

# **Field Datasheet**

**Groundwater Assessment** 

Company:	MDU Heskett	
Event:	2017	
Sample ID:	1470	
Sampling Person	nal: Da Car	

		Company of the Company	2007 1102
Phone:	(701) 25	8-9720	

°F Wind:	Light	ъ .	
	- 1/0	Precip	: Sunny / Partly Cloudy / Cloudy
		Sampling I	nformation
	Purging Method:	Bladder	Control Settings
	Sampling Method:	Bladder	Purge: 5 sec.
	Dedicated Equip?:	Øes No	Recover: 5 sec.
Visible	Duplicate Sample?:	Yes No	PSI: 10
	Duplicate Sample ID:		Pumping Rate:/ () > mL/min
_ ft	Purge Date:	27/1/17	Time Purging Began: 5/9/5 am/pm
ft	Well Purged Dry?	Yes (No	Time Purged Dry: am/pm
liters	Sample Date:	277/1/2/7	Time of Sampling: 09/0 am/pm
ft			
_ ft	Bottle	1L Raw, 500mL Nitiro	, 500mL Nitric (filtered), 4-1L Nitric
el Indicator	List:	25	50 mL Sulfuric
	ft ft liters ft ft It	Sampling Method: Dedicated Equip?: Duplicate Sample?: Duplicate Sample ID:  ft Purge Date: Well Purged Dry? liters Sample Date: ft Bottle	Sampling Method: Bladder  Dedicated Equip?: Tes No  Duplicate Sample?: Yes No  Duplicate Sample ID:  ft Purge Date: 27 July 7  Well Purged Dry? Yes No  Sample Date: 27 July 7  It Bottle 1L Raw, 500mL Nitirc List: 25

#### Field Measurements

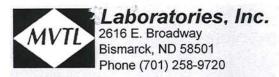
	ization secutive)	Temp (°C)	Spec. Cond.	pН	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Water Level (ft)	mL Removed	Discription: Clarity, Color, Odor, Ect.
SEQ#	Time		±5%	±0.1	±10%	±20 mV	±10%	0.25 ft		clear, slightly turbid, turbid
1	0850	11,62	4658	6,95	1.39	275,2	6.18	21,76	500	ch
2	0855	11,10	4671	6.95	0.62	274.5	4.39	2213	500	cles
3	0800	11,28	4676	6,96	0.62	274.0	0135	22,21	500	de
4	0905	11146	4672	6,96	0,64	273,7	0,42	22,30	500	cl_
5	0910	11,44	4881	6.96	0,68	272,9	0.43	22,39	500	de
6								ι		
7										
8										
9										
10										
Stabilizad:	/Vac	No				T	atal Valuma	Damovad.	1200	ml

Comments:

Total Volume Removed: 1500 mL

### **MVTL Calibration Worksheet**

Site: MDU He	skett				Technician:	arron 1	Vieswa	5
Instrument (Circle One):	#1 650 MDS 0	8F100203	#2 65	50 MDS 04H14	736		#\$ 556 MPS 12E10	2056
pH Buffer 7 Buffer 10 Conductivity Buffer 10000	Temp°C Pre Ci 21.90 7,09 21.94 100	7,00	Post Cal Range 6.95-7.05 9.95-10.05 ±10%	mv -/6./ -/93.7 Buffer 5000	mv Range +/- 50 0 +/- 50 -180 +/- 50 Check	Time: / 2  pH  Buffer  Conduct  Buffer 5	Temp °C 22.3/	Reading 6, 98
ORP 231 mV @ 25C DO	10.81 248	8,33	•	ric Pressure (m	,			
pH  Buffer 7  Buffer 10  Conductivity  Buffer 10000  ORP	Temp °C Pre C	al Post Cal	Post Cal Range 6.95-7.05 9.95-10.05 ±10%	mv Buffer 5000	mv Range +/- 50 0 +/- 50 -180 +/- 50 Check	Time:  pH  Buffe  Conduct  Buffer 5	tivity	Reading
231 mV @ 25C DO			±10 mV Baromet mg/L	ric Pressure (n	nm Hg)			



# **Chain of Custody Record**

Project Name:		Event:	Work Order Number:
	MDU Heskett	July 2017	82-2038
Report To: Attn: Address: phone: email:	MDU Samantha Marshall 400 N. 4th St Bismarck, ND 58501 701-222-7829	Carbon Copy: Attn: Address:	Name of Sampler(s):  Darren Mieswany

	Sample Information						Bottle Type			Fi	eld Para	meters	s Analysis	
Lab Number	Sample ID	Date	Time	Sample Type		. mer	500ml Nitric	Withic (filtered)			Temp (°C)	Spec. Cond.	Ha	Analysis Required
W3197	MW104	27.July17	1057	GW	Х						11.92	14256	6.91	
W3198	MW70	27 July 17		GW	Х	×	X					4681		
														MDU CCR List with TSS and Dissolved CCR Metal

Comments:

Relinquished By:	Sample Condition:				
Name:	Date/Time	Location:	Temp (°C)		
1 Thurse	275617	Log In Walk In #2	KOT 4, 8 TM562 FM588		
2	, ,				

Name:	Date/Time
Think	27020017
	1226



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#### **CASE NARRATIVE**

MVTL Lab Reference No/SDG:

201782-2059

IML Lab Reference No/SDG:

S1708054

Client:

**Montana Dakota Utilities** 

Location:

MDU Heskett Ash Site

**Project Identification:** 

**CCR July 2017** 

**MVTL Laboratory Identifications:** 

17-W3214 through 17-W3215

IML Laboratory Identifications:

S1708054-001 through S1708054-002

Page 1 of 2

MDU Sample Identification	MVTL Laboratory #	IML Laboratory #
MW104	17-W3214	\$1708054-001
MW70	17-W3215	S1708054-002

#### I. RECEIPT

- All samples were received at the laboratory on 27 Jul 2017 at 1226.
- 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.
  - o Temperature of samples upon receipt was 4.8°C.
- No other exceptions on sample receipt were encountered on this sample set unless noted here.
- All samples requiring radiochemistry analysis were sent via courier to Inter-Mountain Labs (IML) for analysis there. Samples were received at IML on 2 Aug 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.
  - o 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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#### **CASE NARRATIVE**

**MVTL Lab Reference No/SDG:** 

IML Lab Reference No/SDG:

Client:

Location:

**Project Identification:** 

**MVTL Laboratory Identifications:** 

**IML Laboratory Identifications:** 

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201782-2059

S1708054

**Montana Dakota Utilities** 

**MDU Heskett Ash Site** 

**CCR July 2017** 

17-W3214 through 17-W3215

S1708054-001 through S1708054-002

#### REPORTING ٧.

- Per email from Barr Engineering dated 10 March 2016, IML was directed 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.

Claudette Carroll - MVTL Bismarck Laboratory Manager

publication of statements, conclusions or extracts from or regarding our reports is reserved pending our written approval.

DATE:\_\_\_\_5 Sen)

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



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CERTIFICATE of ANALYSIS - CCR

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

Project Name: MDU Heskett Sample Description: MW104

Event and Year: July 2017

1 of 2 Page:

Report Date: 31 Aug 17 Lab Number: 17-W3214 Work Order #: 82-2059 Account #: 002800

Date Sampled: 27 Jul 17 10:57 Date Received: 27 Jul 17 12:26 Sampled By: MVTL Field Services

Temp at Receipt: 4.8C ROI

	As Recei Result	ved	Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	6.91	units	NA	SM 4500 H+ B	27 Jul 17 10:57	DJN
Temperature - Field	11.9	Degrees C	NA	SM 2550B	27 Jul 17 10:57	DJN
Conductivity - Field	14256	umhos/cm	1	EPA 120.1	27 Jul 17 10:57	DJN
Radium 226	See Atta	ched Report			15 Aug 17	OL
Radium 228	See Atta	ched Report			16 Aug 17	OL

Approved by:

Clauditte K. Canto

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 con
! = Due to sample quantity + = Due to inf

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

CERTIFICATION: ND # ND-00016



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Page:

2 of 2

CERTIFICATE of ANALYSIS - CCR

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

Project Name: MDU Heskett Sample Description: MW70

Event and Year: July 2017

Report Date: 31 Aug 17 Lab Number: 17-W3215 Work Order #: 82-2059

Account #: 002800

Date Sampled: 27 Jul 17 9:10 Date Received: 27 Jul 17 12:26 Sampled By: MVTL Field Services

Temp at Receipt: 4.8C ROI

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst	
pH - Field Temperature - Field Conductivity - Field Radium 226 Radium 228		units Degrees C umhos/cm ched Report ched Report	NA NA 1	SM 4500 H+ B SM 2550B EPA 120.1	27 Jul 17 9:10 27 Jul 17 9:10 27 Jul 17 9:10 15 Aug 17 16 Aug 17	DJN	

Approved by:

Clauditte K. Cantlo

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:  $\Theta$  = Due to sample matrix # = Due to co ! = Due to sample quantity # = Due to in

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

CERTIFICATION: ND # ND-00016



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

Date: 8/25/2017

**CLIENT:** 

MVTL Laboratories, Inc.

Project:

201782-2059

Lab Order:

S1708054

**CASE NARRATIVE** 

Report ID: S1708054001

Samples 17-W3214 MW104, and 17-W3215 MW70 were received on August 2, 2017.

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

Page 1 of 1



Inter-Mountain Labs

1673 Terra Avenue, Sheridan, Wyoming 82801

ph: (307) 672-8945

#### Sample Analysis Report

Company:

MVTL Laboratories, Inc.

2616 E Broadway Ave.

Bismarck, ND 58501

ProjectName:

201782-2059

Lab ID:

S1708054-001 ClientSample ID: 17-W3214 MW104

COC:

201782-2059

Date Reported 8/25/2017

Report ID

S1708054001

WorkOrder:

S1708054

CollectionDate: 7/27/2017 10:57:00 AM

DateReceived: 8/2/2017 11:50:00 AM

FieldSampler:

Matrix:

Water

#### Comments

Analyses	alyses Result Units Qual		RL	Method	Date Analyzed/Init		
Radionuclides - Total							
Radium 226	0.2	pCi/L		0.2	SM 7500 Ra-B	08/15/2017 1032	MB
Radium 226 Precision (±)	0.1	pCi/L			SM 7500 Ra-B	08/15/2017 1032	MB
Radium 228	-1.7	pCi/L		1	Ga-Tech	08/16/2017 1425	MB
Radium 228 Precision (±)	1.6	pCi/L			Ga-Tech	08/16/2017 1425	MB

#### These results apply only to the samples tested.

#### Qualifiers:

- В Analyte detected in the associated Method Blank
- Value above quantitation range
- Holding times for preparation or analysis exceeded Н
- Analyzed by another laboratory
- Not Detected at the Reporting Limit
- Spike Recovery outside accepted recovery limits

#### **RL** - Reporting Limit

- С Calculated Value
- Analyzed at IML Gillette laboratory
- Analyte detected below quantitation limits
- Value exceeds Monthly Ave or MCL or is less than LCL
- Outside the Range of Dilutions
- Matrix Effect

Reviewed by: \_AJL

Wade Nieuwsma, Assistant Laboratory Manager

Page 1 of 2



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

#### Sample Analysis Report

Company:

MVTL Laboratories, Inc.

2616 E Broadway Ave. Bismarck, ND 58501

201782-2059

ProjectName: Lab ID:

S1708054-002 ClientSample ID: 17-W3215 MW70

COC:

201782-2059

Date Reported

8/25/2017

Report ID

S1708054001

WorkOrder:

S1708054

CollectionDate: 7/27/2017 9:10:00 AM

DateReceived: 8/2/2017 11:50:00 AM

FieldSampler:

Matrix:

Water

Comments							
Analyses	Result	Units	Qual	RL	Method	Date Analyzed/I	nit
Radionuclides - Total							
Radium 226	0.3	pCi/L		0.2	SM 7500 Ra-B	08/15/2017 1032	MB
Radium 226 Precision (±)	0.1	pCi/L			SM 7500 Ra-B	08/15/2017 1032	MB
Radium 228	-0.7	pCi/L		1	Ga-Tech	08/16/2017 1729	MB
Radium 228 Precision (±)	1.6	pCi/L			Ga-Tech	08/16/2017 1729	MB

#### These results apply only to the samples tested.

Qualifiers:

В Analyte detected in the associated Method Blank

Value above quantitation range

Holding times for preparation or analysis exceeded Н

Analyzed by another laboratory

Not Detected at the Reporting Limit

Spike Recovery outside accepted recovery limits

#### RL - Reporting Limit

Calculated Value

Analyzed at IML Gillette laboratory

Analyte detected below quantitation limits

Value exceeds Monthly Ave or MCL or is less than LCL

Outside the Range of Dilutions

Matrix Effect

Reviewed by:

Wade Nieuwsma, Assistant Laboratory Manager

Page 2 of 2



Inter-Mountain Labs

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

### ANALYTICAL QC SUMMARY REPORT

**CLIENT:** MVTL Laboratories, Inc. Date: 8/25/2017

Work Order:

S1708054

Report ID: S1708054001

		Report 15: 31700034001						
ect:	201782-2059							
Radiu	m 228 by Ga/Tech	Sample Type MBLK		Units	: pCi/L			
	MB-455 (08/15/17 10:52)	RunNo: 149274	Prepl	Oate: 08/0	9/17 12:00	Bato		
	Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
-	Total Radium 228	ND	1					
Radiu	m 228 by Ga/Tech	Sample Type LCS			s: pCi/L			
	LCS-455 (08/15/17 13:56)	RunNo: 149274	Prepl		9/17 12:00		hID 13581	
	Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
	Total Radium 228	38	1	39.5		97.3	65.9 - 132	
Radiu	m 228 by Ga/Tech	Sample Type MS		Units	s: pCi/L			
	MS-455 (08/15/17 20:03)	RunNo: 149274	Prepl	Date: 08/0	9/17 12:00	Bato	hID 13581	
	Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
•	Total Radium 228	44	1	39.5	ND	112	50 - 139	
Radiu	m 228 by Ga/Tech	Sample Type MSD		Units	s: pCi/L			
	MSD-455 (08/15/17 23:06)	RunNo: 149274	Prepl	Date: 08/0	9/17 12:00	Bato	hID 13581	
	Analyte	Result	RL	Conc	%RPD	%REC	% RPD Limits	Qual
	Total Radium 228	41	1	44	7.62	104	20	
Radiu	m 226 in Water -	Sample Type MBLK		Units	s: pCi/L			
	MB-1782 (08/15/17 10:32)	RunNo: 149108	Prepl	Date: 08/0	07/17 0:00	Bato	hID 13561	
	Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
	Radium 226	ND	0.2					
Radiu	m 226 in Water -	Sample Type LCS		Units	: pCi/L			
	LCS-1782 (08/15/17 10:32)	RunNo: 149108	Prepi	Date: 08/0	07/17 0:00	Bato	hID 13561	
	Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
	Radium 226	6.6	0.2	6.41		102	67.1 - 122	
Radiu	m 226 in Water -	Sample Type MS		Units	: pCi/L			
	MS-1782 (08/15/17 10:32)	RunNo: 149108	Prepl	Date: 08/0	7/17 0:00	Bato	hID 13561	
	Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
	Radium 226	6.2	0.2	6.41	ND	97.1	65 - 131	
Radiu	m 226 in Water -	Sample Type MSD		Units	: pCi/L			
	MSD-1782 (08/15/17 10:32)	RunNo: 149108	8 PrepDate: 08/07/17 0:00 BatchID 1356			hID 13561		
	1			_				

Qualifiers:

- Analyte detected in the associated Method Blank
- Analyzed at IML Gillette laboratory G
- J Analyte detected below quantitation limits
- ND Not Detected at the Reporting Limit RPD outside accepted recovery limits
- Х Matrix Effect

Analyte

Radium 226

- Value above quantitation range
  - Holding times for preparation or analysis exceeded Н

RL

0.2

Conc

6.2

%RPD

2.14

%REC

99.2

Analyzed by another laboratory L

Result

6.4

- Outside the Range of Dilutions
- Spike Recovery outside accepted recovery limits

% RPD Limits Qual

20



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

## **Chain of Custody Record**

Page	1	of	1	

	Phone: (701) 258-9720 Toll Free: (800) 279-6885 Fax: (701) 258-9724										201782-2059		
		Fax: (701) 258-9724									201702-2009		
Company Nam	e and Address:			Account #	:						Phone #:		
4											701-258-9720		
		<u>VTL</u>		Contact:							Fax #:		
		<u>Broadway</u>		Claudette							For faxed report check box		
		<u>c, ND 58501</u>		Name of S	ampler:						E-mail: ccarroll@mvtl.com		
Billing Address	s (indicate if differen	t from above):									For e-mail report check box		
				Quote Nui	nber						Date Submitted:		
		30x 249									31-Jul-17		
	<u>New Ulm</u>	<u>, MN 56073</u>		Project Na	me/Numb	er:					Purchase Order #:		
											BL5932		
	<b>T</b>	Sample Information			Bottle Type						Analysis		
\$17080	1=1												
	757						33	9					
						- J	Ž	s	Ŀ				
IML Lab				Sample Date Time Type Sampled Sampled Consider Contract C									
Number	MVTL Lab Number	Client Committee ID	Sample	Date	Time	ıtre	00	O de	Glass Jar	Other			
	INIVIL Lab Number	Client Sample ID	Туре	Sampled	Sampled	5	2	× 5	ਹ	ō	Analysis Required		
00 1	17-W3214	MW104	GW	27-Jul-17	1057		4				Ra226 & Ra228		
002	17-W3215	MW70	GW	27-Jul-17	910		4				Ra226 & Ra228		
		•											
				.,,									
	I was with warrant has were	orted as a numerical value											

Transferred by:	Date:	Time:	Sample Condition:	Received by:	Date:		Temp:
T. Olson	31-Jul-17	1700	INTACT	RADDY HERMAN	8/2/17	11:50	24.4°C
2.							



# **Field Datasheet**

**Groundwater Assessment** 

Company:	MDU Hesk	ett
Event:	2017	
Sample ID:	MW104	
Sampling Pe	rsonal: Darren	Niesu
		· ' - /

Phone: (701) 259 0720

Phone: (701) 258-9	3720		_									
Weather Conditions:	<del></del>	Temp:	68	°F	Wind:	Light		Precip:	Suni	ny / Partly C	loudy//Clo	udy
	Well Info	rmation	00				Sa	mpling I	nformatio	on	( _	
Well Locked?	Yes	(No)				Purging Method:	Blac	lder		Co	ntrol Setting	s
Well Labeled?	/Yés/	No				Sampling Method:	Blac	ider		Purge:	5	sec.
Casing Straight?	Yeş	No				Dedicated Equip?:	(Yes)	No		Recover:	5 5°	sec.
Grout Seal Intact?	Yes	No	Not	Visible		Duplicate Sample?:	Yes	(NO)		PSI:	10	
Repairs Necessary:						Duplicate Sample ID:				Pumping R	ate: / ව ()	mL/min
Casing	Diameter:		2"									
Water Level Bef	ore Purge:		4.09	ft		Purge Date	2771	V17	Time Purg	ing Began:	1022	বুলী/pm
Total V	Vell Depth:	·		ft		Well Purged Dry?		<b>₫</b>		Purged Dry:		am/pm
We	ell Volume:	~	_	liters		Sample Date	2776	17	Time of	f Sampling:	1057	am/pm
Depth to Top	p of Pump:	-ر		ft			<i>"</i>					
Water Level After	er Sample:	/	4,48	ft		Bottle	1L Raw, 50	0mL Nitirc,	500mL Niti	ric (filtered),	4-1L Nitric	
Measuremen	nt Method:	Electric '	Water Leve	el Indicator		List:		25	0 mL Sulfu	ric		
				المالية المالية								

#### **Field Measurements**

Stabili: (3 cons		Temp (°C)	Spec. Cond. ±5%	<b>pH</b> ±0.1	DO (mg/L) ±10%	ORP (mV) ±20 mV	Turbidity (NTU) ±10%	Water Level (ft) 0.25 ft	mL Removed	Discription: Clarity, Color, Odor, Ect. clear, slightly turbid, turbid
	1027	11.87	14176	6.92	1.94	259.0	4.45	14.44	500	Ch
1	1032	11-61	14201	6.92	1,03	262.0	2,13.	14,41	500	de
3	1037	11.65	14177	6,92	1,89	263,0	1,28	14.42	500	Ch
4	1042	11.47	14/96	6.91	0,74	264,2	1011	14,41	500	On-
5	1047	12106	14233	6A1	0,63	265,2	0,88	14.42	500	Ch
6	1052	1201	14251	6291	0,65	265,7	0,83	14,43	500	de
7	1057	11,92	14256	6.91	8-5	266.1	0,80	14,43	500	an
8	b #				0.57					
9										
10	Non	) No					tal Volume	D	2530	ml

Stabilized: Yes No
Comments:

Total Volume Removed: 3500 mL



# **Field Datasheet**

Groundwater Assessment

Company:	MDU Heskett	
Event:	2017	
Sample ID:	のいつの	

Gloundwater Assessment								Sample ID. / I [ W ] ()								
2616 E. Broadway Ave, Bis	marck, ND							Sampling P	ersonal: /	2000	N/2	b can				
Phone: (701) 258-97	720										· · · · · · · · · · · · · · · · · · ·	. –				
Weather Conditions:		Temp:	(4 °F	•	Wind:	Light	<del>/</del>		Precip	: Suni	ny / Partly C	Cloudy / Clou	udy			
1	Well Info	rmation	t			JVV.		Sa	mpling	Informatio	on					
Well Locked?	Yes /	No				Purgir	ng Method:	Blad	lder		Co	ntrol Setting	s			
Well Labeled?	Yes	No				Samplir	ng Method:	Blad	lder		Purge:	5	sec.			
Casing Straight?	Yes	No				Dedicat	ed Equip?:	Øes	No		Recover:	55	sec.			
Grout Seal Intact?	Yes	No	Not Vis	ible		Duplicate	Sample?:	Yes	(No		PSI:	10				
Repairs Necessary:						Duplicate 9	Sample ID:	حـــــ			Pumping R	ate:/っつ	mL/min			
Casing	Diameter:		2"													
Water Level Befo	ore Purge:	<u>2</u>	1.22	ft		Р	urge Date:	2721	v/7	Time Purg	ing Began:	1845	am/pm			
Total W	ell Depth:	<del></del>	-	ft			urged Dry?		(No	Time F	urged Dry:		am/pm			
Wei	Il Volume:		-	liters		Sa	mple Date:	2774	-17	Time of	Sampling:	0910	(am/pm			
Depth to Top	of Pump:		_	ft					. ,							
Water Level Afte	r Sample:	2	2,42	ft		Bottle		1L Raw, 50	0mL Nitirc	, 500mL Nitr	ic (filtered),	4-1L Nitric				
Measurement	t Method:	Electric V	Vater Level In	dicator		List:			2	50 mL Sulfu	ric					
				<b>-</b>	24											

#### Field Measurements

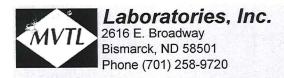
	ization ecutive)	Temp (°C)	Spec. Cond.	рН	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Water Level (ft)	mL Removed	Discription: Clarity, Color, Odor, Ect.
SEQ#	Time		±5%	±0.1	±10%	±20 mV	±10%	0.25 ft		clear, slightly turbid, turbid
1	0850	11,62	4658	6,95	1.39	275,2	6.18	21,76	500	Ch-
2	Ø855	11,10	4671	6.95	0.62	274.5	4.39	2213	500	cles
3	0800	11,28	4676	6,96	0.62	274,0	0135	22,21	500	ch
4	0905	11146	4672	6,96	On 64	273,7	0,42	22,30	500	cl_
5	0910	11,44	4681	6.96	0,68	272,9	0,43	22,39	500	d
6			•					ı		
7										
- 8										
9										
10 Stabilizadi	Van	Ma					tal Valuma		7242	

Stabilized: Yes No
Comments:

Total Volume Removed: 2500 mL

## **MVTL Calibration Worksheet**

Site: MDU Hes	skett	Technician: 1/2 Won Wilsway										
Instrument (Circle One):	#1 650 MDS 08F100203	#2 650 MDS 04H14736	#\$ 556 MPS 12E102056									
	Pre Site Calib	ration	Post Site Check									
Date: 2754	1417 Time: 0743		Time: 1220									
pH Buffer 7 Buffer 10 Conductivity Buffer 10000 ORP 231 mV @ 25C	Temp °C Pre Cal Post Cal 21.90 7.05 7.00 21.94 10.01 10.00  21.34 P242 10000  [0.8] 248.( 231.0	Post Cal Range mv 50  6.95-7.05	pH Temp °C Reading  Buffer 7 $22.31$ $6.98$									
	21.66 8.56 8.33	mg/L 720,4										
Date:	Time:	_ mv Range	Time:									
pН	Temp °C Pre Cal Post Cal	Post Cal Range mv 50	<b>pH</b> Temp °C Reading									
Buffer 7		6.95-7.05 0 +/- 50	Buffer 7									
1			<u> </u>									
Buffer 10		9.95-10.05 -180 +/- 5										
Conductivity		Check	Conductivity									
Buffer 10000		±10% Buffer 5000	Buffer 5000									
ORP												
231 mV @ 25C		±10 mV	·									
DO		Barometric Pressure (mm Hg)										
		mg/L										



# **Chain of Custody Record**

Project Nam	e:	Event:	Work Order Number:
	MDU Heskett	July 2017	82-2059
Report To: Attn: Address:	MDU Samantha Marshall 400 N. 4th St Bismarck, ND 58501	Carbon Copy: Attn: Address:	Name of Sampler(s):
phone: email:	701-222-7829		

	Sample Information							Bottle Type				eld Para	meters	Analysis	
Lab Number	Sample ID	Date	Time	Sample Type		1 liter Nitri.		//	//	//	Temp (°C)	Spec. Cond.	Ha .	Analysis Required	
W3214	MW104					4						14256	6.91		
21684	MW70	25 4/17	0910	GW		4					11.44	4681	6.96		
		/	Ī		ai .					Ш					
						$\perp$				Ш				Rad 226 & Rad 228	
9						$\sqcup$	_	_		$\sqcup$					
						$\perp \downarrow$		_	_	$\sqcup$					
						$\perp$	_	_		$\sqcup$					
						$\sqcup$	$\perp$	_						2	

Comments:

Relinquished By:	Sample Condition:					
Name:	Date/Time	Location:	Temp <sub>s</sub> (°C)			
1 Gay Nky	277417	Walk In #2	R OJ 4,8 TM562/TM588			
2						

Receive	ed by:
Name:	Date/Time
Teall	27242017



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.mytl.com



September 1, 2017

Montana Dakota Utilities Attn: Samantha Marshall 400 N. 4<sup>th</sup> St. Bismarck, ND 58501

RE: Groundwater Sampling Event - MDU Heskett Ash Site

Dear Ms. Marshall:

On August 24, 2017, MVTL Laboratories' Field Services division collected groundwater samples at the MDU Heskett site near Mandan, ND for the Heskett Coal Combustion Rule.

All wells were located and were found to be in generally good condition. The wells for CCR were purged and sampled using a dedicated bladder pump and BARR's SOP for low flow purging and sampling. Samples were collected from well MW70. The samples collected were, placed on ice and transported back to the MVTL laboratory in Bismarck, ND for analysis. The field data report for the sampling event accompanies this letter.

Thank you for your trust and support of our services. If you have any questions, please call me at (800) 279-6885.

Sincerely,

Jeremy Meyer

**MVTL Field Services** 



Water Level After Sample:

Comments:

Measurement Method:

## **Field Datasheet**

#### **Groundwater Assessment**

Company: MDU Heskett

Event: 2017

Sample ID: MW 7

Sampling Personal: Warren Mizson

1L Raw, 500mL Nitirc, 500mL Nitric (filtered), 4-1L Nitric

250 mL Sulfuric

Phone: (701) 258-9720 Wind: E10 Weather Conditions: Temp: Precip: Sunny / Partly Cloudy / Cloudy **Well Information** Sampling Information NO Well Locked? Yes Purging Method: Bladder Control Settings Well Labeled? yes> No Sampling Method: Bladder Purge: sec. Casing Straight? Yes No Dedicated Equip?: Yes No Recover: sec. Yes Grout Seal Intact? No Not Visible No Duplicate Sample?: Yes PSI: Repairs Necessary: Duplicate Sample ID: Pumping Rate: 100 mL/min Casing Diameter: 2" 21,08 Water Level Before Purge: Time Purging Began: // Purge Date: 2 @m/pm Total Well Depth: Well Purged Dry? Time Purged Dry: Yes NO am/pm Well Volume: Time of Sampling: liters Sample Date: am/pm 76 Depth to Top of Pump:

Bottle

List:

### **Field Measurements**

**Electric Water Level Indicator** 

(3 con	lization secutive)	Temp (°C)	Spec. Cond. ±5%	<b>pH</b> ±0.1	DO (mg/L) ±10%	ORP (mV)	Turbidity (NTU)	Level (ft)	mL Removed	Discription: Clarity, Color, Odor, Ect.
SEQ#	Time	, , ,	±370	±0.1	±10%	±20 mV	±10%	0.25 ft		clear, slightly turbid, turbid
1	UD 27	1096	4776	6.95	2.68	28/ 3	12,3	21.94	500	can
2	0832	11.93	4766	6,98	0,60	280,7	1.83	22.01	500	de
3	0837	11.76	4759	6:97	0,43	280.8	2,21	22.07	590	de
4	0842	11.58	4761	6,97	0,34	280,5	3,37	22,21	500	clin
5	0847	11,63	4757	6,97	0,35	280.2	مے یا	22128	500	Cl
6	0852	11.54	4755	6.98	0,34.	218W	3,62	22.35	500	Ch
7					,	27919				
8										
9										
10										
Stabilized	Yes	No			<u> </u>	To	tal Volume	Removed:	310100	ml



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#### CASE NARRATIVE

**MVTL Lab Reference No/SDG:** 

201782-2335

Client:

**Montana Dakota Utilities** 

Location:

**MDU** Heskett

**Project Identification:** 

CCR August 2017

**MVTL Laboratory Identifications:** 

17-W3590

Page 1 of 1

MDU Sample Identification	MVTL Laboratory #
MW70	17-W3590

#### I. RECEIPT

- All samples were received at the laboratory on 25 Aug 17 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.
  - o Temperature of samples upon receipt was 2.3°C.
- All samples were properly preserved unless noted here and/or flagged on the individual analytical laboratory report.
- No other exceptions on sample receipt were encountered on this sample set unless noted here.

#### II. HOLDING TIMES

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

#### III. METHODS

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

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

All laboratory of	lata has been approve	d by MVTL Laborat	ories.		
SIGNED:	Claudette	anto	DATE:	14 Sep 17	
Claude	tte Carroll - MVTL Bisn	narck Laboratory N	/lanager	•	

**MVTL** 

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Page: 1 of 2

Quality Control Report
Lab ID: 17-W3590

Project: MDII Hackett CCP

Lab ID: 17-W3590		Pr	oject: MI	DU Heske	ett - CCR	7	Work Or	der: 201	782-2335	5							
Analyte	LCS Spike Amt	LCS Rec %	LCS % Rec Limits	Matrix Spike Amt	Matrix Spike ID	Matrix Spike Orig Result	Matrix Spike Result	Matrix Spike Rec %	Matrix Spike % Rec Limits	MSD/ Dup Orig Result	MSD/ Dup Result	MSD Rec %	MSD/ Dup RPD	MSD/ Dup RPD Limit (<)	Known Rec (%)	Known % Rec Limits	Method Blank
Antimony - Total mg/l	0.1000	99	80-120	0.400 0.400 0.400	17-W3585q 17W3622q 17W3541q	< 0.001 < 0.001 < 0.001	0.3956 0.3874 0.3848	99 97 96	75-125 75-125 75-125	0.3956 0.3874 0.3848	0.4032 0.4106 0.3822	101 103 96	1.9 5.8 0.7	20 20 20	-	-	< 0.001
Arsenic - Total mg/l	0.1000	98	80-120	0.400 0.400 0.400	17-W3585 17-W3622 17-W3541	0.0025 0.0143 < 0.002	0.3964 0.4042 0.3932	98 97 98	75-125 75-125 75-125	0.3964 0.4042 0.3932	0.4056 0.4282 0.3790	101 103 95	2.3 5.8 3.7	20 20 20	-	-	< 0.002
Barium - Total mg/l	0.1000	92	80-120	0.400 0.400 0.400	17-W3585q 17W3622q 17W3541q	0.0150 0.0302 0.0054	0.3738 0.3992 0.3726	90 92 92	75-125 75-125 75-125	0.3738 0.3992 0.3726	0.3874 0.4096 0.3684	93 95 91	3.6 2.6 1.1	20 20 20	-	- -	< 0.002
Beryllium - Total mg/l	0.1000	97	80-120	0.400 0.400 0.400	17-W3585q 17W3622q 17W3541q	< 0.0005 < 0.0005 < 0.0005	0.3900	97 98 98	75-125 75-125 75-125	0.3878 0.3900 0.3902	0.3928 0.3888 0.3766	98 97 94	1.3 0.3 3.5	20 20 20			< 0.0005
Boron - Total mg/l	0.40 0.40 0.40	105 105 110	80-120 80-120 80-120	0.800 2.00 0.400	17-D3076 17-W3585 17-W3622	0.43 < 0.5 0.18	1.14 1.94 0.57	89 97 97	75-125 75-125 75-125	1.14 1.94 0.57	1.14 1.99 0.57	89 100 97	0.0 2.5 0.0	20 20 20	-	-	< 0.1 < 0.1 < 0.1 < 0.1
Cadmium - Total mg/l	0.1000	105	80-120	0.400 0.400 0.400	17-W3585q 17W3622q 17W3541q	< 0.0005 < 0.0005 < 0.0005	0.3924	100 98 95	75-125 75-125 75-125	0.3990 0.3924 0.3802	0.3992 0.4028 0.3844	100 101 96	0.1 2.6 1.1	20 20 20	-		< 0.0005
Calcium - Total mg/l	20.0	107	80-120	100	17W3604q	25.7	126	100	75-125	126	126	100	0.0	20	-	_	< 1 < 1
Chloride mg/l	30.0 30.0	89 88	80-120 80-120	30.0	17-W3603	7.3	35.5	94	80-120	35.5	35.0	92	1.4	20	-	-	< 1 < 1
Chromium - Total mg/l	0.1000	97	80-120	0.400 0.400 0.400	17-W3585q 17W3622q 17W3541q	0.0023 < 0.002 < 0.002	0.3666 0.3662 0.3604	91 92 90	75-125 75-125 75-125	0.3666 0.3662 0.3604	0.3760 0.3686 0.3518	93 92 88	2.5 0.7 2.4	20 20 20	-	-	< 0.002
Cobalt - Total mg/l	0.1000	96	80-120	0.400 0.400 0.400	17-W3585q 17W3622q 17W3541q	< 0.002 < 0.002 < 0.002	0.3702 0.3646 0.3656	93 91 91	75-125 75-125 75-125	0.3702 0.3646 0.3656	0.3756 0.3708 0.3592	94 93 90	1.4 1.7 1.8	20 20 20	-	-	< 0.002
Fluoride mg/l	0.50	108	90-110	0.500	17-W3590	0.31	0.82	102	80-120	0.82	0.83	104	1.2	20	-	-	< 0.1 < 0.1

### **MVTL**

### MINNESOTA VALLEY TESTING LABORATORIES, INC.

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Page: 2 of 2

**Quality Control Report** 

Lab ID: 17-W3590 Project: MDU Heskett Work Order: 201782-2335

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
Lead - Total mg/l	0.1000	97	80-120	0.400 0.400 0.400	17-W3585q 17W3622q 17W3541q	< 0.001 < 0.001 < 0.001	0.3504 0.3626 0.3546	88 91 89	75-125 75-125 75-125	0.3504 0.3626 0.3546	0.3574 0.3698 0.3472	89 92 87	2.0 2.0 2.1	20 20 20	-	- - -	< 0.0005
Lithium - Total mg/l	0.40 0.40	102 102	80-120 80-120	0.400 0.400	17-W3585 17-W3622	0.10 0.14	0.48 0.56	95 105	75-125 75-125	0.48 0.56	0.50 0.58	100 110	4.1 3.5	20 20	-	-	< 0.1 < 0.1 < 0.1
Mercury - Total mg/l	0.0020	100	85-115	0.002 0.002	17-W3585 17-W3622	< 0.0002 < 0.0002		100 100	70-130 70-130	0.0020 0.0020	0.0020 0.0020	100 100	0.0	20 20	-	-	< 0.0002
Molybdenum - Total mg/l	0.1000	93	80-120	0.400 0.400 0.400	17-W3585q 17W3622q 17W3541q	0.0024 < 0.002 < 0.002	0.3978 0.3820 0.3878	99 96 97	75-125 75-125 75-125	0.3978 0.3820 0.3878	0.3986 0.3950 0.3790	99 99 95	0.2 3.3 2.3	20 20 20	-	- - -	< 0.002
pH units	-	-	-	-	-	1-0	-	-	n=:	6.7	6.7	-	0.0	20	-	-	-
Selenium - Total mg/l	0.1000	107	80-120	0.400 0.400 0.400	17-W3585q 17W3622q 17W3541q	0.3381 < 0.005 < 0.005	0.7208 0.3920 0.3964	96 98 99	75-125 75-125 75-125	0.7208 0.3920 0.3964	0.7292 0.3888 0.4010	98 97 100	1.2 0.8 1.2	20 20 20	-	-	< 0.002
Sulfate mg/l	100	100	80-120	100	17-W3588	< 5	94.4	94	80-120	94.4	115	115	19.7	20	-	-	< 5
Thallium - Total mg/l	0.1000	97	80-120	0.400 0.400 0.400	17-W3585q 17W3622q 17W3541q	< 0.0005 < 0.0005 < 0.0005	0.3462 0.3678 0.3488	87 92 87	75-125 75-125 75-125	0.3462 0.3678 0.3488	0.3602 0.3744 0.3458	90 94 86	4.0 1.8 0.9	20 20 20	-	-	< 0.0005
Total Dissolved Solids mg/l	-	-	-	-	-	-	-	-	-	4030	4030	-	0.0	20		-	< 10

Approved by:	C. awo
	145eg17



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CERTIFICATE of ANALYSIS - CCR

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

Project Name: MDU Heskett

Sample Description: MW70

Event and Year: Aug 2017

Page: 1 of 1

Report Date: 11 Sep 17 Lab Number: 17-W3590 Work Order #: 82-2335 Account #: 002800

Date Sampled: 24 Aug 17 8:52 Date Received: 25 Aug 17 8:00 Sampled By: MVTL Field Services

PO #: 165275

Temp at Receipt: 2.3C ROI

	As Receive Result	ed	Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	25 Aug 17	EMS
pH - Field	6.98	units	NA	SM 4500 H+ B	24 Aug 17 8:52	DJN
рн	* 7.5	units	0.1	SM4500 H+ B	25 Aug 17 18:00	SVS
Temperature - Field	11.5	Degrees C	NA	SM 2550B	24 Aug 17 8:52	DJN
Conductivity - Field	4755	umhos/cm	1	EPA 120.1	24 Aug 17 8:52	DJN
Fluoride	0.31	mg/l	0.10	SM4500-F-C	28 Aug 17 17:00	EMS
Sulfate	2530	mg/l	5.00	ASTM D516-07	7 Sep 17 15:55	EMS
Chloride	31.2	mg/l	1.0	SM4500-Cl-E	8 Sep 17 10:30	RAG
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	31 Aug 17 11:30	EV
Total Dissolved Solids	4030	mg/l	10	I1750-85	25 Aug 17 16:16	SVS
Calcium - Total	426	mg/l	1.0	6010D	5 Sep 17 15:30	SZ
Lithium - Total	0.37	mg/l	0.10	6010D	6 Sep 17 9:52	SZ
Boron - Total	0.47	mg/l	0.10	6010D	6 Sep 17 12:58	SZ
Antimony - Total	< 0.001	mg/l	0.0010	6020B	6 Sep 17 16:20	BT
Arsenic - Total	< 0.002	mg/l	0.0020	6020B	7 Sep 17 10:38	BT
Barium - Total	0.0100	mg/l	0.0020	6020B	6 Sep 17 16:20	BT
Beryllium - Total	< 0.0005	mg/l	0.0005	6020B	6 Sep 17 16:20	BT
Cadmium - Total	< 0.0005	mg/l	0.0005	6020B	6 Sep 17 16:20	
Chromium - Total	< 0.002	mg/l	0.0020	6020B	6 Sep 17 16:20	BT
Cobalt - Total	< 0.002	mg/l	0.0020	6020B	6 Sep 17 16:20	BT
Lead - Total	< 0.001 ^	mg/l	0.0005	6020B	6 Sep 17 16:20	BT
Molybdenum - Total	0.0027	mg/l	0.0020	6020B	6 Sep 17 16:20	BT
Selenium - Total	0.0147	mg/l	0.0020	6020B	6 Sep 17 16:20	BT
Thallium - Total	< 0.0005	mg/l	0.0005	6020B	6 Sep 17 16:20	BT

<sup>\*</sup> Holding time exceeded

Approved by:

Clauditte K. Canto

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

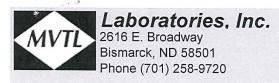
The reporting limit was elevated for any analyte requiring a dilution as coded below:

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

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

CERTIFICATION: ND # ND-00016

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



# **Chain of Custody Record**

Project Name:		Event:	Work Order Number:
	MDU Heskett	August 2017	82-2335
Report To: Attn: Address: phone: email:	MDU Samantha Marshall 400 N. 4th St Bismarck, ND 58501 701-222-7829	Carbon Copy: Attn: Address:	Name of Sampler(s):  Darren Nieswaag

1	Sample	e Information				Bottl	е Тур	е	Fi	eld Para	meters	Analysis
Lab Number	Sample ID	$D_{ate}$	Time Sample r.	ed/.	1 liter	500mL Nitric	(Mitered)		<sup>T</sup> emp (°C)	Spec. Cond.	Ha	Analysis Required
V3590	MW70	24Aug (7 (	0852 GW		x x				11,54	4755	6.98	
					_	$\Box$						MDU 000 13 4 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7
					+	+		$\vdash$				MDU CCR List with TSS and Dissolved CCR Metals.
						++		$\vdash$				
.6)						$\dagger \dagger$						

Comments:

	R	elinquished By:	Sample Condition:				
	Nar	me:	Date/Time	Location:	Temp (°C)		
1	Dan	Ninn	24 Aug (7	Log In Walk In #2	FOF 2, 3 TM562 KIM588		
2			.,,		i e		

Rece	eived by:
Name:	
112.	25 Aug 17
NBACHMANN	0800



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



#### **CASE NARRATIVE**

**MVTL Lab Reference No/SDG:** 

201782-2336

IML Lab Reference No/SDG:

S1708480

Client:

**Montana Dakota Utilities** 

Location:

**MDU Heskett Ash Site** 

**Project Identification:** 

CCR August 2017

**MVTL Laboratory Identifications:** 

17-W3591

**IML Laboratory Identifications:** 

S1708480-001

Page 1 of 2

MDU Sample Identification	MVTL Laboratory #	IML Laboratory #
MW70	17-W3591	S1708480-001

#### I. RECEIPT

- All samples were received at the laboratory on 25 Aug 2017 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.
  - o Temperature of samples upon receipt was 2.3°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 30 Aug 2017.
  - o 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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#### **CASE NARRATIVE**

**MVTL Lab Reference No/SDG:** 

IML Lab Reference No/SDG:

Client:

Location:

**Project Identification:** 

MVTL Laboratory Identifications: IML Laboratory Identifications:

Page 2 of 2

201782-2336

S1708480

**Montana Dakota Utilities** 

**MDU Heskett Ash Site** 

CCR August 2017

17-W3591

S1708480-001

#### V. REPORTING

- Per email from Barr Engineering dated 10 March 2016, IML was directed 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: Claudelle Canto DATE: 30077

Claudette Carroll - MVTL Bismarck Laboratory Manager



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CERTIFICATE of ANALYSIS - CCR

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

Project Name: MDU Heskett

Sample Description: MW70

Event and Year: Aug 2017

1 of 1 Page:

Report Date: 3 Oct 17 Lab Number: 17-W3591 Work Order #: 82-2336 Account #: 002800

Date Sampled: 24 Aug 17 8:52 Date Received: 25 Aug 17 8:00 Sampled By: MVTL Field Services

PO #: 165275

Temp at Receipt: 2.3C ROI

	As Recei	lved	Method RL	Method Reference	Date Analyzed				
pH - Field Temperature - Field Conductivity - Field Radium 226 Radium 228		units Degrees C umhos/cm ached Report ached Report	NA NA 1	SM 4500 H+ B SM 2550B EPA 120.1	24 Aug 17 24 Aug 17 24 Aug 17 12 Sep 17 12 Sep 17	8:52	DJN DJN DJN OL OL		

Approved by:

Clauditte K. Cantle

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



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

Date: 9/19/2017

CLIENT:

MVTL Laboratories, Inc.

Project:

201782-2336

Lab Order:

S1708480

**CASE NARRATIVE** 

Report ID: S1708480001

Sample 17-W3591 MW70 was received on August 30, 2017.

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

Page 1 of 1



Inter-Mountain Labs

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

#### Sample Analysis Report

Company:

MVTL Laboratories, Inc.

2616 E Broadway Ave. Bismarck, ND 58501

ProjectName:

201782-2336

Lab ID:

S1708480-001 ClientSample ID: 17-W3591 MW70

COC:

201782-2336

Date Reported

9/19/2017

Report ID

S1708480001

WorkOrder:

S1708480

CollectionDate: 8/24/2017 8:52:00 AM

DateReceived:

8/30/2017 10:05:00 AM

FieldSampler:

Matrix:

Water

#### Comments

Analyses	Result L		Units Qual	RL	Method	Date Analyzed/Init		
Radionuclides - Total								
Radium 226	0.17	pCi/L		0.2	SM 7500 Ra-B	09/12/2017 1417	MB	
Radium 226 Precision (±)	0.1	pCi/L			SM 7500 Ra-B	09/12/2017 1417	MB	
Radium 228	-0.7	pCi/L		1	Ga-Tech	09/12/2017 2237	MB	
Radium 228 Precision (±)	1.2	pCi/L			Ga-Tech	09/12/2017 2237	MB	

#### These results apply only to the samples tested.

#### Qualifiers:

- Analyte detected in the associated Method Blank
- Value above quantitation range
- Holding times for preparation or analysis exceeded
- Analyzed by another laboratory
- ND Not Detected at the Reporting Limit
- Spike Recovery outside accepted recovery limits

### **RL** - Reporting Limit

- Calculated Value
- Analyzed at IML Gillette laboratory
- Analyte detected below quantitation limits
- Value exceeds Monthly Ave or MCL or is less than LCL М
- Outside the Range of Dilutions
- Matrix Effect

Reviewed by:

Wade Nieuwsma, Assistant Laboratory Manager

Page 1 of 1



Inter-Mountain Labs

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

### **ANALYTICAL QC SUMMARY REPORT**

CLIENT:

Project:

Work Order:

MVTL Laboratories, Inc.

S1708480

201782-2336

Date: 9/19/2017

Report ID: S1708480001

MB-458 (09/11/17 16:02) Analyte							
Analyte	RunNo: 150089	PrepDa	ate: 08/3	0/17 14:00	Bato	hlD 13664	
	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qua
Total Radium 228	ND	1					
Radium 228 by Ga/Tech	Sample Type LCS	Units: pCi/L					
LCS-458 (09/11/17 19:05)	RunNo: 150089	PrepDa	ate: 08/3	0/17 14:00	Bato	hID 13664	
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qua
Total Radium 228	39	1	39.3		99.8	65.9 - 132	
Radium 228 by Ga/Tech	Sample Type MS		Units	: pCi/L			
MS-458 (09/12/17 01:12)	RunNo: 150089	PrepDa	ate: 08/3	0/17 14:00	Bato		
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qua
Total Radium 228	36	1	39.3	ND	90.4	50 - 139	
Radium 228 by Ga/Tech	Sample Type MSD	Units: pCi/L					
MSD-458 (09/12/17 04:16)	RunNo: 150089	PrepDa	ate: 08/3	0/17 14:00	Bato	hID 13664	
Analyte	Result	RL	Conc	%RPD	%REC	% RPD Limits	Qua
Total Radium 228	42	1	36	16.0	106	20	
Radium 226 in Water -	Sample Type MBLK	Units: pCi/L					
MB-1789 (09/12/17 11:40)	RunNo: 149947	PrepDate: 08/30/17 0:00			Bato	hID 13647	
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qua
Radium 226	ND	0.2					
	Sample Type LCS		Units	: pCi/L			
Radium 226 in Water -							
LCS-1789 (09/12/17 11:40)	RunNo: 149947	PrepDa	ite: 08/3	0/17 0:00	Bato	:hID 13647	
	RunNo: 149947 Result	PrepDa RL		0/17 0:00 Ref Samp		chID 13647 % Rec Limits	Qua
LCS-1789 (09/12/17 11:40)							Qua
Analyte	Result	RL	Spike 6.41		%REC	% Rec Limits	Qua
LCS-1789 (09/12/17 11:40) Analyte Radium 226	Result 6.1	RL 0.2	Spike 6.41 Units	Ref Samp	%REC 94.9	% Rec Limits	Qua
LCS-1789 (09/12/17 11:40)	Result 6.1 Sample Type MS	RL 0.2	Spike 6.41 Units ate: 08/3	Ref Samp	%REC 94.9 Bato	% Rec Limits 67.1 - 122	
LCS-1789 (09/12/17 11:40) Analyte  Radium 226  Radium 226 in Water -  MS-1789 (09/12/17 11:40)	Result  6.1  Sample Type MS  RunNo: 149947	RL 0.2 PrepDa	Spike 6.41 Units ate: 08/3	Ref Samp : pCi/L 0/17 0:00	%REC 94.9 Bato	% Rec Limits 67.1 - 122 hID 13647	
LCS-1789 (09/12/17 11:40)	Result 6.1 Sample Type MS RunNo: 149947 Result	O.2 PrepDa	Spike 6.41 Units ate: 08/3 Spike 6.41	Ref Samp : pCi/L 0/17 0:00 Ref Samp	%REC 94.9 Batc %REC	% Rec Limits 67.1 - 122 chID 13647 % Rec Limits	
LCS-1789 (09/12/17 11:40)	Result 6.1 Sample Type MS RunNo: 149947 Result 5.9	RL 0.2 PrepDa RL 0.2	Spike 6.41 Units: ste: 08/36 Spike 6.41 Units:	Ref Samp : pCi/L 0/17 0:00 Ref Samp ND	%REC 94.9 Batc %REC 92.4	% Rec Limits 67.1 - 122 chID 13647 % Rec Limits	
LCS-1789 (09/12/17 11:40)	Result  6.1  Sample Type MS  RunNo: 149947  Result  5.9  Sample Type MSD	RL 0.2 PrepDa RL 0.2	Spike 6.41 Units: ste: 08/36 Spike 6.41 Units:	Ref Samp : pCi/L 0/17 0:00 Ref Samp ND : pCi/L	%REC 94.9 Batc %REC 92.4	% Rec Limits 67.1 - 122 chID 13647 % Rec Limits 65 - 131	Qua

Qualifiers:

- B Analyte detected in the associated Method Blank
- G Analyzed at IML Gillette laboratory
- J Analyte detected below quantitation limits
- ND Not Detected at the Reporting Limit
- R RPD outside accepted recovery limits
- X Matrix Effect

- E Value above quantitation range
- H Holding times for preparation or analysis exceeded
- L Analyzed by another laboratory
- O Outside the Range of Dilutions
- S Spike Recovery outside accepted recovery limits



Transferred by:

T. Olson

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

Date:

28-Aug-17

Time:

1700

## **Chain of Custody Record**

Received by:

Date:

8.30.17

Temp:

10:05

Page	1	of	4	
raue	1	UI		

Toll Free: (8	Phone: (701) 258-9720 Toll Free: (800) 279-6885 Fax: (701) 258-9724 Company Name and Address: Account #:						201782-2336							
Company Nam	e and Address:		Ad	Account #	:	-					Phone #	: 701-258-9720		
	M	VTL		Contact:					,		Fax #:	701-236-3126		
		Broadway		Contact.	Claud	lette	<b>.</b>				For faxed report check box			
		c, ND 58501		Name of S			•	<u>.</u>			E-mail:			
Billing Address	s (indicate if differen		· · · · · · · · · · · · · · · · · · ·								1	or e-mail report check box		
		,		Quote Nur	nber						Date Submitted:			
	<u>PO B</u>	30x 249									28-Aug-17			
	New Ulm	<u>, MN 56073</u>		Project Name/Number:						Purchas	e Order#:			
												BL5949		
		Sample Information					В	ottle	Ту	ре		Analysis		
S 1708 48 IML Lab	MVTL Lab Number	Client Sample ID	Sample Type	Date Sampled	Time Sampled	Untreated	1000 ml HNO3	VOC Vials Umpreserved	Glass Jar	Other		Analysis Required		
001	17-W3591	MW70	GW	24-Aug-17	852		4					Ra226 & Ra228		
-														
											·			
Comments: Al	I results must be rep	orted as a numerical valu	е.							,				

Sample Condition:



Comments:

# **Field Datasheet**

**Groundwater Assessment** 

Company:	MDU Heskett	
Event:	2017	
Sample ID:	mv 70	

												,
2616 E. Broadway Ave, Bismar	rck, ND						Sampli	ng Personal:	Dura	nries	:	
Phone: (701) 258-9720												
Weather Conditions:		Temp:	5 °F		Wind:	E10		Preci	p: Sun	ny / Partly Cl	oudy / Clo	udy
We	ell Info	rmation						Sampling	Informati	on		
Well Locked?	Yes	.dlo				Purging Meth	od:	Bladder		Con	ntrol Setting	s
Well Labeled?	yes>	No				Sampling Meth	od:	Bladder		Purge:	7	sec
Casing Straight?	(es	No				Dedicated Equi	o?: 🕎	No No		Recover:	53	sec
Grout Seal Intact?	Yes	No	Not Visit	ole		Duplicate Sample	?: Y	es Mo		PSI:		
Repairs Necessary:						Duplicate Sample	ID:			Pumping Ra	ite: <i>  O 0</i>	mL/mir
Casing Dia	ameter:		2"									
Water Level Before	Purge:	21,	08	ft		Purge Da	ite: 244	cg 17		ging Began:	182C	@mi/pm
Total Well	Depth:	_		ft		Well Purged D	ry? Y	eś "No		Purged Dry:		am/pm
Well V	/olume:	_	_	liters		Sample Da	ite: 2 4/	fr917	Time o	f Sampling:	<u>9852</u>	- am/pm
Depth to Top of	Pump:	3	2,76	ft			,					
Water Level After S		27	2,58	ft		Bottle	1L Rav	v, 500mL Nitir	c, 500mL Nit	ric (filtered), 4	4-1L Nitric	
Measurement Method: Electric Water Level		Vater Level Ind	licator		List:	250 mL Sulfuric						
				Field	Measure	ements						

	ization ecutive)	Temp (°C)	Spec. Cond. ±5%	<b>pH</b> ±0.1	DO (mg/L) ±10%	ORP (mV) ±20 mV	Turbidity (NTU) ±10%	Water Level (ft) 0.25 ft	mL Removed	Discription: Clarity, Color, Odor, Ect. clear, slightly turbid, turbid
1	0827	1296	4776	6.95	2.68	28,3	12,3	21.94	500	cher
2	0832	11.93	4766	6,98	0,60	280,7	1.83	22.01	500	de
3	0837	11.76	4759	6.97	0,43	280.8	221	22.07	580	de
4	0842	11.58	4761	6.97	0134	280,5	3,37	22,21	500	Clin
5	0847	11,63	4757	6.97	0,35	280.2	3.48	22128	500	Cl
6	9852	11,54	4755	6.98	0,34.	21900	3062	22.35	500	Ch
7					,	27919				
8										
9										
10									1,7,10	
Stabilized:	Yes	) No	No Total Volume Removed: 3000 mL							



# **Chain of Custody Record**

Project Nam	e:	Event:	Work Order Number:
	<b>MDU Heskett</b>	August 2017	82-2336
Report To: Attn: Address: phone: email:	MDU Samantha Marshall 400 N. 4th St Bismarck, ND 58501 701-222-7829	Carbon Copy: Attn: Address:	Name of Sampler(s):  Davien Nieswaag

	Samp	le Information		Bottle Type	Field Parameters	Analysis
Lab Number	Sample ID	Date Time	Sample Type	1 lifer Nitric	Temp (°C) Spec. Cond.	Analysis Required
W 3591	mw70	24 Aug 17 085 2	GW GW	4	11,54 4755 6.98	
						,
		-				
						Rad 226 & Rad 228
						%
6	1					

Comments:

Relinquished By:	Sample Condition:				
Name:	Date/Time	Location:	Temp (°C)		
1 0- 26	24Aig17	Login	ROIZ,3		
Jan 1 1	1809	Walk In #2	TM562 / TM588		
2					

	Receive	ed by:
	Name:	Date/Time
	NBuchman	25 Ang?7 8800
• se li li	,× , °	



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October 21, 2016

Montana Dakota Utilities Attn: Samantha Marshall 400 N. 4<sup>th</sup> St. Bismarck, ND 58501

RE: Groundwater Sampling Event- MDU Heskett Ash Site

Dear Ms. Marshall:

It was brought to MVTL's attention by BARR that the field data report for the August sampling event had an error. The error was the amount of volume removed for well 105. The initial report had 8500mL listed for volume removed but after reviewing the field sheet the actual volume removed was 7500mL. The attached field data report has the corrected data.

Thank you for your trust and support of our services. If you have any questions, please call me at (800) 279-6885.

Sincerely,

Jeremy Meyer

**MVTL Field Services** 



**MDU Heskett** 

**GROUNDWATER SAMPLING - NDDH** 

Attn: Samantha Marshall

400 N. 4th St

Bismarck, ND 58501

701-222-7829

WO#	82-2728	82-2749	82-2696
	82-2724	82-2748	82-2694

WELL ID	PURGE DATE	START PURGE TIME	SAMPLE DATE	TIME OF SAMPLE	WELL CASING ELEVATION	STATIC WATER LEVEL (ft)	WATER LEVEL START	TOTAL DEPTH	WATER LEVEL END	VOLUME IN WELL (L)	VOLUME REMOVED (mL	SAMPLE METHOD	TEMP (°C)	EC	pН	Turbidity NTU	SAMPLE APPEARANCE
2-90	30-Aug-16	16:17	30-Aug-16	16:37	1686.60	1665.02	21.58	24.80	NA	2.0	2000.0	Bladder	11.62	7676	6.86	0.53	clear
3-90	30-Aug-16	14:55	30-Aug-16	15:15	1686.01	1666.98	19.03	21.93	19.12	1.8	2000.0	Bladder	13.89	5222	6.80	1.61	clear
13	29-Aug-16	8:31	29-Aug-16	9:01	1724.98	1694.76	30.22	41.90	30.72	7.2	3000.0	Bladder	12.41	10873	6.81	1.15	clear
33	30-Aug-16	12:53	30-Aug-16	13:52	1717.91	1675.83	42.08	46.55	42.73	2.8	6000.0	Bladder	13.67	5298	6.45	1.69	clear
70	30-Aug-16	8:30	30-Aug-16	8:50	1706.36	1685.02	21.34	43.06	22.67	13.4	2000.0	Bladder	9.54	4136	6.90	4.76	clear
80R	31-Aug-16	10:04	31-Aug-16	10:24	NA	NA	14.80	30.10	15.09	9.4	2000.0	Bladder	12.62	5734	7.01	1.42	clear
44R	29-Aug-16	11:51	29-Aug-16	12:16	NA	NA	28.74	45.88	28.83	10.6	2500.0	Bladder	11.77	9498	6.50	0.73	clear
101	30-Aug-16	9:53	30-Aug-16	11:43	NA	NA	37.18	57.09	41.59	12.3	11000.0	Bladder	14.11	4968	6.67	4.88	clear
102	29-Aug-16	13:17	29-Aug-16	14:07	NA	NA	17.78	33.20	21.88	9.5	5000.0	Bladder	13.76	8160	6.76	2.87	clear
103	29-Aug-16	10:09	29-Aug-16	10:44	NA	NA	33.16	47.10	37.14	8.6	3500.0	Bladder	11.07	5247	6.64	1.63	clear
104	31-Aug-16	8:30	31-Aug-16	9:00	NA	NA	14.41	32.85	14.71	11.4	3000.0	Bladder	12.44	14048	6.88	4.30	clear
105	31-Aug-16	11:29	31-Aug-16	12:44	NA	NA	13.60	32.39	13.90	11.6	7500.0	Bladder	13.06	7590	6.64	4.71	clear
1-90	NA NA	NA	31-Aug-16	13:52	1675.86	1664.00	11.86	17.02	NA	NA	NA	WL	NA	NA	NA	NA	Water Level Only
2	NA NA	NA	31-Aug-16	13:55	1698.60	1659.92	38.68	63.70	NA	NA	NA	WL	NA	NA	NA	NA	Water Level Only
4B	NA NA	NA NA	31-Aug-16		1662,80	1645,10	17.70	26.15	NA	NA	NA	WL	NA	NA	NA	NA	Water Level Only
8	NA NA	NA	31-Aug-16		1664.90	1647.87	17.03	28.02	NA	NA	NA NA	WL	NA	NA	NA	NA	Water Level Only
	107	177	217.03.10	10.00	1,00,.00	1	17.55										



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#### CASE NARRATIVE

MVTL Lab Reference No/SDG:

201682-2694

Client:

**Montana Dakota Utilities** 

Location:

**MDU Heskett** 

**Project Identification:** 

CCR August 2016

**MVTL Laboratory Identifications:** 

16-W3783 through 16-W3788

Page 1 of 2

MDU Sample Identification	MVTL Laboratory #					
Dup1	16-W3783					
Field Blank (FB)	16-W3784					
MW13	16-W3785					
MW103	16-W3786					
MW44R	16-W3787					
MW102	16-W3788					

#### I. RECEIPT

- All samples were received at the laboratory on 30 Aug 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.
  - o Temperature of samples upon receipt was 3.4°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.

#### II. HOLDING TIMES

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

#### III. METHODS

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

#### 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.
  - o For some metals, the reported results were elevated due to instrument performance at the lower limit of quantitation (LLOQ).
  - o For some metals, the reported results were elevated due to additional dilutions required to minimize the effects of sample matrix.
  - One selenium (total) matrix spike duplicate recovery was outside the acceptable limits.



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



#### **CASE NARRATIVE**

MVTL Lab Reference No/SDG:

201682-2694

Client:

**Montana Dakota Utilities** 

Location:

**MDU Heskett** 

**Project Identification:** 

CCR August 2016

**MVTL Laboratory Identifications:** 

16-W3783 through 16-W3788

Page 2 of 2

Recovery for the matrix spike was acceptable. RPD for the matrix spike duplicate and the matrix spike recoveries was within limits. No further action was taken.

- One selenium (dissolved) matrix spike duplicate recovery was outside the acceptable limits. Recovery for the matrix spike was acceptable. RPD for the matrix spike duplicate and the matrix spike recoveries was within limits. No further action was taken.
- One arsenic (total) matrix spike duplicate recovery was outside the acceptable limits.
   Recovery for the matrix spike was acceptable. RPD for the matrix spike duplicate and the matrix spike recoveries was within limits. No further action was taken.



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

Project Name: MDU Heskett CCR GW August 2016

Sample Description: Dup 1

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Report Date: 19 Sep 16 Lab Number: 16-W3783 Work Order #:82-2694 Account #: 002800

Date Sampled: 29 Aug 16

Date Received: 30 Aug 16 8:00 Sampled By: MVTL Field Services

Temp at Receipt: 3.4C ROI

	As Receive Result	ed	Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	30 Aug 16	ML
рН	* 6.7	units	N/A	SM4500 H+ B	30 Aug 16 17:00	ML
Total Suspended Solids	12	mg/l	1	I3765-85	30 Aug 16 15:44	ML
Total Alkalinity	544	mg/l CaCO3	20	SM2320-B	30 Aug 16 17:00	ML
Fluoride	0.22	mg/l	0.10	SM4500-F-C	30 Aug 16 17:00	ML
Sulfate	4910	mg/l	5.00	ASTM D516-07	2 Sep 16 9:10	EMS
Chloride	6.1	mg/l	1.0	SM4500-C1-E	1 Sep 16 11:15	EMS
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	31 Aug 16 11:29	EV
Mercury - Dissolved	< 0.0002	mg/l	0.0002	EPA 245.1	31 Aug 16 12:30	EV
Total Dissolved Solids	6980	mg/l	5	I1750-85	30 Aug 16 14:30	ML
Calcium - Total	472	mg/l	1.0	6010	12 Sep 16 13:23	KMD
Magnesium - Total	364	mg/l	1.0	6010	12 Sep 16 13:23	KMD
Sodium - Total	1340	mg/l	1.0	6010	12 Sep 16 13:23	KMD
Potassium - Total	17.6	mg/l	1.0	6010	12 Sep 16 13:23	KMD
Lithium - Total	1.06	mg/l	0.10	6010	7 Sep 16 9:47	KMD
Boron - Total	1.14	mg/l	0.10	6010	12 Sep 16 12:45	KMD
Calcium - Dissolved	452	mg/l	1.0	6010	12 Sep 16 13:23	KMD
Magnesium - Dissolved	390	mg/l	1.0	6010	12 Sep 16 13:23	KMD
Sodium - Dissolved	1610	mg/l	1.0	6010	12 Sep 16 13:23	KMD
Potassium - Dissolved	19.9	mg/l	1.0	6010	12 Sep 16 13:23	KMD
Lithium - Dissolved	1.11	mg/l	0.10	6010	7 Sep 16 10:47	KMD
Boron - Dissolved	1.22	mg/l	0.10	6010	12 Sep 16 12:45	KMD
Antimony - Total	< 0.001	mg/l	0.0010	6020	12 Sep 16 9:20	KMD
Arsenic - Total	0.0030	mg/l	0.0020	6020	16 Sep 16 19:18	CC
Barium - Total	0.0233	mg/l	0.0020	6020	12 Sep 16 9:20	KMD
Beryllium - Total	< 0.0005	mg/l	0.0005	6020	12 Sep 16 9:20	KMD
Cadmium - Total	< 0.0005	mg/l	0.0005	6020	12 Sep 16 9:20	KMD
Chromium - Total	< 0.002	mg/l	0.0020	6020	12 Sep 16 9:20	KMD
Cobalt - Total	< 0.005 @	mg/l	0.0020	6020	16 Sep 16 19:19	CC
Lead - Total	< 0.0005	mg/l	0.0005	6020	12 Sep 16 9:20	KMD
Molybdenum - Total	0.0030	mg/l	0.0020	6020	12 Sep 16 9:20	KMD
Selenium - Total	0.0022	mg/l	0.0020	6020	12 Sep 16 9:20	KMD
Thallium - Total	< 0.0005	mg/l	0.0005	6020	12 Sep 16 9:20	KMD
Antimony - Dissolved	< 0.001	mg/l	0.0010	6020	12 Sep 16 10:30	KMD
Arsenic - Dissolved	0.0038	mg/l	0.0020	6020	16 Sep 16 19:18	CC
Barium - Dissolved	0.0210	mg/l	0.0020	6020	12 Sep 16 10:30	KMD
Beryllium - Dissolved	< 0.001 ^	mg/1	0.0005	6020	13 Sep 16 10:50	KMD
Cadmium - Dissolved	< 0.0005	mg/l	0.0005	6020	12 Sep 16 10:30	KMD

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



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

Report Date: 19 Sep 16 Lab Number: 16-W3783 Work Order #:82-2694 Account #: 002800 Date Sampled: 29 Aug 16

Date Received: 30 Aug 16 8:00 Sampled By: MVTL Field Services

Project Name: MDU Heskett CCR GW August 2016

Sample Description: Dup 1

Temp at Receipt: 3.4C ROI

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
Chromium - Dissolved	< 0.002 mg/l	0.0020	6020	12 Sep 16 10:30	KMD
Cobalt - Dissolved	< 0.005 @ mg/l	0.0020	6020	16 Sep 16 19:18	CC
Lead - Dissolved	< 0.0005 mg/l	0.0005	6020	16 Sep 16 19:18	CC
Molybdenum - Dissolved	0.0022 mg/l	0.0020	6020	12 Sep 16 10:30	KMD
Selenium - Dissolved	0.0022 mg/l	0.0020	6020	12 Sep 16 10:30	KMD
Thallium - Dissolved	< 0.0005 mg/l	0.0005	6020	12 Sep 16 10:30	KMD

\* Holding time exceeded

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

Approved by:

Claudite K. Canto

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



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

Project Name: MDU Heskett CCR GW August 2016 Sample Description: Field Blank (FB)

1 of 2 Page:

Report Date: 19 Sep 16 Lab Number: 16-W3784 Work Order #:82-2694 Account #: 002800

Date Sampled: 29 Aug 16

Date Received: 30 Aug 16 8:00 Sampled By: MVTL Field Services

Temp at Receipt: 3.4C ROI

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
	Result	N.L	NOI CI CII CII C		
Metal Digestion			EPA 200.2	30 Aug 16	ML
рН	* 6.0 units	N/A	SM4500 H+ B	30 Aug 16 17:00	ML
Total Suspended Solids	< 1 mg/l	1	I3765-85	30 Aug 16 15:44	ML
Total Alkalinity	< 20 mg/l CaCO	3 20	SM2320-B	30 Aug 16 17:00	ML
Fluoride	< 0.1 mg/1	0.10	SM4500-F-C	30 Aug 16 17:00	ML
Sulfate	< 5 mg/l	5.00	ASTM D516-07	2 Sep 16 9:10	EMS
Chloride	< 1 mg/l	1.0	SM4500-C1-E	1 Sep 16 11:15	EMS
Mercury - Total	< 0.0002 mg/1	0.0002	EPA 245.1	31 Aug 16 11:29	EV
Mercury - Dissolved	< 0.0002 mg/l	0.0002	EPA 245.1	31 Aug 16 12:30	EV
Total Dissolved Solids	< 5 mg/l	5	I1750-85	30 Aug 16 14:30	ML
Calcium - Total	< 1 mg/l	1.0	6010	2 Sep 16 12:24	SZ
Magnesium - Total	< 1 mg/l	1.0	6010	2 Sep 16 12:24	SZ
Sodium - Total	< 1 mg/l	1.0	6010	2 Sep 16 12:24	SZ
Potassium - Total	< 1 mg/l	1.0	6010	2 Sep 16 12:24	SZ
Lithium - Total	< 0.1 mg/l	0.10	6010	7 Sep 16 9:47	KMD
Boron - Total	< 0.1 mg/l	0.10	6010	6 Sep 16 14:12	KMD
Calcium - Dissolved	< 1 mg/l	1.0	6010	12 Sep 16 13:23	KMD
Magnesium - Dissolved	< 1 mg/l	1.0	6010	12 Sep 16 13:23	KMD
Sodium - Dissolved	< 1 mg/l	1.0	6010	12 Sep 16 13:23	KMD
Potassium - Dissolved	< 1 mg/l	1.0	6010	12 Sep 16 13:23	KMD
Lithium - Dissolved	< 0.1 mg/l	0.10	6010	7 Sep 16 10:47	
Boron - Dissolved	< 0.1 mg/l	0.10	6010	30 Aug 16 15:23	KMD
Antimony - Total	< 0.001 mg/1	0.0010	6020	12 Sep 16 9:20	KMD
Arsenic - Total	< 0.002 mg/1	0.0020	6020	12 Sep 16 9:20	KMD
Barium - Total	< 0.002 mg/1	0.0020	6020	12 Sep 16 9:20	KMD
Beryllium - Total	< 0.0005 mg/1	0.0005	6020	12 Sep 16 9:20	KMD
Cadmium - Total	< 0.0005 mg/1	0.0005	6020	12 Sep 16 9:20	KMD
Chromium - Total	< 0.002 mg/1	0.0020	6020	12 Sep 16 9:20	KMD
Cobalt - Total	< 0.002 mg/1	0.0020	6020	12 Sep 16 9:20	KMD
Lead - Total	< 0.0005 mg/l	0.0005	6020	12 Sep 16 9:20	KMD
Molybdenum - Total	< 0.002 mg/1	0.0020	6020	12 Sep 16 9:20	KMD
Selenium - Total	< 0.002 mg/1	0.0020	6020	12 Sep 16 9:20	KMD
Thallium - Total	< 0.0005 mg/1	0.0005	6020	12 Sep 16 9:20	KMD
Antimony - Dissolved	< 0.001 mg/1	0.0010	6020	12 Sep 16 10:30	KMD
Arsenic - Dissolved	< 0.002 mg/1	0.0020	6020	12 Sep 16 10:30	KMD
Barium - Dissolved	< 0.002 mg/l	0.0020	6020	12 Sep 16 10:30	KMD
Beryllium - Dissolved	< 0.001 ^ mg/l	0.0005	6020	13 Sep 16 10:50	KMD
Cadmium - Dissolved	< 0.0005 mg/l	0.0005	6020	12 Sep 16 10:30	KMD

RL = Method Reporting Limit

The reporting limit was elevated for any analyte requiring a dilution as coded below:  $\emptyset$  = Due to sample matrix # = Due to core ! = Due to sample quantity + = Due to into

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



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Report Date: 19 Sep 16 Lab Number: 16-W3784 Work Order #:82-2694 Account #: 002800 Date Sampled: 29 Aug 16

Date Received: 30 Aug 16 8:00

Sampled By: MVTL Field Services

Project Name: MDU Heskett CCR GW August 2016

Sample Description: Field Blank (FB)

Montana Dakota Utilities

Samantha Marshall

Bismarck ND 58501

400 N. 4th

Temp at Receipt: 3.4C ROI

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
Chromium - Dissolved	< 0.002 mg/l	0.0020	6020	12 Sep 16 10:30	KMD
Cobalt - Dissolved	< 0.002 mg/l	0.0020	6020	12 Sep 16 10:30	KMD
Lead - Dissolved	< 0.0005 mg/l	0.0005	6020	12 Sep 16 10:30	KMD
Molybdenum - Dissolved	< 0.002 mg/l	0.0020	6020	12 Sep 16 10:30	KMD
Selenium - Dissolved	< 0.002 mg/l	0.0020	6020	12 Sep 16 10:30	KMD
Thallium - Dissolved	< 0.0005 mg/l	0.0005	6020	12 Sep 16 10:30	KMD

<sup>\*</sup> Holding time exceeded

Approved by:

Claudite K. Canto

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 con
! = Due to sample quantity + = Due to int

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

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



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

Report Date: 19 Sep 16 Lab Number: 16-W3785 Work Order #:82-2694 Account #: 002800

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Page:

Date Sampled: 29 Aug 16 9:01 Date Received: 30 Aug 16 8:00 Sampled By: MVTL Field Services

Project Name: MDU Heskett CCR GW August 2016

Sample Description: MW13

Temp at Receipt: 3.4C ROI

	As Receive Result	ed	Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	30 Aug 16	ML
рН	* 6.8	units	N/A	SM4500 H+ B	30 Aug 16 17:00	ML
Total Suspended Solids	10	mg/l	1	I3765-85	30 Aug 16 15:44	ML
pH - Field	6.81	units	NA	SM 4500 H+ B	29 Aug 16 9:01	DJN
Temperature - Field	12.4	Degrees C	NA	SM 2550B	29 Aug 16 9:01	DJN
Total Alkalinity	503	mg/l CaCO3	20	SM2320-B	30 Aug 16 17:00	ML
Conductivity - Field	10873	umhos/cm	1	EPA 120.1	29 Aug 16 9:01	DJN
Fluoride	0.85	mg/l	0.10	SM4500-F-C	30 Aug 16 17:00	ML
Sulfate	6440	mg/1	5.00	ASTM D516-07	2 Sep 16 9:10	EMS
Chloride	80.7	mg/1	1.0	SM4500-C1-E	1 Sep 16 11:15	EMS
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	31 Aug 16 11:29	EV
Mercury - Dissolved	< 0.0002	mg/l	0.0002	EPA 245.1	31 Aug 16 12:30	EV
Total Dissolved Solids	9660	mg/l	5	I1750-85	30 Aug 16 14:30	ML
Calcium - Total	402	mg/l	1.0	6010	12 Sep 16 13:23	KMD
Magnesium - Total	620	mg/l	1.0	6010	12 Sep 16 13:23	KMD
Sodium - Total	1890	mg/l	1.0	6010	12 Sep 16 13:23	KMD
Potassium - Total	23.0	mg/l	1.0	6010	12 Sep 16 13:23	KMD
Lithium - Total	0.94	mg/l	0.10	6010	7 Sep 16 9:47	KMD
Boron - Total ·	0.72	mg/l	0.10	6010	6 Sep 16 14:12	KMD
Calcium - Dissolved	426	mg/l	1.0	6010	12 Sep 16 13:23	KMD
Magnesium - Dissolved	655	mg/l	1.0	6010	12 Sep 16 13:23	KMD
Sodium - Dissolved	2040	mg/l	1.0	6010	12 Sep 16 13:23	KMD
Potassium - Dissolved	25.1	mg/l	1.0	6010	12 Sep 16 13:23	KMD
Lithium - Dissolved	0.92	mg/l	0.10	6010	7 Sep 16 10:47	KMD
Boron - Dissolved	0.61	mg/l	0.10	6010	30 Aug 16 15:23	KMD
Antimony - Total	< 0.001	mg/l	0.0010	6020	12 Sep 16 9:20	KMD
Arsenic - Total	< 0.002	mg/l	0.0020	6020	12 Sep 16 9:20	KMD
Barium - Total	0.0071	mg/l	0.0020	6020	12 Sep 16 9:20	KMD
Beryllium - Total	< 0.0005	mg/l	0.0005	6020	12 Sep 16 9:20	KMD
Cadmium - Total	< 0.0005	mg/l	0.0005	6020	12 Sep 16 9:20	KMD
Chromium - Total	< 0.002	mg/l	0.0020	6020	12 Sep 16 9:20	KMD
Cobalt - Total	< 0.002	mg/l	0.0020	6020	12 Sep 16 9:20	KMD
Lead - Total	< 0.0005	mg/l	0.0005	6020	12 Sep 16 9:20	KMD
Molybdenum - Total	< 0.002	mg/l	0.0020	6020	12 Sep 16 9:20	KMD
Selenium - Total	0.0502	mg/l	0.0020	6020	12 Sep 16 9:20	KMD
Thallium - Total	< 0.0005	mg/l	0.0005	6020	12 Sep 16 9:20	KMD
Antimony - Dissolved	< 0.001	mg/l	0.0010	6020	12 Sep 16 10:30	KMD
Arsenic - Dissolved	< 0.002	mg/l	0.0020	6020	12 Sep 16 10:30	KMD

RL = Method Reporting Limit

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

## = Due to sample matrix ## = Due to complete the configuration of t

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



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Samantha Marshall 400 N. 4th

Montana Dakota Utilities Bismarck ND 58501

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Report Date: 19 Sep 16 Lab Number: 16-W3785 Work Order #:82-2694 Account #: 002800

Date Sampled: 29 Aug 16 9:01 Date Received: 30 Aug 16 8:00 Sampled By: MVTL Field Services

Temp at Receipt: 3.4C ROI

Project Name: MDU Heskett CCR GW August 2016 Sample Description: MW13

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
Barium - Dissolved	0.0066 mg/l	0.0020	6020	12 Sep 16 10:30	KMD
Beryllium - Dissolved	< 0.001 ^ mg/l	0.0005	6020	13 Sep 16 10:50	KMD
Cadmium - Dissolved	< 0.0005 mg/l	0.0005	6020	12 Sep 16 10:30	KMD
Chromium - Dissolved	< 0.002 mg/l	0.0020	6020	12 Sep 16 10:30	KMD
Cobalt - Dissolved	< 0.002 mg/l	0.0020	6020	12 Sep 16 10:30	KMD -
Lead - Dissolved	< 0.0005 mg/l	0.0005	6020	12 Sep 16 10:30	KMD
Molybdenum - Dissolved	< 0.002 mg/l	0.0020	6020	12 Sep 16 10:30	KMD
Selenium - Dissolved	0.0540 mg/l	0.0020	6020	12 Sep 16 10:30	KMD
Thallium - Dissolved	< 0.0005 mg/l	0.0005	6020	12 Sep 16 10:30	KMD

\* Holding time exceeded

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

Approved by:

Claudette K. Canto

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 co
! = Due to sample quantity + = Due to in

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



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

Project Name: MDU Heskett CCR GW August 2016

Sample Description: MW103

1 of 2 Page:

Report Date: 19 Sep 16 Lab Number: 16-W3786 Work Order #:82-2694 Account #: 002800

Date Sampled: 29 Aug 16 10:44 Date Received: 30 Aug 16 8:00 Sampled By: MVTL Field Services

Temp at Receipt: 3.4C ROI

	As Receive Result	ed	Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion			1	EPA 200.2	30 Aug 16	ML
	* 6.7	units	N/A	SM4500 H+ B	30 Aug 16 17:00	ML
Total Suspended Solids	4	mg/l	1	I3765-85	30 Aug 16 15:44	ML
pH - Field	6.64	units	NA	SM 4500 H+ B	29 Aug 16 10:44	DJN
Temperature - Field	11.1	Degrees C	NA	SM 2550B	29 Aug 16 10:44	DJN
Total Alkalinity	445	mg/l CaCO3	20	SM2320-B	30 Aug 16 17:00	ML
Conductivity - Field	5247	umhos/cm	1	EPA 120.1	29 Aug 16 10:44	DJN
Fluoride	0.18	mg/l	0.10	SM4500-F-C	30 Aug 16 17:00	ML
Sulfate	2790	mg/1	5.00	ASTM D516-07	2 Sep 16 9:10	EMS
Chloride	145	mg/l	1.0	SM4500-C1-E	1 Sep 16 11:15	EMS
Mercury - Total	< 0.0002	mg/1	0.0002	EPA 245.1	31 Aug 16 11:29	EV
Mercury - Dissolved	< 0.0002	mg/1	0.0002	EPA 245.1	31 Aug 16 12:30	EV
Total Dissolved Solids	4460	mg/l	5	I1750-85	30 Aug 16 14:30	ML
Calcium - Total	555	mg/l	1.0	6010	2 Sep 16 12:24	SZ
Magnesium - Total	496	mg/l	1.0	6010	2 Sep 16 12:24	SZ
Sodium - Total	240	mg/1	1.0	6010	2 Sep 16 12:24	SZ
Potassium - Total	20.1	mg/l	1.0	6010	2 Sep 16 12:24	SZ
Lithium - Total	0.81	mg/1	0.10	6010	7 Sep 16 9:47	KMD
Boron - Total	0.21	mg/l	0.10	6010	6 Sep 16 14:12	KMD
Calcium - Dissolved	540	mg/l	1.0	6010	12 Sep 16 13:23	KMD
Magnesium - Dissolved	484	mg/l	1.0	6010	12 Sep 16 13:23	KMD
Sodium - Dissolved	262	mg/l	1.0	6010	12 Sep 16 13:23	KMD
Potassium - Dissolved	20.4	mg/l	1.0	6010	12 Sep 16 13:23	KMD
Lithium - Dissolved	0.83	mg/l	0.10	6010	7 Sep 16 10:47	KMD
Boron - Dissolved	< 0.2 @	mg/l	0.10	6010	30 Aug 16 15:23	KMD
Antimony - Total	< 0.001	mg/l	0.0010	6020	12 Sep 16 9:20	KMD
Arsenic - Total	< 0.002	mg/1	0.0020	6020	12 Sep 16 9:20	KMD
Barium - Total	0.0101	mg/l	0.0020	6020	12 Sep 16 9:20	KMD
Beryllium - Total	< 0.0005	mg/l	0.0005	6020	12 Sep 16 9:20	KMD
Cadmium - Total	< 0.0005	mg/1	0.0005	6020	12 Sep 16 9:20	KMD
Chromium - Total	< 0.002	mg/1	0.0020	6020	12 Sep 16 9:20	KMD
Cobalt - Total	< 0.002	mg/1	0.0020	6020	12 Sep 16 9:20	KMD
Lead - Total	< 0.0005	mg/1	0.0005	6020	12 Sep 16 9:20	KMD
Molybdenum - Total	< 0.002	mg/1	0.0020	6020	12 Sep 16 9:20	KMD
Selenium - Total	0.0618	mg/1	0.0020	6020	12 Sep 16 9:20	KMD
Thallium - Total	< 0.0005	mg/1	0.0005	6020	12 Sep 16 9:20	KMD
Antimony - Dissolved	< 0.0005	mg/1	0.0010	6020	12 Sep 16 10:30	KMD
Arsenic - Dissolved	< 0.001	mg/1	0.0020	6020	12 Sep 16 10:30	KMD
Atsente - Dissolved	< 0.00Z		5.0020	5526		

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



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

Project Name: MDU Heskett CCR GW August 2016 Sample Description: MW103

2 of 2 Page:

Report Date: 19 Sep 16 Lab Number: 16-W3786 Work Order #:82-2694 Account #: 002800

Date Sampled: 29 Aug 16 10:44 Date Received: 30 Aug 16 8:00 Sampled By: MVTL Field Services

Temp at Receipt: 3.4C ROI

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
Barium - Dissolved	0.0084 mg/l	0.0020	6020	12 Sep 16 10:30	KMD
Beryllium - Dissolved	< 0.001 ^ mg/l	0.0005	6020	13 Sep 16 10:50	KMD
Cadmium - Dissolved	< 0.0005 mg/l	0.0005	6020	12 Sep 16 10:30	KMD
Chromium - Dissolved	< 0.002 mg/l	0.0020	6020	12 Sep 16 10:30	KMD
Cobalt - Dissolved	< 0.002 mg/l	0.0020	6020	12 Sep 16 10:30	KMD
Lead - Dissolved	< 0.0005 mg/1	0.0005	6020	12 Sep 16 10:30	KMD
Molybdenum - Dissolved	< 0.002 mg/1	0.0020	6020	12 Sep 16 10:30	KMD
Selenium - Dissolved	0.0718 mg/l	0.0020	6020	12 Sep 16 10:30	KMD
Thallium - Dissolved	< 0.0005 mg/l	0.0005	6020	12 Sep 16 10:30	KMD

\* Holding time exceeded

Approved by:

Claudite K. Canto

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 con
! = Due to sample quantity + = Due to int

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

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



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Samantha Marshall 400 N. 4th

Montana Dakota Utilities Bismarck ND 58501

Page: 1 of 2

Report Date: 19 Sep 16 Lab Number: 16-W3787 Work Order #:82-2694 Account #: 002800

Date Sampled: 29 Aug 16 12:16 Date Received: 30 Aug 16 8:00 Sampled By: MVTL Field Services

Project Name: MDU Heskett CCR GW August 2016

Sample Description: MW44R

Temp at Receipt: 3.4C ROI

Result   RL   Reference   Analyzed   Analyst
pH * 6.6 units N/A SM4500 H+ B 30 Aug 16 17:00 ML Total Suspended Solids 4 mg/l 1 T3765-85 30 Aug 16 15:44 ML pH - Field 6.50 units NA SM 4500 H+ B 29 Aug 16 12:16 DJN Temperature - Field 11.8 Degrees C NA SM 2550B 29 Aug 16 12:16 DJN Total Alkalinity 453 mg/l CaCO3 20 SM2320-B 30 Aug 16 17:00 ML Conductivity - Field 9498 umhos/cm 1 EPA 120.1 29 Aug 16 12:16 DJN Fluoride 0.65 mg/l 0.10 SM4500-F-C 30 Aug 16 17:00 ML Sulfate 5780 mg/l 5.00 ASTM D516-07 2 Sep 16 9:31 EMS Chloride 271 mg/l 1.0 SM4500-Cl-E 1 Sep 16 11:15 EMS Mercury - Total <0.0002 mg/l 0.0002 EPA 245.1 31 Aug 16 11:29 EV
pH * 6.6 units N/A SM4500 H+ B 30 Aug 16 17:00 ML Total Suspended Solids 4 mg/l 1 T3765-85 30 Aug 16 15:44 ML pH - Field 6.50 units NA SM 4500 H+ B 29 Aug 16 12:16 DJN Temperature - Field 11.8 Degrees C NA SM 2550B 29 Aug 16 12:16 DJN Total Alkalinity 453 mg/l CaCO3 20 SM2320-B 30 Aug 16 17:00 ML Conductivity - Field 9498 umhos/cm 1 EPA 120.1 29 Aug 16 12:16 DJN Fluoride 0.65 mg/l 0.10 SM4500-F-C 30 Aug 16 17:00 ML Sulfate 5780 mg/l 5.00 ASTM D516-07 2 Sep 16 9:31 EMS Chloride 271 mg/l 1.0 SM4500-Cl-E 1 Sep 16 11:15 EMS Mercury - Total <0.0002 mg/l 0.0002 EPA 245.1 31 Aug 16 11:29 EV
Total Suspended Solids 4 mg/l 1 T3765-85 30 Aug 16 15:44 ML pH - Field 6.50 units NA SM 4500 H+ B 29 Aug 16 12:16 DJN Temperature - Field 11.8 Degrees C NA SM 2550B 29 Aug 16 12:16 DJN Total Alkalinity 453 mg/l CaCO3 20 SM2320-B 30 Aug 16 17:00 ML Conductivity - Field 9498 umhos/cm 1 EPA 120.1 29 Aug 16 12:16 DJN Fluoride 0.65 mg/l 0.10 SM4500-F-C 30 Aug 16 17:00 ML Sulfate 5780 mg/l 5.00 ASTM D516-07 2 Sep 16 9:31 EMS Chloride 271 mg/l 1.0 SM4500-Cl-E 1 Sep 16 11:15 EMS Mercury - Total <0.0002 mg/l 0.0002 EPA 245.1 31 Aug 16 11:29 EV
pH - Field     6.50     units     NA     SM 4500 H+ B     29 Aug 16 12:16 DJN       Temperature - Field     11.8 Degrees C     NA     SM 2550B     29 Aug 16 12:16 DJN       Total Alkalinity     453 mg/l CaCO3 20 SM2320-B     30 Aug 16 17:00 ML       Conductivity - Field     9498 umhos/cm     1 EPA 120.1 29 Aug 16 12:16 DJN       Fluoride     0.65 mg/l     0.10 SM4500-F-C 30 Aug 16 17:00 ML       Sulfate     5780 mg/l     5.00 ASTM D516-07 2 Sep 16 9:31 EMS       Chloride     271 mg/l     1.0 SM4500-Cl-E 1 Sep 16 11:15 EMS       Mercury - Total     < 0.0002 mg/l
Temperature - Field 11.8 Degrees C NA SM 2550B 29 Aug 16 12:16 DJN Total Alkalinity 453 mg/l CaCO3 20 SM2320-B 30 Aug 16 17:00 ML Conductivity - Field 9498 umhos/cm 1 EPA 120.1 29 Aug 16 12:16 DJN Fluoride 0.65 mg/l 0.10 SM4500-F-C 30 Aug 16 17:00 ML Sulfate 5780 mg/l 5.00 ASTM D516-07 2 Sep 16 9:31 EMS Chloride 271 mg/l 1.0 SM4500-Cl-E 1 Sep 16 11:15 EMS Mercury - Total < 0.0002 mg/l 0.0002 EPA 245.1 31 Aug 16 11:29 EV
Total Alkalinity 453 mg/l CaCO3 20 SM2320-B 30 Aug 16 17:00 ML Conductivity - Field 9498 umhos/cm 1 EPA 120.1 29 Aug 16 12:16 DJN Fluoride 0.65 mg/l 0.10 SM4500-F-C 30 Aug 16 17:00 ML Sulfate 5780 mg/l 5.00 ASTM D516-07 2 Sep 16 9:31 EMS Chloride 271 mg/l 1.0 SM4500-Cl-E 1 Sep 16 11:15 EMS Mercury - Total <0.0002 mg/l 0.0002 EPA 245.1 31 Aug 16 11:29 EV
Conductivity - Field       9498       umhos/cm       1       EPA 120.1       29 Aug 16 12:16 DJN         Fluoride       0.65       mg/l       0.10       SM4500-F-C       30 Aug 16 17:00 ML         Sulfate       5780       mg/l       5.00       ASTM D516-07       2 Sep 16 9:31 EMS         Chloride       271       mg/l       1.0       SM4500-Cl-E       1 Sep 16 11:15 EMS         Mercury - Total       < 0.0002
Fluoride 0.65 mg/l 0.10 SM4500-F-C 30 Aug 16 17:00 ML Sulfate 5780 mg/l 5.00 ASTM D516-07 2 Sep 16 9:31 EMS Chloride 271 mg/l 1.0 SM4500-Cl-E 1 Sep 16 11:15 EMS Mercury - Total < 0.0002 mg/l 0.0002 EPA 245.1 31 Aug 16 11:29 EV
Sulfate     5780     mg/l     5.00     ASTM D516-07     2 Sep 16 9:31 EMS       Chloride     271     mg/l     1.0     SM4500-Cl-E     1 Sep 16 11:15 EMS       Mercury - Total     < 0.0002
Chloride 271 mg/l 1.0 SM4500-Cl-E 1 Sep 16 11:15 EMS Mercury - Total < 0.0002 mg/l 0.0002 EPA 245.1 31 Aug 16 11:29 EV
Mercury - Total < 0.0002 mg/l 0.0002 EPA 245.1 31 Aug 16 11:29 EV
real contract the contract of
Management Discalated . 0.0000 mm/l 0.0000 EDA 045 1 31 Aug 16 10 20 EW
Mercury - Dissolved < 0.0002 mg/l 0.0002 EPA 245.1 31 Aug 16 12:30 EV
Total Dissolved Solids 8880 mg/l 5 I1750-85 30 Aug 16 14:30 ML
Calcium - Total 444 mg/l 1.0 6010 12 Sep 16 13:23 KMD
Magnesium - Total 1020 mg/l 1.0 6010 12 Sep 16 13:23 KMD
Sodium - Total 1080 mg/l 1.0 6010 12 Sep 16 13:23 KMD
Potassium - Total 32.8 mg/l 1.0 6010 12 Sep 16 13:23 KMD
Lithium - Total 1.89 mg/l 0.10 6010 7 Sep 16 9:47 KMD
Boron - Total 0.44 mg/l 0.10 6010 6 Sep 16 14:12 KMD
Calcium - Dissolved 434 mg/l 1.0 6010 12 Sep 16 13:23 KMD
Magnesium - Dissolved 1000 mg/l 1.0 6010 12 Sep 16 13:23 KMD
Sodium - Dissolved 1060 mg/l 1.0 6010 12 Sep 16 13:23 KMD
Potassium - Dissolved 32.3 mg/l 1.0 6010 12 Sep 16 13:23 KMD
Lithium - Dissolved 1.76 mg/l 0.10 6010 7 Sep 16 10:47 KMD
Boron - Dissolved 0.43 mg/l 0.10 6010 30 Aug 16 15:23 KMD
Antimony - Total < 0.001 mg/l 0.0010 6020 12 Sep 16 9:20 KMD
Arsenic - Total < 0.002 mg/l 0.0020 6020 12 Sep 16 9:20 KMD
Barium - Total 0.0068 mg/l 0.0020 6020 12 Sep 16 9:20 KMD
Beryllium - Total < 0.0005 mg/l 0.0005 6020 12 Sep 16 9:20 KMD
Cadmium - Total < 0.0005 mg/l 0.0005 6020 12 Sep 16 9:20 KMD
Chromium - Total < 0.002 mg/l 0.0020 6020 12 Sep 16 9:20 KMD
Cobalt - Total < 0.002 mg/l 0.0020 6020 12 Sep 16 9:20 KMD
Lead - Total < 0.0005 mg/l 0.0005 6020 12 Sep 16 9:20 KMD
Molybdenum - Total < 0.002 mg/l 0.0020 6020 12 Sep 16 9:20 KMD
Selenium - Total 0.0815 mg/l 0.0020 6020 12 Sep 16 9:20 KMD
Thallium - Total < 0.0005 mg/l 0.0005 6020 12 Sep 16 9:20 KMD
Antimony - Dissolved < 0.001 mg/l 0.0010 6020 12 Sep 16 10:30 KMD
Arsenic - Dissolved < 0.002 mg/l 0.0020 6020 12 Sep 16 10:30 KMD

RL = Method Reporting Limit

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© = Due to sample matrix # = Due to com
! = Due to sample quantity + = Due to int

# = Due to concentration of other analytes
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Samantha Marshall

Montana Dakota Utilities 400 N. 4th Bismarck ND 58501

Sample Description: MW44R

Project Name: MDU Heskett CCR GW August 2016

Page: 2 of 2

Report Date: 19 Sep 16 Lab Number: 16-W3787 Work Order #:82-2694 Account #: 002800

Date Sampled: 29 Aug 16 12:16 Date Received: 30 Aug 16 8:00 Sampled By: MVTL Field Services

Temp at Receipt: 3.4C ROI

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
Barium - Dissolved	0.0066 mg/l	0.0020	6020	12 Sep 16 10:30	KMD
Beryllium - Dissolved	< 0.001 ^ mg/l	0.0005	6020	13 Sep 16 10:50	KMD
Cadmium - Dissolved	< 0.0005 mg/l	0.0005	6020	12 Sep 16 10:30	KMD
Chromium - Dissolved	< 0.002 mg/l	0.0020	6020	12 Sep 16 10:30	KMD
Cobalt - Dissolved	< 0.002 mg/l	0.0020	6020	12 Sep 16 10:30	KMD
Lead - Dissolved	< 0.0005 mg/l	0.0005	6020	12 Sep 16 10:30	KMD
Molybdenum - Dissolved	< 0.002 mg/l	0.0020	6020	12 Sep 16 10:30	KMD
Selenium - Dissolved	0.0797 mg/l	0.0020	6020	12 Sep 16 10:30	KMD
Thallium - Dissolved	< 0.0005 mg/l	0.0005	6020	12 Sep 16 10:30	KMD

\* Holding time exceeded

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

Approved by:

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

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

Project Name: MDU Heskett CCR GW August 2016

Sample Description: MW102

Page: 1 of 2

Report Date: 19 Sep 16 Lab Number: 16-W3788 Work Order #:82-2694 Account #: 002800

Date Sampled: 29 Aug 16 14:07 Date Received: 30 Aug 16 8:00 Sampled By: MVTL Field Services

Temp at Receipt: 3.4C ROI

	As Receive Result	eđ	Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	20 Aug 16	ML
pH	* 6.8	units	N/A	SM4500 H+ B	30 Aug 16 30 Aug 16 17:00	(5.5.55)
Total Suspended Solids	11	mg/l	1	I3765-85	30 Aug 16 17:00	
pH - Field	6.76	units	NA.	SM 4500 H+ B	29 Aug 16 14:07	
Temperature - Field	13.8	Degrees C	NA	SM 2550B	29 Aug 16 14:07	
Total Alkalinity	544	mg/l CaCO3	20	SM2320-B	30 Aug 16 17:00	
Conductivity - Field	8160	umhos/cm	1	EPA 120.1	29 Aug 16 14:07	
Fluoride	0.22	mg/1	0.10	SM4500-F-C	30 Aug 16 17:00	
Sulfate	4020	mg/l	5.00	ASTM D516-07	2 Sep 16 9:31	
Chloride	6.4	mg/l	1.0	SM4500-C1-E	1 Sep 16 11:15	
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	31 Aug 16 11:29	
Mercury - Dissolved	< 0.0002	mg/1	0.0002	EPA 245.1	31 Aug 16 11:23	
Total Dissolved Solids	6940	mg/1	5	I1750-85	30 Aug 16 14:30	
Calcium - Total	464	mg/1	1.0	6010	12 Sep 16 13:23	
Magnesium - Total	358	mg/1	1.0	6010	12 Sep 16 13:23	
Sodium - Total	1320	mg/l	1.0	6010	12 Sep 16 13:23	
Potassium - Total	16.2	mg/1	1.0	6010	12 Sep 16 13:23	
Lithium - Total	1.06	mg/l	0.10	6010		
Boron - Total	1.11	mg/1	0.10	6010	7 Sep 16 9:47 12 Sep 16 12:45	
Calcium - Dissolved	447	mg/1	1.0	6010	12 Sep 16 12:45	
Magnesium - Dissolved	382	mg/l	1.0	6010	12 Sep 16 13:23	
Sodium - Dissolved	1560	mg/1	1.0	6010	12 Sep 16 13:23	
Potassium - Dissolved	17.9	mg/1	1.0	6010	12 Sep 16 13:23	
Lithium - Dissolved	1.08	mg/1	0.10	6010	7 Sep 16 13:23	
Boron - Dissolved	1.20	mg/1	0.10	6010	12 Sep 16 10:47	
Antimony - Total	< 0.001	mg/1	0.0010	6020	12 Sep 16 12:45	
Arsenic - Total	0.0031	mg/l	0.0010	6020	12 Sep 16 9:20	
Barium - Total	0.0234	mg/1	0.0020	6020	12 Sep 16 9:20	
Beryllium - Total	< 0.0005	mg/1	0.0025	6020	12 Sep 16 9:20	
Cadmium - Total	< 0.0005	mg/1	0.0005	6020		
Chromium - Total	< 0.0003	mg/l	0.0020	6020	12 Sep 16 9:20	
Cobalt - Total	< 0.002	mg/1	0.0020	6020	12 Sep 16 9:20	
Lead - Total	< 0.005 @	mg/1	0.0020	6020	16 Sep 16 19:18 12 Sep 16 9:20	
Molybdenum - Total	0.0030	mg/l	0.0020	6020	-	
Selenium - Total	< 0.002	mg/l	0.0020	6020	12 Sep 16 9:20	
Thallium - Total	< 0.002	mg/1	0.0020	6020	12 Sep 16 9:20	
Antimony - Dissolved	< 0.001	mg/1	0.0010	6020	12 Sep 16 9:20	KMD
Arsenic - Dissolved	0.0033	mg/l	0.0010	6020	12 Sep 16 10:30	
DIDDOIYCU	0.0033	1119/1	0.0020	6020	12 Sep 16 10:30	KMD

RL = Method Reporting Limit

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Samantha Marshall Montana Dakota Utilities 400 N. 4th

Bismarck ND 58501

Page: 2 of 2

Report Date: 19 Sep 16 Lab Number: 16-W3788 Work Order #:82-2694 Account #: 002800

Date Sampled: 29 Aug 16 14:07 Date Received: 30 Aug 16 8:00 Sampled By: MVTL Field Services

Project Name: MDU Heskett CCR GW August 2016

Sample Description: MW102

Temp at Receipt: 3.4C ROI

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
Barium - Dissolved	0.0208 mg/l	0.0020	6020	12 Sep 16 10:30	KMD
Beryllium - Dissolved	< 0.001 ^ mg/l	0.0005	6020	13 Sep 16 10:50	KMD
Cadmium - Dissolved	< 0.0005 mg/l	0.0005	6020	12 Sep 16 10:30	KMD
Chromium - Dissolved	< 0.002 mg/1	0.0020	6020	12 Sep 16 10:30	KMD
Cobalt - Dissolved	< 0.005 @ mg/l	0.0020	6020	12 Sep 16 10:30	KMD
Lead - Dissolved	< 0.0005 mg/l	0.0005	6020	12 Sep 16 10:30	KMD
Molybdenum - Dissolved	< 0.002 mg/1	0.0020	6020	12 Sep 16 10:30	KMD
Selenium - Dissolved	< 0.002 mg/1	0.0020	6020	12 Sep 16 10:30	KMD
Thallium - Dissolved	< 0.0005 mg/l	0.0005	6020	12 Sep 16 10:30	KMD

<sup>\*</sup> Holding time exceeded

Approved by:

Claudite K. Canto

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

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

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

# **MVTL**

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MEMBER ACIL

Quality Control Report
Lab IDs: 16-W3783 to 16-W3788

Project: MDU Heskett CCR GW August 2016

Work Ordon, 201692 2604

Page: 1 of 5

<b>Lab IDs:</b> 16-W3783 to 16-V	N3788	Pi	roject: Ml	DU Hesk	ett CCR GW		16	-1				Wo	rk Ord	er: 201682	2-2694		
Analyte	LCS Spike Amt	LCS Rec %	LCS % Rec Limits	Matrix Spike Amt	Matrix Spike ID	Matrix Spike Orig Result	Matrix Spike Result	Matrix Spike Rec %	Matrix Spike % Rec Limits	MSD/ Dup Orig Result	MSD/ Dup Result	MSD Rec %	MSD/ Dup RPD	MSD/ Dup RPD Limit (<)	Known Rec (%)	Known % Rec Limits	Method Blank
Antimony - Dissolved mg/l	0.1000	97	80-120	0.100	16W3830q	< 0.001	0.0990	99	75-125	0.0990	0.1070	107	7.8	20	-	-	< 0.001
Antimony - Total mg/l	0.1000	98	80-120	0.400 0.100	16W3829q 16W3786q	< 0.001 < 0.001	0.3952 0.1002	99 100	75-125 75-125	0.3952 0.1002	0.4246 0.1004	106 100	7.2 0.2	20 20	-	-	< 0.001 < 0.001
Arsenic - Dissolved mg/l	0.1000	98	80-120	0.100	16W3830q	< 0.002	0.1042	104	75-125	0.1042	0.1146	115	9.5	20	_	_	< 0.002
Arsenic - Total mg/l	0.1000 0.1000	111 99	80-120 80-120	0.400 0.100 0.400 0.400 0.400	16W3829q 16W3786q 16W3957q 16W3968q 16W4006q	< 0.002 < 0.002 < 0.002 < 0.002 0.0023	0.4044 0.1075 0.4454 0.4664 0.4334	101 108 111 117 108	75-125 75-125 75-125 75-125 75-125	0.4044 0.1075 0.4454 0.4664 0.4334	0.4444 0.1054 0.4466 0.5048 0.4374	111 105 112 126 109	9.4 2.0 0.3 7.9 0.9	20 20 20 20 20 20		-	< 0.002 < 0.002 < 0.002
Barium - Dissolved mg/I	0.1000	101	80-120	0.100	16W3830q	0.0185	0.1186	100	75-125	0.1186	0.1230	104	3.6	20	-	-	< 0.002
Barium - Total mg/l	0.1000	97	80-120	0.400 0.100	16W3829q 16W3786q	0.0133 0.0101	0.4256 0.1090	103 99	75-125 75-125	0.4256 0.1090	0.4442 0.1132	108 103	4.3 3.8	20 20	-	-	< 0.002 < 0.002
Beryllium - Dissolved mg/l	0.1000	107	80-120	0.100	16-W3830	< 0.001	0.0865	86	75-125	0.0865	0.0913	91	5.4	20	_	-	< 0.0005
Beryllium - Total mg/l	0.1000	102	80-120	0.400 0.100	16W3829q 16W3786q	< 0.0005 < 0.0005	0.4548 0.1174	114 117	75-125 75-125	0.4548 0.1174	0.4746 0.1162	119 116	4.3 1.0	20 20	-	-	< 0.0005 < 0.0005
Boron - Dissolved mg/l	0.40 0.40	112 108	80-120 80-120	1.50 0.600	16-W3788 16-W3788	1.34 1.20	2.94 1.87	107 112	75-125 75-125	2.94 1.87	2.94 1.83	107 105	0.0 2.2	20 20	-	-	< 0.1 < 0.1 < 0.1 < 0.1
Boron - Total mg/l	0.40 0.40 0.40	112 108 102	80-120 80-120 80-120	0.400 0.400 0.400 0.400 0.400	16-D3542 16-W3786 16-W3829 16-W3855 16-D3704	1.51 0.21 0.42 0.26 0.58	1.92 0.58 0.78 0.66 1.01	102 92 90 100 108	75-125 75-125 75-125 75-125 75-125	1.92 0.58 0.78 0.66 1.01	1.99 0.59 0.80 0.69 1.05	120 95 95 108 118	3.6 1.7 2.5 4.4 3.9	20 20 20 20 20 20	-		< 0.1 < 0.1 < 0.1 < 0.1 < 0.1 < 0.1
Cadmium - Dissolved mg/l	0.1000	105	80-120	0.100	16W3830q	< 0.0005	0.0982	98	75-125	0.0982	0.1066	107	8.2	20	-	-	< 0.0005
Cadmium - Total mg/l	0.1000	106	80-120	0.400 0.100	16W3829q 16W3786q	< 0.0005 < 0.0005	1	100 103	75-125 75-125	0.4002 0.1031	0.4410 0.1020	110 102	9.7 1.1	20 20	-	-	< 0.0005 < 0.0005

# **MVTL**

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MEMBER ACIL

Quality Control Report Lab IDs: 16-W3783 to 16-W3788

Project: MDU Heskett CCR GW August 2016

Page: 2 of 5

<b>Lab IDs:</b> 16-W3/83 to 16-V	<u> </u>	P:	roject: M	DU Hesk	ett CCR GW		16					Wo	rk Ord	er: 201682	2-2694		
Analyte	LCS Spike Amt	LCS Rec %	LCS % Rec Limits	Matrix Spike Amt	Matrix Spike ID	Matrix Spike Orig Result	Matrix Spike Result	Matrix Spike Rec %	Matrix Spike % Rec Limits	MSD/ Dup Orig Result	MSD/ Dup Result	MSD Rec %	MSD/ Dup RPD	MSD/ Dup RPD Limit (<)	Known Rec (%)	Known % Rec Limits	Method Blank
Calcium - Dissolved mg/l	20.0 20.0	108 106	80-120 80-120	500 500	16-W3827 16-W3869	505 445	1040 1020	107 115	75-125 75-125	1040 1020	1020 995	103 110	1.9 2.5	20 20	- - -	-	< 1 < 1 < 1 < 1
Calcium - Total mg/l	20.0 20.0 20.0	108 106 111	80-120 80-120 80-120	100 100 500 1000	16W3725q 16W3746q 16W3786q 16W3783q	98.6 27.1 555 472	192 124 1020 1470	93 97 93 100	75-125 75-125 75-125 75-125	192 124 1020 1470	190 127 1020 1580	91 100 93 111	1.0 2.4 0.0 7.2	20 20 20 20 20	-		<1 <1 <1 <1 <1 <1 <1 <1 <1 <1
Chloride mg/l	30.0	100	80-120	30.0	16-W3716	1.9	29.8	93	80-120	29.8	30.0	94	0.7	20	-	-	< I < 1
Chromium - Dissolved mg/l	0.1000	93	80-120	0.100	16W3830q	< 0.002	0.0973	97	75-125	0.0973	0.1060	106	8.6	20	_	-	< 0.002
Chromium - Total mg/l	0.1000	92	80-120	0.400 0.100	16W3829q 16W3786q	< 0.002 < 0.002	0.3686 0.1020	92 102	75-125 75-125	0.3686 0.1020	0.4086 0.1018	102 102	10.3	20 20	-	-	< 0.002 < 0.002
Cobalt - Dissolved mg/l	0.1000	93	80-120	0.100	16W3830q	< 0.002	0.0963	96	75-125	0.0963	0.1025	102	6.2	20	-	-	< 0.002
Cobalt - Total mg/l	0.1000 0.1000	102 93	80-120 80-120	0.400 0.100 0.400 0.400 0.400	16W3829q 16W3786q 16W3957q 16W3968q 16W4006q	<0.002 <0.002 <0.002 <0.002 0.0024 <0.002	0.3676 0.0980 0.3992 0.4122 0.3966	92 98 100 102 99	75-125 75-125 75-125 75-125 75-125	0.3676 0.0980 0.3992 0.4122 0.3966	0.4074 0.0993 0.4066 0.4440 0.3934	102 99 102 110 98	10.3 1.3 1.8 7.4 0.8	20 20 20 20 20 20		-	< 0.002 < 0.002 < 0.002
Fluoride mg/l	0.50	104	90-110	0.500	16-W3787	0.65	1.07	84	80-120	1.07	1.08	86	0.9	20	-	-	< 0.1 < 0.1
Lead - Dissolved mg/l	0.1000	99	80-120	0.100	16W3830q	< 0.0005	0.0920	92	75-125	0.0920	0.0940	94	2.2	20	-	-	< 0.0005
Lead - Total mg/l	0.1000	96	80-120	0.400 0.100	16W3829q 16W3786q	< 0.0005 < 0.0005	1	95 88	75-125 75-125	0.3788 0.0882	0.3914 0.0908	98 91	3.3 2.9	20 20	-	-	< 0.0005 < 0.0005

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Quality Control Report Lab IDs: 16-W3783 to 16-W3788

Project: MDU Heskett CCR GW August 2016

Work Order 201602 2604

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<b>Lab IDs:</b> 16-W3783 to 16-W	/3/88	P	roject: M	MDU Heskett CCR GW August 2016								Wo	rk Orde	er: 201682	2-2694		
Analyte	LCS Spike Amt	LCS Rec %	LCS % Rec Limits	Matrix Spike Amt	Matrix Spike ID	Matrix Spike Orig Result	Matrix Spike Result	Matrix Spike Rec %	Matrix Spike % Rec Limits	MSD/ Dup Orig Result	MSD/ Dup Result	MSD Rec %	MSD/ Dup RPD	MSD/ Dup RPD Limit (<)	Known Rec (%)	Known % Rec Limits	Method Blank
Lithium - Dissolved mg/l	0.40	100	80-120	0.800 0.800	16-W3827 16-W3869	1.24 1.39	1.87 2.13	79 93	75-125 75-125	1.87 2.13	1.91 2.05	84 82	2.1 3.8	20 20	-	-	< 0.1 < 0.1 < 0.1
Lithium - Total mg/l	0.40	92	80-120	0.400 0.400	16-W3786 16-W3829	0.81 0.44	1.19 0.92	95 120	75-125 75-125	1.19 0.92	1.18 0.93	92 122	0.8	20 20	-	-	< 0.1 < 0.1 < 0.1
Magnesium - Dissolved mg/l	20.0 20.0	111 108	80-120 80-120	500 500	16-W3827 16-W3869	720 880	1260 1460	108 116	75-125 75-125	1260 1460	1240 1420	104 108	1.6 2.8	20 20	-	-	<1 <1 <1 <1 <1
Magnesium - Total mg/l	20.0 20.0 20.0	111 108 114	80-120 80-120 80-120	100 100 500 1000	16W3725q 16W3746q 16W3786q 16W3783q	33.5 15.0 496 364	133 115 975 1400	100 100 96 104	75-125 75-125 75-125 75-125	133 115 975 1400	132 117 960 1480	98 102 93 112	0.8 1.7 1.6 5.6	20 20 20 20 20	-		<1 <1 <1 <1 <1 <1 <1 <1 <1 <1
Mercury - Dissolved mg/l	0.0020	100	85-115	0.002	16-W3788	< 0.0002	0.0020	100	70-130	0.0020	0.0019	95	5.1	20	_	_	< 0.0002
Mercury - Total mg/l	0.0020	100	85-115	0.002 0.002	16-W3675 16-W3788	< 0.0002 < 0.0002		90 90	70-130 70-130	0.0018 0.0018	0.0019 0.0018	95 90	5.4 0.0	20 20	-	-	< 0.0002
Molybdenum - Dissolved mg/l	0.1000	91	80-120	0.100	16-W3830	0.0021	0.1069	105	75-125	0.1069	0.1137	112	6.2	20	-	_	< 0.002
Molybdenum - Total mg/l	0.1000	96	80-120	0.400 0.100	16W3829q 16W3786q	0.0051 < 0.002	0.4414 0.1136	109 114	75-125 75-125	0.4414 0.1136	0.4610 0.1182	114 118	4.3 4.0	20 20	-	-	< 0.002 < 0.002
pH units	-	-	-	-	-	-	-	-	-	6.8 7.0	6.8 7.0	_	0.0	20 20	-	-	-
Potassium - Dissolved mg/l	10.0	106 103	80-120 80-120	100 100	16-W3827 16-W3869	23.4 20.5	136 140	113 120	75-125 75-125	136 140	134 137	111 116	1.5 2.2	20 20	-	- - -	< 1 < 1 < 1 < 1

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<b>Lab IDs:</b> 16-W3783 to 16-V	V3788	P	roject: M	DU Hesk	ett CCR GW		16					Wo	rk Ord	er: 201682	2-2694		
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 10.0	106 103 98	80-120 80-120 80-120	20.0 20.0 100 200	16W3725q 16W3746q 16W3786q 16W3783q	9.6 4.6 20.1 17.6	29.7 23.8 120 226	100 96 100 104	75-125 75-125 75-125 75-125	29.7 23.8 120 226	29.3 24.3 118 242	98 98 98 112	1.4 2.1 1.7 6.8	20 20 20 20 20	- - - -	- - - -	<1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1
Selenium - Dissolved mg/l	0.1000	110	80-120	0.100	16W3830q	< 0.002	0.1160	116	75-125	0.1160	0.1259	126	8.2	20	_	_	< 0.002
Selenium - Total mg/l	0.1000	115	80-120	0.400 0.100	16W3829q 16W3786q	0.0210 0.0618	0.4736 0.1796	113 118	75-125 75-125	0.4736 0.1796	0.5240 0.1859	126 124	10.1 3.4	20 20	-	-	< 0.002 < 0.002
Sodium - Dissolved mg/l	20.0	112	80-120 80-120	500 500	16-W3827 16-W3869	805 885	1340 1450	107 113	75-125 75-125	1340 1450	1300 1420	99 107	3.0 2.1	20 20	-	-	<1 <1 <1 <1
Sodium - Total mg/l	20.0 20.0 20.0	112 110 104	80-120 80-120 80-120	100 100 500 1000	16W3725q 16W3746q 16W3786q 16W3783q	256 107 240 1340	342 196 730 2350	86 89 98 101	75-125 75-125 75-125 75-125	342 196 730 2350	339 198 720 2470	83 91 96 113	0.9 1.0 1.4 5.0	20 20 20 20 20	-	-	<1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1
Sulfate mg/l	100 100	99 97	90-110 90-110	100 100	16-W3784 16-W3789	< 5 216	96.8 314	97 98	80-120 80-120	96.8 314	97.7 325	98 109	0.9	20 20	-	-	< 5 < 5
Thallium - Dissolved mg/l	0.1000	96	80-120	0.100	16W3830q	< 0.0005	0.0902	90	75-125	0.0902	0.0930	93	3.1	20	_	-	< 0.0003
Thallium - Total mg/l	0.1000	84	80-120	0.400 0.100	16W3829q 16W3786q	< 0.0005 < 0.0005	0.3548 0.0910	89 91	75-125 75-125	0.3548 0.0910	0.3738 0.0926	93 93	5.2 1.7	20 20	-	- ea	< 0.0005
Total Alkalinity mg/l CaCO3	410	99	90-110	410 410	16-W3785 16-W3791	503 445	896 845	96 98	80-120 80-120	896 845	895 847	96 98	0.1 0.2	20 20	95	80-120	< 20 < 20
Total Dissolved Solids mg/l	-	-	-	-	-	-	-	-	-	4460	4490	-	0.7	20	-	_	< 5

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**Quality Control Report** 

**Lab IDs:** 16-W3783 to 16-W3788 Project: MDU Heskett CCR GW August 2016

Work Order: 201682-2694

	LCS	LCS	LCS	Matrix	Matrix	Matrix Spike	Matrix	Matrix Spike	Matrix Spike	MSD/ Dup	MSD/	MSD	MSD/	MSD/		V	
Analyte	Spike Amt	Rec %	% Rec Limits	Spike Amt	Spike ID	Orig Result	Spike	Rec %	% Rec Limits	Orig Result	Dup Result	Rec %	60 484006400674866	RPD Limit (<)	Known Rec (%)	Known % Rec Limits	Method Blank
Total Suspended Solids mg/l	-	-		-	-	-	-	-	-	54 11	53 11	-	1.9 0.0	20 20	-	-	< 1

Amented
C. Caurel
23 Sep 2016



**Groundwater Assessment** 

Company:	MDU Heskett	
Event:	August 2016	
Sample ID:	MW13	
Sampling Per	onal: PACCED ACCEDAC	

Phone: (701) 258-9	720		_				- -			, ,		-	
Weather Conditions:		Temp:	63 °F		Wind:	NWS			Precip:	Suni	ny / Partiy C	loudy / Clo	udy
	Well Info	rmation						Sa	mpling l	nformatio	()		
Well Locked?	Yes	ØB∕				Purgir	ng Method:	Blad	der		Co	ntrol Setting	s
Well Labeled?	Yes	No				Samplir	ng Method:	Blad	der		Purge:	94	sec.
Casing Straight?	€es	No				Dedicat	ed Equip?:	Yes	No		Recover:	56	sec.
Grout Seal Intact?	(Yes)	No	Not Visi	ble		Duplicate	Sample?:	Yes	NO	1	PSI:	<i></i>	
Repairs Necessary:						Duplicate 5	Sample ID:				Pumping R	ate: 100	mL/min
Casing	Diameter:		2"										
Water Level Befo	ore Purge:	30	1.22	ft		P	urge Date:	29Au	916	Time Purg	ing Began:	0831	am)pm
Total W	/ell Depth:		<b></b>	ft		Well P	urged Dry?	Yes	MO.	Time F	urged Dry:		am/pm
We	ll Volume:			liters		Sa	mple Date:	29 Au	16	Time o	f Sampling:	m901	am/pm
Depth to Top	of Pump:	3^	7,10	ft								<del></del>	
Water Level Afte	er Sample:		30.72	ft		Bottle	500 m	L Nitric	1 Lite	r Raw			
Measuremen	t Method:	Electric V	Nater Level inc	licator		List:		500 mL Niti	ric (filtered)		4 - 1 Lit	er Nitric	
				Field	Measure	ements							

Stabili (3 cons	zation ecutive)	Temp (°C)	Spec. Cond.	рН	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Water Level (ft)	mL Removed	Discription: Clarity, Color, Odor, Ect.
SEQ#	Time		±5%	±0.1	±10%	±20 mV	±10%	0.25 ft		clear, slightly turbid, turbid
1	0836	11,30	10887	6.80	3.20	237.1	4.18	30.69	500	Ca
2	0841	11,70	10885	6.81	2,97	234,6	3.85	30,72	500	car
3	0846	11,74	10893	6,81	2,61	228,7	2.85	30,72	500	(Co
4	0851	11.80	10872	6.81	2.61	226,6	1,17	30,72	500	Chir
5	1856	12.30	10882	6.81	2,53	222.6	1,24	30,72	500	de
6	0901	12.41	10873	6.81	2,54	220,7	1.15	30,70	500	Chr
7				,	,	-				
8								4.		
9					1.,					
10 Stabilized:	(Yes)	No					otal Volume		2000	ml

Comments:

Total Volume Removed: 3000 mL



**Groundwater Assessment** 

Company:	MDU Heskett	
Event:	August 2016	
Sample ID:	nw103	
Sampling Person	al: Darce	1/20/8/11

								Sampling F	ersonai:	11000	CAN	1 CW	aux
Phone: (701) 258-9	9720									<del>U - ( ) · · · · · · · · · · · · · · · · · ·</del>	10		
					····		•					= ; ;	
Weather Conditions:		Temp:	<u> 68</u>	°F	Wind:	Light			Precip:	Sunt	ny / Partiy C	Cloudy / Cl	loudy
	Well Info	rmation						Sa	ampling I	nformatio	on ·		
Well Locked?	Yes	No)				Purgir	ng Method:	Blac	dder		Co	ntrol Settir	ngs
Well Labeled?	_(Yes	No				Samplir	ng Method:	Blad	dder		Purge:		sec.
Casing Straight?		No				Dedicat	ed Equip?:	(Yes)	No		Recover:	56	sec.
Grout Seal Intact?	Çes Yes	No	Not V	/isible		Duplicate	Sample?:	Yes	No		PSI:		
Repairs Necessary:	_					Duplicate :	Sample ID:				Pumping R	late: / ()	Ø mL/min
Casing	Diameter:		2"				······································		,			/_ <del></del> _	
Water Level Bef	fore Purge:	:	33.1L	ft		F	urge Date:	29 Au	طراه	Time Purg	ing Began:	1009	am/pm
Total V	Vell Depth:		~	ft		Well P	urged Dry?	Yes	/NO)	Time F	urged Dry:		am/pm
We	ell Volume:			liters		Sa	mple Date:	292	///-	Time of	Sampling:	1044	(am/pm
Depth to To	p of Pump:	4	Oilo	ft			<u> </u>	7: 1	<del>- 10</del>			757	/
Water Level After	er Sample:	3	7,14	ft		Bottle	500 m	L Nitric	1 Lite	r Raw			
Measuremer	nt Method:	Electric \	Nater Level	Indicator		List:		500 mL Ni	tric (filtered)		4 - 1 Lit	er Nitric	
							·						<del></del>
				Field	Measure	ments	<del></del>		<b>—</b>			i	
	ı		I	1 [		1	i	I	1				

	ecutive)	Temp (°C)	Spec. Cond.	рН	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Water Level (ft)	mL Removed	Discription: Clarity, Color, Odor, Ect.	
SEQ#	Time		±5%	±0.1	±10%	±20 mV	±10%	0.25 ft		clear, slightly turbid, turbid	
1	1014	10.93	5272	6.62	4.60	202.3	3.79	34,42	500	de	
2	1019	11,26	5269	GAGGI	15.4.88	201,2	3,52	-34,54	500	dy	
3	1024	10,95	5267	6.64	4,22	200.1	2,25	34,73	5004	d	
4	1029	10,86	5263	6-64	4.11	12/99.0	2116	34,87	500	d_	
5	1034	10,59	5261	6.64	5,68	197,9	1155	35.06	500	dr	
6	1029	10,74	5250	6.64	5.54	197,5	1,60	35.16	500	On	
7	1044	1107	5247	6.64	5,23	197.0	1.63	35,24	500	ch	
8		ĺ									
9											
10							-			TOV	
Stabilized:	Yes /	No Total Volume Removed: (5) 3 mL									

Comments:



**Groundwater Assessment** 

Company:	MDU Heskett	
Event:	August 2016	
Sample ID:	MWYUR	
Sampling Pe	rsonal:	1/5080000

Phone: (701) 258-9720

Weather C	onditions:		Temp:	72	°F	Wind: /	NW5			Precip:	Sunr	ny / Partly C	loudy / Clo	udv
		Well Info	ormation						Sa	·	nformatio	7	, . 010	
We	ell Locked?	Xes Xes	No				Purgir	ng Method:	T				ntrol Setting	16
	Il Labeled?	Yes	No					ng Method:		der		Purge:	B 4	sec.
Casin	g Straight?	Yes	No				Dedicat	ed Equip?:		No		Recover:	54	sec.
Grout S	eal Intact?		No	Not V	isible	ı	Duplicate	Sample?:	Yes	(QM)		PSI:		
Repairs Ne	ecessary:						Duplicate \$	Sample ID:		_		Pumping R	ate: 100	mL/min
	······································	Diameter:		2"	لمام				***************************************					
Wate	er Level Bef		2	8-64	28,7 ft		Р	urge Date:	29/	216	Time Purg	ing Began:	1151	(am)/pm
Total Well Dep				<u> </u>	ft		Well Pt	urged Dry?	Yes	NG	Time P	urged Dry:		am/pm
Well Volume				<del></del>	, liters		Sa	mple Date:	29A2	vlla	Time of	Sampling:	12-16	amkam
	Depth to To	<u></u>		35 c 1	, ft								,	
	er Level Aft	····	2	8,83	ft		Bottle	500 m	nL Nitric	1 Lite	r Raw			
Measurement Method:		Electric V	Water Level	Indicator		List: 500 mL Nitric (fil		ric (filtered)		4 - 1 Lite	er Nitric			
	Field Measurements													
Stabili	ization	Temp	Spec.		DO	ORP	Turbidity	Water	mL		Discription:	:		
(3 cons	ecutive)	(°C)	Cond.	рH	(mg/L)	(mV)	(NTU)	Level (ft)		Clarity	, Color, Ode	or Ect		
SEQ#	Time		±5%	±0.1	±10%	±20 mV	±10%	0.25 ft			slightly turbid,			
1	1156	12,11	19537	6,50	2,14	194,3	1.35	28.83	500	Cle	7 —			
2	1201	11.87	9499	6,50	1.98	193.1	1.45	28.83	500	ca				
3	1206	12.01	9495	6.50	1.53	191,0	1.50	28,83		Clean		Tursxi	12.6.6	
4	12/1	11,84	9495	6.00	1,52	188,6	0.70	28,83	<del></del>	do			2166	
5	1216	11,77	9498	6,50	1,54	187,3	0.73	28,83		do				
6														
7											·····			
8														
9					<b>₽</b> .									
10														
Stabilized:		No		_		To	otal Volume	Removed:	2500	mL		•		
Comments	; \ )													



**Groundwater Assessment** 

Company:	MDU Heskett
Event:	August 2016
Sample ID:	nw102.
Sampling Person	nal: Darren Nieswaas

Phone: (701) 258-9720

Weather Conditions:		Temp:	76 °F		Wind:	: // w 5 Precip: Sunny) Partly Cle						Cloudy / Clou	ıdy
,	Well Info	rmation	, -					Sampling Information					
Well Locked?	LYEST	/Ng/				Purging Method:		Bladder		Control S		ntrol Settings	S
Well Labeled?	Yes	No				Samplin	g Method:	Blad	der		Purge:	4	sec.
Casing Straight?	Nes .	No				Dedicate	ed Equip?:	⟨Yes⟩	No		Recover:	56	sec.
Grout Seal Intact?	Yes	No	Not Visi	ble		Duplicate	Sample?:	Yes	No		PSI:	~	
Repairs Necessary:						Duplicate S	Sample ID:	DUP	- /		Pumping R	late: 100	mL/min
Casing	Diameter:		2" "							•			
Water Level Befo	ore Purge:	/	7,78	ft		Pi	urge Date:	29 Au	16	Time Purg	ing Began:	13/7	amtpm
Total W	/ell Depth:			ft		Well Pu	rged Dry?	Yes	Mg	Time F	ourged Dry:		am/pm
We	Il Volume:		_	liters	ě	Sar	nple Date:	29 1	16	Time o	f Sampling:	14017	am/pm
Depth to Top	of Pump:	2	27,05	ft					· ,O			<u> </u>	
Water Level After Sample:		2	1,88	ft		Bottle	500 ml	. Nitric	1 Lite	r Raw			
Measurement Method:		Electric '	Water Level Inc	licator		List:		500 mL Niti	ic (filtered)		4 - 1 Lit	er Nitric	
				Eiold	Moseur	monto					•		

### Field Measurements

						·				
Stabilization (3 consecutive)		Temp (°C)	Spec. Cond.	рH	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Water Level (ft)	mL Removed	Discription: Clarity, Color, Odor, Ect.
SEQ#	Time		±5%	±0.1	±10%	±20 mV	±10%	0.25 ft		clear, slightly turbid, turbid
1	13:22	12,62	1004/	6.74	0,76	-77,5	5,19	18.86	500	der
2	1327	13.16	9933	6.73	1,04	-64,4	10,7	19,11	500	Cler
3	1332	13,25	9655	6.71	1.11	-55.8	16,1	19.22	500	de
4	1337	13,00	9397	6,70	0,92	-57.1	13,5	19,31	500	cli
5	13470	12,96	8893	6,70	1,20	-48.8	7,80	19,63	500100	Och _
6	1357	13,47	8402	6,72	0.85	-45.3	2,96	19,94	500 10	00ch
7 1	731402	-14.17	8219	6,75	0.91	-43,4	2,88	19.95	500	cla
8	1407	13,76	8160	6,76	0.93	-41.9	2.87	20.02	500	dr
9			Í							
10									_	
Stabilized:	\/ Yes	No	··			To	otal Volume	Removed:	4000	mV

Comments:



# **Chain of Custody Record**

Project	t Name:			Name of Sampler(s):					
MDU.	Heskett	CCR Grou	ndwater	August 2016	Dav	Kn Nieswans			
	MDU Samantha Marshall 400 N. 4th St Bismarck, ND 58501 701-222-7829		<u>Carbon Copy:</u> <u>Attn</u> : <u>Address</u> :		Work Order Number:	82-2694			

	Samp	le Information		Bottle Type Field Parameters					Analysis		
Lab Number	Sample ID	Date Date	Sample Type	Gradient	500 ml HNO <sub>3</sub> 1 lijer	500 ml HNO <sub>3</sub> (fillered)		Field Temperature °C	Field Spec. Cond.	Field pH	Analysis Required
w3783	Dup 1	29 Aug/6 NA	W		ХX					NA	
W3784	Field Blank (FB)	29 Aug/6 NA	W		ХX				NA	NA	
w3785	nw13	29Aug/6 0901	GW		XX	X		12.41	10873	6.81	
W3786	nw 103	29 Aug/ 6 1044	GW		XX	X		11.07	5247	6.64	9
w3787	nw 44R	29 Aug/ 6 12/6	GW		XX	X		11.77	9498	6.50	
63788	mw102	29 Aug/ 140	1 GW		XX	X		13,76		6.76	MDU CCR List with TSS and
				ļi .							Dissolved CCR Metals. No RadChem.
											, , ,
				ÿ							
										<i>y</i>	,
			-							-	

Comments:

	Transferred by:	Sample Condition	Date/Time	Received by:	Sample Condition	Date/Time	°C
1	Day King	Walkin 2	29Ay/6	C. Jackson		30 Aug 16	ROI 3, 4
2			, 05				TM 588
3							29/16 m
							1656



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October 21, 2016

Montana Dakota Utilities Attn: Samantha Marshall 400 N. 4<sup>th</sup> St. Bismarck, ND 58501

RE: Groundwater Sampling Event- MDU Heskett Ash Site

Dear Ms. Marshall:

It was brought to MVTL's attention by BARR that the field data report for the August sampling event had an error. The error was the amount of volume removed for well 105. The initial report had 8500mL listed for volume removed but after reviewing the field sheet the actual volume removed was 7500mL. The attached field data report has the corrected data.

Thank you for your trust and support of our services. If you have any questions, please call me at (800) 279-6885.

Sincerely,

Jeremy Meyer

**MVTL Field Services** 



**MDU Heskett** 

**GROUNDWATER SAMPLING - NDDH** 

Attn: Samantha Marshall

400 N. 4th St

Bismarck, ND 58501

701-222-7829

WO#	82-2728	82-2749	82-2696
	82-2724	82-2748	82-2694

WELL ID	PURGE DATE	START PURGE TIME	SAMPLE DATE	TIME OF SAMPLE	WELL CASING ELEVATION	STATIC WATER LEVEL (ft)	WATER LEVEL START	TOTAL DEPTH	WATER LEVEL END	VOLUME IN WELL (L)	VOLUME REMOVED (mL	SAMPLE METHOD	TEMP (°C)	EC	pН	Turbidity NTU	SAMPLE APPEARANCE
2-90	30-Aug-16	16:17	30-Aug-16	16:37	1686.60	1665.02	21.58	24.80	NA	2.0	2000.0	Bladder	11.62	7676	6.86	0.53	clear
3-90	30-Aug-16	14:55	30-Aug-16	15:15	1686.01	1666.98	19.03	21.93	19.12	1.8	2000.0	Bladder	13.89	5222	6.80	1.61	clear
13	29-Aug-16	8:31	29-Aug-16	9:01	1724.98	1694.76	30.22	41.90	30.72	7.2	3000.0	Bladder	12.41	10873	6.81	1.15	clear
33	30-Aug-16	12:53	30-Aug-16	13:52	1717.91	1675.83	42.08	46.55	42.73	2.8	6000.0	Bladder	13.67	5298	6.45	1.69	clear
70	30-Aug-16	8:30	30-Aug-16	8:50	1706.36	1685.02	21.34	43.06	22.67	13.4	2000.0	Bladder	9.54	4136	6.90	4.76	clear
80R	31-Aug-16	10:04	31-Aug-16	10:24	NA	NA	14.80	30.10	15.09	9.4	2000.0	Bladder	12.62	5734	7.01	1.42	clear
44R	29-Aug-16	11:51	29-Aug-16	12:16	NA	NA	28.74	45.88	28.83	10.6	2500.0	Bladder	11.77	9498	6.50	0.73	clear
101	30-Aug-16	9:53	30-Aug-16	11:43	NA	NA	37.18	57.09	41.59	12.3	11000.0	Bladder	14.11	4968	6.67	4.88	clear
102	29-Aug-16	13:17	29-Aug-16	14:07	NA	NA	17.78	33.20	21.88	9.5	5000.0	Bladder	13.76	8160	6.76	2.87	clear
103	29-Aug-16	10:09	29-Aug-16	10:44	NA	NA	33.16	47.10	37.14	8.6	3500.0	Bladder	11.07	5247	6.64	1.63	clear
104	31-Aug-16	8:30	31-Aug-16	9:00	NA	NA	14.41	32.85	14.71	11.4	3000.0	Bladder	12.44	14048	6.88	4.30	clear
105	31-Aug-16	11:29	31-Aug-16	12:44	NA	NA	13.60	32.39	13.90	11.6	7500.0	Bladder	13.06	7590	6.64	4.71	clear
1-90	NA.	NA	31-Aug-16	13:52	1675.86	1664.00	11.86	17.02	NA	NA	NA NA	WL	NA	NA	NA	NA	Water Level Only
2	NA NA	NA	31-Aug-16	13:55	1698.60	1659.92	38.68	63.70	NA	NA	NA	WL	NA	NA	NA	NA	Water Level Only
4B	NA NA	NA NA	31-Aug-16		1662,80	1645,10	17.70	26.15	NA	NA NA	NA	WL	NA	NA	NA	NA	Water Level Only
8	NA NA	NA NA	31-Aug-16		1664.90	1647.87	17.03	28.02	NA	NA	NA NA	WL	NA	NA	NA	NA	Water Level Only
	1		0.7.09.10	13.00													





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#### **CASE NARRATIVE**

**MVTL Lab Reference No/SDG:** 

201682-2696

IML Lab Reference No/SDG:

S1609012

Client:

**Montana Dakota Utilities** 

Location:

**MDU Heskett Ash Site** 

**Project Identification:** 

CCR August 2016

**MVTL Laboratory Identifications:** 

**16-W3795** through **16-W3800** 

**IML Laboratory Identifications:** 

S1609012-001 through S1609012-006

Page 1 of 2

MDU Sample Identification	MVTL Laboratory #	IML Laboratory #
Dup1	16-W3795	S1609012-001
Field Blank (FB)	16-W3796	S1609012-002
MW13	16-W3797	S1609012-003
MW103	16-W3798	S1609012-004
MW44R	16-W3799	\$1609012-005
MW102	16-W3800	\$1609012-006

### I. RECEIPT

- All samples were received at the laboratory on 30 August 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 3.4°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 1 September 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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### **CASE NARRATIVE**

**MVTL Lab Reference No/SDG:** 

201682-2696

IML Lab Reference No/SDG:

S1609012

Client:

**Montana Dakota Utilities** 

Location:

**MDU Heskett Ash Site** 

**Project Identification:** 

CCR August 2016

**MVTL Laboratory Identifications:** 

**16-W3795** through **16-W3800** 

**IML Laboratory Identifications:** 

S1609012-001 through S1609012-006

Page 2 of 2

#### V. REPORTING

- Per email from Barr Engineering dated 10 March 2016, IML was directed 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.

laudette Contle

SIGNED:

DATE

Z65014

Claudette Carroll - MVTL Bismarck Laboratory Manager



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Samantha Marshall Montana Dakota Utilities

400 N. 4th

Bismarck ND 58501

1 of 1 Page:

Report Date: 26 Sep 16 Lab Number: 16-W3795 Work Order #:82-2696 Account #: 002800

Date Sampled: 29 Aug 16

Date Received: 30 Aug 16 8:00 Sampled By: MVTL Field Services

Project Name: MDU Heskett CCR Radiochem Aug. 2016

Sample Description: Dup 1

Temp at Receipt: 3.4C ROI

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
Radium 226 Radium 228	See Attached Report See Attached Report			14 Sep 16 17 Sep 16	OL OL

OL = Analysis performed by an Outside Laboratory.

Approved by:

Clauditte K. Canteo 26 Sept6

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 con
! = Due to sample quantity + = Due to inf

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



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Samantha Marshall Montana Dakota Utilities 400 N. 4th

Bismarck ND 58501

1 of 1 Page:

Report Date: 26 Sep 16 Lab Number: 16-W3796 Work Order #:82-2696 Account #: 002800

Date Sampled: 29 Aug 16

Date Received: 30 Aug 16 8:00 Sampled By: MVTL Field Services

Project Name: MDU Heskett CCR Radiochem Aug. 2016 Sample Description: Field Blank (FB)

Temp at Receipt: 3.4C ROI

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
Radium 226	See Attached Report			14 Sep 16	OL
Radium 228	See Attached Report			17 Sep 16	OL

OL = Analysis performed by an Outside Laboratory.

Approved by:

Clauditte K. Cantlo 26 Sep 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 con! #= Due to sample quantity #= Due to int

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



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Samantha Marshall

400 N. 4th

Bismarck ND 58501

Montana Dakota Utilities

Page: 1 of 1

Report Date: 26 Sep 16 Lab Number: 16-W3797 Work Order #:82-2696 Account #: 002800

Date Sampled: 29 Aug 16 9:01 Date Received: 30 Aug 16 8:00 Sampled By: MVTL Field Services

Project Name: MDU Heskett CCR Radiochem Aug. 2016

Sample Description: MW13

Temp at Receipt: 3.4C ROI

	As Receive Result	ed	Method RL	Method Reference	Date Analyzed		Analyst
pH - Field	6.81	units	NA	SM 4500 H+ B	29 Aug 16		DJN
Temperature - Field	12.4	Degrees C	NA	SM 2550B	29 Aug 16	9:01	DJN
Conductivity - Field	10873	umhos/cm	1	EPA 120.1	29 Aug 16	9:01	DJN
Radium 226	See Attac	hed Report			14 Sep 16		OL
Radium 228	See Attac	hed Report			17 Sep 16		OL

OL = Analysis performed by an Outside Laboratory.

Approved by:

Clauditte K. Cantle

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 con! = Due to sample quantity = Due to int

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



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Page:

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Montana Dakota Utilities

Report Date: 26 Sep 16 Lab Number: 16-W3798

Work Order #:82-2696 Account #: 002800

Date Sampled: 29 Aug 16 10:44 Date Received: 30 Aug 16 8:00

Sampled By: MVTL Field Services

Project Name: MDU Heskett CCR Radiochem Aug. 2016

Sample Description: MW103

400 N. 4th

Samantha Marshall

Bismarck ND 58501

Temp at Receipt: 3.4C ROI

	As Recei Result	ived	Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	6.64	units	NA	SM 4500 H+ B	29 Aug 16 10:44	DJN
Temperature - Field	11.1	Degrees C	NA	SM 2550B	29 Aug 16 10:44	DJN
Conductivity - Field	5247	umhos/cm	1	EPA 120.1	29 Aug 16 10:44	DJN
Radium 226	See Atta	ached Report			14 Sep 16	OL
Radium 228	See Atta	ached Report			18 Sep 16	OL

OL = Analysis performed by an Outside Laboratory.

Approved by:

Clauditte K. Cantlo 26 Sep 14

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



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Samantha Marshall Montana Dakota Utilities

400 N. 4th

Sample Description: MW44R

Bismarck ND 58501

Page: 1 of 1

Report Date: 26 Sep 16 Lab Number: 16-W3799 Work Order #:82-2696 Account #: 002800

Date Sampled: 29 Aug 16 12:16 Date Received: 30 Aug 16 8:00 Sampled By: MVTL Field Services

Project Name: MDU Heskett CCR Radiochem Aug. 2016

Temp at Receipt: 3.4C ROI

	As Recei Result	ived	Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	6.50	units	NA	SM 4500 H+ B	29 Aug 16 12:16	DJN
Temperature - Field	11.8	Degrees C	NA	SM 2550B	29 Aug 16 12:16	DJN
Conductivity - Field	9498	umhos/cm	1	EPA 120.1	29 Aug 16 12:16	DJN
Radium 226	See Atta	ached Report			14 Sep 16	OL
Radium 228	See Atta	ached Report			18 Sep 16	OL

OL = Analysis performed by an Outside Laboratory.

Approved by:

Claudite K. Canto

26 Fp 16

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

 $\mathtt{RL}$  = 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



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Page:

1 of 1

Report Date: 26 Sep 16 Lab Number: 16-W3800 Work Order #:82-2696 Account #: 002800

Date Sampled: 29 Aug 16 14:07 Date Received: 30 Aug 16 8:00 Sampled By: MVTL Field Services

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

Project Name: MDU Heskett CCR Radiochem Aug. 2016

Sample Description: MW102

Temp at Receipt: 3.4C ROI

	As Rece: Result	ived	Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	6.76	units	NA	SM 4500 H+ B	29 Aug 16 14:07	DJN
Temperature - Field	13.8	Degrees C	NA	SM 2550B	29 Aug 16 14:07	DJN
Conductivity - Field	8160	umhos/cm	1	EPA 120.1	29 Aug 16 14:07	DJN
Radium 226	See Atta	ached Report			14 Sep 16	OL
Radium 228	See Atta	ached Report			18 Sep 16	OL

OL = Analysis performed by an Outside Laboratory.

Approved by:

Claudite K. Canto

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 con! = Due to sample quantity += Due to int

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



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

Date: 9/26/2016

CLIENT:

MVTL Laboratories, Inc.

Project:

201682-2696

Lab Order:

S1609012

ASTM approved and recognized standards

**CASE NARRATIVE** 

Report ID: S1609012001

Samples 16-W3795 Dup 1, 16-W3796 Field Blank, 16-W3797 MW13, 16-W3798 MW103, 16-W3799 MW44R, and 16-W3800 MW102 were received on September 1, 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

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

Reviewed by: All

Wade Nieuwsma, Assistant Laboratory Manager

Page 1 of 1



Inter-Mountain Labs

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

### Sample Analysis Report

Company:

MVTL Laboratories, Inc.

2616 E Broadway Ave.

Bismarck, ND 58501

ProjectName:

201682-2696

Lab ID:

S1609012-001 ClientSample ID: 16-W3795 Dup 1

COC:

201682-2696

Date Reported

9/26/2016

Report ID

S1609012001

WorkOrder:

S1609012

CollectionDate: 8/29/2016

DateReceived: 9/1/2016 10:41:00 AM

FieldSampler:

Matrix:

Water

### Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Radionuclides - Total							
Radium 226	0.4	pCi/L		0.2	SM 7500 Ra-B	09/14/2016 951	МВ
Radium 226 Precision (±)	0.1	pCi/L			SM 7500 Ra-B	09/14/2016 951	МВ
Radium 228	0.4	pCi/L		1	Ga-Tech	09/17/2016 1710	МВ
Radium 228 Precision (±)	3.1	pCi/L			Ga-Tech	09/17/2016 1710	MB

These results apply only to the samples tested.

Qualifiers:

В Analyte detected in the associated Method Blank

Value above quantitation range

Analyte detected below quantitation limits

Value exceeds Monthly Ave or MCL or is less than LCL

Outside the Range of Dilutions

Matrix Effect

**RL - Reporting Limit** 

Calculated Value С

Holding times for preparation or analysis exceeded Н

1. Analyzed by another laboratory

ND Not Detected at the Reporting Limit

Spike Recovery outside accepted recovery limits

Reviewed by:

Wade Nieuwsma, Assistant Laboratory Manager

Page 1 of 6



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

### Sample Analysis Report

Company:

MVTL Laboratories, Inc.

2616 E Broadway Ave.

Bismarck, ND 58501

ProjectName:

201682-2696

Lab ID: ClientSample ID: 16-W3796 Field Blank

S1609012-002

COC:

201682-2696

Date Reported 9/26/2016

Report ID

S1609012001

WorkOrder:

S1609012

CollectionDate: 8/29/2016

DateReceived: 9/1/2016 10:41:00 AM

FieldSampler:

Matrix:

Water

#### Commente

Comments							
Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Radionuclides - Total							
Radium 226	0.18	pCi/L		0.2	SM 7500 Ra-B	09/14/2016 951	MB
Radium 226 Precision (±)	0.1	pCi/L			SM 7500 Ra-B	09/14/2016 951	MB
Radium 228	-1.2	pCi/L		1	Ga-Tech	09/17/2016 2011	MB
Radium 228 Precision (±)	3.2	pCi/L			Ga-Tech	09/17/2016 2011	MB

### These results apply only to the samples tested.

Qualifiers:

В Analyte detected in the associated Method Blank

Value above quantitation range

Analyte detected below quantitation limits

Value exceeds Monthly Ave or MCL or is less than LCL

Outside the Range of Dilutions

Matrix Effect

**RL - Reporting Limit** 

Calculated Value С

Holding times for preparation or analysis exceeded Н

L Analyzed by another laboratory

ND Not Detected at the Reporting Limit

Spike Recovery outside accepted recovery limits

Reviewed by:

Wade Nieuwsma, Assistant Laboratory Manager

Page 2 of 6



Inter-Mountain Labs

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

### Sample Analysis Report

Company:

MVTL Laboratories, Inc.

2616 E Broadway Ave.

Bismarck, ND 58501

ProjectName:

201682-2696

Lab ID:

S1609012-003 ClientSample ID: 16-W3797 MW13

COC:

201682-2696

Date Reported

9/26/2016

Report ID

S1609012001

WorkOrder:

S1609012

CollectionDate: 8/29/2016 9:01:00 AM

DateReceived: 9/1/2016 10:41:00 AM

FieldSampler:

Matrix:

Water

### Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Radionuclides - Total							
Radium 226	0.2	pCi/L		0.2	SM 7500 Ra-B	09/14/2016 951	MB
Radium 226 Precision (±)	0.1	pCi/L			SM 7500 Ra-B	09/14/2016 951	MB
Radium 228	-3.4	pCi/L		1	Ga-Tech	09/17/2016 2312	MB
Radium 228 Precision (±)	3.5	pCi/L			Ga-Tech	09/17/2016 2312	MB

These results apply only to the samples tested.

Qualifiers:

В Analyte detected in the associated Method Blank

Value above quantitation range

Analyte detected below quantitation limits

Value exceeds Monthly Ave or MCL or is less than LCL

Outside the Range of Dilutions

Matrix Effect

**RL** - Reporting Limit

С Calculated Value

Holding times for preparation or analysis exceeded

Analyzed by another laboratory

ND Not Detected at the Reporting Limit

Spike Recovery outside accepted recovery limits

Reviewed by:

Wade Nieuwsma, Assistant Laboratory Manager

Page 3 of 6



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

#### Sample Analysis Report

Company:

MVTL Laboratories, Inc.

2616 E Broadway Ave.

Bismarck, ND 58501

ProjectName:

201682-2696

Lab ID: ClientSample ID:

S1609012-004 16-W3798 MW103

COC:

201682-2696

Date Reported

9/26/2016

Report ID

S1609012001

WorkOrder:

S1609012

CollectionDate: 8/29/2016 10:44:00 AM

DateReceived: 9/1/2016 10:41:00 AM

FieldSampler:

Matrix:

Water

#### Cammanta

Date Analyzed/Init		
51 MB		
51 MB		
13 MB		
13 MB		
9: 9: 2		

#### These results apply only to the samples tested.

#### Qualifiers:

- Analyte detected in the associated Method Blank В
- Value above quantitation range
- Analyte detected below quantitation limits
- Value exceeds Monthly Ave or MCL or is less than LCL
- Outside the Range of Dilutions
- Matrix Effect

#### **RL** - Reporting Limit

- С Calculated Value
- Holding times for preparation or analysis exceeded
- Analyzed by another laboratory
- ND Not Detected at the Reporting Limit
- Spike Recovery outside accepted recovery limits

Reviewed by:

Wade Nieuwsma, Assistant Laboratory Manager

Page 4 of 6



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

### Sample Analysis Report

Company:

MVTL Laboratories, Inc.

2616 E Broadway Ave.

Bismarck, ND 58501

ProjectName:

201682-2696

Lab ID:

S1609012-005 ClientSample ID: 16-W3799 MW44R

COC:

201682-2696

Date Reported

9/26/2016

Report ID

S1609012001

WorkOrder:

S1609012

CollectionDate: 8/29/2016 12:16:00 PM

DateReceived: 9/1/2016 10:41:00 AM FieldSampler:

Matrix:

Water

#### Comments

Analyses	Result Units		Units Qual RI		Method	Date Analyzed/Init			
Radionuclides - Total									
Radium 226	0.2	pCi/L		0.2	SM 7500 Ra-B	09/14/2016 951	MB		
Radium 226 Precision (±)	0.1	pCi/L			SM 7500 Ra-B	09/14/2016 951	MB		
Radium 228	-1.9	pCi/L		1	Ga-Tech	09/18/2016 514	MB		
Radium 228 Precision (±)	3.5	pCi/L			Ga-Tech	09/18/2016 514	MB		

These results apply only to the samples tested.

Qualifiers:

В Analyte detected in the associated Method Blank

Value above quantitation range

Analyte detected below quantitation limits

Value exceeds Monthly Ave or MCL or is less than LCL

Outside the Range of Dilutions

Matrix Effect

**RL** - Reporting Limit

С Calculated Value

Holding times for preparation or analysis exceeded Н

Analyzed by another laboratory

Not Detected at the Reporting Limit ND

Spike Recovery outside accepted recovery limits

Reviewed by:

Wade Nieuwsma, Assistant Laboratory Manager

Page 5 of 6



Inter-Mountain Labs

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

### Sample Analysis Report

Company:

MVTL Laboratories, Inc.

2616 E Broadway Ave.

Bismarck, ND 58501

ProjectName:

201682-2696

Lab ID:

S1609012-006 ClientSample ID: 16-W3800 MW102

COC:

201682-2696

Date Reported 9/26/2016

Report ID

S1609012001

WorkOrder:

S1609012

CollectionDate: 8/29/2016 2:07:00 PM

DateReceived: 9/1/2016 10:41:00 AM

FieldSampler:

Matrix:

Water

#### Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init		
Radionuclides - Total								
Radium 226	0.4	pCi/L		0.2	SM 7500 Ra-B	09/14/2016 951	MB	
Radium 226 Precision (±)	0.1	pCi/L			SM 7500 Ra-B	09/14/2016 951	MB	
Radium 228	-0.4	pCi/L		1	Ga-Tech	09/18/2016 815	MB	
Radium 228 Precision (±)	3.0	pCi/L			Ga-Tech	09/18/2016 815	MB	

These results apply only to the samples tested.

Qualifiers:

Analyte detected in the associated Method Blank В

Value above quantitation range

Analyte detected below quantitation limits

М Value exceeds Monthly Ave or MCL or is less than LCL

Outside the Range of Dilutions

Matrix Effect

**RL** - Reporting Limit

С Calculated Value

Holding times for preparation or analysis exceeded

Analyzed by another laboratory

ND Not Detected at the Reporting Limit

Spike Recovery outside accepted recovery limits

Reviewed by:

Wade Nieuwsma, Assistant Laboratory Manager

Page 6 of 6



Inter-Mountain Labs

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

### **ANALYTICAL QC SUMMARY REPORT**

CLIENT: Work Order:

Project:

MVTL Laboratories, Inc.

S1609012

201682-2696

Date: 9/26/2016

Report ID: S1609012001

Radium 228 by Ga/Tech	Sample Type MBLK		Units	: pCi/L			
MB-384 (09/16/16 17:01)	RunNo: 138877	Prep	Date: 09/0	7/16 12:00	Bato	hID: 12303	
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-384 (09/16/16 20:02)	RunNo: 138877	Prepi	Date: 09/0	7/16 12:00	Bato	hID: 12303	
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Total Radium 228	37	1	38.5		96.0	61.3 - 120	
Radium 228 by Ga/Tech	Sample Type MS		Units	: pCi/L			
MS-384 (09/17/16 02:04)	RunNo: 138877	Prepl	Date: 09/0	7/16 12:00	Bato	hID: 12303	
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Total Radium 228	46	1	38.5	ND	119	64.3 - 120	
Radium 228 by Ga/Tech	Sample Type MSD		Units	: pCi/L			
MSD-384 (09/17/16 05:05)	RunNo: 138877	Prepl	Date: 09/0	7/16 12:00	Bato	hID: 12303	
Analyte	Result	RL Conc %RPD			%REC	% RPD Limits	Qual
Total Radium 228	42	1	46	8.12	110	20	
Radium 226 in Water - Total by SM7500RA_B	Sample Type MBLK		Units	: pCi/L			
MB-1660 (09/14/16 09:51)	RunNo: 138729	PrepDate: 09/07/16 0:00			Batc		
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Radium 226	ND	0.2					
Radium 226 in Water - Total by SM7500RA_B	Sample Type LCS		Units	pCi/L			
LCS-1660 (09/14/16 09:51)	RunNo: 138729	Prep[	Date: 09/0	7/16 0:00	Batc	hID: 12295	
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Radium 226	5.3	0.2	5.99		88.4	67.1 - 122	****
Radium 226 in Water - Total by SM7500RA_B	Sample Type MS		Units:	pCi/L			
S1608482-001AMS (09/14/16 09:51)	RunNo: 138729	Prep	Date: 09/0	7/16 0:00	Batc	hID: 12295	
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Radium 226	10.1	0.2	12	0.3	81.5	65 - 131	

Qualifiers:

B Analyte detected in the associated Method Blank

H Holding times for preparation or analysis exceeded

L Analyzed by another laboratory

O Outside the Range of Dilutions

S Spike Recovery outside accepted recovery limits

E Value above quantitation range

J Analyte detected below quantitation limits

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

X Matrix Effect



### LABORATORIES, Inc. 2616 E Broadway Ave Bismarck, ND 58501 Phone: (701) 258-9720

# **Chain of Custody Record**

Page	1	of	1	
aye		UI	į.	

Toll Free: (800) 279	9-6885	Fax: (701) 258-9724									201682-2696
Company Name and A	Address:	(101) 200-3124		Account #	<u> </u>						
				, ioooding	*						Phone #: 701-258-9720
	<u>M</u>		Contact:							Fax #:	
	<u>2616 E</u> Bismarci			Claud	lett	e				For faxed report check box	
Billing Address (indic	ate if differen		Name of S	Sampler:						E-mail: ccarroll@mvtl.com	
			Quote Nu	mhor				····		For e-mail report check box	
	<u>PO B</u>		Quote Nu	inner						Date Submitted:	
	<u>New Ulm</u>		Project Na	me/Numbe	ər:					8/30/2016 Purchase Order #:	
	-								BL5652		
		Sample Information	T	Т	r		В	ottle	Ту	ре	Analysis
	Lab Number	Client Sample ID	Sample Type	Date Sampled	Time Sampled	Untreated	1000 ml HNO3	VOC Vials Umpreserved	Glass Jar	Other	Analysis Required
51609012-00 16	-W3795	Dup 1		8/29/2016						J	Ra226 & Ra228
<u>-eng</u> 16	-W3796	Field Blank		8/29/2016				<del></del>			1/d220 & 1/d220
16	-W3797	MW13		8/29/2016	901			<del></del>			
-014 16	-W3798	MVV103		8/29/2016	1044						
	-W3799	MW44R		8/29/2016	1216						
_006 16	-W3800	MW102		8/29/2016	1407	-					
					- 1107						
	1			1	f f	1	- 1				

_	Transferred by:	Date:	Time:	Sample Condition:	// Received by: /	, Date:	T	<b>—</b>
L	C. Jackson	08/30/16	1700		Jan Balala	9/1/1/a	12:481	Temp:
2					JULIUS CO	19410	1017/	9000
٠	100 100 100 100 100 100 100 100 100 100							



**Groundwater Assessment** 

Company:	MDU Heskett	
Event:	August 2016	
Sample ID:	MW13	

2616 E. Broadway Ave, Bis	smarck, ND							Sampling F	ersonal:	HASI	20 N/	iesna	S-C,
Phone: (701) 258-9	720						_			V 0	"	_	/
Veather Conditions:		Temp:	63 9	F	Wind:	NWS			Precip:	Sunr	ny / Partly C	loudy / Clou	ıdy
	Well Info	rmation				, ,		Sa	ampling I	nformatio	on C		
Well Locked?	Yes	₩o				Purgit	ng Method:	Blac	lder		Co	ntrol Settings	S
Well Labeled?	Yes	No				Samplii	ng Method:	Blac	der		Purge:	94	sec.
Casing Straight?	€es	No				Dedicat	ed Equip?:	Yes	No		Recover:	56	sec.
Grout Seal Intact?	(Yes)	No	Not Vis	sible		Duplicate	Sample?:	Yes	NO		PSI:	<i></i>	
Repairs Necessary:						Duplicate:	Sample ID:				Pumping R	ate: 100	mL/min
Casing	Diameter:		2"										
Water Level Bef	ore Purge:	30	). 22	ft		F	urge Date:	29Au	916	Time Purg	ing Began:	0831	/am/pm
Total W	Vell Depth:		-	ft		Well P	urged Dry?	Yes	NO	Time F	urged Dry:		am/pm
We	ell Volume:			liters		Sa	mple Date:	29 Au	16	Time of	Sampling:	0901	am/pm
Depth to Top	o of Pump:	3	7,10	ft				ر	,				
Water Level After	er Sample:		30.72	ft		Bottle 500 m		L Nitric	1 Lite	er Raw			
Measurement Method: Electric Water Level Indicator				ndicator		List:	500 mL Nit	500 mL Nitric (filtered)			er Nitric		
				Field	Measure	ements							

Stabili	ecutive)	Temp (°C)	Spec. Cond.	pH	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Level (ft)	mL Removed	Discription: Clarity, Color, Odor, Ect.
SEQ#	Time			±0.1	±10%	±20 mV	±10%	0.25 ft		clear, slightly turbid, turbid
1	0836	11,30	10887	6.80	3,20	237.	418	30.69	500	CCES
2	0841	11,70	10885	6.81	2:97	234,6	3.85	30,72	500	can
3	0846	11,74	10893	6.81	2,61	228,7	2.85	30,72	500	16
4	0851	11.80	10872	6.81	2.61	226,6	1,17	30,72	500	Car
5	1856	12.30	10882	.6.81	2,53	222.6	1,24	30,72	500	de
6	0901	12.41	10873	6,81	2,54	220,7	1.15	30,42	500	ch
7	•			•	•					
8								.0.		
9					·					
10	(Vas)								2000	

Stabilized: (Yes No Comments:

Total Volume Removed: 3000 mL



**Groundwater Assessment** 

Company:	MDU Heskett	
Event:	August 2016	
Sample ID:	mw103	

2616 E. Broadway Ave, Bis	smarck, ND							Sampling P	ersonal:	Darc	- 11	resin	aue			
Phone: (701) 258-9	Phone: (701) 258-9720									<del>U * 07 / * *</del>	71 10					
Weather Conditions:	ather Conditions: Temp: 6% °F Wind: Light									Precip: Sunny / Partly Cloudy						
	Well Info	<u> </u>				<u> </u>		Sampling Information								
Well Locked?	Yes	No)				Purgir	g Method:	Blac	lder		Co	ntrol Settir	ngs			
Well Labeled?	-(Yes	No				Samplin	g Method:	Blac	lder		Purge:	4	sec.			
Casing Straight?	Yes	No				Dedicate	ed Equip?:	(Yes)	No		Recover:	56	sec.			
Grout Seal Intact?	Yes	No	Not Vi	sible		Duplicate	Sample?:	Yes	No		PSI:					
Repairs Necessary:		·				Duplicate S	Sample ID:	<del></del>			Pumping R	ate: / 🔿	O mL/min			
Casing	Diameter:		2"						,			,				
Water Level Bef	ore Purge:		33.16	ft		Р	urge Date:	29 Ave	طراه	Time Purg	ing Began:	1009	(am/pm			
Total V	Vell Depth:			ft		Well Ρι	rged Dry?	Yes	No)		urged Dry:	,	am/pm			
We	ell Volume:			liters		Sai	mple Date:	292	lla	Time of	Sampling:	1044	(am/pm			
Depth to Top	o of Pump:	4	10,10	ft				, , ,	<i>y</i>			<del>,                                    </del>	7			
Water Level After	er Sample:		7.14	ft		Bottle 500 m		L Nitric	1 Lite	er Raw						
Measurement Method: Electric Water Level Indicator				-	List:		500 mL Nit	ric (filtered)		4 - 1 Lite	er Nitric					
				Field I	Measure	ements										

Stabili (3 cons	ization ecutive)	Temp (°C)	Spec. Cond.	рН	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Water Level (ft)	mL Removed	Discription: Clarity, Color, Odor, Ect.		
SEQ#	Time		±5%	±0.1	±10%	±20 mV	±10%	0.25 ft		clear, slightly turbid, turbid		
1	1014	10.93	5272	662	4.60	202.3	3.79	34,42	500	de		
2	1019	11,26	5269	6,64	15,4,88	201,2	3,52	34,54	500	cly		
3	1024	10,95	5267	6.64	4.22	200.1	2,25	34,73	5000	d		
4	1029	10,86	5263	6-64	411	12/99.0	2116	34,87	500	d		
5	1034	10,59	5261	6.64.	5,68	197,9	1155	35.06	500	dr		
6	1029	10,74	5250	6.64	5.54	197.5	1,60	35016	500	On		
7	1044	llio7	5247	6.64	5,23	197,0		35,24	500	ch		
8			,									
9												
10									~~~	TOV		
Stabilized:	r∕Yes /	No	Total Volume Removed: <u>りん ケ</u> ール									

Stabilized: Yes / No Total Volume Removed: 53 30 Comments:



**Groundwater Assessment** 

Company:	MDU Heskett	-
Event:	August 2016	
Sample ID:	MWYUR	

						•	<del></del>		7			
2616 E. Broadway Ave, Bis	smarck, ND						Sampling I	Personal://	10/16	n Ni	esura	orc
Phone: (701) 258-9	720							W		<i>t y</i>		
Veather Conditions:		Temp:	72 °F	Wind: /	NWS			Precip:	Suni	ny / Partly C	loudy / Clo	udy
	Well Info	rmation					S	ampling l	nformatio	on		
Well Locked?	(Ves	No			Purgir	ng Method:	Bla	dder		Co	ntrol Setting	s .
Well Labeled?	Yes	No			Sampli	ng Method:	Bla	dder		Purge:	84	sec.
Casing Straight?	Yes	No			Dedicat	ed Equip?:	⊈es>	No		Recover:	54	sec.
Grout Seal Intact?	Yes	No	Not Visible		Duplicate	Sample?:	Yes		]	PSI:		
Repairs Necessary:		<u></u>			Duplicate:	Sample ID:				Pumping R	ate: <i>] 00</i>	mL/min
Casing	Diameter:		~2"						-			
Water Level Bef	ore Purge:	7	8-6428.1 th		F	urge Date:	291	roll	Time Purg	ing Began:	1151	@m/pm
Total W	Vell Depth:	•	t ft		Well P	urged Dry?	Yes	NG	Time F	urged Dry:	·	am/pm
We	ell Volume:		, liters		Sa	mple Date:	29A	isllo	Time of	f Sampling:	1216	am/pm
Depth to Top	o of Pump:	τ'	350/6 ft									
Water Level Afte	Water Level After Sample: 29,93 ft			Bottle 500 r		nL Nitric	1 Lite	er Raw				
Measuremer	nt Method:	Electric V	Water Level Indicator		List:		500 mL Ni	tric (filtered)	)	4 - 1 Lite	er Nitric	
			Field	Measure	ements							

							·				
	1 1		1		DO (mg/L)	ORP Turbidity ) (mV) (NTU)		Water Level (ft)	mL Removed	Discription: Clarity, Color, Odor, Ect.	
SEQ#	Time	( 0)	±5%	±0.1	±10%	±20 mV	±10%	0.25 ft	Kemoved	clarity, Color, Odor, Ect.	
1	1156	12,11	#9537	6.50	2.14	194,3	130	2883	500	Cler	
2	1201	1/87	9499	6,50	1.98	193.1	1.45	28.83	500	ch	
3	1206	12.01	9495	6:50	1.53	191,0	1.50	28,83	500	Clear Turbitivo	7. [
4	12/1	11,84	9495	6.00	1,52	188,6	0,70	28,83	500	de	
5	1216	11,77	9498	6,50	1,54	187,3	0.73	28.83	500	de	
6		, ,									
7											
8											
9					Ψ,						
10 Stabilized:	Yes	No				<u> </u>	l otal Volume	Removed:	2500	ML	



**Groundwater Assessment** 

Company:	MDU Heskett
Event:	August 2016
Sample ID:	nw102.
Sampling Person	nal Daccontinación

Phone: (701) 258-97	720					_						
Weather Conditions:		Temp:	76 °F	Wind:	NWS			Precip:	Sunr	y) Partly Cl	oudy / Clou	ıdy
1	Well Info	rmation		_			Sa	mpling l	nformatio	n		
Well Locked?	1 Xes	(No)			Purgin	g Method:	Blac	der		Con	trol Settings	;
Well Labeled?	Yes	No			Samplin	g Method:	Blac	der		Purge:	4	sec.
Casing Straight?	Yes	No			Dedicate	ed Equip?:	(Yes)	No		Recover:	56	sec.
Grout Seal Intact?	Yes	No	Not Visible		Duplicate	Sample?:	Yes	No		PSI:	~	
Repairs Necessary:					Duplicate S	Sample ID:	DUP	-1		Pumping Ra	te: 100	mL/min
Casing	Diameter:		2" 🦼									
Water Level Befo	ore Purge:	/	7, 78 f	<u>t</u>	Pi	urge Date:	29 Au	1/6	Time Purg	ing Began:	13/7	amtpm
Total W	ell Depth:		f	t	Well Pu	rged Dry?	Yes	Mg/	Time P	urged Dry:		am/pm
We	Il Volume:		liters		Sar	nple Date:	29 Am	16	Time of	Sampling:	1407	amipm
Depth to Top	of Pump:	2	-7.05 f	t				<del> </del>			· · · · · · · · · · · · · · · · · · ·	
Water Level Afte	r Sample:	2	(, \$\frac{1}{3}\) f	t	Bottle	500 m	L Nitric	1 Lite	r Raw			
Measuremen	t Method:	Electric \	Water Level Indicator		List:		500 mL Nit	ric (filtered)		4 - 1 Lite	r Nitric	

### **Field Measurements**

	ization ecutive)	Temp (°C)	Spec. Cond.	рН	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Water Level (ft)	mL Removed	Discription: Clarity, Color, Odor, Ect.
SEQ#	Time		±5%	±0.1	±10%	±20 mV	±10%	0.25 ft		clear, slightly turbid, turbid
1	13:22	12.62	1000/	6.74	0,76	-77,5	5.19	18.86	500	der
2	1327	13.16	9933	6,73	1.04	-64,4	10,7	19,11	500	Cler
3	1332	13,25	9655	6,71	1.11	-55.8	16,1	19.22	500	de
4	1337	13,00	9397	6,70	0,92	-57.1	13,5	19:31	500	de
5	13479	12,96	8893	6,70	1,20	-4828	7,80	17,63	500100	Och _
6	1357	13,47	8402	6,72	0.85	-45.3	2,96	19,94	500 101	00cm
7 N	131402	-14.17	8219	6,75	0.91	-43,4	2,88	19.95	500	Cla
8	1407	13,76	8160	6,76	0.93	-41.9	2.87	20,02	500	dr
9								iane Z		
10										
Stabilized:	\/ Yes	No				To	otal Volume	Removed:	4000	- mi/

Comments:

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

# **Chain of Custody Record**

Projec	ct Name:				Name of Sampler(s):
MDU	Heskett	CCR Rad	iochem	August 2016	Darren Nicswaag
Report To: Attn: Address:	MDU Samantha Marshall 400 N. 4th St Bismarck, ND 58501		Carbon Copy: Attn: Address:	5.	Work Order Number: 82 - 2696
Phone:	701-222-7829				

	Samp		Е	ottle T	уре		Fie	eld Para	meters	Analysis			
Lab Number	Sample ID	Date	Time	Sample Type	Gradient	1000 ml HNO <sub>3</sub>			/	Field Temperature °C	Field Spec. Cond.	Field pH	Analysis Required
W3795	Dup 1	29,Aug/6	NA	W		4					NA	NA	
w3796	Field Blank (FB)	29 Aug 16	NA	W		4			N	۱A	NA	NA	
w3797	MW13	29 Aug/6	0901	GW		4			ĺ	2.41	10873	6.81	
w3798	MW103	29Aug/6	1044	ow		4				11.07	5247	6.64	
W3799	mw 44R	29 Ang/6	1216	Gw		4				11,77	9498	6.50	
w3800	nw102	29Anglb	1407	Gw		4			l	3.76	8160	6.76	MDU CCR Numerical
	,									,			RadChem
					=								
	l l												

Comments:

	Transferred by:	Sample Condition	Date/Time	Received by:	Sample Condition	Date/Time	° C
1	Du Min	Walkin 2	29 Angle	C. Jackson		30 Aug 16	ROJ 3.4
2			7 . 3	,			TM588
3							29 Aug 16 DN
							1656



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October 21, 2016

Montana Dakota Utilities Attn: Samantha Marshall 400 N. 4<sup>th</sup> St. Bismarck, ND 58501

RE: Groundwater Sampling Event- MDU Heskett Ash Site

Dear Ms. Marshall:

It was brought to MVTL's attention by BARR that the field data report for the August sampling event had an error. The error was the amount of volume removed for well 105. The initial report had 8500mL listed for volume removed but after reviewing the field sheet the actual volume removed was 7500mL. The attached field data report has the corrected data.

Thank you for your trust and support of our services. If you have any questions, please call me at (800) 279-6885.

Sincerely,

Jeremy Meyer

**MVTL Field Services** 



**MDU Heskett** 

**GROUNDWATER SAMPLING - NDDH** 

Attn: Samantha Marshall

400 N. 4th St

Bismarck, ND 58501

701-222-7829

WO#	82-2728	82-2749	82-2696
	82-2724	82-2748	82-2694

WELL ID	PURGE DATE	START PURGE TIME	SAMPLE DATE	TIME OF SAMPLE	WELL CASING ELEVATION	STATIC WATER LEVEL (ft)	WATER LEVEL START	TOTAL DEPTH	WATER LEVEL END	VOLUME IN WELL (L)	VOLUME REMOVED (mL	SAMPLE METHOD	TEMP (°C)	EC	pН	Turbidity NTU	SAMPLE APPEARANCE
2-90	30-Aug-16	16:17	30-Aug-16	16:37	1686.60	1665.02	21.58	24.80	NA	2.0	2000.0	Bladder	11.62	7676	6.86	0.53	clear
3-90	30-Aug-16	14:55	30-Aug-16	15:15	1686.01	1666.98	19.03	21.93	19.12	1.8	2000.0	Bladder	13.89	5222	6.80	1.61	clear
13	29-Aug-16	8:31	29-Aug-16	9:01	1724.98	1694.76	30.22	41.90	30.72	7.2	3000.0	Bladder	12.41	10873	6.81	1.15	clear
33	30-Aug-16	12:53	30-Aug-16	13:52	1717.91	1675.83	42.08	46.55	42.73	2.8	6000.0	Bladder	13.67	5298	6.45	1.69	clear
70	30-Aug-16	8:30	30-Aug-16	8:50	1706.36	1685.02	21.34	43.06	22.67	13.4	2000.0	Bladder	9.54	4136	6.90	4.76	clear
80R	31-Aug-16	10:04	31-Aug-16	10:24	NA	NA	14.80	30.10	15.09	9.4	2000.0	Bladder	12.62	5734	7.01	1.42	clear
44R	29-Aug-16	11:51	29-Aug-16	12:16	NA	NA	28.74	45.88	28.83	10.6	2500.0	Bladder	11.77	9498	6.50	0.73	clear
101	30-Aug-16	9:53	30-Aug-16	11:43	NA	NA	37.18	57.09	41.59	12.3	11000.0	Bladder	14.11	4968	6.67	4.88	clear
102	29-Aug-16	13:17	29-Aug-16	14:07	NA	NA	17.78	33.20	21.88	9.5	5000.0	Bladder	13.76	8160	6.76	2.87	clear
103	29-Aug-16	10:09	29-Aug-16	10:44	NA	NA	33.16	47.10	37.14	8.6	3500.0	Bladder	11.07	5247	6.64	1.63	clear
104	31-Aug-16	8:30	31-Aug-16	9:00	NA	NA	14.41	32.85	14.71	11.4	3000.0	Bladder	12.44	14048	6.88	4.30	clear
105	31-Aug-16	11:29	31-Aug-16	12:44	NA	NA	13.60	32.39	13.90	11.6	7500.0	Bladder	13.06	7590	6.64	4.71	clear
1-90	NA.	NA	31-Aug-16	13:52	1675.86	1664.00	11.86	17.02	NA	NA	NA NA	WL	NA	NA	NA	NA	Water Level Only
2	NA NA	NA	31-Aug-16	13:55	1698.60	1659.92	38.68	63.70	NA	NA	NA	WL	NA	NA	NA	NA	Water Level Only
4B	NA NA	NA NA	31-Aug-16		1662,80	1645,10	17.70	26.15	NA	NA NA	NA	WL	NA	NA	NA	NA	Water Level Only
8	NA NA	NA NA	31-Aug-16		1664.90	1647.87	17.03	28.02	NA	NA	NA NA	WL	NA	NA	NA	NA	Water Level Only
	1		0.7.09.10	13.00													





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September 9, 2016

Montana Dakota Utilities Attn: Samantha Marshall 400 N. 4<sup>th</sup> St. Bismarck, ND 58501

RE: Groundwater Sampling Event- MDU Heskett Ash Site

Dear Ms. Marshall:

From August 29-31, 2016, MVTL Laboratories' Field Services division collected groundwater samples at the MDU Heskett site near Mandan, ND for the Heskett Coal Combustion Rule analytical list. All wells were located and were found to be in generally good condition. The wells for CCR were purged and sampled using a dedicated bladder pump and BARR's SOP for low flow purging and sampling. The samples collected were, placed on ice and transported back to the MVTL laboratory in Bismarck, ND for analysis. The field data report for the sampling event accompanies this letter.

Thank you for your trust and support of our services. If you have any questions, please call me at (800) 279-6885.

Sincerely,

Jeremy Meyer

**MVTL Field Services** 



**MDU Heskett** 

**GROUNDWATER SAMPLING - NDDH** 

Attn: Samantha Marshall

400 N. 4th St

Bismarck, ND 58501 701-222-7829

WO# 82-2728 82-2749 82-2696 82-2724 82-2748 82-2694

WELL ID	PURGE DATE	START PURGE TIME	SAMPLE DATE	TIME OF SAMPLE	WELL CASING ELEVATION	STATIC WATER LEVEL (ft)	WATER LEVEL START	TOTAL DEPTH	WATER LEVEL END	VOLUME IN WELL (L)	VOLUME REMOVED (mL	SAMPLE METHOD	TEMP (°C)	EC	pН	Turbidity NTU	SAMPLE APPEARANCE
2-90	30-Aug-16	16:17	30-Aug-16	16:37	1686.60	1665.02	21.58	24.80	NA	2.0	2000.0	Bladder	11.62	7676	6.86	0.53	clear
3-90	30-Aug-16	14:55	30-Aug-16	15:15	1686.01	1666.98	19.03	21.93	19.12	1.8	2000.0	Bladder	13.89	5222	6.80	1.61	clear
13	29-Aug-16	8:31	29-Aug-16	9:01	1724.98	1694.76	30.22	41.90	30.72	7.2	3000.0	Bladder	12.41	10873	6.81	1.15	clear
33	30-Aug-16	12:53	30-Aug-16	13:52	1717.91	1675.83	42.08	46.55	42.73	2.8	6000.0	Bladder	13.67	5298	6.45	1.69	clear
70	30-Aug-16	8:30	30-Aug-16	8:50	1706.36	1685.02	21.34	43.06	22.67	13.4	2000.0	Bladder	9.54	4136	6.90	4.76	clear
80R	31-Aug-16	10:04	31-Aug-16	10:24	NA	NA	14.80	30.10	15.09	9.4	2000.0	Bladder	12.62	5734	7.01	1.42	clear
44R	29-Aug-16	11:51	29-Aug-16	12:16	NA	NA	28.74	45.88	28.83	10.6	2500.0	Bladder	11.77	9498	6.50	0.73	clear
101	30-Aug-16	9:53	30-Aug-16	11:43	NA	NA	37.18	57.09	41.59	12.3	11000.0	Bladder	14.11	4968	6.67	4.88	clear
102	29-Aug-16	13:17	29-Aug-16	14:07	NA	NA	17.78	33.20	21.88	9.5	5000.0	Bladder	13.76	8160	6.76	2.87	clear
103	29-Aug-16	10:09	29-Aug-16	10:44	NA	NA	33.16	47.10	37.14	8.6	3500.0	Bladder	11.07	5247	6.64	1.63	clear
104	31-Aug-16	8:30	31-Aug-16	9:00	NA	NA	14.41	32.85	14.71	11.4	3000.0	Bladder	12.44	14048	6.88	4.30	clear
105	31-Aug-16	11:29	31-Aug-16	12:44	NA	NA	13.60	32.39	13.90	11.6	8500.0	Bladder	13.06	7590	6.64	4.71	clear
1-90	NA NA	NA	31-Aug-16	13:52	1675.86	1664.00	11.86	17.02	NA	NA	NA	WL	NA	NA	NA	NA	Water Level Only
2	NA NA	NA	31-Aug-16	13:55	1698.60	1659.92	38.68	63.70	NA	NA	NA	WL	NA	NA	NA	NA	Water Level Only
4B	NA	NA	31-Aug-16	ľ	1662.80	1645.10	17.70	26.15	NA	NA	NA	WL	NA	NA	NA	NA	Water Level Only
8	NA NA	NA	31-Aug-16	13:59	1664.90	1647.87	17.03	28.02	NA	NA	NA	WL	NA	NA	NA	NA	Water Level Only



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#### CASE NARRATIVE

MVTL Lab Reference No/SDG:

201682-2724

Client:

**Montana Dakota Utilities** 

Location:

**MDU** Heskett

**Project Identification:** 

CCR August 2016

**MVTL Laboratory Identifications:** 

16-W3827 through 16-W3833

Page 1 of 2

MDU Sample Identification	MVTL Laboratory #
Dup 2	16-W3827
Field Blank (FB)	16-W3828
MW70	16-W3829
MW101	16-W3830
MW33	16-W3831
MW3-90	16-W3832
MW2-90	16-W3833

#### I. RECEIPT

- All samples were received at the laboratory on 31 Aug 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.
  - o Temperature of samples upon receipt was 6.2°C.
- All samples were properly preserved unless noted here and/or flagged on the individual analytical laboratory report.
- No other exceptions on sample receipt were encountered on this sample set unless noted here.

#### II. HOLDING TIMES

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

#### III. METHODS

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



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#### CASE NARRATIVE

MVTL Lab Reference No/SDG:

201682-2724

Client:

**Montana Dakota Utilities** 

Location:

**MDU Heskett** 

**Project Identification:** 

CCR August 2016

**MVTL Laboratory Identifications:** 

16-W3827 through 16-W3833

Page 2 of 2

#### 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.
  - o For some metals, the reported results were elevated due to instrument performance at the lower limit of quantitation (LLOQ).
  - For some metals, the reported results were elevated due to additional dilutions required to minimize the effects of sample matrix.
  - The recoveries for two selenium matrix spike/matrix spike duplicate were outside the
    acceptable limits. RPD for the recoveries was within limits. High recoveries were
    determined to be due to sample matrix. Data was accepted based on acceptable recovery of
    the LCS. No further action was taken.
  - Three selenium matrix spike duplicate recoveries were outside the acceptable limits.
     Recoveries for the matrix spikes were acceptable. RPD for the recoveries of the matrix spike duplicates and the matrix spikes were within limits. No further action was taken.
  - o Recovery for one selenium matrix spike was outside of the acceptable limits. Recovery of the matrix spike duplicate was acceptable. RPD for the recoveries of the matrix spike/matrix spike duplicate was acceptable. No further action was taken.

All laboratory	data has been approved b	y MVTL Laboratories.			
SIGNED:	Claudette	awo	_ DATE:	16 Sep 16	
Claud	lette Carroll - MVTL Bismar	ck Laboratory Manag	er ,		



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

Lab Number: 16-W3827 Work Order #:82-2724 Account #: 002800

1 of 2

Report Date: 15 Sep 16

Page:

Date Sampled: 30 Aug 16

Date Received: 31 Aug 16 8:00 Sampled By: MVTL Field Services

Project Name: MDU Heskett CCR GW August 2016

Sample Description: Dup 2

Temp at Receipt: 6.2C ROI

	As Receive	ed	Method RL	Method Reference	Date	e yzed	Analy	at
	Result		КL	Reference	Allal	.yzeu	Allary	SC
Metal Digestion				EPA 200.2	31 A	ug 16	ML	
На	* 7.0	units	N/A	SM4500 H+ B	31 A	ug 16 17	00 ML	
Total Suspended Solids	3	mg/l	1	I3765-85		ug 16 16		
Total Alkalinity	493	mg/l CaCO3	20	SM2320-B	31 A	ug 16 17	00 ML	
Fluoride	0.91	mg/l	0.10	SM4500-F-C	31 A	ug 16 17	00 ML	
Sulfate	4770	mg/l	5.00	ASTM D516-07	2 5	Sep 16 9	51 EMS	
Chloride	84.1	mg/l	1.0	SM4500-C1-E	1 9	Sep 16 11	50 EMS	
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	9 9	Sep 16 11	30 EV	
Mercury - Dissolved	< 0.0002	mg/l	0.0002	EPA 245.1	13 8	Sep 16 13	06 EV	
Total Dissolved Solids	6900	mg/l	5	I1750-85	31 A	ug 16 14	18 ML	
Calcium - Total	497	mg/l	1.0	6010	2 5	Sep 16 15	39 SZ	
Magnesium - Total	765	mg/l	1.0	6010	2 5	Sep 16 15	39 SZ	
Sodium - Total	805	mg/l	1.0	6010	2 9	Sep 16 15	39 SZ	
Potassium - Total	25.6	mg/l	1.0	6010	2 5	Sep 16 15	39 SZ	
Lithium - Total	1.33	mg/l	0.10	6010	7 5	Sep 16 9	47 KMD	
Boron - Total	0.42	mg/l	0.10	6010	6 8	Sep 16 14	12 KMD	
Calcium - Dissolved	505	mg/l	1.0	6010	12 5	Sep 16 13	23 KMD	
Magnesium - Dissolved	720	mg/l	1.0	6010	12 5	Sep 16 13	23 KMD	
Sodium - Dissolved	805	mg/l	1.0	6010	12 5	Sep 16 13	23 KMD	
Potassium - Dissolved	23.4	mg/l	1.0	6010	12 5	Sep 16 13	23 KMD	
Lithium - Dissolved	1.24	mg/l	0.10	6010		Sep 16 10		
Boron - Dissolved	0.38	mg/l	0.10	6010	6 8	Sep 16 14		
Antimony - Total	< 0.001	mg/l	0.0010	6020		_	20 KMD	
Arsenic - Total	< 0.002	mg/l	0.0020	6020			20 KMD	
Barium - Total	0.0098	mg/l	0.0020	6020	12 5	Sep 16 9	20 KMD	
Beryllium - Total	< 0.0005	mg/l	0.0005	6020	12 5		20 KMD	
Cadmium - Total	< 0.0005	mg/l	0.0005	6020	12 5		20 KMD	
Chromium - Total	< 0.002	mg/l	0.0020	6020	12 9	Sep 16 9	20 KMD	
Cobalt - Total	< 0.002	mg/l	0.0020	6020	12 8		20 KMD	
Lead - Total	< 0.0005	mg/l	0.0005	6020	12 5	Sep 16 9	20 KMD	
Molybdenum - Total	< 0.002	mg/l	0.0020	6020	12 9	- <u>r</u>	20 KMD	
Selenium - Total	0.1435	mg/l	0.0020	6020		-	20 KMD	
Thallium - Total	< 0.0005	mg/l	0.0005	6020		-	20 KMD	
Antimony - Dissolved	< 0.001	mg/l	0.0010	6020		Sep 16 10		
Arsenic - Dissolved	< 0.002	mg/l	0.0020	6020		Sep 16 10		
Barium - Dissolved	0.0096	mg/l	0.0020	6020	12 5	Sep 16 10	30 KMD	
Beryllium - Dissolved	< 0.001 ^	mg/l	0.0005	6020		Sep 16 10		
Cadmium - Dissolved	< 0.0005	mg/l	0.0005	6020	12 5	Sep 16 10	30 KMD	

RL = Method Reporting Limit



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Page:

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Report Date: 15 Sep 16 Lab Number: 16-W3827 Work Order #:82-2724 Account #: 002800

Date Sampled: 30 Aug 16

Date Received: 31 Aug 16 8:00 Sampled By: MVTL Field Services

Montana Dakota Utilities

Project Name: MDU Heskett CCR GW August 2016 Sample Description: Dup 2

400 N. 4th

Samantha Marshall

Bismarck ND 58501

Temp at Receipt: 6.2C ROI

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
Chromium - Dissolved	< 0.002 mg/l	0.0020	6020	12 Sep 16 10:30	KMD
Cobalt - Dissolved	< 0.002 mg/1	0.0020	6020	12 Sep 16 10:30	KMD
Lead - Dissolved	< 0.0005 mg/1	0.0005	6020	12 Sep 16 10:30	KMD
Molybdenum - Dissolved	< 0.002 mg/1	0.0020	6020	12 Sep 16 10:30	KMD
Selenium - Dissolved	0.1606 mg/l	0.0020	6020	12 Sep 16 10:30	KMD
Thallium - Dissolved	< 0.0005 mg/l	0.0005	6020	12 Sep 16 10:30	KMD

\* Holding time exceeded

Approved by:

Claudite K. Canto

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 coded below:

! = Due to sample quantity + = Due to in

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

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



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Samantha Marshall Montana Dakota Utilities 400 N. 4th

Bismarck ND 58501

Project Name: MDU Heskett CCR GW August 2016

Sample Description: Field Blank (FB)

Page: 1 of 2

Report Date: 15 Sep 16 Lab Number: 16-W3828 Work Order #:82-2724 Account #: 002800

Date Sampled: 30 Aug 16

Date Received: 31 Aug 16 8:00 Sampled By: MVTL Field Services

Temp at Receipt: 6.2C ROI

	As Receive Result	ed	Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	31 Aug 16	ML
Н	* 6.2	units	N/A	SM4500 H+ B	31 Aug 16 17:00	ML
Total Suspended Solids	< 1	mg/l	1	13765-85	31 Aug 16 16:05	ML
Total Alkalinity	< 20	mg/l CaCO3	20	SM2320-B	31 Aug 16 17:00	ML
Fluoride	< 0.1	mg/l	0.10	SM4500-F-C	31 Aug 16 17:00	ML
Sulfate	< 5	mg/l	5.00	ASTM D516-07	2 Sep 16 9:51	EMS
Chloride	< 1	mg/l	1.0	SM4500-C1-E	1 Sep 16 11:50	EMS
Mercury - Total	< 0.0002	mq/l	0.0002	EPA 245.1	9 Sep 16 11:30	EV
Mercury - Dissolved	< 0.0002	mg/l	0.0002	EPA 245.1	13 Sep 16 13:06	EV
Total Dissolved Solids	< 5	mg/l	5	I1750-85	31 Aug 16 14:18	ML
Calcium - Total	< 1	mg/l	1.0	6010	2 Sep 16 15:39	SZ
Magnesium - Total	< 1	mg/l	1.0	6010	2 Sep 16 15:39	SZ
Sodium - Total	< 1	mg/1	1.0	6010	2 Sep 16 15:39	SZ
Potassium - Total	< 1	mq/l	1.0	6010	2 Sep 16 15:39	SZ
Lithium - Total	< 0.1	mg/l	0.10	6010	7 Sep 16 9:47	KMD
Boron - Total	< 0.1	mg/l	0.10	6010	6 Sep 16 14:12	KMD
Calcium - Dissolved	< 1	mg/l	1.0	6010	12 Sep 16 13:23	KMD
Magnesium - Dissolved	< 1	mg/l	1.0	6010	12 Sep 16 13:23	KMD
Sodium - Dissolved	< 1	mg/l	1.0	6010	12 Sep 16 13:23	KMD
Potassium - Dissolved	< 1	mg/l	1.0	6010	12 Sep 16 13:23	KMD
Lithium - Dissolved	< 0.1	mg/l	0.10	6010	7 Sep 16 10:47	KMD
Boron - Dissolved	< 0.1	mg/l	0.10	6010	6 Sep 16 15:12	KMD
Antimony - Total	< 0.001	mg/l	0.0010	6020	12 Sep 16 9:20	KMD
Arsenic - Total	< 0.002	mg/l	0.0020	6020	12 Sep 16 9:20	KMD
Barium - Total	< 0.002	mg/l	0.0020	6020	12 Sep 16 9:20	KMD
Beryllium - Total	< 0.0005	mg/l	0.0005	6020	12 Sep 16 9:20	KMD
Cadmium - Total	< 0.0005	mg/l	0.0005	6020	12 Sep 16 9:20	KMD
Chromium - Total	< 0.002	mg/l	0.0020	6020	12 Sep 16 9:20	KMD
Cobalt - Total	< 0.002	mg/l	0.0020	6020	12 Sep 16 9:20	KMD
Lead - Total	< 0.0005	mg/l	0.0005	6020	12 Sep 16 9:20	KMD
Molybdenum - Total	< 0.002	mg/l	0.0020	6020	12 Sep 16 9:20	KMD
Selenium - Total	< 0.002	mg/l	0.0020	6020	12 Sep 16 9:20	KMD
Thallium - Total	< 0.0005	mg/l	0.0005	6020	12 Sep 16 9:20	KMD
Antimony - Dissolved	< 0.001	mg/l	0.0010	6020	12 Sep 16 10:30	KMD
Arsenic - Dissolved	< 0.002	mg/l	0.0020	6020	12 Sep 16 10:30	KMD
Barium - Dissolved	< 0.002	mg/l	0.0020	6020	12 Sep 16 10:30	KMD
Beryllium - Dissolved	< 0.001 ^	mg/l	0.0005	6020	13 Sep 16 10:50	KMD
Cadmium - Dissolved	< 0.0005	mg/l	0.0005	6020	12 Sep 16 10:30	KMD

RL = Method Reporting Limit

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

@ = Due to sample matrix # = Due to conduct to sample quantity # = Due to interpolation | + = Du

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



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

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Report Date: 15 Sep 16 Lab Number: 16-W3828 Work Order #:82-2724 Account #: 002800

Date Sampled: 30 Aug 16

Date Received: 31 Aug 16 8:00 Sampled By: MVTL Field Services

Project Name: MDU Heskett CCR GW August 2016

Sample Description: Field Blank (FB)

Temp at Receipt: 6.2C ROI

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
Chromium - Dissolved	< 0.002 mg/l	0.0020	6020	12 Sep 16 10:30	KMD
Cobalt - Dissolved	< 0.002 mg/l	0.0020	6020	12 Sep 16 10:30	KMD ·
Lead - Dissolved	< 0.0005 mg/l	0.0005	6020	12 Sep 16 10:30	KMD
Molybdenum - Dissolved	< 0.002 mg/l	0.0020	6020	12 Sep 16 10:30	KMD
Selenium - Dissolved	< 0.002 mg/l	0.0020	6020	12 Sep 16 10:30	KMD
Thallium - Dissolved	< 0.0005 mg/l	0.0005	6020	12 Sep 16 10:30	KMD

\* Holding time exceeded

Approved by:

Clauditte K. Canto

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

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



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

Project Name: MDU Heskett CCR GW August 2016

Sample Description: MW70

Page: 1 of 2

Report Date: 15 Sep 16 Lab Number: 16-W3829 Work Order #:82-2724 Account #: 002800

Date Sampled: 30 Aug 16 8:50 Date Received: 31 Aug 16 8:00 Sampled By: MVTL Field Services

Temp at Receipt: 6.2C ROI

	As Receive	ed	Method	Method	Date	
	Result		RL	Reference	Analyzed	Analyst
Metal Digestion				EPA 200.2	31 Aug 16	ML
рН	* 6.8	units	N/A	SM4500 H+ B	31 Aug 16 17:	00 ML
Total Suspended Solids	11	mg/l	1	I3765-85	31 Aug 16 16:	)5 ML
pH - Field	6.90	units	NA	SM 4500 H+ B	30 Aug 16 8:	0 DJN
Temperature - Field	9.54	Degrees C	NA	SM 2550B	30 Aug 16 8:	0 DJN
Total Alkalinity	419	mg/l CaCO3	20	SM2320-B	31 Aug 16 17:	00 ML
Conductivity - Field	4136	umhos/cm	1	EPA 120.1	30 Aug 16 8:	0 DJN
Fluoride	0.31	mg/l	0.10	SM4500-F-C	31 Aug 16 17:	00 ML
Sulfate	2080	mg/l	5.00	ASTM D516-07	2 Sep 16 9:	51 EMS
Chloride	34.0	mg/l	1.0	SM4500-Cl-E	1 Sep 16 11:	0 EMS
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	9 Sep 16 11:	30 EV
Mercury - Dissolved	< 0.0002	mg/l	0.0002	EPA 245.1	13 Sep 16 13:	06 EV
Total Dissolved Solids	3460	mg/l	5	I1750-85	31 Aug 16 14:	L8 ML
Calcium - Total	358	mg/l	1.0	6010	2 Sep 16 16:	39 SZ
Magnesium - Total	148	mg/l	1.0	6010	2 Sep 16 16:	39 SZ
Sodium - Total	493	mg/l	1.0	6010	2 Sep 16 16:	39 SZ
Potassium - Total	10.3	mg/l	1.0	6010	2 Sep 16 16:	39 SZ
Lithium - Total	0.44	mg/l	0.10	6010	7 Sep 16 9:	17 KMD
Boron - Total	0.42	mg/l	0.10	6010	6 Sep 16 14:	12 KMD
Calcium - Dissolved	396	mg/l	1.0	6010	12 Sep 16 13:	23 KMD
Magnesium - Dissolved	160	mg/l	1.0	6010	12 Sep 16 13:	23 KMD
Sodium - Dissolved	575	mg/l	1.0	6010	12 Sep 16 13:	
Potassium - Dissolved	10.8	mg/l	1.0	6010	12 Sep 16 13:	23 KMD
Lithium - Dissolved	0.44	mg/l	0.10	6010	7 Sep 16 10:	17 KMD
Boron - Dissolved	0.38	mg/l	0.10	6010	6 Sep 16 15:	12 KMD
Antimony - Total	< 0.001	mg/l	0.0010	6020	12 Sep 16 9:	
Arsenic - Total	< 0.002	mg/l	0.0020	6020	12 Sep 16 9:	
Barium - Total	0.0133	mg/l	0.0020	6020	12 Sep 16 9:	20 KMD
Beryllium - Total	< 0.0005	mg/l	0.0005	6020	12 Sep 16 9:	20 KMD
Cadmium - Total	< 0.0005	mg/l	0.0005	6020	12 Sep 16 9:	20 KMD
Chromium - Total	< 0.002	mg/l	0.0020	6020	12 Sep 16 9:	20 KMD
Cobalt - Total	< 0.002	mg/l	0.0020	6020	12 Sep 16 9:	20 KMD
Lead - Total	< 0.0005	mg/l	0.0005	6020	12 Sep 16 9:	
Molybdenum - Total	0.0051	mg/l	0.0020	6020	12 Sep 16 9:	20 KMD
Selenium - Total	0.0210	mg/l	0.0020	6020	12 Sep 16 9:	20 KMD
Thallium - Total	< 0.0005	mg/l	0.0005	6020	12 Sep 16 9:	20 KMD
Antimony - Dissolved	< 0.001	mg/l	0.0010	6020	12 Sep 16 10:	30 KMD
Arsenic - Dissolved	< 0.002	mg/l	0.0020	6020	12 Sep 16 10:	30 KMD

RL = Method Reporting Limit

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

@ = Due to sample matrix # = Due to conduct to sample quantity # = Due to into the conduct to the c

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



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Samantha Marshall Montana Dakota Utilities 400 N. 4th

Bismarck ND 58501

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Report Date: 15 Sep 16 Lab Number: 16-W3829 Work Order #:82-2724 Account #: 002800

Date Sampled: 30 Aug 16 8:50 Date Received: 31 Aug 16 8:00 Sampled By: MVTL Field Services

Project Name: MDU Heskett CCR GW August 2016

Sample Description: MW70

Temp at Receipt: 6.2C ROI

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
Barium - Dissolved	0.0094 mg/l	0.0020	6020	12 Sep 16 10:30	KMD
Beryllium - Dissolved	< 0.001 ^ mg/l	0.0005	6020	13 Sep 16 10:50	KMD
Cadmium - Dissolved	< 0.0005 mg/l	0.0005	6020	12 Sep 16 10:30	KMD
Chromium - Dissolved	< 0.002 mg/1	0.0020	6020	12 Sep 16 10:30	KMD
Cobalt - Dissolved	< 0.002 mg/1	0.0020	6020	12 Sep 16 10:30	KMD
Lead - Dissolved	< 0.0005 mg/l	0.0005	6020	12 Sep 16 10:30	KMD
Molybdenum - Dissolved	0.0034 mg/l	0.0020	6020	12 Sep 16 10:30	KMD
Selenium - Dissolved	0.0210 mg/l	0.0020	6020	12 Sep 16 10:30	KMD
Thallium - Dissolved	< 0.0005 mg/1	0.0005	6020	12 Sep 16 10:30	KMD

<sup>\*</sup> Holding time exceeded

Approved by:

Claudite K. Canto

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 conduct to sample quantity + = Due to interpret to the conduct to the conduct

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

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



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

Project Name: MDU Heskett CCR GW August 2016 Sample Description: MW101

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Report Date: 15 Sep 16 Lab Number: 16-W3830 Work Order #:82-2724 Account #: 002800

Date Sampled: 30 Aug 16 11:43 Date Received: 31 Aug 16 8:00 Sampled By: MVTL Field Services

Temp at Receipt: 6.2C ROI

	As Receive Result	ed	Method RL	Method Reference	Da An	te alyzed		Analyst
	RODGEO							2
Metal Digestion				EPA 200.2	31	Aug 1	6	ML
Н	* 6.7	units	N/A	SM4500 H+ B	31	Aug 1	6 17:00	ML
Total Suspended Solids	9	mg/l	1	I3765-85	31	Aug 1	6 16:05	ML
pH - Field	6.67	units	NA	SM 4500 H+ B	30	Aug 1	6 11:43	DJN
Temperature - Field	14.1	Degrees C	NA	SM 2550B	30	Aug 1	6 11:43	DJN
Total Alkalinity	459	mg/l CaCO3	20	SM2320-B	31	Aug 1	6 17:00	ML
Conductivity - Field	4968	umhos/cm	1	EPA 120.1	30	Aug 1	6 11:43	DJN
Fluoride	< 0.1	mg/l	0.10	SM4500-F-C	31	Aug 1	6 17:00	ML
Sulfate	2680	mg/l	5.00	ASTM D516-07	2	Sep 1	6 9:51	EMS
Chloride	18.9	mg/l	1.0	SM4500-C1-E	1	Sep 1	6 11:50	EMS
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	9	Sep 1	6 11:30	EV
Mercury - Dissolved	< 0.0002	mg/l	0.0002	EPA 245.1	13	Sep 1	6 13:06	EV
Total Dissolved Solids	4220	mg/l	5	I1750-85	31	Aug 1	6 14:18	ML
Calcium - Total	338	mg/l	1.0	6010	2	Sep 1	6 16:39	SZ
Magnesium - Total	274	mg/1	1.0	6010	2	Sep 1	6 16:39	SZ
Sodium - Total	545	mg/l	1.0	6010	2	Sep 1	6 16:39	SZ
Potassium - Total	18.6	mg/l	1.0	6010	2	Sep 1	6 16:39	SZ
Lithium - Total	0.85	mg/l	0.10	6010	7	Sep 1	6 9:47	KMD
Boron - Total	1.03	mg/l	0.10	6010	6	Sep 1	6 14:12	KMD
Calcium - Dissolved	378	mg/1	1.0	6010	12	Sep 1	6 13:23	KMD
Magnesium - Dissolved	298	mg/l	1.0	6010	12	Sep 1	6 13:23	KMD
Sodium - Dissolved	635	mq/l	1.0	6010	12	Sep 1	6 13:23	KMD
Potassium - Dissolved	19.8	mg/l	1.0	6010	12	Sep 1	6 13:23	KMD
Lithium - Dissolved	0.83	mq/l	0.10	6010	7	Sep 1	6 10:47	KMD
Boron - Dissolved	1.03	mg/1	0.10	6010	6	Sep 1	6 15:12	KMD
Antimony - Total	< 0.001	mg/l	0.0010	6020	12	Sep 1	6 9:20	KMD
Arsenic - Total	< 0.002	mg/l	0.0020	6020	12	Sep 1	6 9:20	KMD
Barium - Total	0.0199	mg/l	0.0020	6020	12	Sep 1	6 9:20	KMD
Beryllium - Total	< 0.0005	mg/l	0.0005	6020	12	Sep 1	6 9:20	KMD
Cadmium - Total	< 0.0005	mg/l	0.0005	6020	12	Sep 1	6 9:20	KMD
Chromium - Total	< 0.002	mg/l	0.0020	6020	12	Sep 1	6 9:20	KMD
Cobalt - Total	< 0.002	mg/1	0.0020	6020	12	Sep 1	6 9:20	KMD
Lead - Total	< 0.0005	mg/l	0.0005	6020	12	Sep 1	6 9:20	KMD
Molybdenum - Total	0.0031	mg/l	0.0020	6020		Sep 1		KMD
Selenium - Total	< 0.002	mg/l	0.0020	6020		Sep 1		KMD
Thallium - Total	< 0.0005	mg/l	0.0005	6020		Sep 1		KMD
Antimony - Dissolved	< 0.001	mg/l	0.0010	6020			6 10:30	KMD
Arsenic - Dissolved	< 0.002	mg/l	0.0020	6020	12	Sep 1	6 10:30	KMD

RL = Method Reporting Limit

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

@ = Due to sample matrix # = Due to conduct to sample quantity + = Due to information with the conduction of the conduction

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



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Report Date: 15 Sep 16 Lab Number: 16-W3830 Work Order #:82-2724 Account #: 002800

Date Sampled: 30 Aug 16 11:43 Date Received: 31 Aug 16 8:00

Sampled By: MVTL Field Services

Project Name: MDU Heskett CCR GW August 2016

Sample Description: MW101

400 N. 4th

Samantha Marshall

Bismarck ND 58501

Montana Dakota Utilities

Temp at Receipt: 6.2C ROI

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
Barium - Dissolved	0.0185 mg/l	0.0020	6020	12 Sep 16 10:30	KMD
Beryllium - Dissolved	$< 0.001 ^ mg/1$	0.0005	6020	13 Sep 16 10:50	KMD
Cadmium - Dissolved	< 0.0005 mg/1	0.0005	6020	12 Sep 16 10:30	KMD
Chromium - Dissolved	< 0.002 mg/1	0.0020	6020	12 Sep 16 10:30	KMD
Cobalt - Dissolved	< 0.002 mg/l	0.0020	6020	12 Sep 16 10:30	KMD
Lead - Dissolved	< 0.0005 mg/l	0.0005	6020	12 Sep 16 10:30	KMD
Molybdenum - Dissolved	0.0021  mg/l	0.0020	6020	12 Sep 16 10:30	KMD
Selenium - Dissolved	< 0.002 mg/1	0.0020	6020	12 Sep 16 10:30	KMD
Thallium - Dissolved	< 0.0005 mg/l	0.0005	6020	12 Sep 16 10:30	KMD

\* Holding time exceeded

Approved by:

Clauditte K. Canteo

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 conduct to sample quantity + = Due to interpolation with the conduction of the conducti

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

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



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

Project Name: MDU Heskett CCR GW August 2016

Sample Description: MW33

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Report Date: 15 Sep 16 Lab Number: 16-W3831 Work Order #:82-2724 Account #: 002800

Date Sampled: 30 Aug 16 13:53 Date Received: 31 Aug 16 8:00 Sampled By: MVTL Field Services

Temp at Receipt: 6.2C ROI

	As Receive Result	ed	Method RL	Method Reference	Dat Ana	e llyzed	Analyst
Metal Digestion				EPA 200.2	31	Aug 16	ML
рН	* 6.6	units	N/A	SM4500 H+ B	31	Aug 16 17:00	ML
Total Suspended Solids	2	mg/l	1	I3765-85	31	Aug 16 16:05	ML
pH - Field	6.45	units	NA	SM 4500 H+ B	30	Aug 16 13:53	DJN
Temperature - Field	13.7	Degrees C	NA	SM 2550B	30	Aug 16 13:53	DJN
Total Alkalinity	484	mg/l CaCO3	20	SM2320-B	31	Aug 16 17:00	ML
Conductivity - Field	5298	umhos/cm	1	EPA 120.1	30	Aug 16 13:53	DJN
Fluoride	0.20	mg/l	0.10	SM4500-F-C	31	Aug 16 17:00	ML
Sulfate	3190	mg/l	5.00	ASTM D516-07	2	Sep 16 9:51	EMS
Chloride	12.1	mg/l	1.0	SM4500-C1-E	1	Sep 16 11:50	EMS
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	9	Sep 16 11:30	EV
Mercury - Dissolved	< 0.0002	mg/l	0.0002	EPA 245.1	13	Sep 16 13:06	EV
Total Dissolved Solids	4980	mg/l	5	I1750-85	31	Aug 16 14:18	ML
Calcium - Total	452	mg/l	1.0	6010	2	Sep 16 16:39	SZ
Magnesium - Total	450	mg/l	1.0	6010	2	Sep 16 16:39	SZ
Sodium - Total	422	mg/1	1.0	6010	2	Sep 16 16:39	SZ
Potassium - Total	19.9	mg/1	1.0	6010	2	Sep 16 16:39	SZ
Lithium - Total	0.89	mg/l	0.10	6010	7	Sep 16 9:47	KMD
Boron - Total	0.40	mg/l	0.10	6010	6	Sep 16 14:12	KMD
Calcium - Dissolved	515	mg/l	1.0	6010	12	Sep 16 13:23	KMD
Magnesium - Dissolved	510	mg/l	1.0	6010	12	Sep 16 13:23	KMD
Sodium - Dissolved	505	mg/l	1.0	6010		Sep 16 13:23	KMD
Potassium - Dissolved	22.8	mg/l	1.0	6010		Sep 16 13:23	KMD
Lithium - Dissolved	0.93	mg/1	0.10	6010		Sep 16 10:47	KMD
Boron - Dissolved	0.41	mg/1	0.10	6010		Sep 16 15:12	KMD
Antimony - Total	< 0.001	mg/1	0.0010	6020		Sep 16 14:15	CC
Arsenic - Total	< 0.002	mg/l	0.0020	6020		Sep 16 14:15	CC
Barium - Total	0.0157	mg/1	0.0020	6020		Sep 16 14:15	CC
Beryllium - Total	< 0.0005	mg/1	0.0005	6020		Sep 16 14:15	CC
Cadmium - Total	< 0.0005	mg/l	0.0005	6020		Sep 16 14:15	CC
Chromium - Total	< 0.0003	mg/l	0.0020	6020		Sep 16 14:15	CC
Cobalt - Total	< 0.002	mg/l	0.0020	6020		Sep 16 14:15	CC
Lead - Total	< 0.002	mg/l	0.0020	6020		Sep 16 14:15	CC
	< 0.0003	<b>.</b>	0.0003	6020		Sep 16 14:15	CC
Molybdenum - Total		mg/l		6020		Sep 16 14:15	CC
Selenium - Total	< 0.002	mg/l	0.0020	6020		Sep 16 14:15 Sep 16 14:15	CC
Thallium - Total	< 0.0005	mg/l	0.0005				CC
Antimony - Dissolved	< 0.001	mg/1	0.0010	6020		Sep 16 19:37	CC
Arsenic - Dissolved	< 0.002	mg/l	0.0020	6020	14	Sep 16 19:37	CC

RL = Method Reporting Limit



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Samantha Marshall Montana Dakota Utilities

400 N. 4th

Bismarck ND 58501

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Report Date: 15 Sep 16 Lab Number: 16-W3831 Work Order #:82-2724 Account #: 002800

Date Sampled: 30 Aug 16 13:53 Date Received: 31 Aug 16 8:00 Sampled By: MVTL Field Services

Temp at Receipt: 6.2C ROI

Project Name: MDU Heskett CCR GW August 2016

Sample Description: MW33

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
Barium - Dissolved	0.0160 mg/l	0.0020	6020	14 Sep 16 19:37	CC
Beryllium - Dissolved	< 0.0005 mg/1	0.0005	6020	14 Sep 16 19:37	CC
Cadmium - Dissolved	< 0.0005 mg/1	0.0005	6020	14 Sep 16 19:37	CC
Chromium - Dissolved	< 0.002 mg/1	0.0020	6020	14 Sep 16 19:37	CC
Cobalt - Dissolved	0.0024 mg/l	0.0020	6020	14 Sep 16 19:37	CC
Lead - Dissolved	< 0.0005 mg/1	0.0005	6020	14 Sep 16 19:37	CC
Molybdenum - Dissolved	< 0.002 mg/1	0.0020	6020	14 Sep 16 19:37	CC
Selenium - Dissolved	< 0.002 mg/l	0.0020	6020	15 Sep 16 15:19	CC
Thallium - Dissolved	< 0.0005 mg/l	0.0005	6020	15 Sep 16 15:19	CC

\* Holding time exceeded

Approved by:

Clauditte K. Cantlo

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 con
! = Due to sample quantity + = Due to int

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



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

Report Date: 15 Sep 16 Lab Number: 16-W3832 Work Order #:82-2724 Account #: 002800

Date Sampled: 30 Aug 16 15:15 Date Received: 31 Aug 16 8:00 Sampled By: MVTL Field Services

Project Name: MDU Heskett CCR GW August 2016

Sample Description: MW3-90

Temp at Receipt: 6.2C ROI

	As Receive Result	ed	Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	31 Aug 16	ML
На	* 6.9	units	N/A	SM4500 H+ B	31 Aug 16 17:00	ML
Total Suspended Solids	2	mg/l	1	I3765-85	31 Aug 16 16:05	ML
pH - Field	6.80	units	NA	SM 4500 H+ B	30 Aug 16 15:15	DJN
Temperature - Field	13.9	Degrees C	NA	SM 2550B	30 Aug 16 15:15	DJN
Total Alkalinity	530	mg/l CaCO3	20	SM2320-B	31 Aug 16 17:00	ML
Conductivity - Field	5222	umhos/cm	`1	EPA 120.1	30 Aug 16 15:15	DJN
Fluoride	0.12	mg/l	0.10	SM4500-F-C	31 Aug 16 17:00	ML
Sulfate	2810	mg/l	5.00	ASTM D516-07	2 Sep 16 9:51	EMS
Chloride	38.8	mg/l	1.0	SM4500-Cl-E	1 Sep 16 11:50	EMS
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	9 Sep 16 11:30	EV
Mercury - Dissolved	< 0.0002	mg/l	0.0002	EPA 245.1	13 Sep 16 13:06	EV
Total Dissolved Solids	4620	mg/l	5	I1750-85	31 Aug 16 14:18	ML
Calcium - Total	545	mg/l	1.0	6010	2 Sep 16 16:39	SZ
Magnesium - Total	258	mg/l	1.0	6010	2 Sep 16 16:39	SZ
Sodium - Total	565	mg/l	1.0	6010	2 Sep 16 16:39	SZ
Potassium - Total	12.4	mg/l	1.0	6010	2 Sep 16 16:39	SZ
Lithium - Total	0.30	mg/l	0.10	6010	7 Sep 16 9:47	KMD
Boron - Total	< 0.2 @	mg/1	0.10	6010	6 Sep 16 14:12	KMD
Calcium - Dissolved	580	mg/l	1.0	6010	12 Sep 16 13:23	KMD
Magnesium - Dissolved	268	mg/l	1.0	6010	12 Sep 16 13:23	KMD
Sodium - Dissolved	630	mg/l	1.0	6010	12 Sep 16 13:23	KMD
Potassium - Dissolved	12.5	mg/l	1.0	6010	12 Sep 16 13:23	KMD
Lithium - Dissolved	0.28	mg/l	0.10	6010	7 Sep 16 10:47	KMD
Boron - Dissolved	< 0.2 @	mg/l	0.10	6010	6 Sep 16 15:12	KMD
Antimony - Total	< 0.001	mg/l	0.0010	6020	14 Sep 16 14:15	CC
Arsenic - Total	< 0.002	mg/l	0.0020	6020	14 Sep 16 14:15	CC
Barium - Total	0.0138	mg/l	0.0020	6020	14 Sep 16 14:15	CC
Beryllium - Total	< 0.0005	mg/l	0.0005	6020	14 Sep 16 14:15	CC
Cadmium - Total	< 0.0005	mg/l	0.0005	6020	14 Sep 16 14:15	CC
Chromium - Total	< 0.002	mg/1	0.0020	6020	14 Sep 16 14:15	CC
Cobalt - Total	< 0.002	mg/l	0.0020	6020	14 Sep 16 14:15	CC
Lead - Total	< 0.0005	mg/l	0.0005	6020	14 Sep 16 14:15	CC
Molybdenum - Total	< 0.002	mg/l	0.0020	6020	14 Sep 16 14:15	CC
Selenium - Total	0.0973	mg/l	0.0020	6020	14 Sep 16 14:15	CC
Thallium - Total	< 0.0005	mq/1	0.0005	6020	14 Sep 16 14:15	CC
Antimony - Dissolved	< 0.001	mg/1	0.0010	6020	14 Sep 16 19:37	CC
Arsenic - Dissolved	< 0.002	mg/l	0.0020	6020	14 Sep 16 19:37	CC

RL = Method Reporting Limit

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

@ = Due to sample matrix # = Due to conduct to sample quantity + = Due to interport to the conduct to the conduct

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



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Report Date: 15 Sep 16 Lab Number: 16-W3832 Work Order #:82-2724 Account #: 002800

Date Sampled: 30 Aug 16 15:15 Date Received: 31 Aug 16 8:00 Sampled By: MVTL Field Services

Project Name: MDU Heskett CCR GW August 2016

Sample Description: MW3-90

400 N. 4th

Samantha Marshall

Bismarck ND 58501

Montana Dakota Utilities

Temp at Receipt: 6.2C ROI

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
Barium - Dissolved Beryllium - Dissolved Cadmium - Dissolved Chromium - Dissolved Cobalt - Dissolved Lead - Dissolved Molybdenum - Dissolved	0.0128 mg/l < 0.0005 mg/l < 0.0005 mg/l < 0.002 mg/l < 0.002 mg/l < 0.0005 mg/l < 0.0005 mg/l	0.0020 0.0005 0.0005 0.0020 0.0020 0.0005 0.0020	6020 6020 6020 6020 6020 6020 6020	14 Sep 16 19:37 14 Sep 16 19:37	CC CC
Selenium - Dissolved Thallium - Dissolved	0.0972 mg/l < 0.0005 mg/l	0.0020 0.0005	6020 6020	15 Sep 16 15:19 15 Sep 16 15:19	

\* Holding time exceeded

Approved by:

Clauditte K. Cantlo

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 con! = Due to sample quantity + = Due to int

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



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

Project Name: MDU Heskett CCR GW August 2016

Sample Description: MW2-90

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Report Date: 15 Sep 16 Lab Number: 16-W3833 Work Order #:82-2724 Account #: 002800

Date Sampled: 30 Aug 16 16:37 Date Received: 31 Aug 16 8:00 Sampled By: MVTL Field Services

Temp at Receipt: 6.2C ROI

	As Receive Result	ed	Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	31 Aug 16	ML
рН	* 6.9	units	N/A	SM4500 H+ B	31 Aug 16 17:00	ML
Total Suspended Solids	4	mg/l	1	I3765-85	31 Aug 16 16:05	ML
pH - Field	6.86	units	NA	SM 4500 H+ B	30 Aug 16 16:37	DJN
Temperature - Field	11.6	Degrees C	NA	SM 2550B	30 Aug 16 16:37	DJN
Total Alkalinity	493	mg/l CaCO3	20	SM2320-B	31 Aug 16 17:00	ML
Conductivity - Field	7676	umhos/cm	1	EPA 120.1	30 Aug 16 16:37	DJN
Fluoride	0.92	mg/l	0.10	SM4500-F-C	31 Aug 16 17:00	ML
Sulfate	4810	mg/l	5.00	ASTM D516-07	2 Sep 16 9:51	EMS
Chloride	84.7	mg/l	1.0	SM4500-Cl-E	1 Sep 16 11:50	EMS
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	9 Sep 16 11:30	EV
Mercury - Dissolved	< 0.0002	mg/l	0.0002	EPA 245.1	13 Sep 16 13:06	EV
Total Dissolved Solids	6920	mg/l	5	I1750-85	31 Aug 16 14:18	ML
Calcium - Total	470	mg/l	1.0	6010	2 Sep 16 16:39	SZ
Magnesium - Total	725	mg/l	1.0	6010	2 Sep 16 16:39	SZ
Sodium - Total	765	mg/l	1.0	6010	2 Sep 16 16:39	SZ
Potassium - Total	23.8	mg/l	1.0	6010	2 Sep 16 16:39	SZ
Lithium - Total	1.55	mg/l	0.10	6010	7 Sep 16 9:47	KMD
Boron - Total	0.39	mg/l	0.10	6010	6 Sep 16 14:12	KMD
Calcium - Dissolved	540	mg/l	1.0	6010	12 Sep 16 13:23	KMD
Magnesium - Dissolved	770	mg/l	1.0	6010	12 Sep 16 13:23	KMD
Sodium - Dissolved	855	mg/l	1.0	6010	12 Sep 16 13:23	KMD
Potassium - Dissolved	24.9	mg/l	1.0	6010	12 Sep 16 13:23	KMD
Lithium - Dissolved	1.36	mg/l	0.10	6010	7 Sep 16 10:47	KMD
Boron - Dissolved	0.37	mg/l	0.10	6010	6 Sep 16 15:12	KMD
Antimony - Total	< 0.001	mg/l	0.0010	6020	14 Sep 16 14:15	CC
Arsenic - Total	< 0.002	mg/l	0.0020	6020	14 Sep 16 14:15	CC
Barium - Total	0.0099	mg/l	0.0020	6020	14 Sep 16 14:15	CC
Beryllium - Total	< 0.0005	mg/l	0.0005	6020	14 Sep 16 14:15	CC
Cadmium - Total	< 0.0005	mg/l	0.0005	6020	14 Sep 16 14:15	CC
Chromium - Total	< 0.002	mg/l	0.0020	6020	14 Sep 16 14:15	CC
Cobalt - Total	< 0.002	mg/l	0.0020	6020	14 Sep 16 14:15	CC
Lead - Total	< 0.0005	mg/l	0.0005	6020	14 Sep 16 14:15	CC
Molybdenum - Total	< 0.002	mg/l	0.0020	6020	14 Sep 16 14:15	CC
Selenium - Total	0.1557	mg/l	0.0020	6020	14 Sep 16 14:15	CC
Thallium - Total	< 0.0005	mg/l	0.0005	6020	14 Sep 16 14:15	CC
Antimony - Dissolved	< 0.001	mg/l	0.0010	6020	14 Sep 16 19:37	CC
Arsenic - Dissolved	< 0.002	mg/l	0.0020	6020	14 Sep 16 19:37	CC

RL = Method Reporting Limit

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



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Samantha Marshall Montana Dakota Utilities 400 N. 4th

Bismarck ND 58501

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Report Date: 15 Sep 16 Lab Number: 16-W3833 Work Order #:82-2724 Account #: 002800

Date Sampled: 30 Aug 16 16:37 Date Received: 31 Aug 16 8:00 Sampled By: MVTL Field Services

Project Name: MDU Heskett CCR GW August 2016

Sample Description: MW2-90

Temp at Receipt: 6.2C ROI

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
Barium - Dissolved	0.0096 mg/l	0.0020	6020	14 Sep 16 19:37	CC
Beryllium - Dissolved	< 0.0005 mg/1	0.0005	6020	14 Sep 16 19:37	CC
Cadmium - Dissolved	< 0.0005 mg/1	0.0005	6020	14 Sep 16 19:37	CC
Chromium - Dissolved	< 0.002 mg/1	0.0020	6020	14 Sep 16 19:37	CC
Cobalt - Dissolved	< 0.002 mg/1	0.0020	6020	14 Sep 16 19:37	CC
Lead - Dissolved	< 0.0005 mg/1	0.0005	6020	14 Sep 16 19:37	CC
Molybdenum - Dissolved	< 0.002 mg/1	0.0020	6020	14 Sep 16 19:37	CC
Selenium - Dissolved	0.1634 mg/l	0.0020	6020	15 Sep 16 15:19	CC
Thallium - Dissolved	< 0.0005 mg/l	0.0005	6020	15 Sep 16 15:19	CC

\* Holding time exceeded

Approved by:

Clauditte K. Cantep

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

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Quality Control Report Lab IDs: 16-W3827 to 16-W3833

Project: MDU Heskett CCR GW August 2016

Work Order: 201682-2724

Lab IDS: 10-W 382/ 10 10-V	Y											WOIK Order: 201002-2/24						
Analyte	LCS Spike Amt	LCS Rec %	LCS % Rec Limits	Matrix Spike Amt	Matrix Spike ID	Matrix Spike Orig Result	Matrix Spike Result	Matrix Spike Rec %	Matrix Spike % Rec Limits	MSD/ Dup Orig Result	MSD/ Dup Result	MSD Rec %	MSD/ Dup RPD	MSD/ Dup RPD Limit (<)	Known Rec (%)	Known % Rec Limits	Method Blank	
Antimony - Dissolved mg/l	0.1000 0.1000	97 110	80-120 80-120	0.100 0.100	16W3830q 16-W3869	< 0.001 < 0.001	0.0990 0.1084	99 108	75-125 75-125	0.0990 0.1084	0.1070 0.1138	107 114	7.8 4.9	20 20	-		< 0.001 < 0.001	
Antimony - Total mg/l	0.1000 0.1000	98 104	80-120 80-120	0.400 0.100 0.400 0.400 0.400	16W3829q 16W3786q 16W3855q 16W3874q 16W3898q	< 0.001 < 0.001 < 0.001 < 0.001 < 0.001	0.3952 0.1002 0.4272 0.4506 0.4428	99 100 107 113 111	75-125 75-125 75-125 75-125 75-125	0.3952 0.1002 0.4272 0.4506 0.4428	0.4246 0.1004 0.4114 0.4456 0.4556	106 100 103 111 114	7.2 0.2 3.8 1.1 2.8	20 20 20 20 20 20	-	-	< 0.001 < 0.001 < 0.001	
Arsenic - Dissolved mg/l	0.1000 0.1000	98 110	80-120 80-120	0.100 0.100	16W3830q 16-W3869	< 0.002 < 0.002	0.1042 0.1165	104 116	75-125 75-125	0.1042 0.1165	0.1146 0.1212	115 121	9.5 4.0	20 20	-	-	< 0.002 < 0.002	
Arsenic - Total mg/l	0.1000 0.1000	99 104	80-120 80-120	0.400 0.100 0.400 0.400 0.400	16W3829q 16W3786q 16W3855q 16W3874q 16W3898q	< 0.002 < 0.002 0.0032 0.0064 0.0028	0.4044 0.1075 0.4442 0.4668 0.4684	101 108 110 115 116	75-125 75-125 75-125 75-125 75-125	0.4044 0.1075 0.4442 0.4668 0.4684	0.4444 0.1054 0.4186 0.4570 0.4740	111 105 104 113 118	9.4 2.0 5.9 2.1 1.2	20 20 20 20 20 20	- - - -	-	< 0.002 < 0.002 < 0.002	
Barium - Dissolved mg/l	0.1000 0.1000	101 102	80-120 80-120	0.100 0.100	16W3830q 16-W3869	0.0185 0.0171	0.1186 0.1272	100 110	75-125 75-125	0.1186 0.1272	0.1230 0.1258	104 109	3.6 1.1	20 20	-	-	< 0.002 < 0.002	
Barium - Total mg/l	0.1000 0.1000	97 105	80-120 80-120	0.400 0.100 0.400 0.400 0.400	16W3829q 16W3786q 16W3855q 16W3874q 16W3898q	0.0133 0.0101 0.0702 0.0482 0.0304	0.4256 0.1090 0.4890 0.4812 0.4766	103 99 105 108 112	75-125 75-125 75-125 75-125 75-125	0.4256 0.1090 0.4890 0.4812 0.4766	0.4442 0.1132 0.4828 0.4888 0.4784	108 103 103 110 112	4.3 3.8 1.3 1.6 0.4	20 20 20 20 20 20	-	- - - -	< 0.002 < 0.002 < 0.002	
Beryllium - Dissolved mg/l	0.1000 0.1000	107 112	80-120 80-120	0.100 0.100	16-W3830 16-W3869	< 0.001 < 0.0005	0.0865 0.1179	86 118	75-125 75-125	0.0865 0.1179	0.0913 0.1197	91 120	5.4 1.5	20 20	-	-	< 0.0005 < 0.0005	
Beryllium - Total mg/l	0.1000 0.1000	102 106	80-120 80-120	0.400 0.100 0.400 0.400	16W3829q 16W3786q 16W3855q 16W3874q	< 0.0005 < 0.0005 < 0.0005 < 0.0005	0.1174 0.5018	114 117 125 125	75-125 75-125 75-125 75-125	0.4548 0.1174 0.5018 0.5008 0.4986	0.4746 0.1162 0.4690 0.4878 0.5002	119 116 117 122	4.3 1.0 6.8 2.6 0.3	20 20 20 20 20 20	- - -		< 0.0005 < 0.0005 < 0.0005	

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Lab IDs: 16-W3827 to 16-Y	W 3833	P	roject: M	DU Hesk	ett CCR GW		16			L	.,	Wo	rk Ord	er: 201682	2-2724		
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
Boron - Dissolved mg/l	0.40 0.40	102 110	80-120 80-120	0.600 0.600	16-W3827 16-W3869	0.38 0.39	0.88 0.96	83 95	75-125 75-125	0.88 0.96	0.86 0.96	80 95	2.3 0.0	20 20	- - -	-	< 0.1 < 0.1 < 0.1 < 0.1
Boron - Total mg/l	0.40	102	80-120	0.400 0.400 0.400 0.400	16-D3542 16-W3786 16-W3829 16-W3855	1.51 0.21 0.42 0.26	1.92 0.58 0.78 0.66	102 92 90 100	75-125 75-125 75-125 75-125	1.92 0.58 0.78 0.66	1.99 0.59 0.80 0.69	120 95 95 108	3.6 1.7 2.5 4.4	20 20 20 20 20	- - -	-	< 0.1 < 0.1 < 0.1
Cadmium - Dissolved mg/l	0.1000 0.1000	105 114	80-120 80-120	0.100 0.100	16W3830q 16-W3869	< 0.0005 < 0.0005	0.0982 0.1046	98 105	75-125 75-125	0.0982 0.1046	0.1066 0.1098	107 110	8.2 4.9	20 20	-	-	< 0.0005
Cadmium - Total mg/l	0.1000 0.1000	106 109	80-120 80-120	0.400 0.100 0.400 0.400 0.400	16W3829q 16W3786q 16W3855q 16W3874q 16W3898q	< 0.0005 < 0.0005 < 0.0005 < 0.0005 < 0.0005		100 103 111 115 113	75-125 75-125 75-125 75-125 75-125	0.4002 0.1031 0.4452 0.4612 0.4532	0.4410 0.1020 0.4246 0.4690 0.4518	110 102 106 117 113	9.7 1.1 4.7 1.7 0.3	20 20 20 20 20 20	- - - -	-	< 0.0003 < 0.0003 < 0.0003
Calcium - Dissolved mg/l	20.0 20.0	108 106	80-120 80-120	500 500	16-W3827 16-W3869	505 445	1040 1020	107 115	75-125 75-125	1040 1020	1020 995	103 110	1.9 2.5	20 20	-	-	<1 <1 <1 <1
Calcium - Total mg/l	20.0 20.0	107 102	80-120 80-120	100 500 100	16W3789q 16W3829q 16W3859q	43.7 358 17.8	143 800 121	99 88 103	75-125 75-125 75-125	143 800 121	139 800 121	95 88 103	2.8 0.0 0.0	20 20 20	-	-	< 1 < 1 < 1 < 1
Chloride mg/l	30.0	101	80-120	30.0	16-W3827	84.1	112	93	80-120	112	113	96	0.9	20	-	-	< 1 < 1 < 1 < 1
Chromium - Dissolved mg/l	0.1000 0.1000	93 103	80-120 80-120	0.100 0.100	16W3830q 16-W3869	< 0.002 < 0.002	0.0973 0.1106	97 111	75-125 75-125	0.0973 0.1106	0.1060 0.1155	106 116	8.6 4.3	20 20	-	-	< 0.002 < 0.002

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Quality Control Report Lab IDs: 16-W3827 to 16-W3833

Project: MDU Heskett CCR GW August 2016

Work Order: 201682-2724

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Lab IDs: 16-W3827 to 16-W3833 Project: MDU Heskett CCR GW August 2016										Work Order: 201682-2724							
Analyte	LCS Spike Amt	LCS Rec %	LCS % Rec Limits	Matrix Spike Amt	Matrix Spike ID	Matrix Spike Orig Result	Matrix Spike Result	Matrix Spike Rec %	Matrix Spike % Rec Limits	MSD/ Dup Orig Result	MSD/ Dup Result	MSD Rec %	MSD/ Dup RPD	MSD/ Dup RPD Limit (<)	Known Rec (%)	Known % Rec Limits	Method Blank
Chromium - Total mg/l	0.1000 0.1000	92 97	80-120 80-120	0.400 0.100 0.400 0.400 0.400	16W3829q 16W3786q 16W3855q 16W3874q 16W3898q	< 0.002 < 0.002 < 0.002 < 0.002 < 0.002	0.3686 0.1020 0.4026 0.4136 0.4216	92 102 101 103 105	75-125 75-125 75-125 75-125 75-125	0.3686 0.1020 0.4026 0.4136 0.4216	0.4086 0.1018 0.3860 0.4100 0.4282	102 102 96 102 107	10.3 0.2 4.2 0.9 1.6	20 20 20 20 20 20	- - - -	-	< 0.002 < 0.002 < 0.002
Cobalt - Dissolved mg/l	0.1000 0.1000	93 102	80-120 80-120	0.100 0.100	16W3830q 16-W3869	< 0.002 < 0.002	0.0963 0.1080	96 108	75-125 75-125	0.0963 0.1080	0.1025 0.1132	102 113	6.2 4.7	20 20	-	-	< 0.002 < 0.002
Cobalt - Total mg/l	0.1000 0.1000	93 99	80-120 80-120	0.400 0.100 0.400 0.400 0.400	16W3829q 16W3786q 16W3855q 16W3874q 16W3898q	< 0.002 < 0.002 < 0.002 < 0.002 < 0.002	0.3676 0.0980 0.4172 0.4188 0.4166	92 98 104 105 104	75-125 75-125 75-125 75-125 75-125	0.3676 0.0980 0.4172 0.4188 0.4166	0.4074 0.0993 0.3900 0.4096 0.4290	102 99 98 102 107	10.3 1.3 6.7 2.2 2.9	20 20 20 20 20 20		-	< 0.002 < 0.002 < 0.002
Fluoride mg/l	0.50	100	90-110	0.500 0.500	16-D3564 16-W3869	2.46 0.25	2.90 0.66	88 82	80-120 80-120	2.90 0.66	2.93 0.67	94 84	1.0 1.5	20 20	-	-	< 0.1 < 0.1
Lead - Dissolved mg/l	0.1000 0.1000	99 105	80-120 80-120	0.100 0.100	16W3830q 16-W3869	< 0.0005 < 0.0005	0.0920 0.1012	92 101	75-125 75-125	0.0920 0.1012	0.0940 0.1014	94 101	2.2 0.2	20 20	-	-	< 0.0005 < 0.0005
Lead - Total mg/I	0.1000 0.1000	96 101	80-120 80-120	0.400 0.100 0.400 0.400 0.400	16W3829q 16W3786q 16W3855q 16W3874q 16W3898q	< 0.0005 < 0.0005 0.0006 < 0.0005 0.0010	0.3788 0.0882 0.4066 0.4256 0.4022	95 88 102 106 100	75-125 75-125 75-125 75-125 75-125	0.3788 0.0882 0.4066 0.4256 0.4022	0.3914 0.0908 0.4006 0.4282 0.4134	98 91 100 107 103	3.3 2.9 1.5 0.6 2.7	20 20 20 20 20 20		- - -	< 0.0005 < 0.0005 < 0.0005
Lithium - Dissolved mg/l	0.40	100	80-120	0.800 0.800	16-W3827 16-W3869	1.24 1.39	1.87 2.13	79 93	75-125 75-125	1.87 2.13	1.91 2.05	84 82	2.1 3.8	20 20	-		< 0.1 < 0.1 < 0.1
Lithium - Total mg/l	0.40	92	80-120	0.400 0.400	16-W3786 16-W3829	0.81 0.44	1.19 0.92	95 120	75-125 75-125	1.19 0.92	1.18 0.93	92 122	0.8	20 20	- - -		< 0.1 < 0.1 < 0.1

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**Quality Control Report** 

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Lab IDs: 16-W3827 to 16-W3833 Project: MDU Heskett CCR GW August 2016 Work Order: 201682-2724 Matrix Matrix Matrix MSD/ MSD/ LCS LCS LCS Matrix Matrix Dup Spike Matrix Spike Spike MSD/ **MSD** MSD/ Dup Known Known Spike Rec % Rec Spike Spike Orig Spike Rec % Rec Orig Dup Rec Dup RPD Rec % Rec Method Result Amt % Limits Amt ID Result Result % Limits Result % **RPD** Limit (<) (%) Limits Blank Analyte Magnesium - Dissolved mg/l 16-W3827 1260 75-125 20.0 111 80-120 500 720 108 1260 1240 104 20 < 1 1.6 20.0 108 80-120 500 16-W3869 880 1460 116 75-125 1460 1420 108 2.8 20 < 1 < 1 < 1 Magnesium - Total mg/l 20.0 80-120 100 16W3789a 14.7 119 75-125 119 111 104 116 101 2.6 20 < 1 20.0 106 500 16W3829a 148 625 95 75-125 96 0.8 20 80-120 625 630 < 1 16W3859a 7.4 106 75-125 106 0.0 20 100 113 113 113 < 1 < 1 < 0.0002 0.0018 90 Mercury - Dissolved mg/l 0.0020 90 85-115 0.002 16-W3868 70-130 0.0018 0.0018 90 0.0 20 < 0.0002 0.002 16-W3869 < 0.0002 0.0017 85 70-130 0.0017 0.0017 85 0.0 20 Mercury - Total mg/l 0.0020 95 85-115 0.002 A43991 < 0.0002 0.0018 90 70-130 0.0018 0.0018 90 0.0 20 < 0.0002 0.002 16-W3866 < 0.0002 0.0019 95 70-130 0.0019 0.0019 95 0.0 20 0.002 16-W3896 < 0.0002 0.0019 95 70-130 0.0019 20 0.0018 90 5.4 Molybdenum - Dissolved mg/l 0.1000 91 80-120 16-W3830 105 75-125 0.1069 0.1137 112 6.2 0.100 0.0021 0.1069 20 < 0.002 0.1000 105 80-120 0.100 16-W3869 < 0.002 0.1140 114 75-125 0.1140 0.1208 121 5.8 20 < 0.002 96 0.4414 109 75-125 Molybdenum - Total mg/l 0.1000 80-120 0.400 16W3829a 0.0051 0.4414 0.4610 114 4.3 20 < 0.002 16W3786q 75-125 0.1000 102 80-120 0.100 < 0.002 0.1136 114 0.1136 0.1182 4.0 20 118 < 0.0020.400 16W3855q 0.0074 0.4220 104 75-125 0.4220 0.4098 101 2.9 20 < 0.002 0.400 16W3874q 0.0069 0.4358 107 75-125 0.4358 0.4268 105 2.1 20 0.400 16W3898q 0.0024 0.4456 111 75-125 0.4456 0.4594 114 3.0 20 12.2 12.2 0.0 20 pH units 20 7.5 7.5 0.0 75-125 134 1.5 Potassium - Dissolved mg/l 10.0 106 80-120 100 16-W3827 23.4 136 113 136 111 20 < 1 80-120 2.2 10.0 103 16-W3869 20.5 140 120 75-125 140 137 20 100 116 < 1 < 1 < 1

## MVTL

1126 N. Front St. ~ New Ulm, MN 56073 ~ 800-782-3557 ~ Fax 507-359-2890 2616 E. Broadway Ave. ~ Bismarck, ND 58502 ~ 800-279-6885 ~ Fax 701-258-9724 1201 Lincoln Highway ~ Nevada, IA 50201 ~ 800-362-0855 ~ Fax 515-382-3885 www.mvtl.com

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**Quality Control Report** 

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<b>Lab IDs:</b> 16-W3827 to 16-	W 3833	P	roject: M	DU Hesk	ett CCR GW	August 20   <b>Matrix</b>	16	3/1-4-2		TATOD!	1000	Wo	rk Orde	er: 201682	2-2724		
Analyte	LCS Spike Amt	LCS Rec %	LCS % Rec Limits	Matrix Spike Amt	Matrix Spike ID	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	96 91	80-120 80-120	20.0 100 20.0	16W3789q 16W3829q 16W3859q	8.7 10.3 2.8	30.2 105 24.1	108 95 106	75-125 75-125 75-125	30.2 105 24.1	29.5 108 24.1	104 98 106	2.3 2.8 0.0	20 20 20	-	-	<1 <1 <1 <1
Selenium - Dissolved mg/l	0.1000 0.1000	110 118	80-120 80-120	0.100 0.100	16W3830q 16-W3869	< 0.002 < 0.005	0.1160 0.1246	116 125	75-125 75-125	0.1160 0.1246	0.1259 0.1332	126 129	8.2 6.7	20 20	-	-	< 0.002 < 0.002
Selenium - Total mg/l	0.1000 0.1000	115 115	80-120 80-120	0.400 0.100 0.400 0.400 0.400	16W3829q 16W3786q 16W3855q 16W3874q 16W3898q	0.0210 0.0618 < 0.002 < 0.002 0.0024	0.4736 0.1796 0.5170 0.5496 0.5150	113 118 129 137 128	75-125 75-125 75-125 75-125 75-125	0.4736 0.1796 0.5170 0.5496 0.5150	0.5240 0.1859 0.4934 0.5120 0.5286	126 124 123 128 132	10.1 3.4 4.7 7.1 2.6	20 20 20 20 20 20	- - -	-	< 0.002 < 0.002 < 0.002
Sodium - Dissolved mg/l	20.0 20.0	112 110	80-120 80-120	500 500	16-W3827 16-W3869	805 885	1340 1450	107 113	75-125 75-125	1340 1450	1300 1420	99 107	3.0 2.1	20 20	-	-	<1 <1 <1 <1
Sodium - Total mg/l	20.0 20.0	102 98	80-120 80-120	100 500 100	16W3789q 16W3829q 16W3859q	165 493 222	264 950 311	99 91 89	75-125 75-125 75-125	264 950 311	256 940 313	91 89 91	3.1 1.1 0.6	20 20 20	-	-	<1 <1 <1 <1 <1
Sulfate mg/l	100	97	90-110	100	16-W3828	< 5	95.4	95	80-120	95.4	105	105	9.6	20	-	_	< 5
Thallium - Dissolved mg/l	0.1000 0.1000	96 94	80-120 80-120	0.100 0.100	16W3830q 16-W3869	< 0.0005 < 0.0005	0.0902 0.0876	90 88	75-125 75-125	0.0902 0.0876	0.0930 0.0881	93 88	3.1 0.6	20 20	***	-	< 0.0005 < 0.0005
Thallium - Total mg/l	0.1000 0.1000	84 98	80-120 80-120	0.400 0.100 0.400 0.400 0.400	16W3829q 16W3786q 16W3855q 16W3874q 16W3898q	< 0.0005 < 0.0005 < 0.0005 < 0.0005 < 0.0005	0.3548 0.0910 0.3870 0.3982 0.3838	89 91 97 100 96	75-125 75-125 75-125 75-125 75-125	0.3548 0.0910 0.3870 0.3982 0.3838	0.3738 0.0926 0.3766 0.4124 0.3880	93 93 94 103 97	5.2 1.7 2.7 3.5 1.1	20 20 20 20 20 20		-	< 0.0005 < 0.0005 < 0.0005

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Quality Control Report
Lab IDs: 16-W3827 to 16-W3833

**MVTL** 

Project: MDU Heskett CCR GW August 2016

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Work Order: 201682-2724

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	Rec	MSD/ Dup RPD	MSD/ Dup RPD Limit (<)	Known Rec (%)	Known % Rec Limits	Method Blank
Total Alkalinity mg/l CaCO3	410	99	90-110	410 410	16-W3830 16-W3831	459 484	850 871	95 94	80-120 80-120	850 871	847 872	95 95	0.4 0.1	20 20	94	80-120	< 20 < 20
Total Dissolved Solids mg/l	-	-	-	-	-	-	-	-	-	4220	4160	-	1.4	20	-	-	< 5
Total Suspended Solids mg/l	-	-	-	-	-	-	-	-	-	17 81 86	17 79 83	-	0.0 2.5 3.6	20 20 20	-	-	< 1 < 1

Approved by: Complete 16

**MVTL Calibration Worksheet** 

Site: MDU He	skett		Technician:	Vallen Nesswaag
Instrument (Circle One):	#1 650 MDS 08F10020	03 #2 65	50 MDS 04H14736	#3 556 MPS 12E102056
pH Buffer 7 Buffer 10 Conductivity Buffer 10000 CORP	Temp °C Pre Cal $22,73$ $6,92$ $7$ $7$ $7$ $7$ $7$ $7$ $7$ $7$ $7$ $7$	Post Cal Post Cal Range 7.00 6.95-7.05 9.95-10.05 1999 ±10%	mv Range +/- mv 50  -39, 2 0 +/- 50  -2/8, 0 -180 +/- 50  Check  Buffer 5000 4979  TCA	Post Site Check Time: 1647  pH Temp °C Reading Buffer 7 23, 92 7,03  Conductivity Buffer 5000 23,04 5079
231 mV @ 25C DO	22,18 10,6	±10 mV  Baromet  (7,20) mg/L	ric Pressure (mm Hg)	
pH  Buffer 7  Buffer 10  Conductivity	21.91 7.02 [ 21.97 /0.01 ]	Post Cal Post Cal Range  7.00 6.95-7.05  9.95-10.05	-40,4 0 +/- 50 -2/9,3 -180 +/- 50 Check	pH Temp °C Reading Buffer 7 23, 92 6,99  Conductivity
Buffer 10000 <b>ORP</b> 231 mV @ 25C <b>DO</b>		±10%  2 5 7,3 ±10 mV  Baromet  mg/L	Buffer 5000 4955  tric Pressure (mm Hg) 723:0	Buffer 5000 2-3,7/ 510C



**Groundwater Assessment** 

Company:	MDU Heskett	
Event:	August 2016	
Sample ID:	MW70	
Sampling Da	reapple 00 00 - 160 6 1666	

2616 E. Broadway Ave, Bismarck, ND					•	Sampling Personal: Darren Nieswang						
Phone: (701) 258-9720												
Veather Conditions:	Temp:	55 °F	Wind:	Light	-	Precip: Sunny / Partly Cloudy / Cloudy						
Well Inf	ormation	•		,		Sampling Information						
Well Locked? Yes	No.			Purgir	ng Method:	Blac	lder		Cor	trol Settings	5	
Well Labeled? Yes	No No			Samplir	ng Method:	Blac	lder		Purge:	4	sec.	
Casing Straight? Yes	No			Dedicat	ed Equip?:	Yes	~ No_		Recover:	56	sec.	
Grout Seal Intact? Yes	No	Not Visible		Duplicate	Sample?:	Yes	(NO)		PSI:			
Repairs Necessary:				Duplicate \$	Sample ID:				Pumping Ra	ate: / 0 <i>0</i>	mL/min	
Casing Diameter		2"										
Water Level Before Purge	2	<i>1,34</i> ft		Р	Purge Date: 30 Ars 16				Time Purging Began: 1830 and pm			
Total Well Depth		ft		Well P	urged Dry?	Yes No,		Time P	urged Dry:	<u> </u>	am/pm	
Well Volume		liters		Sa	mple Date:	30AC	rlb	Time of	Sampling:	9(57)	am/pm	
Depth to Top of Pump	: '2	32,75 ft				0	, <del>-</del> .					
Water Level After Sample: 22, 67 ft			Bottle	500 m	L Nitric	1 Lite	r Raw					
Measurement Method:		List:	List: 500 mL Nitric (filtered)			4 - 1 Liter Nitric						
		. 100										

Stabilization (3 consecutive)		Temp (°C)	Spec. Cond.	рН	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Water Level (ft)	mL Removed	Discription: Clarity, Color, Odor, Ect.
SEQ#	Time		±5%	±0.1	±10%	±20 mV	±10%	0.25 ft		clear, slightly turbid, turbid
1	0835	9.52	4171	6.89	1.19	177.8	5.75	22,20	500	des
2	0840	9,44	4150	6.90	1,21	178,1	4.38	22,34	500	cly
3	0845	9,52	4140	6,90	1.19	176.6	4.58	22.34	500	Car
4	0851	9,54	4136	6.90	1.18	174,9	4,76	27134	500	Clan
5								•		
6										
7										
8										
9					1.					
10										
Stabilized	Yes	No				To	otal Volume	Removed:	フィロロ	mL

Comments:

notal Volume Removed: 2000 mL



**Groundwater Assessment** 

Company:	MDU Heskett
Event:	August 2016
Sample ID:	MW101,
Sampling Pers	sonal Daller Nitsland

	, 10000.	1000001110111				I $VV$ $I$	$\overline{}$							
2616 E. Broadway Ave, Bis	marck, ND						_	Sampling Personal: Daller Nieswaa					in_	
Phone: (701) 258-93	720					,	-	<i>n</i>						
Weather Conditions:		Temp:	62°F		Wind:	Precip: Sunny Partly Cloudy / Clo								
	Well Info	rmation						Sampling Information						
Well Locked?	Yes	<b>ملا</b>					g Method:	Bla	dder		Col	ntrol Setting	s	
Well Labeled?	Xes .	No				Samplin	g Method:	Bla	dder		Purge:	4	sec.	
Casing Straight?	Xes	No				Dedicate	ed Equip?:	Yes	No		Recover:	56	sec.	
Grout Seal Intact?	Yes	No	No Not Visible			Duplicate	Sample?:	Yes	(No		PSI:	J. E.		
Repairs Necessary:						Duplicate S	Duplicate Sample ID:			]	Pumping Ra	ate: <i>j                                   </i>	mL/min	
Casing	Diameter:		2"											
Water Level Befo	ore Purge:	3	7.18	ft		Purge Date:		30A	v 16	Time Purg	ng Began:	0953	@m/pm	
Total W	/ell Depth:		_	ft		Well Pu	urged Dry?	Yes	<b>⊘</b> ₩o	Time P	urged Dry:		am/pm	
We	II Volume:			liters		Sai	mple Date:	30/4	20	Time of	Sampling:	1143	∠am/pm	
Depth to Top	of Pump:	띡	16,90	ft										
Water Level Afte	er Sample:	4	41.59 ft			Bottle	500 m	L Nitric	1 Lite	er Raw				
Measurement Method:		Electric Water Level Indicator				List:		500 mL Ni	500 mL Nitric (filtered) 4 - 1 Liter Nitric					

#### **Field Measurements**

		ization secutive) Time	Temp (°C)	Spec. Cond. ±5%	<b>pH</b> ±0.1	DO (mg/L) ±10%	ORP (mV) ±20 mV	Turbidity (NTU) ±10%	Water Level (ft) 0.25 ft	mL Removed	Discription: Clarity, Color, Odor, Ect. clear, slightly turbid, turbid
	1	0958	12.55	4953	6,64	2,61	40.0	236	3819	500	da Justid
10	082	1003	12,32	4917	6.65	1,25	11,6	101	38,76	1000	Slightly taked
- 1	018 3	400B	12,52	4902	6.65	1,24	2.5	67.9	39.18	1000	55
Ý	0284	1013	12,52	4910	6,65	1.00	4,6	36,1	39.35	1000	cles
	5	1038	12.63	4922	6,66	1.18	13,7	17.3	39.66	1000	Char
	6	1048.	12.88	4930	6,65	1,49	13,1	11.0	39.86	1000	de
	7	1058	13,50	4955	6.66	1,49	12,3	9.16	40.06	1000	Cles
	8	1108	13,36	4943	6,65	1,42	10,2	7.93	40,22	1000	( las
	9	1118	13.22	4948	6,66	1,40	6,2	6.43	42,44	1000	19
	10	1/28	14,21	4961	6.66	11:09	216	14,92	40,44		de
	Stabilized	: / Yes /	No	_			Te	otal 'Volume	Removed:		mL

Comments

Contined on next page



**Groundwater Assessment** 

	•		
Phone:	(701)	258-9720	

Company:	MDU Heskett	
Event:	August 2016	
Sample ID:	MW/01	
Sampling Pers	onal: Parren Niceway	
Date: 30	And 11	

### **Field Measurements**

Stabili (3 cons	ization ecutive)	Temp (°C)	Spec. Cond.	рН	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Water Level (ft)	mL Removed	Discription: Clarity, Color, Odor, Ect.
SEQ#	Time		±5%	±0.1	±10%	±20 mV	±10%	0.25 ft		clear, slightly turbid, turbid
11	1133,	14.39	4965	6,66	1,29	De 8	4.91	40.58	500	des
12	1138	14,20	4973		1,22	70,3	4.75	40,65	500	d
13	1143	14,11	4968	6,67	1,23	0,5	4.88	40,69	500	Ch
14										
15										
16										
17										
18										
19										
20										
21										
22										
23										
24										
25										
26										
27										1.1111.111.111.1111.1111.1111
28										
29										
30										

Stabilized: Yes No
Comments:

Total Volume Removed: 11,000 mL



**Groundwater Assessment** 

Company:	MDU Heskett	<u>t</u>
Event:	August 2016	
Sample ID:	MW33	
0 1: 0	1 . 7	- 1

2616 E. Broadway Ave, Bis	marck, ND							Sampling Pe	ersonal:	Davie	n Nies	vae _	
Phone: (701) 258-9	720												
Veather Conditions:		Temp:	79	°F	Wind:	55			Precip:	Sum	Fartly CI	oudy / Clou	ıdy
1	Well Info	rmation	<i>'</i> (		~			Sa	mpling l	nformatio	on		
Well Locked?	Yes	₫¥g>				Purgir	g Method:	Blad	der		Con	trol Setting:	3
Well Labeled?	XOS	No				Samplin	g Method:	Blad	der		Purge:	254	→ sec.
Casing Straight?	Yes	No				Dedicate	ed Equip?:	Ves	No		Recover:	56	sec.
Grout Seal Intact?	Yes	No	Not	Visible		Duplicate	Sample?:	Yes	MO		PSI:		
Repairs Necessary:						Duplicate S	Sample ID:			] [	Pumping Ra	te: 100	mL/min
Casing	Diameter:		2"										
Water Level Befo	ore Purge:	۷	12,08	/ ft		Р	urge Date:	30An	s lL	Time Purgi	ng Began: /	253	am/pm
Total W	ell Depth:			ft		Well Pu	rged Dry?	Yes	(VO)	Time P	urged Dry:		am/pm
We	Il Volume:			liters		Sar	nple Date:	30 Au	2/1-	Time of	Sampling:	1353	am/om
Depth to Top of Pump: V41.03 44.52ft													
Water Level After Sample: 12.73 ft		ft		Bottle	500 m	L Nitric	1 Lite	r Raw					
Measuremen	t Method:	Electric V	Vater Leve	I Indicator		List:		500 mL Nitr	ic (filtered)		4 - 1 Lite	r Nitric	
						_							

#### Field Measurements

Stabili (3 cons	zation ecutive)	Temp (°C)	Spec. Cond.	рН	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Water Level (ft)	mL Removed	Discription: Clarity, Color, Odor, Ect.
SEQ#	Time		±5%	±0.1	±10%	±20 mV	±10%	0.25 ft		clear, slightly turbid, turbid
1	1258	13,24	5762	6.59	1,46	-99,6	69,8	42.29	500	Slight tweid
2	1308	13.43	5300	6.51	2.10	-51.5	25.4	42,29	501000	Clas
3	1318	1378	5275	6.47	1.95	-32,7	16.0	42,32	1000	Cler
4	1328	14.16	5273	6.48	1.92	-23,7	7.61	42.36	1000	14
5	1333	13.99	5279	6.48	1.87	-21.8	3.31	42.38	500	la
6	1338	13,73	5290	6.48	1,90	-21,2	2.65	42.43	500	Clay
7	1343	14.00	5278	6.48	1.80	-20,5	1.78	42,43	500	Can
8	1348	13.83	5281	6.48	1.67	-20,0	1,77	42,50	500	Un
9	1353	13,67	5298	6.45	1,69	-22, b	1.69	4250	500	4
10 Stabilized:	(Yes)	No				_	tal Valuma	<u> </u>	(800	ml

Stabilized: Yes No
Comments:

Total Volume Removed: 6000 mL



**Groundwater Assessment** 

Company:	MDU Heskett
Event:	August 2016
Sample ID:	MW 3-90
Sampling Porcons	of Dacco Alle

			<b>U</b> 1.00	and water	7336331	11CIIC		Janupie ID.		2 VV		,	
2616 E. Broadway Ave, Bi	smarck, ND						•	Sampling Po	ersonal:		NI	" India	
Phone: (701) 258-9	9720						•			0000			
Weather Conditions:		Temp:	-2%	°F	Wind:	5-/-			Drosin	0/2	1 Danth C	land (Clay	
			<del>-0U</del>	<u> </u>	vviria.	<del>5</del> 5			Precip:			loudy / Clou	ıay
	Well Info							Sa	mpling l	nformatio	n		
Well Locked?	Yes	440				Purgir	ng Method:	Blad	der		Co	ntrol Settings	ŝ
Well Labeled?	(Yes)	No				Samplin	ng Method:	Blad	der		Purge:	Ц	sec.
Casing Straight?	Xes	No				Dedicat	ed Equip?:	Yes	No		Recover:	57	sec.
Grout Seal Intact?	Yes	No	Not V	isible		Duplicate	Sample?:	Yes	No		PSI:	~	
Repairs Necessary:						Duplicate S	Sample ID:	<del></del>			Pumping R	ate: / () ()	mL/min
Casing	Diameter:		2"										
Water Level Bef	ore Purge:		19,03	ft		Р	urge Date:	30 Au	16	Time Purg	ing Began:	1455	am/pm
Total V	Vell Depth:			ft		Well Pu	urged Dry?	Yes	No	Time P	urged Dry:	<del></del>	am/pm
We	ell Volume:			liters		Sa	mple Date:	30Ac	26/2	Time of	Sampling:	1575	am/6m
Depth to Top	p of Pump:	2	0.17	ft									
Water Level After	er Sample:		191121	ft		Bottle	500 m	L Nitric	1 Lite	r Raw		· "	
Measuremer	nt Method:	Electric \	Nater Level	Indicator		List:		500 mL Nitr	ric (filtered)		4 - 1 Lite	er Nitric	
				Field	Measure	ements							
Stabilization	Temp (°C)	Spec. Cond.	рН	DO (mg/L)	ORP (m)()	Turbidity	Water	mL Bomovod		Discription:			
(3 consecutive)	( ( )	cona.	l h⊔	(mg/L)	(mV)	(NTU)	Level (II)	Removed	Clanty	, Color, Od	∪i, ⊑∪ί.		

	ization secutive)	Temp (°C)	Spec. Cond.	рН	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Water Level (ft)	mL Removed	Discription: Clarity, Color, Odor, Ect.
SEQ#	Time		±5%	±0.1	±10%	±20 mV	±10%	0.25 ft		clear, slightly turbid, turbid
1	1500	12,78	5228	6.81	2,22	-195,7	2.80	19,12	500	ca
2	1505	12,70	5228	6,79	2007	-196,4	1.50	19,12	500	1 h
3	1510	1413	5205	6.84	2.00	-190,7	1,62	19,12	500	Ch
4	1515	13.89	5222	6,80	1.96	-186,6	661	12112	508	Can
5		77								
6										
7										
8										
9										
10	Vas	No					atal Valuma		2800	ml ml

Stabilized: Yes No
Comments:

Total Volume Removed: 2000 mL

There are a lot of ants in this well. There is an odor to the water.



**Groundwater Assessment** 

Company:	MDU Heskett	
Event:	August 2016	
Sample ID:	MW 2-90	
Sampling Do	manal: 0 c ca . C Ca	

			Cioanawate	7336331	HOHE		Sample ID.	211 V	V 2-	ľV	
2616 E. Broadway Ave, Bis	smarck, ND					•	Sampling P	ersonal:		Nicswan	
Phone: (701) 258-9	720					•			<i>(1)</i> - <i>(2)</i>	11/12/14/13	
			$-\alpha$			-					
Weather Conditions:		Temp:		Wind:	8/1	)		Precip:	Sunr	ny / Partly Cloudy)/ Clo	udy
	Well Info	rmation	V				Sa	ımpling lı	nformatio	on	
Well Locked?	Yes	(Me			Purgir	ng Method:	Blac	lder		Control Setting	gs
Well Labeled?	(es/	No			Samplir	ng Method:	Blac	lder		Purge: 4	sec.
Casing Straight?	Yes	No			Dedicat	ed Equip?:	Yes	No		Recover: 56	sec.
Grout Seal Intact?	Yes	No	Not Visible		Duplicate	Sample?:	Yes	No		PSI:	
Repairs Necessary:		غ د			Duplicate :	Sample ID:	000-	~2_		Pumping Rate: / /) O	mL/min
Casing	Diameter:		2"				77				
Water Level Befo	ore Purge:	2	-1.58 ft		Р	urge Date:	301	n llo	Time Purg	ing Began: 1617	am/pm)
Total W	/ell Depth:		<b>f</b> t		Well Po	urged Dry?	Yes *	MO	Time P	urged Dry:	am/pm
We	II Volume:	-	liters		Sa	mple Date:	301	-16	Time of	Sampling: 1 4 3 7	am/om
Depth to Top	of Pump:		2,60 ft				77, 9				
Water Level Afte	er Sample:		ft		Bottle	500 m	L Nitric	1 Lite	r Raw		
Measuremen	t Method:	Electric V	Water Level Indicator		List:		500 mL Nit	ric (filtered)		4 - 1 Liter Nitric	
			Field	Measure	ments						

Stabili	zation ecutive)	Temp (°C)	Spec. Cond.	рН	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Water Level (ft)	mL Removed	Discription: Clarity, Color, Odor, Ect.
SEQ#	Time		±5%	±0.1	±10%	±20 mV	±10%	0.25 ft		clear, slightly turbid, turbid
1 1622		11.95	7734	6.83	4.19	-18,0	0.85	21.90	500	ch
2	1627	11.55	7719	6,87	43,90	-1.9	0.50	2692	500	den
3	1632	11,54	7694	6.87	3,68	10.6	0,58	21.92	500	der
4	1637	11,62	7676	6,86	3,83	16.3	0,53	2/192	500	Can
5	•									
6										
7										
8										
9										
10	Vos	No					4-13/-1		() (200)	

Stabilized: Yes No Comments:

Total Volume Removed: \_\_\_\_\_ mL

A



### Laboratories, Inc.

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

# **Chain of Custody Record**

Projectiv	Name:				Name of Sampler(s):
MDU	Heskett	CCR Grou	ndwater	August 2016	Darren Nieswaag
Attn: Sa Address: 40 Bi	MDU Samantha Marshall 00 N. 4th St Sismarck, ND 58501 01-222-7829		Carbon Copy: Attn: Address:		Work Order Number: 82-2724

	Samı	ple Information			Bot	tle Type	Analysis			
Lab Number	Sample ID	Date Time	Sample Type	Gradient	500 ml HNO <sub>3</sub> 1 liter 500	in HNO <sub>3</sub> (fillered)	Field Temperature °C	Field Spec. Cond.	Field pH	Analysis Required
W3827	Dup 2	30 Aug (6 NA	w		x x x		NA		NA	
w3828	Field Blank (FB)	30 Augl 6 NA	W		x x x		NA	NA	NA	
w3829	MWZO	30Aug/6 0850	GW		XXX		9,54	4136	6.90	
w3830	MWIOI	30 Aug 16 1143	GW		XXX		14.11	4968		
w3831	mw33	30Aug/6 1353	GN		XXX	1	13,67		1	
w3832	mw 3-90	30 Aug 16 1515	GW		XXX	111	13.89	5222	6.80	MDU CCR List with TSS and
w3833	mw 2-90	30Ay16 1637	GW		XXX		11-62	7676		Dissolved CCR Metals. No RadChem.

Comments:

	Transferred by:	Sample Condition	Date/Time	Received by:	Sample Condition	Date/Time	°C
1	Du Ro	Walkin 2	30 Aug 66	C. Jackson		31 Aug 16	ROJ 6.2
2		,					TM 588
3		24					30 Aug 16

1845



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



October 21, 2016

Montana Dakota Utilities Attn: Samantha Marshall 400 N. 4<sup>th</sup> St. Bismarck, ND 58501

RE: Groundwater Sampling Event- MDU Heskett Ash Site

Dear Ms. Marshall:

It was brought to MVTL's attention by BARR that the field data report for the August sampling event had an error. The error was the amount of volume removed for well 105. The initial report had 8500mL listed for volume removed but after reviewing the field sheet the actual volume removed was 7500mL. The attached field data report has the corrected data.

Thank you for your trust and support of our services. If you have any questions, please call me at (800) 279-6885.

Sincerely,

Jeremy Meyer

**MVTL Field Services** 



**MDU Heskett** 

**GROUNDWATER SAMPLING - NDDH** 

Attn: Samantha Marshall

400 N. 4th St

Bismarck, ND 58501

701-222-7829

WO#	82-2728	82-2749	82-2696
	82-2724	82-2748	82-2694

WELL ID	PURGE DATE	START PURGE TIME	SAMPLE DATE	TIME OF SAMPLE	WELL CASING ELEVATION	STATIC WATER LEVEL (ft)	WATER LEVEL START	TOTAL DEPTH	WATER LEVEL END	VOLUME IN WELL (L)	VOLUME REMOVED (mL	SAMPLE METHOD	TEMP (°C)	EC	pН	Turbidity NTU	SAMPLE APPEARANCE
2-90	30-Aug-16	16:17	30-Aug-16	16:37	1686.60	1665.02	21.58	24.80	NA	2.0	2000.0	Bladder	11.62	7676	6.86	0.53	clear
3-90	30-Aug-16	14:55	30-Aug-16	15:15	1686.01	1666.98	19.03	21.93	19.12	1.8	2000.0	Bladder	13.89	5222	6.80	1.61	clear
13	29-Aug-16	8:31	29-Aug-16	9:01	1724.98	1694.76	30.22	41.90	30.72	7.2	3000.0	Bladder	12.41	10873	6.81	1.15	clear
33	30-Aug-16	12:53	30-Aug-16	13:52	1717.91	1675.83	42.08	46.55	42.73	2.8	6000.0	Bladder	13.67	5298	6.45	1.69	clear
70	30-Aug-16	8:30	30-Aug-16	8:50	1706.36	1685.02	21.34	43.06	22.67	13.4	2000.0	Bladder	9.54	4136	6.90	4.76	clear
80R	31-Aug-16	10:04	31-Aug-16	10:24	NA	NA	14.80	30.10	15.09	9.4	2000.0	Bladder	12.62	5734	7.01	1.42	clear
44R	29-Aug-16	11:51	29-Aug-16	12:16	NA	NA	28.74	45.88	28.83	10.6	2500.0	Bladder	11.77	9498	6.50	0.73	clear
101	30-Aug-16	9:53	30-Aug-16	11:43	NA	NA	37.18	57.09	41.59	12.3	11000.0	Bladder	14.11	4968	6.67	4.88	clear
102	29-Aug-16	13:17	29-Aug-16	14:07	NA	NA	17.78	33.20	21.88	9.5	5000.0	Bladder	13.76	8160	6.76	2.87	clear
103	29-Aug-16	10:09	29-Aug-16	10:44	NA	NA	33.16	47.10	37.14	8.6	3500.0	Bladder	11.07	5247	6.64	1.63	clear
104	31-Aug-16	8:30	31-Aug-16	9:00	NA	NA	14.41	32.85	14.71	11.4	3000.0	Bladder	12.44	14048	6.88	4.30	clear
105	31-Aug-16	11:29	31-Aug-16	12:44	NA	NA	13.60	32.39	13.90	11.6	7500.0	Bladder	13.06	7590	6.64	4.71	clear
1-90	NA.	NA	31-Aug-16	13:52	1675.86	1664.00	11.86	17.02	NA	NA	NA NA	WL	NA	NA	NA	NA	Water Level Only
2	NA NA	NA	31-Aug-16	13:55	1698.60	1659.92	38.68	63.70	NA	NA	NA	WL	NA	NA	NA	NA	Water Level Only
4B	NA NA	NA NA	31-Aug-16		1662,80	1645,10	17.70	26.15	NA	NA NA	NA	WL	NA	NA	NA	NA	Water Level Only
8	NA NA	NA NA	31-Aug-16		1664.90	1647.87	17.03	28.02	NA	NA	NA NA	WL	NA	NA	NA	NA	Water Level Only
	1		0.7.09.10	13.00													



### MINNESOTA VALLEY TESTING LABORATORIES, INC.

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#### **CASE NARRATIVE**

MVTL Lab Reference No/SDG:

201682-2728

IML Lab Reference No/SDG:

S1609036

Client:

**Montana Dakota Utilities** 

Location:

**MDU Heskett Ash Site** 

**Project Identification:** 

CCR August 2016

**MVTL Laboratory Identifications:** 

16-W3835 through 16-W3841

**IML Laboratory Identifications:** 

S1609036-001 through S1609036-007

Page 1 of 2

MDU Sample Identification	MVTL Laboratory #	IML Laboratory #
Dup2	16-W3835	\$1609036-001
Field Blank (FB)	16-W3836	\$1609036-002
MW70	16-W3837	\$1609036-003
MW101	16-W3838	S1609036-004
MW33	16-W3839	\$1609036-005
MW2-90	16-W3840	\$1609036-006
MW3-90	16-W3841	\$1609036-007

#### I. RECEIPT

- All samples were received at the laboratory on 31 Aug 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.
  - o Temperature of samples upon receipt was 6.2°C.
- No other exceptions on sample receipt were encountered on this sample set unless noted here.
- All samples requiring radiochemistry analysis were sent via courier to Inter-Mountain Labs (IML) for analysis there. Samples were received at IML on 2 September 2016.
  - o 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.
  - o Please refer to the IML Case Narrative for more information regarding methodology.



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

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#### **CASE NARRATIVE**

MVTL Lab Reference No/SDG:

IML Lab Reference No/SDG:

Client:

Location:

**Project Identification:** 

MVTL Laboratory Identifications:

IML Laboratory Identifications:

Page 2 of 2

201682-2728

S1609036

**Montana Dakota Utilities** 

MDU Heskett Ash Site

CCR August 2016

**16-W3835** through **16-W3841** 

\$1609036-001 through \$1609036-007

#### 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.

#### V. REPORTING

- Per email from Barr Engineering dated 10 March 2016, IML was directed 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: Claudate Cantle

DATE: 70CT16

Claudette Carroll - MVTL Bismarck Laboratory Manager





Page:

1 of 1

Samantha Marshall Montana Dakota Utilities

400 N. 4th

Bismarck ND 58501

Report Date: 6 Oct 16 Lab Number: 16-W3835 Work Order #:82-2728 Account #: 002800

Date Sampled: 30 Aug 16

Date Received: 31 Aug 16 8:00 Sampled By: MVTL Field Services

Project Name: MDU Heskett CCR Radiochem Aug. 2016

Sample Description: Dup 2

Temp at Receipt: 6.2C ROI

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
Radium 226	See Attached Report			14 Sep 16	OL
Radium 228	See Attached Report			18 Sep 16	OL

OL = Analysis performed by an Outside Laboratory.

Approved by:

Clauditte K. Cantel

CC 70CT16

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 co
! = Due to sample quantity + = Due to in

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





1 of 1 Page:

Report Date: 6 Oct 16 Lab Number: 16-W3836 Work Order #:82-2728 Account #: 002800

Date Sampled: 30 Aug 16 Date Received: 31 Aug 16 8:00

Sampled By: MVTL Field Services

Project Name: MDU Heskett CCR Radiochem Aug. 2016

Sample Description: Field Blank (FB)

Montana Dakota Utilities

Samantha Marshall

Bismarck ND 58501

400 N. 4th

Temp at Receipt: 6.2C ROI

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
Radium 226 Radium 228	See Attached Report See Attached Report			14 Sep 16 18 Sep 16	OL OL
Radium 228	see Attached Report			10 Bep 10	Oli

OL = Analysis performed by an Outside Laboratory.

Approved by:

Clauditte K. Canto

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 con
! = Due to sample quantity + = Due to int

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





Samantha Marshall Montana Dakota Utilities 400 N. 4th

Bismarck ND 58501

1 of 1 Page:

Report Date: 6 Oct 16 Lab Number: 16-W3837 Work Order #:82-2728 Account #: 002800

Date Sampled: 30 Aug 16 8:50 Date Received: 31 Aug 16 8:00 Sampled By: MVTL Field Services

Project Name: MDU Heskett CCR Radiochem Aug. 2016

Sample Description: MW70

Temp at Receipt: 6.2C ROI

	As Recei Result	ved	Method RL	Method Reference	Date Analyzed		Analyst
pH - Field	6.90	units	NA	SM 4500 H+ B	30 Aug 16	8:50	DJN
Temperature - Field	9.54	Degrees C	NA	SM 2550B	30 Aug 16	8:50	DJN
Conductivity - Field	4136	umhos/cm	1	EPA 120.1	30 Aug 16	8:50	DJN
Radium 226	See Atta	ched Report			14 Sep 16		OL
Radium 228	See Atta	ched Report			18 Sep 16		OL

OL = Analysis performed by an Outside Laboratory.

Approved by:

Clauditte K. Cantlo 70 CT 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 con
! = Due to sample quantity + = Due to inf

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





Report Date: 6 Oct 16 Lab Number: 16-W3838 Work Order #:82-2728 Account #: 002800

1 of 1

Page:

Date Sampled: 30 Aug 16 11:43 Date Received: 31 Aug 16 8:00 Sampled By: MVTL Field Services

Bismarck ND 58501 Project Name: MDU Heskett CCR Radiochem Aug. 2016

Samantha Marshall

400 N. 4th

Sample Description: MW101

Montana Dakota Utilities

Temp at Receipt: 6.2C ROI

	As Recei	ived	Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	6.67	units	NA	SM 4500 H+ B	30 Aug 16 11:43	DJN
Temperature - Field	14.1	Degrees C	NA	SM 2550B	30 Aug 16 11:43	
Conductivity - Field	4968	umhos/cm	1	EPA 120.1	30 Aug 16 11:43	DJN
Radium 226	See Atta	ached Report			14 Sep 16	OL
Radium 228		ached Report			18 Sep 16	OL

OL = Analysis performed by an Outside Laboratory.

Approved by:

Claudite K. Cante

7(1CT16

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 constant # = Due to in

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





Samantha Marshall Montana Dakota Utilities

400 N. 4th

Bismarck ND 58501

1 of 1 Page:

Report Date: 6 Oct 16 Lab Number: 16-W3839 Work Order #:82-2728 Account #: 002800

Date Sampled: 30 Aug 16 13:53 Date Received: 31 Aug 16 8:00 Sampled By: MVTL Field Services

Project Name: MDU Heskett CCR Radiochem Aug. 2016

Sample Description: MW33

Temp at Receipt: 6.2C ROI

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	6.45	units	NA	SM 4500 H+ B	30 Aug 16 13:53 30 Aug 16 13:53	
Temperature - Field	13.7	Degrees C umhos/cm	NA 1	SM 2550B EPA 120.1	30 Aug 16 13:53	
Conductivity - Field Radium 226 Radium 228		ached Report ached Report	1	EFA 120.1	14 Sep 16 18 Sep 16	OL OL

OL = Analysis performed by an Outside Laboratory.

Approved by:

Clauditte K. Canto 7UCT16

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 con
! = Due to sample quantity + = Due to inf

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





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

Report Date: 6 Oct 16 Lab Number: 16-W3840 Work Order #:82-2728 Account #: 002800

1 of 1

Page:

Date Sampled: 30 Aug 16 15:15 Date Received: 31 Aug 16 8:00 Sampled By: MVTL Field Services

Project Name: MDU Heskett CCR Radiochem Aug. 2016 Sample Description: MW3-90

Temp at Receipt: 6.2C ROI

	As Rece: Result	ived	Method Method RL Reference			
pH - Field Temperature - Field Conductivity - Field Radium 226 Radium 228		units Degrees C umhos/cm ached Report	NA NA 1	SM 4500 H+ B SM 2550B EPA 120.1	30 Aug 16 15:15 30 Aug 16 15:15 30 Aug 16 15:15 14 Sep 16 22 Sep 16	DJN

OL = Analysis performed by an Outside Laboratory.

Claudite Approved by:

70CT16

6

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 con
! = Due to sample quantity + = Due to inf

K. Cantle

CERTIFICATION: ND # ND-00016

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





Page:

1 of 1

Report Date: 6 Oct 16 Lab Number: 16-W3841 Work Order #:82-2728 Account #: 002800

Date Sampled: 30 Aug 16 16:37 Date Received: 31 Aug 16 8:00 Sampled By: MVTL Field Services

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

Project Name: MDU Heskett CCR Radiochem Aug. 2016

Sample Description: MW2-90

Temp at Receipt: 6.2C ROI

	As Receiv Result	red	Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	6.86	units	NA	SM 4500 H+ B	30 Aug 16 16:37	DJN
Temperature - Field	11.6	Degrees C	NA	SM 2550B	30 Aug 16 16:37	DJN
Conductivity - Field	7676	umhos/cm	1	EPA 120.1	30 Aug 16 16:37	DJN
Radium 226	See Attac	hed Report			14 Sep 16	OL
Radium 228	See Attac	hed Report			19 Sep 16	OL

OL = Analysis performed by an Outside Laboratory.

Approved by:

Clauditte K. Cantlo 70CT 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 conduct to sample quantity + = Due to information with ND 20015.

CERTIFICATION: ND # ND-00016

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



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

Date: 9/29/2016

CLIENT:

Lab Order:

MVTL Laboratories, Inc.

Project:

201682-2728

S1609036

nvil Laboratories, inc

CASE NARRATIVE

Report ID: S1609036001

Samples 16-W3835 Dup 2, 16-W3836 Field Blank, 16-W3837 MW70, 16-W3838 MW101, 16-W3839 MW33, 16-W3840 MW3-90, and 16-W3841 MW2-90 were received on September 2, 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: All

Wade Nieuwsma, Assistant Laboratory Manager



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

### Sample Analysis Report

Company: MVTL Laboratories, Inc.

2616 E Broadway Ave.

Bismarck, ND 58501

ProjectName: Lab ID:

201682-2728

S1609036-001 ClientSample ID: 16-W3835 Dup 2

COC:

201682-2728

Date Reported 9/29/2016

Report ID

S1609036001

WorkOrder:

S1609036

CollectionDate: 8/30/2016

DateReceived:

9/2/2016 10:58:00 AM

FieldSampler:

Matrix:

Water

#### Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Radionuclides - Total							
Radium 226	0.3	pCi/L		0.2	SM 7500 Ra-B	09/14/2016 951	MB
Radium 226 Precision (±)	0.1	pCi/L			SM 7500 Ra-B	09/14/2016 951	MB
Radium 228	-3.4	pCi/L		1	Ga-Tech	09/18/2016 1117	MB
Radium 228 Precision (±)	3.4	pCi/L			Ga-Tech	09/18/2016 1117	MB

These results apply only to the samples tested.

Qualifiers:

В Analyte detected in the associated Method Blank

Value above quantitation range

Analyte detected below quantitation limits

Value exceeds Monthly Ave or MCL or is less than LCL

О Outside the Range of Dilutions

Х Matrix Effect **RL** - Reporting Limit

Calculated Value

Holding times for preparation or analysis exceeded

Analyzed by another laboratory L

ND Not Detected at the Reporting Limit

Spike Recovery outside accepted recovery limits

Reviewed by: A

Wade Nieuwsma, Assistant Laboratory Manager

Page 1 of 7



Inter-Mountain Labs

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

#### Sample Analysis Report

Company: MVTL Laboratories, Inc.

Date Reported 9/29/2016 2616 E Broadway Ave. Report ID S1609036001

Bismarck, ND 58501

ProjectName: Lab ID:

201682-2728 S1609036-002

ClientSample ID: 16-W3836 Field Blank

COC:

201682-2728

WorkOrder:

S1609036

CollectionDate: 8/30/2016

DateReceived: 9/2/2016 10:58:00 AM

FieldSampler:

Matrix: Water

Commonte

Date Analyzed/Init	
14/2016 951	MB
14/2016 951	MB
8/2016 1418	MB
8/2016 1418	MB
1	rite Analyzed/Ini 714/2016 951 114/2016 951 18/2016 1418 18/2016 1418

These results apply only to the samples tested.

Qualifiers:

В Analyte detected in the associated Method Blank

Value above quantitation range

Analyte detected below quantitation limits

Value exceeds Monthly Ave or MCL or is less than LCL

Outside the Range of Dilutions

Matrix Effect

**RL** - Reporting Limit

Calculated Value

Holding times for preparation or analysis exceeded

Analyzed by another laboratory L

ND Not Detected at the Reporting Limit

Spike Recovery outside accepted recovery limits

Reviewed by: A)

Wade Nieuwsma, Assistant Laboratory Manager

Page 2 of 7



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

#### Sample Analysis Report

Company:

MVTL Laboratories, Inc.

2616 E Broadway Ave.

Bismarck, ND 58501

ProjectName:

201682-2728

Lab ID:

S1609036-003 ClientSample ID: 16-W3837 MW70

201682-2728

Date Reported

9/29/2016

Report ID

S1609036001

WorkOrder:

S1609036

CollectionDate: 8/30/2016 8:50:00 AM

DateReceived: 9/2/2016 10:58:00 AM

FieldSampler:

Matrix:

Water

#### Comments

Comments							
Analyses	Result	Units	Qual	RL	Method	Date Analyzed/I	nit
Radionuclides - Total							
Radium 226	0.3	pCi/L		0.2	SM 7500 Ra-B	09/14/2016 951	MB
Radium 226 Precision (±)	0.1	pCi/L			SM 7500 Ra-B	09/14/2016 951	MB
Radium 228	-4.3	pCi/L		1	Ga-Tech	09/18/2016 1719	MB
Radium 228 Precision (±)	3.6	pCi/L			Ga-Tech	09/18/2016 1719	MB

#### These results apply only to the samples tested.

Qualifiers:

Analyte detected in the associated Method Blank

Value above quantitation range Ε

Analyte detected below quantitation limits J

М Value exceeds Monthly Ave or MCL or is less than LCL

Outside the Range of Dilutions

Matrix Effect

**RL** - Reporting Limit

Calculated Value

Н Holding times for preparation or analysis exceeded

Analyzed by another laboratory 1.

ND Not Detected at the Reporting Limit

Spike Recovery outside accepted recovery limits

Reviewed by: All

Wade Nieuwsma, Assistant Laboratory Manager

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