium - Total	< 0.0005	mg/l	0.0005	6020	15 Feb 16 15:05	CC
Chromium - Total	< 0.025 ^	mg/l	0.0020	6020	15 Feb 16 15:05	CC
Cobalt - Total	< 0.002	mg/l	0.0020	6020	15 Feb 16 15:05	CC
Lead - Total	< 0.0005	mg/l	0.0005	6020	15 Feb 16 15:05	CC
Molybdenum - Total	< 0.01 ^	mg/l	0.0020	6020	15 Feb 16 15:05	CC
Selenium - Total	< 0.002	mg/l	0.0020	6020	16 Feb 16 9:35	CC
Thallium - Total	< 0.001 ^	mg/l	0.0005	6020	15 Feb 16 15:05	CC

* Holding time exceeded

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

CC

Approved by: Claudette K. Carroll 21 Apr 16

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

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

CERTIFICATION: ND # ND-00016

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Amended 18Mar16 (Alk, Na, Mg, K)

Samantha Marshall
Montana Dakota Utilities
400 N. 4th
Bismarck ND 58501

Report Date: 16 Feb 16
Lab Number: 16-W240
Work Order #:82-0298
Account #: 002800
Date Sampled: 4 Feb 16
Date Received: 5 Feb 16 8:00
Sampled By: MVTL Field Services

Project Name: MDU Heskett-Ash Site CCR

PO #: 160249 OP

Sample Description: Equipment Blank(EB)

Temp at Receipt: 3.1C ROI

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	5 Feb 16	ML
pH	* 5.9	units	N/A	SM4500 H+ B	5 Feb 16 17:00	ML
Total Alkalinity	* < 20	mg/l CaCO3	20	SM2320-B	18 Mar 16 17:00	ML
Fluoride	< 0.1	mg/l	0.10	SM4500-F-C	5 Feb 16 17:00	ML
Sulfate	< 5	mg/l	5.00	ASTM D516-07	12 Feb 16 15:01	KMD
Chloride	< 1	mg/l	1.0	SM4500-Cl-E	11 Feb 16 9:11	EMS
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	9 Feb 16 11:22	EV
Total Dissolved Solids	< 5	mg/l	5	I1750-85	5 Feb 16 14:09	ML
Calcium - Total	< 1	mg/l	1.0	6010	8 Feb 16 14:09	KMD
Magnesium - Total	< 1	mg/l	1.0	6010	8 Feb 16 12:09	KMD
Sodium - Total	< 1	mg/l	1.0	6010	8 Feb 16 12:09	KMD
Potassium - Total	< 1	mg/l	1.0	6010	8 Feb 16 12:09	KMD
Lithium - Total	< 0.1	mg/l	0.10	6010	10 Feb 16 14:54	SZ
Boron - Total	< 0.1	mg/l	0.10	6010	8 Feb 16 16:47	SZ
Antimony - Total	< 0.001	mg/l	0.0010	6020	15 Feb 16 15:05	CC
Arsenic - Total	< 0.005 ^	mg/l	0.0020	6020	15 Feb 16 15:05	CC
Barium - Total	< 0.002	mg/l	0.0020	6020	15 Feb 16 15:05	CC
Beryllium - Total	< 0.001 ^	mg/l	0.0005	6020	15 Feb 16 15:05	CC
Cadmium - Total	< 0.0005	mg/l	0.0005	6020	15 Feb 16 15:05	CC
Chromium - Total	< 0.025 ^	mg/l	0.0020	6020	15 Feb 16 15:05	CC
Cobalt - Total	< 0.002	mg/l	0.0020	6020	15 Feb 16 15:05	CC
Lead - Total	< 0.0005	mg/l	0.0005	6020	15 Feb 16 15:05	CC
Molybdenum - Total	< 0.01 ^	mg/l	0.0020	6020	15 Feb 16 15:05	CC
Selenium - Total	< 0.002	mg/l	0.0020	6020	16 Feb 16 9:35	CC
Thallium - Total	< 0.001 ^	mg/l	0.0005	6020	15 Feb 16 15:05	CC

* Holding time exceeded

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

CC

Approved by: Claudette K. Carroll 21 Apr 16

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

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www.mvtl.com

Amended 18Mar16 (Alk, Na, Mg, K)

Samantha Marshall
Montana Dakota Utilities
400 N. 4th
Bismarck ND 58501

Report Date: 16 Feb 16
Lab Number: 16-W241
Work Order #:82-0298
Account #: 002800
Date Sampled: 4 Feb 16 8:47
Date Received: 5 Feb 16 8:00
Sampled By: MVTL Field Services

Project Name: MDU Heskett-Ash Site CCR

PO #: 160249 OP

Sample Description: Duplicate 1

Temp at Receipt: 3.1C ROI

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	5 Feb 16	ML
pH	* 6.7	units	N/A	SM4500 H+ B	5 Feb 16 17:00	ML
pH - Field	7.04	units	NA	SM 4500 H+ B	4 Feb 16 8:47	DJN
Temperature - Field	7.15	Degrees C	NA	SM 2550B	4 Feb 16 8:47	DJN
Total Alkalinity	* 443	mg/l CaCO3	20	SM2320-B	18 Mar 16 17:00	ML
Conductivity - Field	4962	umhos/cm	1	EPA 120.1	4 Feb 16 8:47	DJN
Fluoride	< 0.1	mg/l	0.10	SM4500-F-C	5 Feb 16 17:00	ML
Sulfate	3000	mg/l	5.00	ASTM D516-07	12 Feb 16 15:01	KMD
Chloride	19.6	mg/l	1.0	SM4500-Cl-E	11 Feb 16 9:11	EMS
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	9 Feb 16 11:22	EV
Total Dissolved Solids	4390	mg/l	5	I1750-85	5 Feb 16 14:09	ML
Calcium - Total	318	mg/l	1.0	6010	8 Feb 16 14:09	KMD
Magnesium - Total	263	mg/l	1.0	6010	8 Feb 16 12:09	KMD
Sodium - Total	640	mg/l	1.0	6010	8 Feb 16 12:09	KMD
Potassium - Total	19.1	mg/l	1.0	6010	8 Feb 16 12:09	KMD
Lithium - Total	0.56	mg/l	0.10	6010	10 Feb 16 14:54	SZ
Boron - Total	1.32	mg/l	0.10	6010	8 Feb 16 16:47	SZ
Antimony - Total	< 0.001	mg/l	0.0010	6020	15 Feb 16 15:05	CC
Arsenic - Total	< 0.005 ^	mg/l	0.0020	6020	15 Feb 16 15:05	CC
Barium - Total	0.0301	mg/l	0.0020	6020	15 Feb 16 15:05	CC
Beryllium - Total	< 0.001 ^	mg/l	0.0005	6020	15 Feb 16 15:05	CC
Cadmium - Total	< 0.0005	mg/l	0.0005	6020	15 Feb 16 15:05	CC
Chromium - Total	< 0.025 ^	mg/l	0.0020	6020	15 Feb 16 15:05	CC
Cobalt - Total	< 0.002	mg/l	0.0020	6020	15 Feb 16 15:05	CC
Lead - Total	< 0.0005	mg/l	0.0005	6020	15 Feb 16 15:05	CC
Molybdenum - Total	< 0.01 ^	mg/l	0.0020	6020	15 Feb 16 15:05	CC
Selenium - Total	< 0.002	mg/l	0.0020	6020	16 Feb 16 9:35	CC
Thallium - Total	< 0.001 ^	mg/l	0.0005	6020	15 Feb 16 15:05	CC

* Holding time exceeded

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

Approved by: Claudette K. Carroll CC 21 Apr 16

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

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MEMBER ACIL

Amended 18Mar16 (Alk, Na, Mg, K)

Samantha Marshall
Montana Dakota Utilities
400 N. 4th
Bismarck ND 58501

Report Date: 16 Feb 16
Lab Number: 16-W242
Work Order #:82-0298
Account #: 002800
Date Sampled: 4 Feb 16 8:47
Date Received: 5 Feb 16 8:00
Sampled By: MVTL Field Services

Project Name: MDU Heskett-Ash Site CCR

PO #: 160249 OP

Sample Description: 101

Temp at Receipt: 3.1C ROI

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	5 Feb 16	ML
pH	* 6.8	units	N/A	SM4500 H+ B	5 Feb 16 17:00	ML
pH - Field	7.04	units	NA	SM 4500 H+ B	4 Feb 16 8:47	DJN
Temperature - Field	7.15	Degrees C	NA	SM 2550B	4 Feb 16 8:47	DJN
Total Alkalinity	* 441	mg/l CaCO3	20	SM2320-B	18 Mar 16 17:00	ML
Conductivity - Field	4962	umhos/cm	1	EPA 120.1	4 Feb 16 8:47	DJN
Fluoride	0.10	mg/l	0.10	SM4500-F-C	5 Feb 16 17:00	ML
Sulfate	3020	mg/l	5.00	ASTM D516-07	12 Feb 16 15:01	KMD
Chloride	20.3	mg/l	1.0	SM4500-Cl-E	11 Feb 16 9:11	EMS
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	9 Feb 16 11:22	EV
Total Dissolved Solids	4400	mg/l	5	I1750-85	5 Feb 16 14:09	ML
Calcium - Total	314	mg/l	1.0	6010	8 Feb 16 14:09	KMD
Magnesium - Total	262	mg/l	1.0	6010	8 Feb 16 12:09	KMD
Sodium - Total	635	mg/l	1.0	6010	8 Feb 16 12:09	KMD
Potassium - Total	19.0	mg/l	1.0	6010	8 Feb 16 12:09	KMD
Lithium - Total	0.57	mg/l	0.10	6010	10 Feb 16 14:54	SZ
Boron - Total	1.32	mg/l	0.10	6010	8 Feb 16 16:47	SZ
Antimony - Total	< 0.001	mg/l	0.0010	6020	15 Feb 16 15:05	CC
Arsenic - Total	< 0.005 ^	mg/l	0.0020	6020	15 Feb 16 15:05	CC
Barium - Total	0.0309	mg/l	0.0020	6020	15 Feb 16 15:05	CC
Beryllium - Total	< 0.001 ^	mg/l	0.0005	6020	15 Feb 16 15:05	CC
Cadmium - Total	< 0.0005	mg/l	0.0005	6020	15 Feb 16 15:05	CC
Chromium - Total	< 0.025 ^	mg/l	0.0020	6020	15 Feb 16 15:05	CC
Cobalt - Total	< 0.002	mg/l	0.0020	6020	15 Feb 16 15:05	CC
Lead - Total	< 0.0005	mg/l	0.0005	6020	15 Feb 16 15:05	CC
Molybdenum - Total	< 0.01 ^	mg/l	0.0020	6020	15 Feb 16 15:05	CC
Selenium - Total	< 0.002	mg/l	0.0020	6020	16 Feb 16 9:35	CC
Thallium - Total	< 0.001 ^	mg/l	0.0005	6020	15 Feb 16 15:05	CC

* Holding time exceeded

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

Approved by: Claudette K. Carroll CC 21 Apr 16

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

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

CERTIFICATION: ND # ND-00016

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www.mvtl.com

Amended 18Mar16 (Alk, Na, Mg, K)

Samantha Marshall
Montana Dakota Utilities
400 N. 4th
Bismarck ND 58501

Report Date: 16 Feb 16
Lab Number: 16-W243
Work Order #:82-0298
Account #: 002800
Date Sampled: 4 Feb 16 11:29
Date Received: 5 Feb 16 8:00
Sampled By: MVTL Field Services

Project Name: MDU Heskett-Ash Site CCR

PO #: 160249 OP

Sample Description: 33

Temp at Receipt: 3.1C ROI

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	5 Feb 16	ML
pH	* 6.6	units	N/A	SM4500 H+ B	5 Feb 16 17:00	ML
pH - Field	6.75	units	NA	SM 4500 H+ B	4 Feb 16 11:29	DJN
Temperature - Field	7.57	Degrees C	NA	SM 2550B	4 Feb 16 11:29	DJN
Total Alkalinity	* 437	mg/l CaCO3	20	SM2320-B	18 Mar 16 17:00	ML
Conductivity - Field	5100	umhos/cm	1	EPA 120.1	4 Feb 16 11:29	DJN
Fluoride	0.23	mg/l	0.10	SM4500-F-C	5 Feb 16 17:00	ML
Sulfate	3190	mg/l	5.00	ASTM D516-07	12 Feb 16 15:01	KMD
Chloride	11.3	mg/l	1.0	SM4500-Cl-E	11 Feb 16 9:11	EMS
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	9 Feb 16 11:22	EV
Total Dissolved Solids	4960	mg/l	5	I1750-85	5 Feb 16 14:09	ML
Calcium - Total	447	mg/l	1.0	6010	8 Feb 16 14:09	KMD
Magnesium - Total	430	mg/l	1.0	6010	8 Feb 16 12:09	KMD
Sodium - Total	441	mg/l	1.0	6010	8 Feb 16 12:09	KMD
Potassium - Total	20.4	mg/l	1.0	6010	8 Feb 16 12:09	KMD
Lithium - Total	0.64	mg/l	0.10	6010	10 Feb 16 14:54	SZ
Boron - Total	< 0.5	mg/l	0.10	6010	8 Feb 16 16:47	SZ
Antimony - Total	< 0.001	mg/l	0.0010	6020	15 Feb 16 15:05	CC
Arsenic - Total	< 0.005 ^	mg/l	0.0020	6020	15 Feb 16 15:05	CC
Barium - Total	0.0124	mg/l	0.0020	6020	15 Feb 16 15:05	CC
Beryllium - Total	< 0.001 ^	mg/l	0.0005	6020	15 Feb 16 15:05	CC
Cadmium - Total	< 0.0005	mg/l	0.0005	6020	15 Feb 16 15:05	CC
Chromium - Total	< 0.025 ^	mg/l	0.0020	6020	15 Feb 16 15:05	CC
Cobalt - Total	< 0.002	mg/l	0.0020	6020	15 Feb 16 15:05	CC
Lead - Total	< 0.0005	mg/l	0.0005	6020	15 Feb 16 15:05	CC
Molybdenum - Total	< 0.01 ^	mg/l	0.0020	6020	15 Feb 16 15:05	CC
Selenium - Total	< 0.002	mg/l	0.0020	6020	16 Feb 16 9:35	CC
Thallium - Total	< 0.001 ^	mg/l	0.0005	6020	15 Feb 16 15:05	CC

* Holding time exceeded

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

Approved by: Claudette K. Carroll 21 Apr 16

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

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CERTIFICATION: ND # ND-00016

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Amended 18Mar16 (Alk, Na, Mg, K)

Samantha Marshall
Montana Dakota Utilities
400 N. 4th
Bismarck ND 58501

Report Date: 16 Feb 16
Lab Number: 16-W244
Work Order #:82-0298
Account #: 002800
Date Sampled: 4 Feb 16 13:31
Date Received: 5 Feb 16 8:00
Sampled By: MVTL Field Services

Project Name: MDU Heskett-Ash Site CCR

PO #: 160249 OP

Sample Description: 3-90

Temp at Receipt: 3.1C ROI

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	5 Feb 16	ML
pH	* 6.9	units	N/A	SM4500 H+ B	5 Feb 16 17:00	ML
pH - Field	7.05	units	NA	SM 4500 H+ B	4 Feb 16 13:31	DJN
Temperature - Field	7.39	Degrees C	NA	SM 2550B	4 Feb 16 13:31	DJN
Total Alkalinity	* 508	mg/l CaCO3	20	SM2320-B	18 Mar 16 17:00	ML
Conductivity - Field	4868	umhos/cm	1	EPA 120.1	4 Feb 16 13:31	DJN
Fluoride	0.13	mg/l	0.10	SM4500-F-C	5 Feb 16 17:00	ML
Sulfate	2680	mg/l	5.00	ASTM D516-07	12 Feb 16 15:01	KMD
Chloride	35.3	mg/l	1.0	SM4500-Cl-E	11 Feb 16 9:11	EMS
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	12 Feb 16 11:36	EV
Total Dissolved Solids	4290	mg/l	5	I1750-85	5 Feb 16 14:09	ML
Calcium - Total	485	mg/l	1.0	6010	8 Feb 16 14:09	KMD
Magnesium - Total	234	mg/l	1.0	6010	8 Feb 16 12:09	KMD
Sodium - Total	550	mg/l	1.0	6010	8 Feb 16 12:09	KMD
Potassium - Total	12.2	mg/l	1.0	6010	8 Feb 16 12:09	KMD
Lithium - Total	0.20	mg/l	0.10	6010	10 Feb 16 14:54	SZ
Boron - Total	0.13	mg/l	0.10	6010	8 Feb 16 17:47	SZ
Antimony - Total	< 0.001	mg/l	0.0010	6020	15 Feb 16 15:05	CC
Arsenic - Total	0.0059	mg/l	0.0020	6020	15 Feb 16 15:05	CC
Barium - Total	0.0124	mg/l	0.0020	6020	15 Feb 16 15:05	CC
Beryllium - Total	< 0.001 ^	mg/l	0.0005	6020	15 Feb 16 15:05	CC
Cadmium - Total	< 0.0005	mg/l	0.0005	6020	15 Feb 16 15:05	CC
Chromium - Total	< 0.025 ^	mg/l	0.0020	6020	15 Feb 16 15:05	CC
Cobalt - Total	< 0.002	mg/l	0.0020	6020	15 Feb 16 15:05	CC
Lead - Total	< 0.0005	mg/l	0.0005	6020	15 Feb 16 15:05	CC
Molybdenum - Total	< 0.01 ^	mg/l	0.0020	6020	15 Feb 16 15:05	CC
Selenium - Total	0.0948	mg/l	0.0020	6020	16 Feb 16 9:35	CC
Thallium - Total	< 0.001 ^	mg/l	0.0005	6020	15 Feb 16 15:05	CC

* Holding time exceeded

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

CC

Approved by: Claudette K. Carroll 21 Apr 16

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

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CERTIFICATION: ND # ND-00016

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www.mvtl.com

MEMBER ACIL

Amended 18Mar16 (Alk, Na, Mg, K)

Samantha Marshall
Montana Dakota Utilities
400 N. 4th
Bismarck ND 58501

Report Date: 16 Feb 16
Lab Number: 16-W245
Work Order #:82-0298
Account #: 002800
Date Sampled: 4 Feb 16 14:53
Date Received: 5 Feb 16 8:00
Sampled By: MVTL Field Services

Project Name: MDU Heskett-Ash Site CCR

PO #: 160249 OP

Sample Description: 2-90

Temp at Receipt: 3.1C ROI

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	5 Feb 16	ML
pH	* 7.0	units	N/A	SM4500 H+ B	5 Feb 16 17:00	ML
pH - Field	7.11	units	NA	SM 4500 H+ B	4 Feb 16 14:53	DJN
Temperature - Field	7.25	Degrees C	NA	SM 2550B	4 Feb 16 14:53	DJN
Total Alkalinity	* 470	mg/l CaCO3	20	SM2320-B	18 Mar 16 17:00	ML
Conductivity - Field	7960	umhos/cm	1	EPA 120.1	4 Feb 16 14:53	DJN
Fluoride	0.99	mg/l	0.10	SM4500-F-C	5 Feb 16 17:00	ML
Sulfate	4920	mg/l	5.00	ASTM D516-07	12 Feb 16 15:01	KMD
Chloride	80.6	mg/l	1.0	SM4500-Cl-E	11 Feb 16 9:11	EMS
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	12 Feb 16 11:36	EV
Total Dissolved Solids	7570	mg/l	5	I1750-85	5 Feb 16 14:09	ML
Calcium - Total	463	mg/l	1.0	6010	8 Feb 16 14:09	KMD
Magnesium - Total	760	mg/l	1.0	6010	8 Feb 16 12:09	KMD
Sodium - Total	820	mg/l	1.0	6010	8 Feb 16 12:09	KMD
Potassium - Total	24.4	mg/l	1.0	6010	8 Feb 16 12:09	KMD
Lithium - Total	1.02	mg/l	0.10	6010	10 Feb 16 14:54	SZ
Boron - Total	< 0.5	mg/l	0.10	6010	8 Feb 16 17:47	SZ
Antimony - Total	< 0.001	mg/l	0.0010	6020	15 Feb 16 15:05	CC
Arsenic - Total	0.0126	mg/l	0.0020	6020	15 Feb 16 15:05	CC
Barium - Total	0.0100	mg/l	0.0020	6020	15 Feb 16 15:05	CC
Beryllium - Total	< 0.001 ^	mg/l	0.0005	6020	15 Feb 16 15:05	CC
Cadmium - Total	< 0.0005	mg/l	0.0005	6020	15 Feb 16 15:05	CC
Chromium - Total	< 0.025 ^	mg/l	0.0020	6020	15 Feb 16 15:05	CC
Cobalt - Total	< 0.002	mg/l	0.0020	6020	15 Feb 16 15:05	CC
Lead - Total	< 0.0005	mg/l	0.0005	6020	15 Feb 16 15:05	CC
Molybdenum - Total	< 0.01 ^	mg/l	0.0020	6020	15 Feb 16 15:05	CC
Selenium - Total	0.1930	mg/l	0.0020	6020	16 Feb 16 12:30	CC
Thallium - Total	< 0.001 ^	mg/l	0.0005	6020	15 Feb 16 15:05	CC

* Holding time exceeded

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

Approved by: Claudette K. Carroll 21 Apr 16

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

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CERTIFICATION: ND # ND-00016

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MEMBER ACIL

Amended 18Mar16 (Alk, Na, Mg, K)

Samantha Marshall
Montana Dakota Utilities
400 N. 4th
Bismarck ND 58501

Report Date: 16 Feb 16
Lab Number: 16-W246
Work Order #:82-0298
Account #: 002800
Date Sampled: 4 Feb 16 16:27
Date Received: 5 Feb 16 8:00
Sampled By: MVTL Field Services

Project Name: MDU Heskett-Ash Site CCR

PO #: 160249 OP

Sample Description: 80R

Temp at Receipt: 3.1C ROI

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	5 Feb 16	ML
pH	* 7.2	units	N/A	SM4500 H+ B	5 Feb 16 17:00	ML
pH - Field	7.29	units	NA	SM 4500 H+ B	4 Feb 16 16:27	DJN
Temperature - Field	7.67	Degrees C	NA	SM 2550B	4 Feb 16 16:27	DJN
Total Alkalinity	* 512	mg/l CaCO3	20	SM2320-B	18 Mar 16 17:00	ML
Conductivity - Field	5851	umhos/cm	1	EPA 120.1	4 Feb 16 16:27	DJN
Fluoride	0.34	mg/l	0.10	SM4500-F-C	5 Feb 16 17:00	ML
Sulfate	3260	mg/l	5.00	ASTM D516-07	12 Feb 16 15:01	KMD
Chloride	169	mg/l	1.0	SM4500-Cl-E	11 Feb 16 9:11	EMS
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	12 Feb 16 11:36	EV
Total Dissolved Solids	5220	mg/l	5	I1750-85	5 Feb 16 14:09	ML
Calcium - Total	268	mg/l	1.0	6010	8 Feb 16 14:09	KMD
Magnesium - Total	535	mg/l	1.0	6010	8 Feb 16 12:09	KMD
Sodium - Total	605	mg/l	1.0	6010	8 Feb 16 12:09	KMD
Potassium - Total	5.6	mg/l	1.0	6010	8 Feb 16 12:09	KMD
Lithium - Total	0.72	mg/l	0.10	6010	10 Feb 16 14:54	SZ
Boron - Total	< 0.5	mg/l	0.10	6010	8 Feb 16 17:47	SZ
Antimony - Total	< 0.001	mg/l	0.0010	6020	15 Feb 16 15:05	CC
Arsenic - Total	0.0094	mg/l	0.0020	6020	15 Feb 16 15:05	CC
Barium - Total	0.1934	mg/l	0.0020	6020	15 Feb 16 15:05	CC
Beryllium - Total	< 0.001 ^	mg/l	0.0005	6020	15 Feb 16 15:05	CC
Cadmium - Total	< 0.0005	mg/l	0.0005	6020	15 Feb 16 15:05	CC
Chromium - Total	0.0177	mg/l	0.0020	6020	15 Feb 16 15:05	CC
Cobalt - Total	0.0068	mg/l	0.0020	6020	15 Feb 16 15:05	CC
Lead - Total	0.0048	mg/l	0.0005	6020	15 Feb 16 15:05	CC
Molybdenum - Total	< 0.01 ^	mg/l	0.0020	6020	15 Feb 16 15:05	CC
Selenium - Total	0.0527	mg/l	0.0020	6020	16 Feb 16 12:30	CC
Thallium - Total	0.0010	mg/l	0.0005	6020	15 Feb 16 15:05	CC

* Holding time exceeded

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

CC

Approved by: Claudette K. Carroll 21 Apr 16

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

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CERTIFICATION: ND # ND-00016

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Quality Control Report

Lab IDs: 16-W239 to 16-W246 **Project:** MDU Heskett-Ash Site CCR **Work Order:** 201682-0298

Analyte	LCS Spike Amt	LCS Rec %	LCS % Rec Limits	Matrix Spike Amt	Matrix Spike ID	Matrix Spike Orig Result	Matrix Spike Result	Matrix Spike Rec %	Matrix Spike % Rec Limits	MSD/ Dup Orig Result	MSD/ Dup Result	MSD Rec %	MSD/ Dup RPD	MSD/ Dup RPD Limit (<)	Known Rec (%)	Known % Rec Limits	Method Blank
Antimony - Total mg/l	0.0800	100	80-120	0.400	16-W186	< 0.001	0.3982	100	75-125	0.3982	0.4036	101	1.3	20	-	-	< 0.001
				0.400	16-W212	< 0.001	0.3956	99	75-125	0.3956	0.3972	99	0.4	20	-	-	
				0.400	16-W245	< 0.001	0.4084	102	75-125	0.4084	0.3942	99	3.5	20	-	-	
Arsenic - Total mg/l	0.0800	101	80-120	0.400	16-W186	0.0071	0.4162	102	75-125	0.4162	0.4092	101	1.7	20	-	-	< 0.002
				0.400	16-W212	< 0.005	0.4162	104	75-125	0.4162	0.4116	103	1.1	20	-	-	
				0.400	16-W245	0.0126	0.4154	101	75-125	0.4154	0.3990	97	4.0	20	-	-	
Barium - Total mg/l	0.0800	99	80-120	0.400	16-W186	0.1102	0.5166	102	75-125	0.5166	0.5192	102	0.5	20	-	-	< 0.002
				0.400	16-W212	0.1138	0.5144	100	75-125	0.5144	0.5086	99	1.1	20	-	-	
				0.400	16-W245	0.0100	0.3956	96	75-125	0.3956	0.3834	93	3.1	20	-	-	
Beryllium - Total mg/l	0.0800	108	80-120	0.400	16-W186	< 0.0005	0.4222	106	75-125	0.4222	0.4224	106	0.0	20	-	-	< 0.0005
				0.400	16-W212	< 0.0005	0.4196	105	75-125	0.4196	0.4118	103	1.9	20	-	-	
				0.400	16-W245	< 0.0005	0.4074	102	75-125	0.4074	0.3892	97	4.6	20	-	-	
Boron - Total mg/l	0.40	100	80-120	0.400	16-W212	0.45	0.83	95	75-125	0.83	0.83	95	0.0	20	-	-	< 0.1
	0.40	102	80-120	2.00	16-W245	< 0.5	2.34	117	75-125	2.34	2.38	119	1.7	20	-	-	< 0.1
	0.40	100	80-120												-	-	< 0.1
	0.40	102	80-120												-	-	< 0.1
															-	-	< 0.1
															-	-	< 0.1
Cadmium - Total mg/l	0.0800	100	80-120	0.400	16-W186	< 0.0005	0.3988	100	75-125	0.3988	0.4046	101	1.4	20	-	-	< 0.0005
				0.400	16-W212	< 0.0005	0.3922	98	75-125	0.3922	0.3928	98	0.2	20	-	-	
				0.400	16-W245	< 0.0005	0.3904	98	75-125	0.3904	0.3774	94	3.4	20	-	-	
Calcium - Total mg/l	20.0	97	80-120	100	16-W238	169	250	81	75-125	250	256	87	2.4	20	-	-	< 1
															-	-	< 1
Chloride mg/l	30.0	100	80-120	30.0	16-W239	< 1	29.3	98	80-120	29.3	31.0	103	5.6	20	-	-	< 1
				30.0	16-W165	18.0	44.2	87	80-120	44.2	43.2	84	2.3	20	-	-	< 1
Chromium - Total mg/l	0.0800	103	80-120	0.400	16-W186	0.0102	0.3994	97	75-125	0.3994	0.4044	99	1.2	20	-	-	< 0.002
				0.400	16-W212	0.0100	0.4032	98	75-125	0.4032	0.4002	98	0.7	20	-	-	
				0.400	16-W245	< 0.025	0.3938	98	75-125	0.3938	0.3810	95	3.3	20	-	-	

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Quality Control Report

Lab IDs: 16-W239 to 16-W246 **Project:** MDU Heskett-Ash Site CCR **Work Order:** 201682-0298

Analyte	LCS Spike Amt	LCS Rec %	LCS % Rec Limits	Matrix Spike Amt	Matrix Spike ID	Matrix Spike Orig Result	Matrix Spike Result	Matrix Spike Rec %	Matrix Spike % Rec Limits	MSD/ Dup Orig Result	MSD/ Dup Result	MSD Rec %	MSD/ Dup RPD	MSD/ Dup RPD Limit (<)	Known Rec (%)	Known % Rec Limits	Method Blank
Cobalt - Total mg/l	0.0800	102	80-120	0.400	16-W186	0.0083	0.3906	96	75-125	0.3906	0.3952	97	1.2	20	-	-	< 0.002
				0.400	16-W212	0.0041	0.3958	98	75-125	0.3958	0.3904	97	1.4	20	-	-	
				0.400	16-W245	< 0.002	0.3900	98	75-125	0.3900	0.3692	92	5.5	20	-	-	
Fluoride mg/l	0.50	104	90-110	0.500	16-W244	0.13	0.60	94	80-120	0.60	0.61	96	1.7	20	-	-	< 0.1
				0.500	16-W246	0.34	0.79	90	80-120	0.79	0.79	90	0.0	20	-	-	< 0.1
Lead - Total mg/l	0.0800	96	80-120	0.400	16-W186	0.0024	0.3736	93	75-125	0.3736	0.3808	95	1.9	20	-	-	< 0.0005
				0.400	16-W212	0.0027	0.3866	96	75-125	0.3866	0.3804	94	1.6	20	-	-	
				0.400	16-W245	< 0.0005	0.3790	95	75-125	0.3790	0.3728	93	1.6	20	-	-	
Lithium - Total mg/l	0.40	108	85-115	0.400	16-W212	0.29	0.69	100	75-125	0.69	0.70	102	1.4	20	-	-	< 0.1
				2.00	16-W245	1.02	2.96	97	75-125	2.96	2.90	94	2.0	20	-	-	< 0.1
Magnesium - Total mg/l	20.0	105	80-120	100	16-D648	72.6	168	95	75-125	168	167	94	0.6	20	-	-	< 1
				100	16-W238	80.5	169	88	75-125	169	172	92	1.8	20	-	-	< 1
										8.7	8.8		1.1	20	-	-	
Mercury - Total mg/l	0.0020	105	85-115	0.002	A3038	< 0.0002	0.0021	105	70-130	0.0021	0.0021	105	0.0	20	-	-	< 0.0002
	0.0020	100	85-115	0.002	16-M199	< 0.0002	0.0017	85	70-130	0.0017	0.0017	85	0.0	20	-	-	< 0.0002
				0.002	16-W207	< 0.0002	0.0020	100	70-130	0.0020	0.0020	100	0.0	20	-	-	
				0.002	16-W243	< 0.0002	0.0020	100	70-130	0.0020	0.0020	100	0.0	20	-	-	
				0.002	16-W246	< 0.0002	0.0020	100	70-130	0.0020	0.0021	105	4.9	20	-	-	
Molybdenum - Total mg/l	0.0800	85	80-120	0.400	16-W186	< 0.01	0.3420	86	75-125	0.3420	0.3516	88	2.8	20	-	-	< 0.002
				0.400	16-W212	< 0.01	0.3278	82	75-125	0.3278	0.3380	84	3.1	20	-	-	
				0.400	16-W245	< 0.01	0.3270	82	75-125	0.3270	0.3318	83	1.5	20	-	-	
pH units	-	-	-	-	-	-	-	-	-	7.1	7.0	-	1.4	20	-	-	-
	-	-	-	-	-	-	-	-	-	7.0	7.1	-	1.4	20	-	-	-
Potassium - Total mg/l	10.0	93	80-120	20.0	16-D648	8.7	28.5	99	75-125	28.5	28.5	99	0.0	20	-	-	< 1
				20.0	16-W238	7.2	25.8	93	75-125	25.8	26.1	94	1.2	20	-	-	< 1
										2.8	2.8		0.0	20	-	-	

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Quality Control Report

Lab IDs: 16-W239 to 16-W246 **Project:** MDU Heskett-Ash Site CCR **Work Order:** 201682-0298

Analyte	LCS Spike Amt	LCS Rec %	LCS % Rec Limits	Matrix Spike Amt	Matrix Spike ID	Matrix Spike Orig Result	Matrix Spike Result	Matrix Spike Rec %	Matrix Spike % Rec Limits	MSD/ Dup Orig Result	MSD/ Dup Result	MSD Rec %	MSD/ Dup RPD	MSD/ Dup RPD Limit (<)	Known Rec (%)	Known % Rec Limits	Method Blank
Selenium - Total mg/l	0.1000	110	80-120	0.400	16-M199	0.0391	0.5384	125	75-125	0.5384	0.5198	120	3.5	20	-	-	< 0.002
	0.1000	116	80-120	0.400	16-W186	0.0030	0.4506	112	75-125	0.4506	0.4500	112	0.1	20	-	-	< 0.002
				0.400	16-W212	0.0090	0.4596	113	75-125	0.4596	0.4592	113	0.1	20	-	-	
				0.400	16-W245	0.1930	0.6622	117	75-125	0.6622	0.6368	111	3.9	20	-	-	
Sodium - Total mg/l	20.0	106	80-120	100	16-D648	31.6	134	102	75-125	134	133	101	0.7	20	-	-	< 1
				100	16-W238	83.8	175	91	75-125	175	174	90	0.6	20	-	-	< 1
				200	16-W199	225	425	100	75-125	425	439	107	3.2	20	-	-	
Sulfate mg/l	100	108	90-110	2000	16-W242	3020	4780	88	80-120	4780	4750	86	0.6	20	-	-	< 5
Thallium - Total mg/l	0.0800	96	80-120	0.400	16-W186	< 0.001	0.3684	92	75-125	0.3684	0.3816	95	3.5	20	-	-	< 0.0005
				0.400	16-W212	< 0.001	0.3844	96	75-125	0.3844	0.3738	93	2.8	20	-	-	
				0.400	16-W245	< 0.001	0.3740	94	75-125	0.3740	0.3704	93	1.0	20	-	-	
Total Alkalinity mg/l CaCO3	410	94	90-110	410	16-W209	412	793	93	80-120	415	419	93	1.0	20	99	80-120	< 20
				410	16-W243	437	802	89	80-120	383	386	90	0.8	20			< 20
Total Dissolved Solids mg/l	-	-	-	-	-	-	-	-	-	5220	5260	-	0.8	20	-	-	< 5

Amended:

Approved by: C. Gustad

13 May 16

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

Field Datasheet

Water Level

Sampling Personnel: Darren Nieswaag

Company: MDU Heskett - Ash Site

Well ID	Date	Time	Depth to Water	Well Depth	Casing Diameter	Well Locked	Well Labeled	Well Strait	Grount Seal Intact	Comments
MW44R	3Feb16	~~1369~~ 1238	29.27	45.85	2"	Yes / No (No circled)	Yes / No (Yes circled)	Yes / No (Yes circled)	Yes / No Not Visable (Yes circled)	
MW2	4Feb16	1713	36.66	63.65	2"	Yes / No (No circled)	Yes / No (Yes circled)	Yes / No (Yes circled)	Yes / No Not Visable (Not Visable circled)	
MW4B	4Feb16	~~1716~~ (20)	18.32	26.12	2"	Yes / No (No circled)	Yes / No (Yes circled)	Yes / No (Yes circled)	Yes / No Not Visable (Not Visable circled)	
MW8	4Feb16	1716	17.22	27.98	2"	Yes / No (No circled)	Yes / No (Yes circled)	Yes / No (Yes circled)	Yes / No Not Visable (Not Visable circled)	
MW 1-90	4Feb16	1459	11.23	17.03	2"	Yes / No (No circled)	Yes / ~~No~~ (Yes circled)	Yes / No (Yes circled)	Yes / No Not Visable (Not Visable circled)	
					2"	Yes / No	Yes / No	Yes / No	Yes / No Not Visable	
					2"	Yes / No	Yes / No	Yes / No	Yes / No Not Visable	
					2"	Yes / No	Yes / No	Yes / No	Yes / No Not Visable	
					2"	Yes / No	Yes / No	Yes / No	Yes / No Not Visable	
					2"	Yes / No	Yes / No	Yes / No	Yes / No Not Visable	
					2"	Yes / No	Yes / No	Yes / No	Yes / No Not Visable	
					2"	Yes / No	Yes / No	Yes / No	Yes / No Not Visable	
					2"	Yes / No	Yes / No	Yes / No	Yes / No Not Visable	
					2"	Yes / No	Yes / No	Yes / No	Yes / No Not Visable	
					2"	Yes / No	Yes / No	Yes / No	Yes / No Not Visable	

Field Datasheet

Groundwater Assessment

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

Company: MDU Heskett - Ash Site
Sample ID: 101
Date: 4 Feb 16
Sampling Personal: Darren Nieswaag

Weather Conditions: Temp: 19 °F Wind: NW 5 Precip: Sunny / Partly Cloudy / ~~Cloudy~~

Well Information

Well Locked?	Yes	(No)	
Well Labeled?	(Yes)	No	
Casing Straight?	(Yes)	No	
Grout Seal Intact?	(Yes)	No	Not Visible
Repairs Necessary:	—		
Casing Diameter:	2"		
Water Level Before Purge:	36.98	Ft	
Well Depth:	57.06	Ft	
Well Volume:	12.4	Liters	
Water Level After Sample:	42.03	Ft	
Measurement Method:	Electric Water Level Indicator		

Sampling Information

Sampling Method: Bladder

Dedicated Equipment?	Yes	(No)	
Duplicate Sample?	(Yes)	No	ID: Dup 1
Pumping Rate:		ml/min	
Time Purging Began:	0817	(am) / pm	
Time of Sampling:	0848	(am) / pm	
Well Purged Dry?	Yes	(No)	
Time Purged Dry:	—	am / pm	
Sample Appearance:	(Clear) / Slightly Turbid / Turbid		Phase: —
Color: —			Odor: —

Control Box Settings
Purge: 5 sec.
Rest: 55 sec.
PSI: 35

Field Measurements

SEQ #	Time	Temp	Cond.	pH	DO (mg/L)	ORP	Turb (NTU)	Water Level (ft)	mL Removed	Appearance
1	0822	7.41	5096	7.15	0.62	38.2	16.9	37.76	500	clear
2	0827	7.41	5095	7.15	0.41	37.9	17.4	38.16	500	clear
3	0832	7.36	5055	7.13	0.36	37.9	17.3	38.85	500	clear
4	0837	7.32	5014	7.08	0.31	37.4	17.4	39.03	500	clear
5	0842	7.37	4970	7.06	0.31	36.0	18.1	39.23	500	clear
6	0847	7.15	4962	7.04	0.33	33.0	17.3	39.35	500	clear
7										
8										
9										
10										

Stabilized: (Yes) No
Total mL Removed: 3000
Comments:

Bottles Collected
500 mL HNO_3
2 Liter Raw
2 - 1 Liter HNO_3
500mL HNO_3 Filtered

MVTL

2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

Field Datasheet

Groundwater Assessment

Company: MDU Heskett - Ash Site

Sample ID: 33

Date: 4 Feb 16

Sampling Personal: Darren Miesmaes

Field Measurements

SEQ #	Time	Temp	Cond.	pH	DO (mg/L)	ORP	Turb (NTU)	Water Level (ft)	mL Removed	Appearance
11	1119	7.38	5091	6.76	0.93	46.4	2.14	40.76	500	Clear
12	1124	7.53	5095	6.75	0.96	46.5	2.32	40.80	500	Clear
13	1129	7.57	5100	6.75	0.96	46.8	2.15	40.80	500	Clear
14										
15										
16										
17										
18										
19										
20										
21										
22										
23										
24										
25										
26										
27										
28										
29										
30										

Stabilized: (Yes) No

Total mL Removed: 6500

Comments:

Field Datasheet

Groundwater Assessment

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

Company: MDU Heskett - Ash Site
Sample ID: 33
Date: 4 Feb. 16
Sampling Personal: Darren Nieswang

Weather Conditions: Temp: 25 °F Wind: W 5 Precip: (Sunny) / Partly Cloudy / Cloudy

Well Information

Well Locked?	Yes	(No)	
Well Labeled?	(Yes)	No	
Casing Straight?	(Yes)	No	
Grout Seal Intact?	Yes	No	(Not Visible)
Repairs Necessary:	—		
Casing Diameter:	2"		
Water Level Before Purge:	40.57	Ft	
Well Depth:	46.30	Ft	
Well Volume:	3.6	Liters	
Water Level After Sample:	40.85	Ft	
Measurement Method:	Electric Water Level Indicator		

Sampling Information

Sampling Method: Bladder

Dedicated Equipment?	Yes	(No)	
Duplicate Sample?	Yes	(No)	ID: —
Pumping Rate:	100	ml/min	
Time Purging Began:	1024	(am) / pm	
Time of Sampling:	1129	(am) / pm	
Well Purged Dry?	Yes	(No)	
Time Purged Dry:	—	am / pm	
Sample Appearance:	(Clear) / Slightly Turbid / Turbid		Phase: —
Color:	—		Odor: —

Control Box Settings
Purge: 5 sec.
Rest: 55 sec.
PSI: 30

Field Measurements

SEQ #	Time	Temp	Cond.	pH	DO (mg/L)	ORP	Turb (NTU)	Water Level (ft)	mL Removed	Appearance
1	1029	7.61	5309	6.87	4.24	17.1	34.6	40.69	500	clear
2	1034	7.45	5168	6.83	1.13	39.5	31.9	40.69	500	clear
3	1039	7.51	5111	6.81	1.07	39.0	30.2	40.71	500	clear
4	1044	7.58	5087	6.79	0.98	40.9	27.2	40.71	500	clear
5	1049	7.73	5080	6.78	0.92	42.2	19.6	40.71	500	clear
6	1054	7.49	5083	6.77	0.86	44.2	10.4	40.71	500	clear
7	1059	7.49	5097	6.76	0.87	44.8	7.53	40.76	500	clear
8	1104	7.46	5095	6.76	0.89	45.2	4.86	40.76	500	clear
9	1109	7.67	5090	6.76	0.91	45.5	3.76	40.76	500	clear
10	1114	7.40	5085	6.76	0.95	46.1	2.70	40.76	500	clear

~~Stabilized: Yes No~~ >Next page

Total mL Removed: Next Page

Comments:

~~Done~~ See page ~~two~~ for ~~more~~ readings

Bottles Collected
~~250 mL H_2SO_4~~
(1) - 500 mL HNO_3
500 mL HNO_3 (Filtered)
2 - 1 Liter Raw
2 - 1 Liter HNO3

MVTL

2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

Field Datasheet

Groundwater Assessment

Company: MDU Heskett - Ash Site

Sample ID: 3-90

Date: 4 Feb 16

Sampling Personal: Darren Nitsman

Field Measurements

SEQ #	Time	Temp	Cond.	pH	DO (mg/L)	ORP	Turb (NTU)	Water Level (ft)	mL Removed	Appearance
11	1321	7.40	4861	7.05	0.65	35.6	0.63	19.59	500	clear
12	1326	7.31	4869	7.06	0.64	38.1	0.60	19.59	500	clear
13	1331	7.39	4868	7.05	0.64	40.0	0.58	19.59	500	clear
14										
15										
16										
17										
18										
19										
20										
21										
22										
23										
24										
25										
26										
27										
28										
29										
30										

Stabilized: (Yes) No

Total mL Removed: 6500

Comments:

MVTL

2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

Field Datasheet

Groundwater Assessment

Company: MDU Heskett - Ash Site

Sample ID: 3-90

Date: 4 Feb 16

Sampling Personal: Darren Nieswaag

Weather Conditions: Temp: 30 °F Wind: NW 10 Precip: (Sunny) / Partly Cloudy / Cloudy

Well Information

Well Locked?	~~Yes~~	(No)	
Well Labeled?	(Yes)	No	
Casing Straight?	(Yes)	No	
Grout Seal Intact?	Yes	No	(Not Visible)
Repairs Necessary:	—		
Casing Diameter:	2"		
Water Level Before Purge:	19.47	Ft	
Well Depth:	21.94	Ft	
Well Volume:	1.6	Liters	
Water Level After Sample:	19.59	Ft	
Measurement Method:	Electric Water Level Indicator		

Sampling Information

Sampling Method: Bladder

Dedicated Equipment?	Yes	(No)	
Duplicate Sample?	Yes	(No)	ID: —
Pumping Rate:	100	ml/min	
Time Purging Began:	1226	am / (pm)	
Time of Sampling:	1331	am / (pm)	
Well Purged Dry?	Yes	(No)	
Time Purged Dry:	—	am / pm	
Sample Appearance:	(Clear) / Slightly Turbid / Turbid		Phase: —
Color:	—		Odor: —

Control Box Settings

Purge: 5 sec.

Rest: 55 sec.

PSI: 20

Field Measurements

SEQ #	Time	Temp	Cond.	pH	DO (mg/L)	ORP	Turb (NTU)	Water Level (ft)	mL Removed	Appearance
1	1231	7.01	4879	7.10	2.04	-25.3	109	19.51	500	Clear
2	1236	7.22	4898	7.10	1.86	-21.6	70.4	19.59	500	Clear
3	1241	7.24	4884	7.08	1.95	-12.6	35.1	19.59	500	Clear
4	1246	7.20	4884	7.07	1.32	-6.5	27.2	19.59	500	Clear
5	1251	7.30	4882	7.07	0.82	7.8	18.4	19.59	500	Clear
6	1256	7.31	4870	7.06	0.64	15.5	7.96	19.59	500	Clear
7	1301	7.41	4875	7.06	0.64	20.5	4.38	19.59	500	Clear
8	1306	7.06	4873	7.06	0.64	25.9	2.79	19.59	500	Clear
9	1311	7.33	4868	7.06	0.66	28.5	1.55	19.59	500	Clear
10	1316	7.37	4867	7.06	0.64	33.6	1.11	19.59	500	Clear

Stabilized: ~~Yes~~ ~~No~~ next page

Total mL Removed: next page

Comments:

Next Page has more readings

Bottles Collected

- ~~250 mL H_2SO_4~~
- ~~500 mL HNO_3~~
- 500 mL HNO_3 (Filtered)
- 2 - 1 Liter Raw
- 2 - 1 Liter HNO3

Field Datasheet

Groundwater Assessment

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

Company: MDU Heskett - Ash Site
Sample ID: 2-90
Date: 4 Feb 16
Sampling Personal: Darren Wiesmann

Weather Conditions: Temp: 34 °F Wind: Light Precip: (Sunny) / Partly Cloudy / Cloudy

Well Information

Well Locked?	Yes	(No)	
Well Labeled?	(Yes)	No	
Casing Straight?	(Yes)	No	
Grout Seal Intact?	Yes	No	(Not Visible)
Repairs Necessary:	—		
Casing Diameter:	2"		
Water Level Before Purge:	21.31	Ft	
Well Depth:	24.80	Ft	
Well Volume:	2.2	Liters	
Water Level After Sample:	21.77	Ft	
Measurement Method:	Electric Water Level Indicator		

Sampling Information

Sampling Method: Bladder

Dedicated Equipment?	Yes	(No)	
Duplicate Sample?	Yes	(No)	ID: —
Pumping Rate:	100	ml/min	
Time Purging Began:	1423	am / (pm)	
Time of Sampling:	1454	am / (pm)	
Well Purged Dry?	Yes	(No)	
Time Purged Dry:	—	am / pm	
Sample Appearance:	(Clear) / Slightly Turbid / Turbid		Phase: —
Color:	—		Odor: —

Control Box Settings
Purge: 5 sec.
Rest: 55 sec.
PSI: 23

Field Measurements

SEQ #	Time	Temp	Cond.	pH	DO (mg/L)	ORP	Turb (NTU)	Water Level (ft)	mL Removed	Appearance
1	1428	7.16	8177	7.12	1.78	68.6	2.42	21.68	500	clear
2	1433	7.13	8132	7.11	1.62	67.1	1.13	21.68	500	clear
3	1438	7.21	8095	7.11	1.66	66.1	0.77	21.71	500	clear
4	1443	7.25	8029	7.11	1.68	64.9	0.51	21.77	500	clear
5	1448	7.19	8013	7.11	1.80	64.3	0.49	21.77	500	clear
6	1453	7.25	7960	7.11	1.81	63.7	0.48	21.77	500	clear
7										
8										
9										
10										

Bottles Collected
~~250 mL H_2SO_4~~
~~2~~ 1 - 500 mL HNO_3
500 mL HNO_3 (Filtered)
2 - 1 Liter Raw
2 - 1 Liter HNO3

Stabilized: (Yes) No
Total mL Removed: 3000
Comments:

Field Datasheet

Groundwater Assessment

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

Company: MDU Heskett - Ash Site
Sample ID: 80R
Date: 4 Feb 16
Sampling Personal: Darren M. Swagg

Weather Conditions: Temp: 38 °F Wind: ~~light~~ SW 5 Precip: (Sunny) / Partly Cloudy / Cloudy

Well Information

Well Locked?	Yes	(No)	
Well Labeled?	(Yes)	No	
Casing Straight?	(Yes)	No	
Grout Seal Intact?	(Yes)	No	Not Visible
Repairs Necessary:	—		
Casing Diameter:	2"		
Water Level Before Purge:	14.53	Ft	
Well Depth:	30.03	Ft	
Well Volume:	9.6	Liters	
Water Level After Sample:	14.84	Ft	
Measurement Method:	Electric Water Level Indicator		

Sampling Information

Sampling Method: Bladder

Dedicated Equipment?	Yes	(No)	
Duplicate Sample?	Yes	(No)	ID: —
Pumping Rate:	100	ml/min	
Time Purging Began:	1547	am / (pm)	
Time of Sampling:	1628	am / (pm)	
Well Purged Dry?	Yes	(No)	
Time Purged Dry:	—	am / pm	
Sample Appearance:	Clear / (Slightly Turbid) / Turbid		Phase: —
Color:	~~Grey~~ Brown		Odor: —

Control Box Settings
Purge: 5 sec.
Rest: 55 sec.
PSI: 23

Field Measurements

SEQ #	Time	Temp	Cond.	pH	DO (mg/L)	ORP	Turb (NTU)	Water Level (ft)	mL Removed	Appearance
1	1552	7.83	5879	7.30	0.44	51.3	273	14.57	500	Slightly Turbid
2	1557	7.81	5849	7.30	0.32	50.9	374	14.66	500	Slightly Turbid
3	1602	7.71	5850	7.29	0.20	50.4	350	14.72	500	Slightly Turbid
4	1607	7.76	5835	7.29	0.13	49.5	415	14.72	500	Slightly Turbid
5	1612	7.73	5845	7.29	0.12	49.0	442	14.78	500	Slightly Turbid
6	1617	7.63	5842	7.29	0.13	48.3	510	14.78	500	Slightly Turbid
7	1622	7.59	5837	7.29	0.13	48.1	511	14.80	500	Slightly Turbid
8	1627	7.67	5851	7.29	0.13	47.3	554	14.80	500	Slightly Turbid
9										
10										

Total mL Removed: 4,000

Stabilized: (Yes) No

Comments:

Bottles Collected
~~250 mL H_2SO_4~~
2 - 500 mL HNO_3
500 mL HNO_3 (Filtered)
2 - 1 Liter Raw
2 - 1 Liter HNO3

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

Chain of Custody Record

Project Name: MDU Heskett - Ash Site CCR

Name of Sampler(s): Darren Nitschmann

Report To:	Montana Dakota Utilities	**Carbon Copy:**
Attn:	Samantha Marshall	Attn:
Address:	400 N. 4th St Bismarck, ND 58501	Address:
Phone:	701-222-7829	

Work Order Number: 82-0298

Sample Information						Bottle Type							Field Parameters			Analysis
Lab Number	Sample ID	Date	Time	Sample Type	Sample Location	500 ml HNO_3	250 ml H_2SO_4	1 liter	1L HNO_3	VOC's (HCl)	1 liter H_2SO_4	1liter Amber HCL	Field Temperature °C	Field Spec. Cond.	Field pH	Analysis Required
W239	Field Blank (FB)	4Feb16	—	—		X		X					—	—	—	MDU CCR Rule
W240	Equipment Blank (EB)	4Feb16	—	—		X		X					—	—	—	
W241	Duplicate 1	4Feb16	0847	GW		X		X					7.15	4962	7.04	
W242	101	4Feb16	0847	GW		X		X					7.15	4962	7.04	
W243	33	4Feb16	1129	GW		X		X					7.57	5100	6.75	
W244	3-90	4Feb16	1331	GW		X		X					7.39	4868	7.05	
W245	2-90	4Feb16	1453	GW		X		X					7.25	7960	7.11	
W246	80R	4Feb16	1627	GW		X		X					7.67	5851	7.29	

Comments:

	Transferred by:	Sample Condition	Date/Time	Received by:	Sample Condition	Date/Time	°C
1	Darren Nitschmann	walk in 2	4Feb16 1756	C. Jackson		5Feb16 0500	3.1 ROF
2							TM588
3							

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

CASE NARRATIVE – AMENDED 26 APRIL 2016

MVTL Lab Reference No/SDG: **201682-0300**
IML Lab Reference No/SDG: **S1602096**

Client: **Montana Dakota Utilities**
Location: **MDU Heskett Ash Site**

Project Identification: **CCR 1st Quarter 2016**

MVTL Laboratory Identifications: **16-W255** through **16-W262**
IML Laboratory Identifications: **S1602096-001** through **S1602096-008**

MDU Sample Identification	MVTL Laboratory #	IML Laboratory #
Field Blank	16-W255	S1602096-001
Equipment Blank	16-W256	S1602096-002
Duplicate 1	16-W257	S1602096-003
101	16-W258	S1602096-004
33	16-W259	S1602096-005
3-90	16-W260	S1602096-006
2-90	16-W261	S1602096-007
80R	16-W262	S1602096-008

I. RECEIPT

- All samples were received at the laboratory on 5 February 2016 at 0800.
- Samples were collected and hand delivered by MVTL Field Service personnel to the laboratory.
- Samples were received on ice and evidence of cooling had begun.
  - Temperature of samples upon receipt was 3.1°C.
- No other exceptions on sample receipt were encountered on this sample set unless noted here.
- All samples requiring radiochemistry analysis were sent via courier to Inter-Mountain Labs (IML) for analysis there. Samples were received at IML on 9 February 2016.
  - All samples were properly preserved unless noted on the individual analytical laboratory report or on the IML Case Narrative.

II. HOLDING TIMES

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

III. METHODS

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

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MEMBER ACIL

CASE NARRATIVE – AMENDED 26 APRIL 2016

MVTL Lab Reference No/SDG: 201682-0300
IML Lab Reference No/SDG: S1602096

Client: Montana Dakota Utilities
Location: MDU Heskett Ash Site

Project Identification: CCR 1st Quarter 2016

MVTL Laboratory Identifications: 16-W255 through 16-W262
IML Laboratory Identifications: S1602096-001 through S1602096-008

MDU Sample Identification	MVTL Laboratory #	IML Laboratory #
Field Blank	16-W255	S1602096-001
Equipment Blank	16-W256	S1602096-002
Duplicate 1	16-W257	S1602096-003
101	16-W258	S1602096-004
33	16-W259	S1602096-005
3-90	16-W260	S1602096-006
2-90	16-W261	S1602096-007
80R	16-W262	S1602096-008

IV. ANALYSIS

- All acceptance criteria was met for calibration, method blanks, laboratory control samples, laboratory fortified matrix/matrix duplicates unless noted on the individual analytical laboratory report or on the IML Case Narrative.
- Reporting limits were elevated higher than the reporting limits specified in the SAP. Higher reporting limits were due to smaller volumes of sample being collected for radiochemistry analyses.

V. REPORTING

- Per email from Barr Engineering dated 10 March 2016, IML reports were amended to report numerical values, including negative results for both the sample results and the method analyte precision.
- Per email from Samantha Marshall with MDU, MVTL was directed to report the radium 226 and radium 228 values individually and then MDU would calculate the summation result using their database tabulations.

All laboratory data has been approved by MVTL Laboratories.

SIGNED: Claudette Carroll DATE: 26 Apr 16
Claudette Carroll - MVTL Bismarck Laboratory Manager

MINNESOTA VALLEY TESTING LABORATORIES, INC.
1126 North Front St. ~ New Ulm, MN 56073 ~ 800-782-3557 ~ Fax 507-359-2890
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Report Date: 9 Mar 16
Lab Number: 16-W255
Work Order #:82-0300
Account #: 002800
Date Sampled: 4 Feb 16
Date Received: 5 Feb 16 8:00
Sampled By: MVTL Field Services

Samantha Marshall
Montana Dakota Utilities
400 N. 4th
Bismarck ND 58501

PO #: 160249 OP

Project Name: MDU Hekett-Ash Site CCR Radiochem

Temp at Receipt: 3.1C ROI

Sample Description: Field Blank(FB)

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
Radium 226	See Attached Report			17 Feb 16	OL
Radium 228	See Attached Report			24 Feb 16	OL

OL = Analysis performed by an Outside Laboratory.

Approved by: Claudette K. Carroll CC 9 Mar 16

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

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

CERTIFICATION: ND # ND-00016

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Report Date: 9 Mar 16
Lab Number: 16-W256
Work Order #:82-0300
Account #: 002800
Date Sampled: 4 Feb 16
Date Received: 5 Feb 16 8:00
Sampled By: MVTL Field Services

Samantha Marshall
Montana Dakota Utilities
400 N. 4th
Bismarck ND 58501

Project Name: MDU Hekett-Ash Site CCR Radiochem

PO #: 160249 OP

Sample Description: Equipment Blank(EB)

Temp at Receipt: 3.1C ROI

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
Radium 226	See Attached Report			17 Feb 16	OL
Radium 228	See Attached Report			24 Feb 16	OL

OL = Analysis performed by an Outside Laboratory.

CC

Approved by: Claudette K. Carroll 9 Mar 16

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

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

CERTIFICATION: ND # ND-00016

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Report Date: 9 Mar 16
Lab Number: 16-W257
Work Order #:82-0300
Account #: 002800
Date Sampled: 4 Feb 16 8:47
Date Received: 5 Feb 16 8:00
Sampled By: MVTL Field Services

Samantha Marshall
Montana Dakota Utilities
400 N. 4th
Bismarck ND 58501

PO #: 160249 OP

Temp at Receipt: 3.1C ROI

Project Name: MDU Hekett-Ash Site CCR Radiochem

Sample Description: Duplicate 1

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	7.04	units	NA	SM 4500 H+ B	4 Feb 16 8:47	DJN
Temperature - Field	7.15	Degrees C	NA	SM 2550B	4 Feb 16 8:47	DJN
Conductivity - Field	4962	umhos/cm	1	EPA 120.1	4 Feb 16 8:47	DJN
Radium 226	See Attached Report				17 Feb 16	OL
Radium 228	See Attached Report				24 Feb 16	OL

OL = Analysis performed by an Outside Laboratory.

CC

Approved by: Claudette K. Carroll 9 Mar 16

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

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

CERTIFICATION: ND # ND-00016

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Report Date: 9 Mar 16
Lab Number: 16-W258
Work Order #:82-0300
Account #: 002800
Date Sampled: 4 Feb 16 8:47
Date Received: 5 Feb 16 8:00
Sampled By: MVTL Field Services

Samantha Marshall
Montana Dakota Utilities
400 N. 4th
Bismarck ND 58501

PO #: 160249 OP

Project Name: MDU Hekett-Ash Site CCR Radiochem

Temp at Receipt: 3.1C ROI

Sample Description: 101

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	7.04	units	NA	SM 4500 H+ B	4 Feb 16 8:47	DJN
Temperature - Field	7.15	Degrees C	NA	SM 2550B	4 Feb 16 8:47	DJN
Conductivity - Field	4962	umhos/cm	1	EPA 120.1	4 Feb 16 8:47	DJN
Radium 226	See Attached Report				17 Feb 16	OL
Radium 228	See Attached Report				24 Feb 16	OL

OL = Analysis performed by an Outside Laboratory.

Approved by: Claudette K. Carroll CC 9 Mar 16

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

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

CERTIFICATION: ND # ND-00016

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MEMBER ACIL

Report Date: 9 Mar 16
Lab Number: 16-W259
Work Order #:82-0300
Account #: 002800
Date Sampled: 4 Feb 16 11:29
Date Received: 5 Feb 16 8:00
Sampled By: MVTL Field Services

Samantha Marshall
Montana Dakota Utilities
400 N. 4th
Bismarck ND 58501

PO #: 160249 OP

Project Name: MDU Hekett-Ash Site CCR Radiochem

Sample Description: 33

Temp at Receipt: 3.1C ROI

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	6.75	units	NA	SM 4500 H+ B	4 Feb 16 11:29	DJN
Temperature - Field	7.57	Degrees C	NA	SM 2550B	4 Feb 16 11:29	DJN
Conductivity - Field	5100	umhos/cm	1	EPA 120.1	4 Feb 16 11:29	DJN
Radium 226	See Attached Report				17 Feb 16	OL
Radium 228	See Attached Report				24 Feb 16	OL

OL = Analysis performed by an Outside Laboratory.

Approved by: Claudette K Carroll 9 Mar 16

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

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

CERTIFICATION: ND # ND-00016

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MEMBER ACIL

Report Date: 9 Mar 16
Lab Number: 16-W260
Work Order #:82-0300
Account #: 002800
Date Sampled: 4 Feb 16 13:31
Date Received: 5 Feb 16 8:00
Sampled By: MVTL Field Services

Samantha Marshall
Montana Dakota Utilities
400 N. 4th
Bismarck ND 58501

PO #: 160249 OP

Temp at Receipt: 3.1C ROI

Project Name: MDU Hekett-Ash Site CCR Radiochem

Sample Description: 3-90

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	7.05	units	NA	SM 4500 H+ B	4 Feb 16 13:31	DJN
Temperature - Field	7.39	Degrees C	NA	SM 2550B	4 Feb 16 13:31	DJN
Conductivity - Field	4868	umhos/cm	1	EPA 120.1	4 Feb 16 13:31	DJN
Radium 226	See Attached Report				17 Feb 16	OL
Radium 228	See Attached Report				24 Feb 16	OL

OL = Analysis performed by an Outside Laboratory.

Approved by: Claudette K. Carroll CC 9 Mar 16

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

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

CERTIFICATION: ND # ND-00016

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Report Date: 9 Mar 16
Lab Number: 16-W261
Work Order #:82-0300
Account #: 002800
Date Sampled: 4 Feb 16 14:53
Date Received: 5 Feb 16 8:00
Sampled By: MVTL Field Services

Samantha Marshall
Montana Dakota Utilities
400 N. 4th
Bismarck ND 58501

PO #: 160249 OP

Project Name: MDU Hekett-Ash Site CCR Radiochem

Temp at Receipt: 3.1C ROI

Sample Description: 2-90

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	7.11	units	NA	SM 4500 H+ B	4 Feb 16 14:53	DJN
Temperature - Field	7.25	Degrees C	NA	SM 2550B	4 Feb 16 14:53	DJN
Conductivity - Field	7960	umhos/cm	1	EPA 120.1	4 Feb 16 14:53	DJN
Radium 226	See Attached Report				17 Feb 16	OL
Radium 228	See Attached Report				25 Feb 16	OL

OL = Analysis performed by an Outside Laboratory.

Approved by: Claudette K. Carroll CC 9 Mar 16

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

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

CERTIFICATION: ND # ND-00016

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Report Date: 9 Mar 16
Lab Number: 16-W262
Work Order #:82-0300
Account #: 002800
Date Sampled: 4 Feb 16 16:27
Date Received: 5 Feb 16 8:00
Sampled By: MVTL Field Services

Samantha Marshall
Montana Dakota Utilities
400 N. 4th
Bismarck ND 58501

PO #: 160249 OP

Project Name: MDU Hekett-Ash Site CCR Radiochem

Temp at Receipt: 3.1C ROI

Sample Description: 80R

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	7.29	units	NA	SM 4500 H+ B	4 Feb 16 16:27	DJN
Temperature - Field	7.67	Degrees C	NA	SM 2550B	4 Feb 16 16:27	DJN
Conductivity - Field	5851	umhos/cm	1	EPA 120.1	4 Feb 16 16:27	DJN
Radium 226	See Attached Report				17 Feb 16	OL
Radium 228	See Attached Report				25 Feb 16	OL

OL = Analysis performed by an Outside Laboratory.

CC

Approved by: Claudette K. Carroll 9Mar16

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

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

CERTIFICATION: ND # ND-00016

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

Your Environmental Monitoring Partner

Date: 3/1/2016

CLIENT: MVTL Laboratories, Inc.
Project: 201682-0300
Lab Order: S1602096

CASE NARRATIVE

Report ID: S1602096001

Samples 16-W255 Field Blank, 16-W256 Equipment Blank, 16-W257 Duplicate 1, 16-W258 101, 16-W259 33, 16-W260 3-90, 16-W261 2-90, and 16-W262 80R were received on February 9, 2016.

All samples were received and analyzed within the EPA recommended holding times, except those noted below in this case narrative. Samples were analyzed using the methods outlined in the following references:

"Standard Methods For The Examination of Water and Wastewater", approved method versions
Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, 3rd Edition
40 CFR Parts 136 and 141
40 CFR Part 50, Appendices B, J, L, and O
Methods indicated in the Methods Update Rule published in the Federal Register Friday, May 18, 2012
ASTM approved and recognized standards

All Quality Control parameters met the acceptance criteria defined by EPA and Inter-Mountain Laboratories except as indicated in this case narrative.

Reviewed by: _____
Wade Nieuwsma, Assistant Laboratory Manager

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

Your Environmental Monitoring Partner

Sample Analysis Report

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

Date Reported 4/6/2016
Report ID S1602096002
(Replaces S1602096001)

ProjectName: 201682-0300
Lab ID: S1602096-001
ClientSample ID: 16-W255 Field Blank
COC: 201682-0300

WorkOrder: S1602096
CollectionDate: 2/4/2016
DateReceived: 2/9/2016 10:08:00 AM
FieldSampler:
Matrix: Water

Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Radionuclides - Total							
Radium 226	0.1	pCi/L		0.4	SM 7500 Ra-B	02/17/2016 1058	MB
Radium 226 Precision (±)	0.1	pCi/L			SM 7500 Ra-B	02/17/2016 1058	MB
Radium 228	-1.1	pCi/L		2	Ga-Tech	02/24/2016 812	MB
Radium 228 Precision (±)	1.1	pCi/L			Ga-Tech	02/24/2016 812	MB

These results apply only to the samples tested.

RL - Reporting Limit

Qualifiers:

B	Analyte detected in the associated Method Blank	C	Calculated Value
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	L	Analyzed by another laboratory
M	Value exceeds Monthly Ave or MCL or is less than LCL	ND	Not Detected at the Reporting Limit
O	Outside the Range of Dilutions	S	Spike Recovery outside accepted recovery limits
X	Matrix Effect		

Reviewed by: _____
Wade Nieuwsma, Assistant Laboratory Manager

Sample Analysis Report

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

Date Reported 4/6/2016
Report ID S1602096002
(Replaces S1602096001)

ProjectName: 201682-0300
Lab ID: S1602096-002
ClientSample ID: 16-W256 Equipment Blank
COC: 201682-0300

WorkOrder: S1602096
CollectionDate: 2/4/2016
DateReceived: 2/9/2016 10:08:00 AM
FieldSampler:
Matrix: Water

Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Radionuclides - Total							
Radium 226	0.1	pCi/L		0.4	SM 7500 Ra-B	02/17/2016 1058	MB
Radium 226 Precision (±)	0.1	pCi/L			SM 7500 Ra-B	02/17/2016 1058	MB
Radium 228	-3.2	pCi/L		2	Ga-Tech	02/24/2016 1113	MB
Radium 228 Precision (±)	1.0	pCi/L			Ga-Tech	02/24/2016 1113	MB

These results apply only to the samples tested.

RL - Reporting Limit

Qualifiers:

B	Analyte detected in the associated Method Blank	C	Calculated Value
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	L	Analyzed by another laboratory
M	Value exceeds Monthly Ave or MCL or is less than LCL	ND	Not Detected at the Reporting Limit
O	Outside the Range of Dilutions	S	Spike Recovery outside accepted recovery limits
X	Matrix Effect		

Reviewed by: _____
Wade Nieuwsma, Assistant Laboratory Manager

Sample Analysis Report

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

Date Reported 4/6/2016
Report ID S1602096002
(Replaces S1602096001)

ProjectName: 201682-0300
Lab ID: S1602096-003
ClientSample ID: 16-W257 Duplicate 1
COC: 201682-0300

WorkOrder: S1602096
CollectionDate: 2/4/2016 8:47:00 AM
DateReceived: 2/9/2016 10:08:00 AM
FieldSampler:
Matrix: Water

Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Radionuclides - Total							
Radium 226	0.3	pCi/L		0.4	SM 7500 Ra-B	02/17/2016 1058	MB
Radium 226 Precision (±)	0.1	pCi/L			SM 7500 Ra-B	02/17/2016 1058	MB
Radium 228	-0.4	pCi/L		2	Ga-Tech	02/24/2016 1413	MB
Radium 228 Precision (±)	1.1	pCi/L			Ga-Tech	02/24/2016 1413	MB

These results apply only to the samples tested.

RL - Reporting Limit

Qualifiers:

B	Analyte detected in the associated Method Blank	C	Calculated Value
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	L	Analyzed by another laboratory
M	Value exceeds Monthly Ave or MCL or is less than LCL	ND	Not Detected at the Reporting Limit
O	Outside the Range of Dilutions	S	Spike Recovery outside accepted recovery limits
X	Matrix Effect		

Reviewed by: _____
Wade Nieuwsma, Assistant Laboratory Manager

Sample Analysis Report

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

Date Reported 4/6/2016
Report ID S1602096002
(Replaces S1602096001)

ProjectName: 201682-0300
Lab ID: S1602096-004
ClientSample ID: 16-W258 101
COC: 201682-0300

WorkOrder: S1602096
CollectionDate: 2/4/2016 8:47:00 AM
DateReceived: 2/9/2016 10:08:00 AM
FieldSampler:
Matrix: Water

Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Radionuclides - Total							
Radium 226	0.5	pCi/L		0.4	SM 7500 Ra-B	02/17/2016 1058	MB
Radium 226 Precision (±)	0.1	pCi/L			SM 7500 Ra-B	02/17/2016 1058	MB
Radium 228	-1.4	pCi/L		2	Ga-Tech	02/24/2016 1714	MB
Radium 228 Precision (±)	1.1	pCi/L			Ga-Tech	02/24/2016 1714	MB

These results apply only to the samples tested.

RL - Reporting Limit

Qualifiers:

B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
M	Value exceeds Monthly Ave or MCL or is less than LCL
O	Outside the Range of Dilutions
X	Matrix Effect
C	Calculated Value
H	Holding times for preparation or analysis exceeded
L	Analyzed by another laboratory
ND	Not Detected at the Reporting Limit
S	Spike Recovery outside accepted recovery limits

Reviewed by: _____
Wade Nieuwsma, Assistant Laboratory Manager

Sample Analysis Report

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

Date Reported 4/6/2016
Report ID S1602096002
(Replaces S1602096001)

ProjectName: 201682-0300
Lab ID: S1602096-005
ClientSample ID: 16-W259 33
COC: 201682-0300

WorkOrder: S1602096
CollectionDate: 2/4/2016 11:29:00 AM
DateReceived: 2/9/2016 10:08:00 AM
FieldSampler:
Matrix: Water

Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Radionuclides - Total							
Radium 226	0.15	pCi/L		0.4	SM 7500 Ra-B	02/17/2016 1058	MB
Radium 226 Precision (±)	0.1	pCi/L			SM 7500 Ra-B	02/17/2016 1058	MB
Radium 228	-4.7	pCi/L		2	Ga-Tech	02/24/2016 2015	MB
Radium 228 Precision (±)	1.2	pCi/L			Ga-Tech	02/24/2016 2015	MB

These results apply only to the samples tested.

RL - Reporting Limit

Qualifiers:

B	Analyte detected in the associated Method Blank	C	Calculated Value
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	L	Analyzed by another laboratory
M	Value exceeds Monthly Ave or MCL or is less than LCL	ND	Not Detected at the Reporting Limit
O	Outside the Range of Dilutions	S	Spike Recovery outside accepted recovery limits
X	Matrix Effect		

Reviewed by: _____
Wade Nieuwsma, Assistant Laboratory Manager

Sample Analysis Report

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

Date Reported 4/6/2016
Report ID S1602096002
(Replaces S1602096001)

ProjectName: 201682-0300
Lab ID: S1602096-006
ClientSample ID: 16-W260 3-90
COC: 201682-0300

WorkOrder: S1602096
CollectionDate: 2/4/2016 1:31:00 PM
DateReceived: 2/9/2016 10:08:00 AM
FieldSampler:
Matrix: Water

Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Radionuclides - Total							
Radium 226	0.1	pCi/L		0.4	SM 7500 Ra-B	02/17/2016 1058	MB
Radium 226 Precision (±)	0.1	pCi/L			SM 7500 Ra-B	02/17/2016 1058	MB
Radium 228	-2.8	pCi/L		2	Ga-Tech	02/24/2016 2316	MB
Radium 228 Precision (±)	1.0	pCi/L			Ga-Tech	02/24/2016 2316	MB

These results apply only to the samples tested. **RL - Reporting Limit**

Qualifiers:

B	Analyte detected in the associated Method Blank	C	Calculated Value
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	L	Analyzed by another laboratory
M	Value exceeds Monthly Ave or MCL or is less than LCL	ND	Not Detected at the Reporting Limit
O	Outside the Range of Dilutions	S	Spike Recovery outside accepted recovery limits
X	Matrix Effect		

Reviewed by: _____
Wade Nieuwsma, Assistant Laboratory Manager

Sample Analysis Report

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

Date Reported 4/6/2016
Report ID S1602096002
(Replaces S1602096001)

ProjectName: 201682-0300
Lab ID: S1602096-007
ClientSample ID: 16-W261 2-90
COC: 201682-0300

WorkOrder: S1602096
CollectionDate: 2/4/2016 2:53:00 PM
DateReceived: 2/9/2016 10:08:00 AM
FieldSampler:
Matrix: Water

Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Radionuclides - Total							
Radium 226	0.2	pCi/L		0.4	SM 7500 Ra-B	02/17/2016 1058	MB
Radium 226 Precision (±)	0.1	pCi/L			SM 7500 Ra-B	02/17/2016 1058	MB
Radium 228	-2.4	pCi/L		2	Ga-Tech	02/25/2016 217	MB
Radium 228 Precision (±)	1.0	pCi/L			Ga-Tech	02/25/2016 217	MB

These results apply only to the samples tested.

RL - Reporting Limit

Qualifiers:

B	Analyte detected in the associated Method Blank	C	Calculated Value
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	L	Analyzed by another laboratory
M	Value exceeds Monthly Ave or MCL or is less than LCL	ND	Not Detected at the Reporting Limit
O	Outside the Range of Dilutions	S	Spike Recovery outside accepted recovery limits
X	Matrix Effect		

Reviewed by: _____
Wade Nieuwsma, Assistant Laboratory Manager

Sample Analysis Report

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

Date Reported 4/6/2016
Report ID S1602096002
(Replaces S1602096001)

ProjectName: 201682-0300
Lab ID: S1602096-008
ClientSample ID: 16-W262 80R
COC: 201682-0300

WorkOrder: S1602096
CollectionDate: 2/4/2016 4:27:00 PM
DateReceived: 2/9/2016 10:08:00 AM
FieldSampler:
Matrix: Water

Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Radionuclides - Total							
Radium 226	0.4	pCi/L		0.4	SM 7500 Ra-B	02/17/2016 1058	MB
Radium 226 Precision (±)	0.1	pCi/L			SM 7500 Ra-B	02/17/2016 1058	MB
Radium 228	0.4	pCi/L		2	Ga-Tech	02/25/2016 518	MB
Radium 228 Precision (±)	1.1	pCi/L			Ga-Tech	02/25/2016 518	MB

These results apply only to the samples tested.

RL - Reporting Limit

Qualifiers:

B	Analyte detected in the associated Method Blank	C	Calculated Value
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	L	Analyzed by another laboratory
M	Value exceeds Monthly Ave or MCL or is less than LCL	ND	Not Detected at the Reporting Limit
O	Outside the Range of Dilutions	S	Spike Recovery outside accepted recovery limits
X	Matrix Effect		

Reviewed by: _____
Wade Nieuwsma, Assistant Laboratory Manager

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

Your Environmental Monitoring Partner

ANALYTICAL QC SUMMARY REPORT

CLIENT: MVTL Laboratories, Inc.
Work Order: S1602096
Project: 201682-0300

Date: 3/1/2016
Report ID: S1602096001

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

MB-323 (02/23/16 17:07)	RunNo: 131567	PrepDate: 02/15/16 13:00			BatchID: 11439		
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Total Radium 228	ND	1					

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

LCS-323 (02/23/16 20:08)	RunNo: 131567	PrepDate: 02/15/16 13:00			BatchID: 11439		
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Total Radium 228	32	1	40.1		80.2	61.3 - 120	

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

MS-323 (02/24/16 02:10)	RunNo: 131567	PrepDate: 02/15/16 13:00			BatchID: 11439		
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Total Radium 228	29	1	40.1	ND	72.7	64.3 - 120	

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

MSD-323 (02/24/16 05:11)	RunNo: 131567	PrepDate: 02/15/16 13:00			BatchID: 11439		
Analyte	Result	RL	Conc	%RPD	%REC	% RPD Limits	Qual
Total Radium 228	31	1	29	7.55	78.4	20	

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

MB-1576 (02/17/16 08:54)	RunNo: 131239	PrepDate: 02/10/16 0:00			BatchID: 11410		
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Radium 226	ND	0.2					

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

LCS-1576 (02/17/16 08:54)	RunNo: 131239	PrepDate: 02/10/16 0:00			BatchID: 11410		
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Radium 226	5.1	0.2	5.54		91.4	67.1 - 122	

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

LCSD-1576 (02/17/16 08:54)	RunNo: 131239	PrepDate: 02/10/16 0:00			BatchID: 11410		
Analyte	Result	RL	Conc	%RPD	%REC	% RPD Limits	Qual
Radium 226	5.4	0.2	5.1	6.73	108	20	

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

S1602072-001A MS (02/17/16 08:54)	RunNo: 131239	PrepDate: 02/10/16 0:00			BatchID: 11410		
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Radium 226	11	1	11.1	ND	96.6	65 - 131	

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
L	Analyzed by another laboratory	ND	Not Detected at the Reporting Limit
O	Outside the Range of Dilutions	R	RPD outside accepted recovery limits
S	Spike Recovery outside accepted recovery limits	X	Matrix Effect

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

Chain of Custody Record

201682-0300

Company Name and Address: MVTL 2616 E Broadway Bismarck, ND 58501	Account #:	Phone #: 701-258-9720
	Contact: Claudette	Fax #: For faxed report check box ☐
	Name of Sampler:	E-mail: ccarroll@mvtl.com For e-mail report check box ☐
Billing Address (indicate if different from above): PO Box 249 New Ulm, MN 56073	Quote Number	Date Submitted: 2/5/2016
	Project Name/Number:	Purchase Order #: BL5512

Sample Information						Bottle Type						Analysis
S1602096 IML Lab Number	MVTL Lab Number	Client Sample ID	Sample Type	Date Sampled	Time Sampled	Untreated	1000 ml HNO3	VOC Vials Unpreserved	Glass Jar	Other		Analysis Required
001	16-W255	Field Blank		2/4/2016								Ra226 & Ra228 on all
002	16-W256	Equipment Blank		2/4/2016								
003	16-W257	Duplicate 1		2/4/2016	847							
004	16-W258	101		2/4/2016	847							
005	16-W259	33		2/4/2016	1129							
006	16-W260	3-90		2/4/2016	1331							
007	16-W261	2-90		2/4/2016	1453							
008	16-W262	80R		2/4/2016	1627							

Comments:

Transferred by:	Date:	Time:	Sample Condition:	Received by:	Date:		Temp:
C. Jackson	02/05/16	1700		Kathy Boyd IML	2.9.16	10:08	7.0
2.							

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

Field Datasheet

Water Level

Sampling Personnel: Darren Nieswaag

Company: **MDU Heskett - Ash Site**

Well ID	Date	Time	Depth to Water	Well Depth	Casing Diameter	Well Locked	Well Labeled	Well Strait	Grount Seal Intact	Comments
MW44R	3 Feb 16	~~1319~~ 1238	29.27	45.85	2"	Yes / No	Yes / No	Yes / No	Yes / No Not Visable	
MW2	4 Feb 16	1713	36.66	63.65	2"	Yes / No	Yes / No	Yes / No	Yes / No Not Visable	
MW4B	4 Feb 16	~~1717~~ 1720	18.32	26.12	2"	Yes / No	Yes / No	Yes / No	Yes / No Not Visable	
MW8	4 Feb 16	1716	17.22	27.98	2"	Yes / No	Yes / No	Yes / No	Yes / No Not Visable	
MW 1-90	4 Feb 16	1459	11.23	17.03	2"	Yes / No	Yes / No	Yes / No	Yes / No Not Visable	
					2"	Yes / No	Yes / No	Yes / No	Yes / No Not Visable	
					2"	Yes / No	Yes / No	Yes / No	Yes / No Not Visable	
					2"	Yes / No	Yes / No	Yes / No	Yes / No Not Visable	
					2"	Yes / No	Yes / No	Yes / No	Yes / No Not Visable	
					2"	Yes / No	Yes / No	Yes / No	Yes / No Not Visable	
					2"	Yes / No	Yes / No	Yes / No	Yes / No Not Visable	
					2"	Yes / No	Yes / No	Yes / No	Yes / No Not Visable	
					2"	Yes / No	Yes / No	Yes / No	Yes / No Not Visable	
					2"	Yes / No	Yes / No	Yes / No	Yes / No Not Visable	
					2"	Yes / No	Yes / No	Yes / No	Yes / No Not Visable	

Field Datasheet

Groundwater Assessment

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

Company: MDU Heskett - Ash Site
Sample ID: 101
Date: 4 Feb 16
Sampling Personal: Darren Nieswaag

Weather Conditions: Temp: 19 °F Wind: NW 5 Precip: Sunny / Partly Cloudy / Cloudy

Well Information

Well Locked?	Yes	(No)	
Well Labeled?	(Yes)	No	
Casing Straight?	(Yes)	No	
Grout Seal Intact?	(Yes)	No	Not Visible
Repairs Necessary:	—		
Casing Diameter:	2"		
Water Level Before Purge:	36.98	Ft	
Well Depth:	57.06	Ft	
Well Volume:	12.4	Liters	
Water Level After Sample:	42.03	Ft	
Measurement Method:	Electric Water Level Indicator		

Sampling Information

Sampling Method: Bladder

Dedicated Equipment?	Yes	(No)	
Duplicate Sample?	(Yes)	No	ID: Dup 1
Pumping Rate:		ml/min	
Time Purging Began:	0817	am / pm	
Time of Sampling:	0848	am / pm	
Well Purged Dry?	Yes	(No)	
Time Purged Dry:	—	am / pm	
Sample Appearance:	(Clear) / Slightly Turbid / Turbid		Phase: —
Color: —			Odor: —

Control Box Settings
Purge: 5 sec.
Rest: 55 sec.
PSI: 35

Field Measurements

SEQ #	Time	Temp	Cond.	pH	DO (mg/L)	ORP	Turb (NTU)	Water Level (ft)	mL Removed	Appearance
1	0822	7.41	5096	7.15	0.62	38.2	16.9	37.76	500	clear
2	0827	7.41	5095	7.15	0.41	37.9	17.4	38.16	500	clear
3	0832	7.36	5055	7.13	0.36	37.9	17.3	38.85	500	clear
4	0837	7.32	5014	7.08	0.31	37.4	17.4	39.03	500	clear
5	0842	7.32	4970	7.06	0.31	36.0	18.1	39.23	500	clear
6	0847	7.15	4962	7.04	0.33	33.0	17.3	39.35	500	clear
7										
8										
9										
10										

Stabilized: (Yes) No
Total mL Removed: 3000

Comments:

Bottles Collected
500 mL HNO_3
2 Liter Raw
2 - 1 Liter HNO_3
500mL HNO_3 Filtered

MVTL

2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

Field Datasheet

Groundwater Assessment

Company: MDU Heskett - Ash Site

Sample ID: 33

Date: 4 Feb 16

Sampling Personal: Darren Nieswand

Field Measurements

SEQ #	Time	Temp	Cond.	pH	DO (mg/L)	ORP	Turb (NTU)	Water Level (ft)	mL Removed	Appearance
11	1119	7.38	5091	6.76	0.93	46.4	2.14	40.76	500	Clear
12	1124	7.53	5095	6.75	0.96	46.5	2.32	40.80	500	Clear
13	1129	7.57	5100	6.75	0.96	46.8	2.15	40.80	500	Clear
14										
15										
16										
17										
18										
19										
20										
21										
22										
23										
24										
25										
26										
27										
28										
29										
30										

Stabilized: (Yes) No

Total mL Removed: 6500

Comments:

Field Datasheet

Groundwater Assessment

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

Company: MDU Heskett - Ash Site
Sample ID: 33
Date: 4 Feb. 16
Sampling Personal: Darren Nieswang

Weather Conditions: Temp: 25 °F Wind: W 5 Precip: (Sunny) / Partly Cloudy / Cloudy

Well Information

Well Locked?	Yes	(No)	
Well Labeled?	(Yes)	No	
Casing Straight?	(Yes)	No	
Grout Seal Intact?	Yes	No	(Not Visible)
Repairs Necessary:	—		
Casing Diameter:	2"		
Water Level Before Purge:	40.57	Ft	
Well Depth:	46.30	Ft	
Well Volume:	3.6	Liters	
Water Level After Sample:	40.85	Ft	
Measurement Method:	Electric Water Level Indicator		

Sampling Information

Sampling Method: Bladder

Dedicated Equipment?	Yes	(No)	
Duplicate Sample?	Yes	(No)	ID: —
Pumping Rate:	100	ml/min	
Time Purging Began:	1024	(am) / pm	
Time of Sampling:	1129	(am) / pm	
Well Purged Dry?	Yes	(No)	
Time Purged Dry:	—	am / pm	
Sample Appearance:	(Clear) / Slightly Turbid / Turbid		Phase: —
Color:	—		Odor: —

Control Box Settings
Purge: 5 sec.
Rest: 55 sec.
PSI: 30

Field Measurements

SEQ #	Time	Temp	Cond.	pH	DO (mg/L)	ORP	Turb (NTU)	Water Level (ft)	mL Removed	Appearance
1	1029	7.61	5309	6.87	4.24	17.1	34.6	40.69	500	clear
2	1034	7.45	5168	6.83	1.13	39.5	31.9	40.69	500	clear
3	1039	7.51	5111	6.81	1.07	39.0	30.2	40.71	500	clear
4	1044	7.58	5087	6.79	0.98	40.9	27.2	40.71	500	clear
5	1049	7.73	5080	6.78	0.92	42.2	19.6	40.71	500	clear
6	1054	7.49	5083	6.77	0.86	44.2	10.4	40.71	500	clear
7	1059	7.49	5097	6.76	0.87	44.8	7.53	40.76	500	clear
8	1104	7.46	5095	6.76	0.89	45.2	4.86	40.76	500	clear
9	1109	7.67	5090	6.76	0.91	45.5	3.76	40.76	500	clear
10	1114	7.40	5085	6.76	0.95	46.1	2.70	40.76	500	clear

Stabilized: ~~Yes~~ ~~No~~ Next page
Total mL Removed: Next page

Bottles Collected
~~250 mL H_2SO_4~~
~~1~~ 2 - 500 mL HNO_3
500 mL HNO_3 (Filtered)
2 - 1 Liter Raw
2 - 1 Liter HNO3

Comments:
~~Odor~~ See page ~~two~~ for ~~more~~ readings

MVTL

2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

Field Datasheet

Groundwater Assessment

Company: MDU Heskett - Ash Site

Sample ID: 3-90

Date: 4 Feb 16

Sampling Personal: Darren Wiesner

Field Measurements

SEQ #	Time	Temp	Cond.	pH	DO (mg/L)	ORP	Turb (NTU)	Water Level (ft)	mL Removed	Appearance
11	1321	7.40	4861	7.05	0.65	35.6	0.63	19.59	500	clear
12	1326	7.31	4869	7.06	0.64	38.1	0.60	19.59	500	clear
13	1331	7.39	4868	7.05	0.64	40.0	0.58	19.59	500	clear
14										
15										
16										
17										
18										
19										
20										
21										
22										
23										
24										
25										
26										
27										
28										
29										
30										

Stabilized: (Yes) No

Total mL Removed: 6500

Comments:

Field Datasheet

Groundwater Assessment

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

Company: MDU Heskett - Ash Site
Sample ID: 3-90
Date: 4 Feb 16
Sampling Personal: Darren Nieswaag

Weather Conditions: Temp: 30 °F Wind: NW 10 Precip: (Sunny) / Partly Cloudy / Cloudy

Well Information

Well Locked?	~~Yes~~	(No)	
Well Labeled?	(Yes)	No	
Casing Straight?	(Yes)	No	
Grout Seal Intact?	Yes	No	(Not Visible)
Repairs Necessary:	—		
Casing Diameter:	2"		
Water Level Before Purge:	19.47	Ft	
Well Depth:	21.94	Ft	
Well Volume:	1.6	Liters	
Water Level After Sample:	19.59	Ft	
Measurement Method:	Electric Water Level Indicator		

Sampling Information

Sampling Method: Bladder

Dedicated Equipment?	Yes	(No)	
Duplicate Sample?	Yes	(No)	ID: —
Pumping Rate:	100	ml/min	
Time Purging Began:	1226	am / (pm)	
Time of Sampling:	1331	am / (pm)	
Well Purged Dry?	Yes	(No)	
Time Purged Dry:	—	am / pm	
Sample Appearance:	(Clear) / Slightly Turbid / Turbid		Phase: —
Color:	—		Odor: —

Control Box Settings
Purge: 5 sec.
Rest: 55 sec.
PSI: 20

Field Measurements

SEQ #	Time	Temp	Cond.	pH	DO (mg/L)	ORP	Turb (NTU)	Water Level (ft)	mL Removed	Appearance
1	1231	7.01	4879	7.10	2.04	-25.3	109	19.51	500	Clear
2	1236	7.22	4898	7.10	1.86	-21.6	70.4	19.59	500	clear
3	1241	7.24	4884	7.08	1.95	-12.6	35.1	19.59	500	clear
4	1246	7.20	4884	7.07	1.32	-6.5	27.2	19.59	500	clear
5	1251	7.30	4882	7.07	0.82	7.8	18.4	19.59	500	clear
6	1256	7.31	4870	7.06	0.64	15.5	7.96	19.59	500	clear
7	1301	7.41	4875	7.06	0.64	20.5	4.38	19.59	500	clear
8	1306	7.06	4873	7.06	0.64	25.9	2.79	19.59	500	clear
9	1311	7.33	4868	7.06	0.66	28.5	1.55	19.59	500	Clear
10	1316	7.37	4867	7.06	0.64	33.6	1.11	19.59	500	clear

~~Stabilized: Yes No~~ Next page Total mL Removed: Next page

Bottles Collected
- ~~250 mL H_2SO_4~~
- (1) - 500 mL HNO_3
- 500 mL HNO_3 (Filtered)
- 2 - 1 Liter Raw
- 2 - 1 Liter HNO3

Comments:

Next Page has more readings

Field Datasheet

Groundwater Assessment

2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

Company: MDU Heskett - Ash Site

Sample ID: 2-90

Date: 4 Feb 16

Sampling Personal: Darren Wiesmann

Weather Conditions: Temp: 34 °F Wind: Light Precip: (Sunny) / Partly Cloudy / Cloudy

Well Information

Well Locked?	Yes	(No)	
Well Labeled?	(Yes)	No	
Casing Straight?	(Yes)	No	
Grout Seal Intact?	Yes	No	(Not Visible)
Repairs Necessary:	—		
Casing Diameter:	2"		
Water Level Before Purge:	21.31	Ft	
Well Depth:	24.80	Ft	
Well Volume:	2.2	Liters	
Water Level After Sample:	21.77	Ft	
Measurement Method:	Electric Water Level Indicator		

Sampling Information

Sampling Method: Bladder

Dedicated Equipment?	Yes	(No)	
Duplicate Sample?	Yes	(No)	ID: —
Pumping Rate:	100	ml/min	
Time Purging Began:	1423	am / (pm)	
Time of Sampling:	1454	am / (pm)	
Well Purged Dry?	Yes	(No)	
Time Purged Dry:	—	am / pm	
Sample Appearance:	(Clear) / Slightly Turbid / Turbid		Phase: —
Color:	—		Odor: —

Control Box Settings

Purge: 5 sec.

Rest: 55 sec.

PSI: 23

Field Measurements

SEQ #	Time	Temp	Cond.	pH	DO (mg/L)	ORP	Turb (NTU)	Water Level (ft)	mL Removed	Appearance
1	1428	7.16	8177	7.12	1.78	68.6	2.42	21.68	500	Clear
2	1433	7.13	8132	7.11	1.62	67.1	1.13	21.68	500	Clear
3	1438	7.21	8095	7.11	1.66	66.1	0.77	21.71	500	Clear
4	1443	7.25	8029	7.11	1.68	64.9	0.51	21.77	500	Clear
5	1448	7.19	8013	7.11	1.80	64.3	0.49	21.77	500	Clear
6	1453	7.25	7960	7.11	1.81	63.7	0.48	21.77	500	Clear
7										
8										
9										
10										

Bottles Collected

~~250 mL H_2SO_4~~

2 - 500 mL HNO_3

500 mL HNO_3 (Filtered)

2 - 1 Liter Raw

2 - 1 Liter HNO3

Stabilized: (Yes) No

Total mL Removed: 3000

Comments:

MVTL

2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

Field Datasheet

Groundwater Assessment

Company: MDU Heskett - Ash Site

Sample ID: 80R

Date: 4 Feb 16

Sampling Personal: Darren M. Eswaag

Weather Conditions: Temp: 38 °F Wind: ~~light~~ SW 5 Precip: (Sunny) / Partly Cloudy / Cloudy

Well Information

Well Locked?	Yes	(No)	
Well Labeled?	(Yes)	No	
Casing Straight?	(Yes)	No	
Grout Seal Intact?	(Yes)	No	Not Visible
Repairs Necessary:	—		
Casing Diameter:	2"		
Water Level Before Purge:	14.53	Ft	
Well Depth:	30.03	Ft	
Well Volume:	9.6	Liters	
Water Level After Sample:	14.84	Ft	
Measurement Method:	Electric Water Level Indicator		

Sampling Information

Sampling Method: Bladder

Dedicated Equipment?	Yes	(No)	
Duplicate Sample?	Yes	(No)	ID: —
Pumping Rate:	100	ml/min	
Time Purging Began:	1547	am / (pm)	
Time of Sampling:	1628	am / (pm)	
Well Purged Dry?	Yes	(No)	
Time Purged Dry:	—	am / pm	
Sample Appearance:	Clear / (Slightly Turbid) / Turbid		Phase: —
Color:	~~Grey~~ Brown		Odor: —

Control Box Settings

Purge: 5 sec.

Rest: 55 sec.

PSI: 23

Field Measurements

SEQ #	Time	Temp	Cond.	pH	DO (mg/L)	ORP	Turb (NTU)	Water Level (ft)	mL Removed	Appearance
1	1552	7.83	5879	7.30	0.44	51.3	273	14.57	500	Slightly Turbid
2	1557	7.81	~~5859~~ 5902	7.30	0.32	50.9	374	14.66	500	Slightly Turbid
3	1602	7.71	5850	7.29	0.20	50.4	350	14.72	500	Slightly Turbid
4	1607	7.76	5835	7.29	0.13	49.5	415	14.72	500	Slightly Turbid
5	1612	7.73	5845	7.29	0.12	49.0	442	14.78	500	Slightly Turbid
6	1617	7.63	5842	7.29	0.13	48.3	510	14.78	500	Slightly Turbid
7	1622	7.59	5837	7.29	0.13	48.1	511	14.80	500	Slightly Turbid
8	1627	7.67	5851	7.29	0.13	47.3	554	14.80	500	Slightly Turbid
9										
10										

Stabilized: (Yes) No

Total mL Removed: 4,000

Comments:

Bottles Collected

- ~~250 mL H_2SO_4~~
- 2 - 500 mL HNO_3
- 500 mL HNO_3 (Filtered)
- 2 - 1 Liter Raw
- 2 - 1 Liter HNO3

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

Chain of Custody Record

Project Name: MDU Heskett - Ash Site CCR Radiochemistry

Name of Sampler(s): Darren Niesvaag

Report To: Montana Dakota Utilities
Attn: Samantha Marshall
Address: 400 N. 4th St
Bismarck, ND 58501
Phone: 701-222-7829

Carbon Copy:
Attn:
Address:

Work Order Number: 82-0300

Sample Information						Bottle Type								Field Parameters			Analysis
Lab Number	Sample ID	Date	Time	Sample Type	Sample Location	500 ml HNO_3	250 ml H2SO4	1 liter	1L HNO_3	VOC's (HCl)	1 liter H2SO4	1liter Amber HCL	Field Temperature °C	Field Spec. Cond.	Field pH	Analysis Required
W255	Field Blank (FB)	4Feb16	—	—					2				—	—	—	MDU CCR Radiochemistry
W256	Equipment Blank (EB)	4Feb16	—	—					2				—	—	—	
W257	Duplicate 1	4Feb16	0847	GW					2				7.15	4962	7.04	
W258	101	4Feb16	0847	GW					2				7.15	4962	7.04	
W259	33	4Feb16	1129	GW					2				7.57	5100	6.75	
W260	3-90	4Feb16	1331	GW					2				7.39	4868	7.05	
W261	2-90	4Feb16	1453	GW					2				7.25	7960	7.11	
W262	80R	4Feb16	1627	GW					2				7.67	5851	7.29	

Comments:

	Transferred by:	Sample Condition	Date/Time	Received by:	Sample Condition	Date/Time	°C
1	Darren Niesvaag	Walk in 2	4Feb16 1756	C. Jackson		5Feb16 0800	3.1 RDI
2							TM588
3							

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

MVTL Lab Reference No/SDG: **201782-0401**
IML Lab Reference No/SDG: **S1702288**
Client: **Montana Dakota Utilities**
Location: **MDU Heskett Ash Site**
Project Identification: **CCR February 2017**
MVTL Laboratory Identifications: **17-W414** through **17-W418**
IML Laboratory Identifications: **S1702288-001** through **S1702288-005**

MDU Sample Identification	MVTL Laboratory #	IML Laboratory #
MW13	17-W414	S1702288-001
MW44R	17-W415	S1702288-002
MW103	17-W416	S1702288-003
MW2-90	17-W417	S1702288-004
FB1	17-W418	S1702288-005

I. RECEIPT

- All samples were received at the laboratory on 21 Feb 2017 at 1621.
- Samples were collected and hand delivered by MVTL Field Service personnel to the laboratory.
- Samples were received on ice and evidence of cooling had begun.
  - Temperature of samples upon receipt was 8.0°C.
- No other exceptions on sample receipt were encountered on this sample set unless noted here.
- All samples requiring radiochemistry analysis were sent via courier to Inter-Mountain Labs (IML) for analysis there. Samples were received at IML on 24 Feb 2017.
  - All samples were properly preserved unless noted on the individual analytical laboratory report or on the IML Case Narrative.

II. HOLDING TIMES

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

III. METHODS

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