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Amended 28 Feb 17 (TDS result)

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

Project Name: MDU Heskett CCR

Sample Description: Field Blank 1

Event and Year: December 2016

1 of 2 Page:

Report Date: 12 Jan 17 Lab Number: 16-W6025 Work Order #:82-4102 Account #: 002800

Date Sampled: 20 Dec 16

Date Received: 20 Dec 16 14:20 Sampled By: MVTL Field Services

PO #: 160249

Temp at Receipt: 6.2C ROI

	As Receive Result	ed	Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	20 Dec 16	SVS
Hq	* 5.9	units	N/A	SM4500 H+ B	20 Dec 16 17:00	SVS
Total Suspended Solids	< 2	mg/l	2	I3765-85	20 Dec 16 17:49	SVS
Total Alkalinity	< 20	mg/l CaCO3	20	SM2320-B	20 Dec 16 17:00	SVS
Fluoride	< 0.1	mg/l	0.10	SM4500-F-C	20 Dec 16 17:00	SVS
Sulfate	< 5	mg/l	5.00	ASTM D516-07	5 Jan 17 14:10	EMS
Chloride	< 1	mg/l	1.0	SM4500-C1-E	4 Jan 17 13:47	EMS
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	28 Dec 16 11:20	EV
Mercury - Dissolved	< 0.0002	mg/l	0.0002	EPA 245.1	28 Dec 16 12:13	EV
Total Dissolved Solids	< 10	mg/l	10	I1750-85	21 Dec 16 16:32	SVS
Calcium - Total	< 1	mg/l	1.0	6010	22 Dec 16 13:48	SZ
Magnesium - Total	< 1	mg/l	1.0	6010	22 Dec 16 13:48	SZ
Sodium - Total	< 1	mg/l	1.0	6010	22 Dec 16 13:48	SZ
Potassium - Total	< 1	mg/l	1.0	6010	22 Dec 16 13:48	SZ
Lithium - Total	< 0.1	mg/l	0.10	6010	6 Jan 17 12:48	KMD
Boron - Total	< 0,1	mg/l	0.10	6010	5 Jan 17 12:35	KMD
Calcium - Dissolved	< 1	mg/l	1.0	6010	22 Dec 16 16:42	SZ
Magnesium - Dissolved	< 1	mg/l	1.0	6010	22 Dec 16 16:42	SZ
Sodium - Dissolved	< 1	mg/l	1.0	6010	22 Dec 16 16:42	SZ
Potassium - Dissolved	< 1	mg/l	1.0	6010	22 Dec 16 16:42	SZ
Lithium - Dissolved	< 0.1	mg/l	0.10	6010	6 Jan 17 13:48	KMD
Boron - Dissolved	< 0.1	mg/l	0.10	6010	5 Jan 17 14:35	KMD
Antimony - Total	< 0.001	mg/l	0.0010	6020	10 Jan 17 15:05	KMD
Arsenic - Total	< 0.002	mg/l	0.0020	6020	10 Jan 17 15:05	KMD
Barium - Total	< 0.002	mg/l	0.0020	6020	10 Jan 17 15:05	KMD
Beryllium - Total	< 0.0005	mg/l	0.0005	6020	10 Jan 17 15:05	KMD
Cadmium - Total	< 0.0005	mg/l	0.0005	6020	10 Jan 17 15:05	KMD
Chromium - Total	< 0.002	mg/l	0.0020	6020	10 Jan 17 15:05	KMD
Cobalt - Total	< 0.002	mg/l	0.0020	6020	10 Jan 17 15:05	KMD
Lead - Total	< 0.001 ^	mg/l	0.0005	6020	10 Jan 17 15:05	KMD
Molybdenum - Total	< 0.002	mg/l	0.0020	6020	10 Jan 17 15:05	KMD
Selenium - Total	< 0.002	mg/l	0.0020	6020	11 Jan 17 9:25	KMD
Thallium - Total	< 0.001 ^	mg/l	0.0005	6020	10 Jan 17 15:05	KMD
Antimony - Dissolved	< 0.001	mg/l	0.0010	6020	9 Jan 17 12:20	KMD
Arsenic - Dissolved	< 0.002	mg/l	0.0020	6020	9 Jan 17 12:20	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 interpret to the conduct to the conduct

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



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2 of 2

Amended 28 Feb 17 (TDS result)

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

Project Name: MDU Heskett CCR

Sample Description: Field Blank 1

Event and Year: December 2016

Page:

Report Date: 12 Jan 17 Lab Number: 16-W6025 Work Order #:82-4102 Account #: 002800

Date Sampled: 20 Dec 16

Date Received: 20 Dec 16 14:20 Sampled By: MVTL Field Services

PO #: 160249

Temp at Receipt: 6.2C ROI

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
Barium - Dissolved	< 0.002 mg/l	0.0020	6020	9 Jan 17 12:20	KMD
Beryllium - Dissolved	< 0.0005 mg/1	0.0005	6020	9 Jan 17 12:20	KMD
Cadmium - Dissolved	< 0.0005 mg/1	0.0005	6020	9 Jan 17 12:20	KMD
Chromium - Dissolved	< 0.002 mg/1	0.0020	6020	9 Jan 17 12:20	KMD
Cobalt - Dissolved	< 0.002 mg/1	0.0020	6020	9 Jan 17 12:20	KMD
Lead - Dissolved	< 0.0005 mg/1	0.0005	6020	9 Jan 17 12:20	KMD
Molybdenum - Dissolved	< 0.002 mg/l	0.0020	6020	9 Jan 17 12:20	KMD
Selenium - Dissolved	< 0.005 ^ mg/l	0.0020	6020	9 Jan 17 12:20	KMD
Thallium - Dissolved	< 0.0005 mg/l	0.0005	6020	9 Jan 17 12:20	KMD

<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 conduct the conduction of the con

# = 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

Sample Description: 103

Event and Year: December 2016

1 of 2 Page:

Report Date: 12 Jan 17 Lab Number: 16-W6026 Work Order #:82-4102 Account #: 002800

Date Sampled: 20 Dec 16 10:01 Date Received: 20 Dec 16 14:20 Sampled By: MVTL Field Services

PO #: 160249

Temp at Receipt: 6.2C ROI

	As Receive Result	ed	Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	20 Dec 16	SVS
pН	* 7.0	units	N/A	SM4500 H+ B	21 Dec 16 17:00	SVS
Total Suspended Solids	8	mg/l	2	13765-85	20 Dec 16 17:49	SVS
pH - Field	6.79	units	NA	SM 4500 H+ B	20 Dec 16 10:01	JSM
Temperature - Field	4.20	Degrees C	NA	SM 2550B	20 Dec 16 10:01	JSM
Total Alkalinity	449	mg/l CaCO3	20	SM2320-B	21 Dec 16 17:00	SVS
Conductivity - Field	5059	umhos/cm	1	EPA 120.1	20 Dec 16 10:01	JSM
Fluoride	0.15	mg/l	0.10	SM4500-F-C	21 Dec 16 17:00	SVS
Sulfate	2380	mg/l	5.00	ASTM D516-07	5 Jan 17 14:10	EMS
Chloride	150	mg/l	1.0	SM4500-C1-E	4 Jan 17 13:47	EMS
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	28 Dec 16 11:20	EV
Mercury - Dissolved	< 0.0002	mg/l	0.0002	EPA 245.1	4 Jan 17 11:53	EV
Total Dissolved Solids	4350	mg/l	10	I1750-85	21 Dec 16 16:32	SVS
Calcium - Total	535	mg/l	1.0	6010	22 Dec 16 13:48	SZ
Magnesium - Total	470	mg/l	1.0	6010	22 Dec 16 13:48	SZ
Sodium - Total	235	mg/l	1.0	6010	22 Dec 16 13:48	SZ
Potassium - Total	17.4	mg/l	1.0	6010	22 Dec 16 13:48	SZ
Lithium - Total	0.62	mg/l	0.10	6010	6 Jan 17 12:48	KMD
Boron - Total	< 0.5 @	mg/l	0.10	6010	5 Jan 17 12:35	KMD
Calcium - Dissolved	510	mg/l	1.0	6010	22 Dec 16 16:42	SZ
Magnesium - Dissolved	461	mg/l	1.0	6010	22 Dec 16 16:42	SZ
Sodium - Dissolved	240	mg/l	1.0	6010	22 Dec 16 16:42	SZ
Potassium - Dissolved	16.9	mg/l	1.0	6010	22 Dec 16 16:42	SZ
Lithium - Dissolved	0.57	mg/l	0.10	6010	6 Jan 17 13:48	KMD
Boron - Dissolved	< 0.5 @	mg/l	0.10	6010	5 Jan 17 14:35	KMD
Antimony - Total	< 0.001	mg/l	0.0010	6020	10 Jan 17 15:05	KMD
Arsenic - Total	< 0.002	mg/l	0.0020	6020	10 Jan 17 15:05	KMD
Barium - Total	0.0072	mg/l	0.0020	6020	10 Jan 17 15:05	KMD
Beryllium - Total	< 0.0005	mg/l	0.0005	6020	10 Jan 17 15:05	KMD
Cadmium - Total	< 0.0005	mg/l	0.0005	6020	10 Jan 17 15:05	KMD
Chromium - Total	0.0034	mg/l	0.0020	6020	10 Jan 17 15:05	KMD
Cobalt - Total	< 0.002	mg/l	0.0020	6020	10 Jan 17 15:05	KMD
Lead - Total	< 0.001 ^	mg/l	0.0005	6020	10 Jan 17 15:05	KMD
Molybdenum - Total	< 0.002	mg/l	0.0020	6020	10 Jan 17 15:05	KMD
Selenium - Total	0.0760	mg/l	0.0020	6020	11 Jan 17 9:25	KMD
Thallium - Total	< 0.001 ^	mg/l	0.0005	6020	10 Jan 17 15:05	KMD

RL = Method Reporting Limit

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

O = Due to sample matrix
| = Due to sample quantity
| = Due to internal standard response



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Report Date: 12 Jan 17 Lab Number: 16-W6026 Work Order #:82-4102 Account #: 002800

Date Sampled: 20 Dec 16 10:01 Date Received: 20 Dec 16 14:20 Sampled By: MVTL Field Services

PO #: 160249

Temp at Receipt: 6.2C ROI

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

Project Name: MDU Heskett CCR

Sample Description: 103

Event and Year: December 2016

	As Received Result	d	Method RL	Method Reference	Date Analyzed	Analyst
Antimony - Dissolved	< 0.001	mg/l	0.0010	6020	9 Jan 17 12:20	KMD
Arsenic - Dissolved	< 0.002	mg/l	0.0020	6020	9 Jan 17 12:20	KMD
Barium - Dissolved	0.0079	mg/l	0.0020	6020	9 Jan 17 12:20	KMD
Beryllium - Dissolved	< 0.0005	mg/l	0.0005	6020	9 Jan 17 12:20	KMD
Cadmium - Dissolved	< 0.0005	mg/1	0.0005	6020	9 Jan 17 12:20	KMD
Chromium - Dissolved	< 0.002	mg/l	0.0020	6020	9 Jan 17 12:20	KMD
Cobalt - Dissolved	< 0.002	mg/l	0.0020	6020	9 Jan 17 12:20	KMD
Lead - Dissolved	< 0.0005	mg/l	0.0005	6020	9 Jan 17 12:20	KMD
Molybdenum - Dissolved	< 0.002	mg/l	0.0020	6020	9 Jan 17 12:20	KMD
Selenium - Dissolved	0.0606	mg/1	0.0020	6020	9 Jan 17 12:20	KMD
Thallium - Dissolved	< 0.0005	mg/l	0.0005	6020	9 Jan 17 12:20	KMD

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

Approved by:

Claudite K. Canto

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

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



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1 of 2 Page:

Report Date: 12 Jan 17 Lab Number: 16-W6027 Work Order #:82-4102 Account #: 002800

Date Sampled: 20 Dec 16 12:20 Date Received: 20 Dec 16 14:20 Sampled By: MVTL Field Services

PO #: 160249

Temp at Receipt: 6.2C ROI

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

Project Name: MDU Heskett CCR

Sample Description: 44R

Event and Year: December 2016

	As Receive Result	ed	Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	20 Dec 16	SVS
Н	* .7.0	units	N/A	SM4500 H+ B	21 Dec 16 17:00	SVS
Total Suspended Solids	5	mg/l	2	I3765-85	20 Dec 16 17:49	SVS
pH - Field	6.62	units	NA	SM 4500 H+ B	20 Dec 16 12:20	JSM
Temperature - Field	6.23	Degrees C	NA	SM 2550B	20 Dec 16 12:20	JSM
Total Alkalinity	438	mg/l CaCO3	20	SM2320-B	21 Dec 16 17:00	SVS
Conductivity - Field	9069	umhos/cm	1	EPA 120.1	20 Dec 16 12:20	JSM
Fluoride	0.67	mg/l	0.10	SM4500-F-C	21 Dec 16 17:00	SVS
Sulfate	5140	mg/l	5.00	ASTM D516-07	5 Jan 17 14:10	EMS
Chloride	241	mg/l	1.0	SM4500-C1-E	4 Jan 17 13:47	EMS
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	28 Dec 16 11:20	EV
Mercury - Dissolved	< 0.0002	mg/l	0.0002	EPA 245.1	4 Jan 17 11:53	EV
Total Dissolved Solids	8830	mg/l	10	I1750-85	21 Dec 16 16:32	SVS
Calcium - Total	420	mg/l	1.0	6010	22 Dec 16 13:48	SZ
Magnesium - Total	980	mg/l	1.0	6010	22 Dec 16 13:48	SZ
Sodium - Total	995	mg/l	1.0	6010	22 Dec 16 13:48	SZ
Potassium - Total	31,2	mg/l	1.0	6010	22 Dec 16 13:48	SZ
Lithium - Total	1.35	mg/l	0.10	6010	6 Jan 17 12:48	KMD
Boron - Total	0.39	mg/l	0.10	6010	5 Jan 17 12:35	KMD
Calcium - Dissolved	431	mg/l	1.0	6010	22 Dec 16 16:42	SZ
Magnesium - Dissolved	1010	mg/l	1.0	6010	22 Dec 16 16:42	SZ
Sodium - Dissolved	1020	mg/l	1.0	6010	22 Dec 16 16:42	SZ
Potassium - Dissolved	25.7	mg/l	1.0	6010	22 Dec 16 16:42	SZ
Lithium - Dissolved	1.31	mg/l	0.10	6010	6 Jan 17 13:48	KMD
Boron - Dissolved	0.28	mg/l	0.10	6010	5 Jan 17 14:35	KMD
Antimony - Total	< 0.001	mg/l	0.0010	6020	10 Jan 17 15:05	KMD
Arsenic - Total	< 0.002	mg/l	0.0020	6020	10 Jan 17 15:05	KMD
Barium - Total	0.0070	mg/l	0.0020	6020	10 Jan 17 15:05	KMD
Beryllium - Total	< 0.0005	mg/l	0.0005	6020	10 Jan 17 15:05	KMD
Cadmium - Total	< 0.0005	mg/l	0.0005	6020	10 Jan 17 15:05	KMD
Chromium - Total	< 0.002	mg/l	0.0020	6020	10 Jan 17 15:05	KMD
Cobalt - Total	< 0.002	mg/l	0.0020	6020	10 Jan 17 15:05	KMD
Lead - Total	< 0.001 ^	mg/l	0.0005	6020	10 Jan 17 15:05	KMD
Molybdenum - Total	< 0.002	mg/l	0.0020	6020	10 Jan 17 15:05	KMD
Selenium - Total	0.0778	mg/l	0.0020	6020	11 Jan 17 9:25	KMD
Thallium - Total	< 0.001 ^	mg/l	0.0005	6020	10 Jan 17 15:05	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 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

Sample Description: 44R

Event and Year: December 2016

Page: 2 of 2

Report Date: 12 Jan 17 Lab Number: 16-W6027 Work Order #:82-4102 Account #: 002800

Date Sampled: 20 Dec 16 12:20 Date Received: 20 Dec 16 14:20 Sampled By: MVTL Field Services

PO #: 160249

Temp at Receipt: 6.2C ROI

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
Antimony - Dissolved	< 0.001 mg/l	0.0010	6020	9 Jan 17 12:20	KMD
Arsenic - Dissolved	< 0.002 mg/l	0.0020	6020	9 Jan 17 12:20	KMD
Barium - Dissolved	0.0065 mg/l	0.0020	6020	9 Jan 17 12:20	KMD
Beryllium - Dissolved	< 0.0005 mg/l	0.0005	6020	9 Jan 17 12:20	KMD
Cadmium - Dissolved	< 0.0005 mg/l	0.0005	6020	9 Jan 17 12:20	KMD
Chromium - Dissolved	< 0.002 mg/l	0.0020	6020	9 Jan 17 12:20	KMD
Cobalt - Dissolved	< 0.002 mg/l	0.0020	6020	9 Jan 17 12:20	KMD
Lead - Dissolved	0.0007 mg/l	0.0005	6020	9 Jan 17 12:20	KMD
Molybdenum - Dissolved	< 0.002 mg/l	0.0020	6020	9 Jan 17 12:20	KMD
Selenium - Dissolved	0.0853 mg/l	0.0020	6020	9 Jan 17 12:20	KMD
Thallium - Dissolved	< 0.0005 mg/l	0.0005	6020	9 Jan 17 12:20	KMD

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

1.6

Approved by:

Claudite K. Cantep

17 Jan 17

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

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



# Field Datasheet

Groundwater Assessment

Company:	MDU Heskett
Event:	2016
Sample ID:	103.
Sampling Personal:	lever Man

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

Weather Conditions:		Temp:	20 °F		Wind:	NOS	-10		Precip	Sunn	v / Partly C	Cloudy / Clo	
	Well Info	rmation	<b>:</b>					Sa		nformatio		1000y / C10	цау
Well Locked?	Yes	(NO)				Purgir	ng Method:	Blad		Inomialio			
Well Labeled?	(PES)	· No					ng Method:		ider	1 }		ntrol Setting	IS
Casing Straight?	(Yes	No					ed Equip?:		No	1 -			sec
Grout Seal Intact?	Yes	No	Not Visi	hile			Sample?:		(A)				sec
Repairs Necessary:		······································		,,,			Sample ID:	Yes	CNA	1	PSI:	30	
	Diameter:		2"			Duplicate (	sample ID:			] [	Pumping R	ate: /20	mL/mir
Water Level Bef		بد.	32.66	-ft				220	<del> </del>	T			
	Vell Depth:		3000	- 11			urge Date:	20 Decl		Time Purgi		3926	@m/pm
	ell Volume:			Tid a ma			irged Dry?	Yes	অত		urged Dry:		am/pm
Depth to Top		· · · · · · · · · · · · · · · · · · ·		liters		Sa.	mple Date:	20 Decl	6	Time of	Sampling:	1001	(m/pm
Water Level After	·	·	36.50			4							
				ft		Bottle	CC	R: 1L Raw,	500mL Nit	irc, 500mL N	litric (filtere	d), 4-1L Nitr	ic
Measuremer	it ivietnod:	Electric V	Vater Level Inc	licator		List:	NDDH	: 1L Raw,	500mL nitri	c, 500mL nit	iric (filtered	), 250mL su	lfiric
			•	Eiold I	14								

Field Measurements

	lization secutive)	Temp (°C)	Spec. Cond.	На	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Water Level (ft)	mL Removed	Discription:
SEQ#	Time		±5%	±0.1	±10%	±20 mV	±10%	0.25 ft	Kemoved .	Clarity, Color, Odor, Ect.
1	1590	4.51	5001	6.72	4.95	2517	8.77	33,49	500	Clear
2	0936	4.04	5050	6,72	5.00	251.2	8.14	33.90	Soo	Cles
3	0941	3,61	5072	6,74	5,38	249,7	4.75	34.19	500	Cler
4	0946		5079	6,78	5,42	247.2	3,13	34,33	500	Cles
5	095]	3.87	5068	6,78	5,43	246,1	2.50	34,45	500	Clea
6	6956	3,85	5072	6,79	5.48	245,0	2,37	34,56	500	Cles
7	1001	4.20	5659	6,79	5:37	243.0	2,29	34.59	500	Cler
8										
9			· · · · · · · · · · · · · · · · · · ·							
10 abilized:	Yes)	No					tal Volume			

Comments:



# **Field Datasheet**

Groundwater Assessment

Company:	MDU Heskett
Event:	2016
Sample ID:	HHR
Sampling Personal:	Jenny Mar -

Phone: (701) 258-9720

											•		
Weather Conditions:		Temp:	S⊃ .Ł		Wind:	N Ø5~(	ਹ		Precip	Supp	w (Dartiv C	Houdy / Clos	1 4 4
	Well Info	rmation					Sampling Information					Houdy / Glot	auy
Well Locked?	Yes	(A)				Drivai	n = 1/10/1 = -1-			monnano		·	
Well Labeled?	)(es	No					ng Method:	Blad	der	1 [	Co	ntrol Setting:	3
						Sampli	ng Method:	Blad	der	l [	Purge:	B	sec.
Casing Straight?	(X)	No				Dedicat	ed Equip?:	YES	No	1 1	Recover:	52	
Grout Seal Intact?	Yes	No	Not Vis	ible)			Sample?:	Yes	Mo	1 +		20	sec.
Repairs Necessary:							Sample ID:		(110)	}	PSI:		
Casing	Diameter:		2"			Dupilcate	Janiple ID.		<del></del>	<u> </u>	Pumping R	ate: 100	mL/min
Water Level Befo	ore Purge:		Z8127	ff			urge Date:	3. 1	77.	T: D :			
	/ell Depth:							20 Da 1	0	Time Purgi		1200	am/pm
				π		Well P	urged Dry?	Yes	No	Time Pi	urged Dry:		am/pm
	II Volume:		<u> </u>	liters		Sa	mple Date:	20 Dec 10	0		Sampling:	1220	
Depth to Top	of Pump:			ft						L	<u></u>	1 2 22	am/pm
Water Level Afte	r Sample:		28,40	ft		Bottle	~~	D. 41 D			10.		
Measuremen	t Method:		Water Level In	dicator		List:	NDDI	R: 1L Raw,	SOUML NIT	irc, 500mL N	litric (filtere	<u>d), 4-1L Nitri</u>	)
			LOVEI III	aroaro1			וחחאו	1: 1L Raw, 5	uumL nitri	c, 500mL nit	iric (filtered)	), 250mL sul	firic
				Field	Magaura	manta							······································

Field Weasurements

	ization secutive)	Temp	Spec. Cond.	Hq	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	. tomoveu	clear, slightly turbid, turbid
1	1205	6.58	9124	6.66	2.02	163,4	0.62	28.42	500	Cleer
2	1210	6.70	9037	6.62	ī,55	170,4	0.68	28,44	520	Clear
3	1215	6,30	9072	6.64	1,53	174.9	0,42	28,44	500	Cler
4	1220	6,23	9069	6,62	1:47	178.4	8.41	28,43	200	Clar
5								0: 22		U1
6										
7				1 TO 10 TO 1						
8										
9										
10										
Stabilized:	(Yes	No				To	tal Volume	Removed:	2000	mL

Comments:



# **Chain of Custody Record**

Projec	t Name:												9	
								<u>Na</u>	me o	f San	npler(s):	p.	1	
MDU	Heskett	CCR Gro	undwater		2016						_	Jem 1	by	
Report To: Attn: Address: Phone:	MDU Samantha Marshall 400 N. 4th St Bismarck, ND 58501 701-222-7829		Carbon ( Attn: Address					Wo	ork O	rder i	Number:	86	2-41	02
	Samp	le Informat	ion				Вс	ttle '	Гуре		Fi	ield Par	ameters	S Analysis
Lab Number	Sample 1D	Date	Time	Sample Type	Gradlent		1 Iller	500 ml HNO <sub>3</sub> (fillered)			Field Temperature °C	Field Spec. Cond.	Field pH	Analysis Required
20 Par 16	Field Blank (FB)		NA	W		X	X >	<b>Κ</b>	1		NA	NA	NA	
	- Dup-		NA	W		-X	$\times \rightarrow$	$\leftarrow$	$\vdash$	_	NA	NA	NA	1
WWO26	103	20 Deel6	100 [	GW			X/X				4.20	5059	6.79	† .
LEOJUI	44R	20 Dec 16	1220			X		_		1	6.23	9069	6.62	- -
Comments:														MDU CCR List with TSS and Dissolved CCR Metals. No RadChem.
	Tṛansferred)by:	Samp	le Conditi	on	Date/Time	1/	Rece	eived I	hv-		ample Co	andition	Date/Tin	me °C
1	Nosh,	log	in		20 Dec 16	110	al	XI)	<u>.ر.</u>	_	ampie O	J. IGIGOTI	20 Dec	2016 to 200 ROF



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:

201682-4103

IML Lab Reference No/SDG:

S1612304

Client:

Montana Dakota Utilities

Location:

**MDU Heskett Ash Site** 

**Project Identification:** 

**CCR December 2016** 

**MVTL Laboratory Identifications:** 

16-W6028 through 16-W6030

**IML Laboratory Identifications:** 

S1612304-001 through S1612304-003

Page 1 of 2

MDU Sample Identification	MVTL Laboratory #	IML Laboratory #
Field Blank (FB) 1	16-W6028	S1612304-001
103	16-W6029	S1612304-002
44R	16-W6030	S1612304-003

#### I. RECEIPT

- All samples were received at the laboratory on 20 December 2016 at 1420.
- 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 28 December 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.

#### 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.



MINNESOTA VALLEY TESTING LABORATORIES, INC.

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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

201682-4103

S1612304

**Montana Dakota Utilities** 

**MDU Heskett Ash Site** 

**CCR December 2016** 

16-W6028 through 16-W6030

S1612304-001 through S1612304-003

#### 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.

I wedthe Canto

Claudette Carroll - MVTL Bismarck Laboratory Manager



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

Project Name: MDU Heskett CCR Radiochem

Sample Description: Field Blank 1

Event and Year: December 2016

1 of 1 Page:

Report Date: 27 Jan 17 Lab Number: 16-W6028 Work Order #:82-4103 Account #: 002800

Date Sampled: 20 Dec 16

Date Received: 20 Dec 16 14:20 Sampled By: MVTL Field Services

PO #: 160249

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	Ä		10 Jan 17 22 Jan 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 co ! = Due to sample quantity + = Due to in

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



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Page:

1 of 1

Report Date: 27 Jan 17 Lab Number: 16-W6029 Work Order #:82-4103 Account #: 002800

Date Sampled: 20 Dec 16 10:01 Date Received: 20 Dec 16 14:20 Sampled By: MVTL Field Services

PO #: 160249

Temp at Receipt: 6.2C ROI

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

Project Name: MDU Heskett CCR Radiochem

Sample Description: 103

Event and Year: December 2016

	As Recei Result	ved	Method RL	Method Reference	Date Analyzed	Analyst	
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	20 Dec 16 10:01 20 Dec 16 10:01 20 Dec 16 10:01 10 Jan 17 22 Jan 16		

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 complete the control of the contr

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



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Page:

1 of 1

Report Date: 27 Jan 17 Lab Number: 16-W6030 Work Order #:82-4103 Account #: 002800

Date Sampled: 20 Dec 16 12:20 Date Received: 20 Dec 16 14:20 Sampled By: MVTL Field Services

PO #: 160249

Temp at Receipt: 6.2C ROI

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

Project Name: MDU Heskett CCR Radiochem

Sample Description: 44R

Event and Year: December 2016

	As Rece: Result	ived	Method RL	Method Reference	Date Analyzed	Analyst
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	20 Dec 16 12:20 20 Dec 16 12:20 20 Dec 16 12:20 10 Jan 17 22 Jan 16	JSM JSM JSM OL 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 concentration of other analytes
! = Due to sample quantity + = Due to internal standard response



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

Date: 1/27/2017

**CLIENT:** 

MVTL Laboratories, Inc.

Project:

Lab Order:

201682-4103

S1612304

CASE NARRATIVE

Report ID: S1612304001

Samples 16-W6028 Field Blank 1, 16-W6029 103, and 16-W6030 44R were received on December 28, 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

Page 1 of 1



1673 Terra Avenue, Sheridan, Wyoming 82801

Sample Analysis Report

MVTL Laboratories, Inc.

2616 E Broadway Ave.

Bismarck, ND 58501

ProjectName:

Company:

201682-4103

Lab ID:

S1612304-001

ClientSample ID: 16-W6028 Field Blank 1

201682-4103

ph: (307) 672-8945

Date Reported 1/27/2017

Report ID

S1612304001

WorkOrder:

S1612304

CollectionDate: 12/20/2016

DateReceived: 12/28/2016 11:27:00 AM

FieldSampler:

Matrix:

Water

Comments								
Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init		
Radionuclides - Total								
Radium 226	0.2	pCi/L		0.3	SM 7500 Ra-B	01/10/2017 1009	MB	
Radium 226 Precision (±)	0.1	pCi/L			SM 7500 Ra-B	01/10/2017 1009	MB	
Radium 228	-3.1	pCi/L		1	Ga-Tech	01/22/2017 607	WN	
Radium 228 Precision (±)	1.8	pCi/L			Ga-Tech	01/22/2017 607	WN	

## 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 .1

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 L

ND Not Detected at the Reporting Limit

Spike Recovery outside accepted recovery limits

Reviewed by:

Wade Nieuwsma, Assistant Laboratory Manager

Page 1 of 3



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:

201682-4103

Lab ID:

S1612304-002 ClientSample ID: 16-W6029 103

201682-4103

Date Reported 1/27/2017

Report ID

S1612304001

WorkOrder:

S1612304

CollectionDate: 12/20/2016 10:01:00 AM

DateReceived: 12/28/2016 11:27:00 AM

FieldSampler:

Matrix:

Water

Comments

COC:

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init		
Radionuclides - Total								
Radium 226	0.3	pCi/L		0.3	SM 7500 Ra-B	01/10/2017 1009	MB	
Radium 226 Precision (±)	0.1	pCi/L			SM 7500 Ra-B	01/10/2017 1009	MB	
Radium 228	0.0	pCi/L		1	Ga-Tech	01/22/2017 910	WN	
Radium 228 Precision (±)	1.5	pCi/L			Ga-Tech	01/22/2017 910	WN	

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

Н Holding times for preparation or analysis exceeded

Analyzed by another laboratory

Not Detected at the Reporting Limit

Spike Recovery outside accepted recovery limits

Reviewed by:

Wade Nieuwsma, Assistant Laboratory Manager

Page 2 of 3



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:

201682-4103

Lab ID:

S1612304-003 ClientSample ID: 16-W6030 44R

COC:

201682-4103

Date Reported 1/27/2017

Report ID

S1612304001

WorkOrder:

S1612304

CollectionDate: 12/20/2016 12:20:00 PM DateReceived: 12/28/2016 11:27:00 AM

FieldSampler:

Matrix:

Water

Comments								
Analyses	Result	Units	Qual RL		Method	Date Analyzed/Init		
Radionuclides - Total								
Radium 226	0.4	pCi/L		0.3	SM 7500 Ra-B	01/10/2017 1009	MB	
Radium 226 Precision (±)	0.1	pCi/L			SM 7500 Ra-B	01/10/2017 1009	MB	
Radium 228	1.3	pCi/L		1	Ga-Tech	01/22/2017 1211	WN	
Radium 228 Precision (±)	1.6	pCi/L			Ga-Tech	01/22/2017 1211	WN	

These results apply only to the samples tested.

Qualifiers:

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 3



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

## ANALYTICAL QC SUMMARY REPORT

CLIENT: MV

Work Order:

MVTL Laboratories, Inc.

S1612304

**Project:** 201682-4103

Date: 1/27/2017

Report ID: S1612304001

Radium 228 by Ga/Tech	Sample Type MBLK	Units: pCi/L		
MB-412 (01/21/17 14:53)	RunNo: 142633	PrepDate: 01/03/17 0:00 BatchID 12769		
Analyte	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-412 (01/21/17 17:54)	RunNo: 142633	PrepDate: 01/03/17 0:00 BatchID 12769		
Analyte	Result	RL Spike Ref Samp %REC % Rec Limits	Qua	
Total Radium 228	• •			
adium 228 by Ga/Tech	Sample Type MS	Units: pCi/L		
MS-412 (01/22/17 00:01)	RunNo: 142633	PrepDate: 01/03/17 0:00 BatchID 12769		
Analyte	Result	RL Spike Ref Samp %REC % Rec Limits 0	Qual	
Total Radium 228	37	1 40.3 ND 92.5 55 - 113		
adium 228 by Ga/Tech	Sample Type MSD	Units: pCi/L		
MSD-412 (01/22/17 03:04)	RunNo: 142633	PrepDate: 01/03/17 0:00 BatchID 12769		
Analyte	Result		Qua	
Total Radium 228	33	1 37 11.3 82.6 30		
adium 226 in Water -	Sample Type MBLK	Units: pCi/L		
MB-1707 (01/11/17 13:52)	RunNo: 142395	PrepDate: 01/03/17 0:00 BatchID 12733		
Analyte	Result	RL Spike Ref Samp %REC % Rec Limits 0	Qual	
Radium 226	ND	0.3		
adium 226 in Water -	Sample Type LCS	Units: pCi/L		
LCS-1707 (01/10/17 10:09)	RunNo: 142395	PrepDate: 01/03/17 0:00 BatchID 12733		
Analyte	Result	RL Spike Ref Samp %REC % Rec Limits 0	Qual	
Radium 226	5.9	0.3 5.89 99.8 65 - 131		
adium 226 in Water -	Sample Type LCSD	Units: pCi/L		
LCSD-1707 (01/10/17 12:11)	RunNo: 142395	PrepDate: 01/03/17 0:00 BatchID 12733		
Analyte	Result	RL Conc %RPD %REC % RPD Limits C	Qual	
Radium 226	6.1	0.3 5.9 3.30 103 20		
	Sample Type MS	Units: pCi/L		
adium 226 in Water -				
S1612304-001AMS (01/10/17 10:09)	RunNo: 142395	PrepDate: 01/03/17 0:00 BatchID 12733		
	RunNo: 142395 Result	DI	Qual	

Qualifiers:

- 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



# Bismarck, ND 58501

_AB	O	RA	7	O	$R_{I}$	E	S,	Inc.	
2616	F	Bro		dy	N/ 2	١,	Δν	0	

Chain of	Custody	Record
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Page 1 of 1 .

	Phone: (701) 2	258-9720											
	300) 279-6885	Fax: (701) 258-9724				201682-4103							
Company Nam	ne and Address:			Account #:							Phone #:		
	n.n	MT1									701-258-9720		
		VTL		Contact:							Fax #:		
		<u>3roadway</u> 3, ND 58501			Claud	ette	<u> </u>			····	For faxed report check box		
Billing Address	s (indicate if different	from above)		Name of S	ampler:						E-mail: ccarroll@mvtl.com		
Jaming Address	3 (maicate il dilletetti	nom above):									For e-mail report check box		
	PO B	ox 249		Quote Nun	nber						Date Submitted:		
New Ulm, MN 56073 Project Name/						er:					Purchase Order #:		
		Sample Information		1		D. W. T					BL5751		
		Sample information		1	Bottle Type					pe	Analysis		
S16123	04												
	·						03	pe					
						g	F	als	Jar				
IML Lab			Sample	Date	Time	eat	Ξ	Vie	S	<u></u>			
Number	MVTL Lab Number	Client Sample ID	Туре	Sampled	Sampled	Untreated	1000 ml HNO3	VOC Vials Umpreserved	Glass	Other	Analysis Required		
001	16-W6028	Field Blank 1	GW	20-Dec-16			4				Ra226 & Ra228		
- అడ	16-W6029	103	GW	20-Dec-16	1001		4				Ra226 & Ra228		
ರಿಂ 3	16-W6030	44R	GW	20-Dec-16	1220		4			<u> </u>			
				200 10	1220		-				Ra226 & Ra228		
										<u> </u>			
						Ī							
Comments: All	results must be repo	orted as a numerical value	)										

Transferred by:	Date:	Time:	Sample Condition:	Received by:	Date:		Temp:
T. Olson	23-Dec-16	1700		Kathy Bayo	12.28.16	11:27	0.4
2.							1



# **Field Datasheet**

**Groundwater Assessment** 

Company:	MDU Heskett
Event:	2016
Sample ID:	103.
Sampling Personal:	Jeres Mar -

Phone: (701) 258-9	•						-	Sampling P	ersonal:	lere	John		
Weather Conditions:		Temp:	2⊘ °F		Wind:	Nos	-10 -10		Precip	Sun	ny / Bartly (	Cloudy / Clo	udv
	Well Info	rmation					· · · · · · · · · · · · · · · · · · ·	Sa	····	nformatio		3100 LY 7 OIC	duy
Well Locked?	Yes	(No)				Purgii	ng Method:	Blad			I	ontrol Setting	ıs
Well Labeled?	(Pês)	No				Sampli	ng Method:	Blad	lder		Purge:		se
Casing Straight?	(Ye₃	No				Dedicat	ed Equip?:	(Tes)	No	1			se
Grout Seal Intact?	Yes	No	Not Visi	ble		Duplicate	Sample?:	Yes	(AD)	1	PSI:	30	i
Repairs Necessary:						Duplicate	Sample ID:			]	Pumping R	late: /00	mL/m
Y	Diameter:		2"										
Water Level Bef	ore Purge:	3	32.66	ft		F	urge Date:	20 Decl	b	Time Purg	ing Began:	0926	@m/pi
Total V	Vell Depth:			ft		Well P	urged Dry?	Yes	(II)	Time P	urged Dry:		am/pi
We	ell Volume:	••		liters		Sa	mple Date:	20 Decl	6	Time of	Sampling:	1001	(m)pi
Depth to Top	p of Pump:	🔻		ft						1			
Water Level Afte	er Sample:		16,50	ft		Bottle	CC	R: 1L Raw,	500mL Nit	irc, 500mL l	Nitric (filtere	ed), 4-1L Niti	ic
Measuremer	nt Method:	Electric W	ater Level Inc	dicator		List:	1					d), 250mL su	
				Eiold	Magazza					-		·/·	

### Field Measurements

							1			
	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	0931	4.51	5001	6.72	4.95	251.2	8,77	33,49	500	Clear
2	0936	4.04	5050	6,72	5.00	251.2	8.14	33.90	Soo	Cles
3	0941	3,61	5072	6,74	5,38	249.7	4.75	34.19	500	Clea
4	0946	3,57	5079	6,78	5.42	247.2	3,13	34,33	SOO	Clas
5	0951	3.87	5068	6,78	5,43	246,1	2.50	34.45	500	Cles
6	6956	3,85	5072	6,79	5,48	245,0		34,56	500	Clea
7	1001	4.20	5059	6,79	5,37	243.0		34.59	500	Cles
8										
9							<b>†</b>			
10							<u> </u>	<del> </del>		
Stabilized:		No	•	•		To	otal Volume	Removed:	3500	mL

Comments:



# **Field Datasheet**

**Groundwater Assessment** 

Company:	MDU Heskett
Event:	2016
Sample ID:	LUR
Sampling Personal:	Jenny Mar -

Phone: (701) 258-9	•							Sampling F	ersonal:	Veri	-Ma		
1 Hone. (101) 200-8	5720										1		
<b>Neather Conditions:</b>		Temp:	20°F		Wind:	N @5~10	D D		Precip:	Sunr	W Dorthy C	Houdy / Clo	
	Well Info	rmation				7.5.0.5.1		· · ·				Houdy / Clo	uay
				<del></del>				<u> </u>	ımpıing i	nformatio	n		
Well Locked?	Yes	(M)				Purgir	ng Method:	Blac	lder		Co	ntrol Setting	s
Well Labeled?	(es	No				Samplir	ng Method:	Blac	lder		Purge:	ති	sec.
Casing Straight?	Ves.	No				Dedicate	ed Equip?:	Yes	No		Recover:	52	sec.
Grout Seal Intact?	Yes	No	Not Vis	ible)			Sample?:	Yes	(No)		PSI:	20	360.
Repairs Necessary:							Sample ID:						1 / *
Casing	Diameter:		2"					<u> </u>		! <u>[</u>	Pumping R	ate: 100	mL/min
Water Level Befo	ore Purge:		ZB127	ft		D	urge Date:	20 Da	11-	Timo Dura	na Daniel	10.50	
	/ell Depth:		-01-1	- r						Time Purgi		1200	am/pm
				π		Well Pu	rged Dry?	Yes	MO)	Time P	urged Dry:	F	am/pm
	Il Volume:			liters		Sar	nple Date:	20 Dal	6	Time of	Sampling:	1220	am/pm
Depth to Top				ft									-
Water Level Afte	er Sample:		LB,40	ft		Bottle	CC	R· 11 Raw	500ml Niti	ro FOOml N	litai o (Ellenno	d), 4-1L Nitr	
Measuremen	t Method:	Electric V	Vater Level In	dicator		List:	NIDDL	J. Al Dow 5	SOOmal mite	10, 500HL P	villic (filtere	a), 4-1L Nitr	IC
							- אטטא	ı. ı. Raw, t	DUUITIL NITTI	s, soumt nit	iric (filtered	), 250mL su	lfiric
				Field I	<b>V</b> leasure	ments							

	ecutive)	Temp (°C)	Spec.	pH	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Level (ft)	mL Removed	Discription: Clarity, Color, Odor, Ect.
	Time	1 00	±5%	±0.1	±10%	±20 mV	±10%	0.25 ft		clear, slightly turbid, turbid
1	1205	6.58	9124	6.66	2.02	163,4	0.62	28.42	500	Clear
2	1210	6.70	9037	6,62	1,55	170,4	0.68	28.44	540	Clear
3	1215	6.30	9072	6.64	1,53	174.9	0,42	28,44	500	Cler
4	1220	6.23	9069	6.62	1,47	178.4	0.41	28,43	500	Elez
5								-0,12	, , ,	
6										
7	-									
8										
9										
10										
Stabilized: Comments	(Yest :	No				To	tal Volume	Removed:	2000	mL



# **Chain of Custody Record**

MDU CCR Numerical RadChem

D	4 N							_						
Projec	ct Name:							Na	me of	<u>Sam</u>	pler(s):	0	Λ	
MDU	Heskett	CCR Rad	liochem		2016						<	Jerry	iler -	
Report To: Attn: Address: Phone:	MDU Samantha Marshall 400 N. 4th St Bismarck, ND 58501 701-222-7829		Carbon ( Attn: Address					Wo	ork Orc	der N	lumber:	82	-410	3
	Samp	le Informat	ion				Во	ttle	Туре		Fi	eld Para	ameters	Analysis
Lab Number	Sample ID	Date	Time	Sample Type	Gradient	1000 ml HAIS					Field Temperature °C	Field Spec. Cond.	Field pH	Analysis Required
W6038	Field Blank (FB)	20 Deille	NA	W		4					NA	NA	NA .	
	So Jor 197 DAD		NA	W		4					NA	NA	NA-	
W6029	103	zoDeelb	100 [	GW		4					4.20	5059	6.79	
WEU30	44 R	20 Dec 16	1220	GW		4					6.23	9069	6.62	1

Comments:

	Transferred by:	Sample Condition	Date/Time	Received by:	Sample Condition	Date/Time	° C
1	Noth	Login	20 Dec 16	TualXUM		20 De 2014	6,2°C, BOIL
2		Ü					TWOO
3							



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### **CASE NARRATIVE**

MVTL Lab Reference No/SDG:

201682-4122

IML Lab Reference No/SDG:

S1612306

Client:

Montana Dakota Utilities

Location:

**MDU Heskett Ash Site** 

**Project Identification:** 

**CCR December 2016** 

**MVTL Laboratory Identifications:** 

**16-W6109** through **16-W6112** 

**IML Laboratory Identifications:** 

S1612306-001 through S1612306-004

Page 1 of 2

MDU Sample Identification	MVTL Laboratory #	IML Laboratory #
Field Blank (FB) 2	16-W6109	S1612306-001
101	16-W6110	S1612306-002
70	16-W6111	S1612306-003
33	16-W6112	S1612306-004

#### I. RECEIPT

- All samples were received at the laboratory on 22 December 2016 at 800.
- 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 5.0°C.
- No other exceptions on sample receipt were encountered on this sample set unless noted here.
- All samples requiring radiochemistry analysis were sent via courier to Inter-Mountain Labs (IML) for analysis there. Samples were received at IML on 28 December 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.
  - 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:

Page 2 of 2

201682-4122

S1612306

**Montana Dakota Utilities** 

**MDU Heskett Ash Site** 

CCR December 2016

16-W6109 through 16-W6112

\$1612306-001 through \$1612306-004

#### 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:	Claudite	anolo	DATE:	30Jan 17	
Claud	dette Carroll - MVTL Bisma	arck Laboratory Mar	nager		



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

Project Name: MDU Heskett CCR Radiochem

Sample Description: Field Blank 2

Event and Year: December 2016

1 of 1 Page:

Report Date: 27 Jan 17 Lab Number: 16-W6109 Work Order #:82-4122 Account #: 002800

Date Sampled: 21 Dec 16

Date Received: 22 Dec 16 8:00 Sampled By: MVTL Field Services

PO #: 160249

Temp at Receipt: 5.0C ROI

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
Radium 226 Radium 228	See Attached Report See Attached Report			10 Jan 17 23 Jan 16	OL

OL = Analysis performed by an Outside Laboratory.

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

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



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



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

Project Name: MDU Heskett CCR Radiochem

Sample Description: 101

Event and Year: December 2016

1 of 1 Page:

Report Date: 27 Jan 17 Lab Number: 16-W6110 Work Order #:82-4122 Account #: 002800

Date Sampled: 21 Dec 16 10:31 Date Received: 22 Dec 16 8:00 Sampled By: MVTL Field Services

PO #: 160249

Temp at Receipt: 5.0C ROI

	As Rece: Result	ived	Method RL	Method Reference	Date Analyzed	Analyst
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	21 Dec 16 10:31 21 Dec 16 10:31 21 Dec 16 10:31 10 Jan 17 23 Jan 16	JSM

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 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 Radiochem

Sample Description: 70

Event and Year: December 2016

Page: 1 of 1

Report Date: 27 Jan 17 Lab Number: 16-W6111 Work Order #:82-4122 Account #: 002800

Date Sampled: 21 Dec 16 12:20 Date Received: 22 Dec 16 8:00 Sampled By: MVTL Field Services

PO #: 160249

Temp at Receipt: 5.0C ROI

	As Rece Result	ived	Method RL	Method Reference	Date Analyzed	Analyst
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	21 Dec 16 12:20 21 Dec 16 12:20 21 Dec 16 12:20 10 Jan 17 23 Jan 16	JSM JSM JSM OL OL

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 co

! = 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

Bismarck ND 58501

Project Name: MDU Heskett CCR Radiochem

Sample Description: 33

Event and Year: December 2016

Page: 1 of 1

Report Date: 27 Jan 17 Lab Number: 16-W6112 Work Order #:82-4122 Account #: 002800

Date Sampled: 21 Dec 16 14:53 Date Received: 22 Dec 16 8:00 Sampled By: MVTL Field Services

PO #: 160249

Temp at Receipt: 5.0C ROI

	As Recei Result	ived	Method RL	Method Reference	Date Analyzed	Analyst
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	21 Dec 16 14:53 21 Dec 16 14:53 21 Dec 16 14:53 10 Jan 17 23 Jan 16	JSM JSM JSM OL OL

OL = Analysis performed by an Outside Laboratory.

Approved by:

Clauditte K. Canto 30 Jan 17

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



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

Date: 1/27/2017

CLIENT:

Lab Order:

MVTL Laboratories, Inc.

Project:

201682-4122

S1612306

CASE NARRATIVE

Report ID: S1612306001

Samples 16-W6109 Field Blank 2, 16-W6110 101, 16-W6111 70, and 16-W6112 33 were received on December 28, 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

Page 1 of 1



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:

201682-4122

Lab ID:

S1612306-001

ClientSample ID: 16-W6109 Field Blank 2 COC:

201682-4122

Date Reported 1/27/2017

Report ID

S1612306001

WorkOrder:

S1612306

CollectionDate: 12/21/2016

DateReceived:

12/28/2016 11:20:00 AM

FieldSampler:

Matrix:

Water

#### Comments

Comments							
Analyses	Result Units Qual RL		RL	Method	Date Analyzed/l	nit	
Radionuclides - Total							
Radium 226	0.4	pCi/L		0.3	SM 7500 Ra-B	01/10/2017 1009	MB
Radium 226 Precision (±)	0.1	pCi/L			SM 7500 Ra-B	01/10/2017 1009	MB
Radium 228	-4.3	pCi/L		1	Ga-Tech	01/23/2017 1233	WN
Radium 228 Precision (±)	1.8	pCi/L			Ga-Tech	01/23/2017 1233	WN

These results apply only to the samples tested.

Qualifiers:

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:

Wade Nieuwsma, Assistant Laboratory Manager

Page 1 of 4



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:

201682-4122

S1612306-002 ClientSample ID: 16-W6110 101

201682-4122

Date Reported

1/27/2017

Report ID

S1612306001

WorkOrder:

S1612306

CollectionDate: 12/21/2016 10:31:00 AM

DateReceived:

12/28/2016 11:20:00 AM

FieldSampler:

Matrix:

Water

#### Commonte

A							
Analyses	Result	Units	Qual	RL	Method	Date Analyzed/I	nit
Radionuclides - Total							
Radium 226	0.6	pCi/L		0.3	SM 7500 Ra-B	01/10/2017 1009	MB
Radium 226 Precision (±)	0.1	pCi/L			SM 7500 Ra-B	01/10/2017 1009	МВ
Radium 228	-1.6	pCi/L		1	Ga-Tech	01/23/2017 1535	WN
Radium 228 Precision (±)	1.8	pCi/L			Ga-Tech	01/23/2017 1535	WN

These results apply only to the samples tested.

Qualifiers:

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 Н

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 4



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## Sample Analysis Report

Company:

MVTL Laboratories, Inc.

2616 E Broadway Ave.

Bismarck, ND 58501

ProjectName:

201682-4122

Lab ID:

S1612306-003 ClientSample ID: 16-W6111 70

COC:

201682-4122

Date Reported

1/27/2017

Report ID

S1612306001

WorkOrder:

S1612306

CollectionDate: 12/21/2016 12:20:00 PM

DateReceived:

12/28/2016 11:20:00 AM

FieldSampler:

Matrix:

Water

#### Comments

yses Result Units Qual RL		RL	Method	Date Analyzed/I	nit	
0.3	pCi/L		0.3	SM 7500 Ra-B	01/10/2017 1009	MB
0.1	pCi/L			SM 7500 Ra-B	01/10/2017 1009	MB
-2.2	pCi/L		1	Ga-Tech	01/23/2017 1837	WN
1.7	pCi/L			Ga-Tech	01/23/2017 1837	WN
	0.3 0.1 -2.2	0.3 pCi/L 0.1 pCi/L -2.2 pCi/L	0.3 pCi/L 0.1 pCi/L -2.2 pCi/L	0.3 pCi/L 0.3 0.1 pCi/L -2.2 pCi/L 1	0.3 pCi/L 0.3 SM 7500 Ra-B 0.1 pCi/L SM 7500 Ra-B -2.2 pCi/L 1 Ga-Tech	0.3 pCi/L 0.3 SM 7500 Ra-B 01/10/2017 1009 0.1 pCi/L SM 7500 Ra-B 01/10/2017 1009 -2.2 pCi/L 1 Ga-Tech 01/23/2017 1837

These results apply only to the samples tested.

Qualifiers:

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

ND Not Detected at the Reporting Limit

Spike Recovery outside accepted recovery limits

Reviewed by: A

Wade Nieuwsma, Assistant Laboratory Manager

Page 3 of 4



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### Sample Analysis Report

Company:

MVTL Laboratories, Inc.

2616 E Broadway Ave.

Bismarck, ND 58501

ProjectName:

201682-4122

Lab ID:

S1612306-004 ClientSample ID: 16-W6112 33

COC:

201682-4122

Date Reported 1/27/2017

Report ID

S1612306001

WorkOrder:

S1612306

CollectionDate: 12/21/2016 2:53:00 PM 12/28/2016 11:20:00 AM

DateReceived:

FieldSampler:

Matrix:

Water

#### Comments

Result	Units	Qual	RL	Method	Date Analyzed/Init	
0.3	pCi/L		0.3	SM 7500 Ra-B	01/10/2017 1211	MB
0.1	pCi/L			SM 7500 Ra-B	01/10/2017 1211	MB
-1.7	pCi/L		1	Ga-Tech	01/23/2017 2140	WN
1.6	pCi/L			Ga-Tech	01/23/2017 2140	WN
	0.3 0.1 -1.7	0.3 pCi/L 0.1 pCi/L -1.7 pCi/L	0.3 pCi/L 0.1 pCi/L -1.7 pCi/L	0.3 pCi/L 0.3 0.1 pCi/L -1.7 pCi/L 1	0.3 pCi/L 0.3 SM 7500 Ra-B 0.1 pCi/L SM 7500 Ra-B -1.7 pCi/L 1 Ga-Tech	0.3 pCi/L 0.3 SM 7500 Ra-B 01/10/2017 1211 0.1 pCi/L SM 7500 Ra-B 01/10/2017 1211 -1.7 pCi/L 1 Ga-Tech 01/23/2017 2140

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

Value exceeds Monthly Ave or MCL or is less than LCL

Outside the Range of Dilutions

X Matrix Effect **RL** - Reporting Limit

Calculated Value

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: All

Wade Nieuwsma, Assistant Laboratory Manager

Page 4 of 4



Inter-Mountain Labs

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

## **ANALYTICAL QC SUMMARY REPORT**

CLIENT:

Project:

Work Order:

MVTL Laboratories, Inc.

S1612306

201682-4122

Date: 1/27/2017

Report ID: S1612306001

Radium 228 by Ga/Tech		Sample Type MBLK		Units	: pCi/L			
MB-412 (01/21/17 14:53	3)	RunNo: 142633	Prepl	Date: 01/0	3/17 0:00	Bate	chID 12769	
Analy	rte	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-412 (01/21/17 17:5	4)	RunNo: 142633	Prepl	Oate: 01/0			chID 12769	
Analy	rte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qua
Total	Radium 228	38	1	40.3		93.5	64.4 - 99.5	
Radium 228 by Ga/Tech		Sample Type MS		Units	: pCi/L			
MS-412 (01/22/17 00:01	)	RunNo: 142633	Prepl	Date: 01/0	3/17 0:00	Bato	chID 12769	
Analy	te	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qua
Total	Radium 228	37	1	40.3	ND	92.5	55 - 113	
Radium 228 by Ga/Tech		Sample Type MSD		Units	: pCi/L			,
MSD-412 (01/22/17 03:0	04)	RunNo: 142633	Prepl	Date: 01/0	3/17 0:00	Bato	chID 12769	
Analy	rte	Result	RL	Conc	%RPD	%REC	% RPD Limits	Qua
Total	Radium 228	33	1	37	11.3	82.6	30	
Radium 226 in Water -		Sample Type MBLK		Units	: pCi/L			
MB-1707 (01/11/17 13:5	52)	RunNo: 142395	Prepl	Date: 01/0	3/17 0:00	Bato	chID 12733	
Analy	te	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qua
Radiu	ım 226	ND	0.3					
Radium 226 in Water -		Sample Type LCS		Units	: pCi/L			
LCS-1707 (01/10/17 10:	09)	RunNo: 142395	Prepl	Date: 01/0	3/17 0:00	Bato	chID 12733	
Analy	te	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qua
Radiu	ım 226	5.9	0.3	5.89		99.8	65 - 131	
Radium 226 in Water -		Sample Type LCSD		Units	: pCi/L			
LCSD-1707 (01/10/17 1	2:11)	RunNo: 142395	Prepl	Date: 01/0	3/17 0:00	Bato	chID 12733	
Analy	te	Result	RL	Conc	%RPD	%REC	% RPD Limits	Qua
Radiu	ım 226	6.1	0.3	5.9	3.30	103	20	
Radium 226 in Water -		Sample Type MS		Units	: pCi/L			
S1612304-001AMS (01/	10/17 10:09)	RunNo: 142395	Prepl	Date: 01/0	3/17 0:00	Bato	chID 12733	
Analy	te	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qua
Radiu	ım 226	5.9	0.3	5.89	ND	96.2	65 - 131	

Qualifiers:

- 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

# **Chain of Custody Record**

Page	1	of	1	
, ago	ž.	<b>U</b> 1	1	

	Phone: (701) 2	258-9720											
Toll Free: (8	800) 279-6885	Fax: (701) 258-9724									201682-4122		
Company Nam	e and Address:			Account #	*		· · · · · · · · · · · · · · · · · · ·				Phone #:		
	M	VTL		Contract						701-258-9720			
		<u>*15</u> Broadway		Contact: Claudette							Fax #:		
		, ND 58501		Name of S		ette	=				For faxed report check box		
Billing Address	s (indicate if differen	from above):									3001101100111		
	PO Box 249					Quote Number							
The second secon	New Ulm	, MN 56073		Project Na	me/Numbe	r:					Purchase Order #:		
											BL5752		
		Sample Information		Ţ	T		В	ottle	Ту	pe	Analysis		
51612	306												
							ဝို	pa					
						peq	1000 ml HNO3	als	ar				
IML Lab			Sample	Date	Time	Untreated	E	C Vi	ss Jar	er	5		
Number	MVTL Lab Number	Client Sample ID	Туре	Sampled	Sampled	L tu	100	VOC Vials Umpreserved	Glas	Other	Analysis Required		
001	16-W6109	Field Blank 2	GW	21-Dec-16			4				Ra226 & Ra228		
002	16-W6110 -	101	GW	21-Dec-16	1031 -		4				Ra226 & Ra228		
003	16-W6111	70	GW	21-Dec-16	1220 *		4				Ra226 & Ra228		
004	16-W6112	33	GW	21-Dec-16	1453		4						
•				2. 200 10	1100		7				Ra226 & Ra228		
								·					
Comments: All	results must be repo	orted as a numerical value	<u> </u>								L. L		

Transferred by:	Date:	Time:	Sample Condition:	Received by:	Date:		Temp:
T. Olson	23-Dec-16	1700		Koth Baro	12.28.16	11:2-0	2.4
2.						1	(,)



**Groundwater Assessment** 

Company:	MDU Heskett
Event:	2016
Sample ID:	(O( 1
Sampling Personal:	Jan Hr

2616 E. Broadway Ave, Bismarck, ND

Dhama: (704) 050 0	700							Camping r	ersonai.		2007 PU		
Phone: (701) 258-9	3720										s /		
Weather Conditions:		Temp:	35 ℉		Wind:	WOZE	25~		Precip	Sun	ny /Partly C	Johan I Cla	
	Well Info	rmation				00 - 0		Sa		nformatio		rioudy / Cic	ouuy
Well Locked?	Yes	ρM				Purgi	ng Method:	Blad				ntrol Setting	15
Well Labeled?	Yes	No				Sampli	ng Method:	Blad	der		Purge:	Ø.	sec
Casing Straight?	Yes	No				Dedicat	ted Equip?:	Yes	No		Recover:	52	sec
Grout Seal Intact?	(Yes)	No	Not Visib	ole		Duplicate	Sample?:	Yes	(N)		PSI:	30	
Repairs Necessary:						Duplicate	Sample ID:	4	<del>-</del>		Pumping R	· · · · · · · · · · · · · · · · · · ·	mL/mi
Casing	Diameter:		2"							<b>.</b>			1112/1111
Water Level Bef	· · · · · · · · · · · · · · · · · · ·		37.02	ft		F	ourge Date:	21 Deell	2	Time Purg	ing Began:	1590	(ana/pn
Total V	Vell Depth:		<u> </u>	ft		Well P	urged Dry?	Yes	(No)	Time P	urged Dry:		am/pn
We	eil Volume:			liters		Sa	mple Date:	21 Dec/6	>	Time of	Sampling:	1031	am/pn
Depth to Top	o of Pump:			ft				:		·	····		
Water Level Afte	er Sample:	6	41.85	ft		Bottle	CC	R: 1L Raw,	500mL Nit	irc, 500mL l	Nitric (filtere	d), 4-1L Nitr	ic
Measurement Method: Electric Water Level Indicator				List:					tiric (filtered				
				Field	Moseuro	monte						f	

#### Field Measurements

- 1								1	l		
		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	0926	5.37	4815	6.83	6.45	100.7	120.6	37.68	500	Clear
	2	0931	6.31	4609	6,77	3,34	41.2	109.0	38.05	500	Clear
	3 -	0936	6.28	4769	6,78	2.44	29,9	95,3	38,49	500	Cleso
	4	0946	6.38	4763	6.78	2.00	36.7	29,9	37.15	<del>Se0</del> 1000	Clez
L	5 G/S	9946 <del>65</del>	5.92	4794	6.79	1.91	29.1	19.0	39.34	<del>500</del> 1000	
-	6 10d	<del>6951</del>	5.90	4766	6,79	1.92	34.6	16.1	39,50	500 looo	Cles
L	7	1016	602	4799	6,79	206	47.7	6,66	39.69	1000	Clean
	8	1021	5.64	4803	6.80	2.16	36.2	5,25	39,70	5 <i>®</i>	Clez
	9	1026	5.63	4803		2.18	36,0	4.92	39.83	S&	Clear
L	10	1031	5,74	4805	679	2,14	45.6	4.42	39.88	580	ĉ be-
_	Stabilized:	Yes >	No				Тс	tal Volume	Removed:	7,000	mL

Comments:



**Groundwater Assessment** 

Company:	MDU Heskett
Event:	2016
Sample ID:	. 70 .
Sampling Personal:	Jeren oles_

2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9	700							Camping 1	sisoliai.	<u></u>	en or ling		
Frione. (701) 258-9	7/20										l v		
Weather Conditions:		Temp:	35	°F	Wind:	W D20-	-25		Precip:	Suni	ny / Partiy C	loudy / Clo	oudv
	Well Info	rmation	-					Sa	mpling l	nformatio			· · · · · · · · · · · · · · · · · · ·
Well Locked?	Yes	No				Purgin	g Method:	Blad	der		Со	ntrol Setting	as
Well Labeled?	Yes	No				Samplin	g Method:	Blade	der		Purge:	5	sec
Casing Straight?	<u> </u>	No				Dedicate	d Equip?:	Yes	No		Recover:	55	sec
Grout Seal Intact?	Yes	No	Not Vi	sible		Duplicate 8	Sample?:	Yes	(No)		PSI:	30	
Repairs Necessary:						Duplicate S	ample ID:	<u> </u>			Pumping R		mL/mir
Casing	Diameter:		2"						·		, , , , , , , , , , , , , , , , , , ,	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	
Water Level Befo	ore Purge:	<u> 20</u>	92	ft		Pi	ırge Date:	21 Der 16		Time Purg	ing Began:	1185	@m/pm
Total W	/ell Depth:	<b>\</b>		ft		Well Pu	rged Dry?	Yes	(No)		urged Dry:		am/pm
We	II Volume:	4		liters		San	ple Date:	21 Dec 10			Sampling:	1220	am/pm
Depth to Top	of Pump:			ft								1-00	
Water Level Afte	er Sample:	2	2, 45	ft		Bottle	CC	R: 1L Raw,	500mL Niti	rc. 500ml I	Vitric (filtere	d) 4-11 Niti	ic .
Measuremen	t Method:	Electric V	Vater Level I	ndicator		List:		H: 1L Raw, 5					
				Field	Measure	ments						,,	

	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	1200	6,60	3688	7.il	1.59	-27.0	1.57	22.04	São	Clea
2	1205	6.49	3874	7,08	1.53	15.2	0.80	22,18	500	Cicar
3	1210	6.53	3864	7.09	1.35	29,1	0.69	22.22	580	Clear
4	1215	6.51	3862	7.07	1.38	38,0	0.64	22,35	500	Clea
5	12 20	6.43	3863	707	1.30	42.2	0.66	22,32	SD	Clea
6								v .		
7										
8										
9										
10										
Stabilized:	(Yes)	No			****	To	ntal Volume	Removed:	7500	ml

Comments:

Total Volume Removed: 4500 mL



**Groundwater Assessment** 

Company:	MDU Heskett
Event:	2016
Sample ID:	^33 <sub>^</sub>
Sampling Personal:	Jenseh-

2616 E. Broadway Ave, Bismarck, ND Phone: (701) 258-9720 TF Weather Conditions: Temp: 35 % WO 20-25 Wind: Precip: Sunny / Partly Cloudy / Cloudy Well Information Sampling Information Well Locked? (No. Yes Purging Method: Bladder Control Settings Well Labeled? No Sampling Method: Bladder Purge: sec. Casing Straight? Yes No Dedicated Equip?: Yes No Recover: SS sec. Grout Seal Intact? Not Visible Yes No Duplicate Sample?: 010 PSI: 30 Yes Repairs Necessary: Duplicate Sample ID: Pumping Rate: 100 mL/min Casing Diameter: 41,80 Water Level Before Purge: 2/Dec/6 Purge Date: Time Purging Began: am/6m Total Well Depth: Well Purged Dry? Yes (100) Time Purged Dry: am/pm Well Volume: Sample Date: 21 Decilo Time of Sampling: 1453 liters am/pm Depth to Top of Pump: Water Level After Sample: Bottle CCR: 1L Raw, 500mL Nitirc, 500mL Nitric (filtered), 4-1L Nitric Measurement Method: List: Electric Water Level Indicator NDDH: 1L Raw, 500mL nitric, 500mL nitiric (filtered), 250mL sulfiric

#### **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	1413	7,47	5436	6,75	2.27	-49,4	55.7	42.02	Sco	Clean
2	1470	7.77	5221	6.66	1,52	-1.7	13.0	42.21	1500	Cler
3	1433	7.64	5180	6.65	1.43	3.0	6.63	42.33	500	Clea
4	1438	7.65	5176	6.64	1.41	6.1	4.07	42.35	500	Clear
5	1443	7.84	5152	6,64	1.41	7.3	2.96	42.37	SOO	Clear
6	1448	7.67	5145	6,65	1,50	9.8	2,29	42,30	500	Cles
7	1453	760	5156	6.64	1,52	13,2	1.85	42.35	Soo	Clear
8										
9										
10			,							
Stabilized:	(Yes)	No				To	tal Volume	Removed:	400	mL §

Comments:



# **Chain of Custody Record**

Projec	t Name:			Name of Sampler(s): /
MDU	Heskett	CCR Radiochem	2016	Jovenny May
Report To: Attn: Address: Phone:	MDU Samantha Marshall 400 N. 4th St Bismarck, ND 58501 701-222-7829	Carbon Copy: Attn: Address:		Work Order Number:  82-4122
	Sample	Information		Bottle Type Field Parameters Analysis
1	1		1	

	Samp	le Informat	ion				3ottle	Туре		Fi	eld Para	meters	Analysis
Lab Number	Sample ID	$D_{ate}$	Time	Sample Type	Gradient	1000 m/ HNO <sub>3</sub>				Field Temperature °C	Field Spec. Cond.	Field pH	Analysis Required
W6109	Field Blank (FB)2	21 Deello	NA	W		4				NA	NA	NA	
El Derlo	- Dup		NA	W		4				NA	NA	NA	
WILLIAM	101	Zi Deelb	1031	GW		4				5,74	4805	6.79	
WULL	70	Zi Deelb	1220	GW		4				6.43	3863	7.07	
Wella	33	21 Declb	1453	Cw		4				7.60	5156	6.64	
													MDU CCR Numerical RadChem
				-			$\vdash$						
				-									
				-		+							
						+			+				

Comments:

	Transferred by:	Sample Condition	Date/Time	// Received by:	Sample Condition	Date/Time	° C
1	they	Wallin AZ	21 Dec 16	Mal Simonan		22 Dec/6	ROJ TH 562 5.70
2				- 1			
3				-			



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:** 

201682-4123

Client:

**Montana Dakota Utilities** 

Location:

**MDU Heskett** 

**Project Identification:** 

CCR December 2016

**MVTL Laboratory Identifications:** 

16-W6113 through 16-W6116

Page 1 of 2

MDU Sample Identification	MVTL Laboratory #
Field Blank (FB)	16-W6113
101	16-W6114
70	16-W6115
33	16-W6116

#### I. RECEIPT

- All samples were received at the laboratory on 22 Dec 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 5.0°C.
- All samples were properly preserved unless noted here and/or flagged on the individual analytical laboratory report.
- No other exceptions on sample receipt were encountered on this sample set unless noted here.

#### II. HOLDING TIMES

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

#### III. METHODS

- Approved methodology was followed for all sample analyses.
  - 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).
  - The recoveries for two selenium dissolved matrix spikes/matrix spike duplicates were outside the acceptable limits. RPD for the recoveries was within limits. Poor recoveries were determined to be due to sample matrix. Data was accepted based on acceptable recovery of the LCS. No further action was taken.



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CASE NARRATIVE

**MVTL Lab Reference No/SDG:** 

Client:

Location:

**Project Identification:** 

**MVTL Laboratory Identifications:** 

Page 2 of 2

201682-4123

**Montana Dakota Utilities** 

**MDU Heskett** 

**CCR December 2016** 

16-W6113 through 16-W6116

- o Recovery for one selenium dissolved matrix spike duplicate was outside of the acceptable limits. Recovery of the matrix spike was acceptable. RPD for the recoveries of the matrix spike/matrix spike duplicate was acceptable. No further action was taken.
- o Recovery for one molybdenum total matrix spike duplicate was outside of the acceptable limits. Recovery of the matrix spike was acceptable. RPD for the recoveries of the matrix spike/matrix spike duplicate was acceptable. No further action was taken.
- o Recovery for one molybdenum dissolved matrix spike duplicate was outside of the acceptable limits. Recovery of the matrix spike was acceptable. RPD for the recoveries of the matrix spike/matrix spike duplicate was acceptable. No further action was taken.
- The recoveries for one alkalinity matrix spike/matrix spike duplicate were outside the acceptable limits. RPD for the recoveries was within limits. Poor recoveries were determined to be due to sample matrix. Data was accepted based on acceptable recovery of the LCS. No further action was taken.
- O Recovery for one beryllium dissolved matrix spike duplicate was outside of the acceptable limits. Recovery of the matrix spike was acceptable. RPD for the recoveries of the matrix spike/matrix spike duplicate was acceptable. No further action was taken.
- The recoveries for two beryllium total matrix spikes duplicates were outside the acceptable limits. Recoveries of the matrix spikes were acceptable. RPD for the recoveries was within limits. Data was accepted based on acceptable recovery of the LCS. No further action was taken.

All laboratory data has been approved by MVTL Laboratories.		
SIGNED: Claudotte Canto	DATE:	17 Jan 17
Claudette Carroll - MVTI Rismarck Laboratory Manager		

**MVTL** 

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**MEMBER** ACIL

**Quality Control Report** 

Page: 1 of 5

<b>Lab IDs:</b> 16-W6113 to 16-V	W 0110		roject: M	DU Hesk	ett CCR Grou	and the same of th				00 n=w=2-v==0.00000	al verseament to an arrange	Wo	rk Ord	er: 201682	2-4123		
Analyte	LCS Spike Amt	LCS Rec %	LCS % Rec Limits	Matrix Spike Amt	Matrix Spike ID	Matrix Spike Orig Result	Matrix Spike Result	Matrix Spike Rec %	Matrix Spike % Rec Limits	MSD/ Dup Orig Result	MSD/ Dup Result	MSD Rec %	MSD/ Dup RPD	MSD/ Dup RPD Limit (<)	Known Rec (%)	Known % Rec Limits	Method Blank
Antimony - Dissolved mg/l	0.0160	106	80-120	0.100 0.100 0.100	16W6119q 16W6129q 16W6132q	< 0.001 < 0.001 < 0.001	0.1070 0.1164 0.0994	107 116 99	75-125 75-125 75-125	0.1070 0.1164 0.0994	0.1088 0.1174 0.1136	109 117 114	1.7 0.9 13.3	20 20 20 20	-	- - -	< 0.001
Antimony - Total mg/l	0.1000 0.1000 0.1000	115 107 111	80-120 80-120 80-120	0.500 0.400 0.400	16W6027q 16W6126q 16W6132q	< 0.001 < 0.001 < 0.001	0.5586 0.4106 0.4598	112 103 115	75-125 75-125 75-125	0.5586 0.4106 0.4598	0.5452 0.4476 0.4642	109 112 116	2.4 8.6 1.0	20 20 20	-	-	< 0.001
Arsenic - Dissolved mg/l	0.0160	101	80-120	0.100 0.100 0.100	16W6119q 16W6129q 16W6132q	< 0.002 0.0033 < 0.002	0.1156 0.1273 0.1053	116 124 105	75-125 75-125 75-125	0.1156 0.1273 0.1053	0.1132 0.1276 0.1200	113 124 120	2.1 0.2 13.0	20 20 20	-	-	< 0.002
Arsenic - Total mg/l	0.1000 0.1000 0.1000	112 108 112	80-120 80-120 80-120	0.500 0.400 0.400	16W6027q 16W6126q 16W6132q	< 0.002 < 0.002 < 0.002	0.5784 0.4088 0.4748	116 102 119	75-125 75-125 75-125	0.5784 0.4088 0.4748	0.5630 0.4568 0.4778	113 114 119	2.7 11.1 0.6	20 20 20	-	es ser	< 0.002
Barium - Dissolved mg/l	0.0160	106	80-120	0.100 0.100 0.100	16W6119q 16W6129q 16W6132q	0.0095 0.0224 0.0237	0.1108 0.1412 0.1142	101 119 90	75-125 75-125 75-125	0.1108 0.1412 0.1142	0.1218 0.1471 0.1342	112 125 110	9.5 4.1 16.1	20 20 20	-	and and	< 0.002
Barium - Total mg/l	0.1000 0.1000 0.1000	105 99 101	80-120 80-120 80-120	0.500 0.400 0.400	16W6027q 16W6126q 16W6132q	0.0070 < 0.002 0.0232	0.5200 0.3976 0.4460	103 99 106	75-125 75-125 75-125	0.5200 0.3976 0.4460	0.5306 0.4676 0.5030	105 117 120	2.0 16.2 12.0	20 20 20	_		< 0.002
Beryllium - Dissolved mg/l	0.0160	101	80-120	0.100 0.100 0.100	16W6119q 16W6129q 16W6132q	< 0.0005 < 0.0005 < 0.0005	0.1199	111 120 105	75-125 75-125 75-125	0.1114 0.1199 0.1051	0.1164 0.1255 0.1251	116 126 125	4.4 4.6 17.4	20 20 20	-	-	< 0.0005
Beryllium - Total mg/l	0.1000 0.1000 0.1000	115 108 111	80-120 80-120 80-120	0.500 0.400 0.400	16W6027q 16W6126q 16W6132q	< 0.0005 < 0.0005 < 0.0005	0.5952 0.4442 0.4942	119 111 124	75-125 75-125 75-125	0.5952 0.4442 0.4942	0.5908 0.5184 0.5346	118 130 134	0.7 15.4 7.9	20 20 20	-	-	< 0.0005
Boron - Dissolved mg/l	0.40	115	80-120	0.300 0.600	16-W6107 16-W6122	0.28 0.24	0.55 0.88	90 107	75-125 75-125	0.55 0.88	0.56 0.84	93 100	1.8 4.7	20 20	- - -	-	< 0.1 < 0.1 < 0.1 < 0.1

MVTL

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**Quality Control Report** 

Page: 2 of 5

<b>Lab IDs:</b> 16-W6113 to 16-Y	W6116	P	roject: Ml	OU Hesk	ett CCR Grou							Wo	rk Ord	er: 201682	2-4123		
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 - Total mg/l	0.40 0.40 0.40 0.40	110 115 115 110	80-120 80-120 80-120 80-120	0.400 0.400 0.400 0.400 0.400	16-W5963 17-D2 16-W6027 16-W6126 16-W6132	< 0.1 1.01 0.39 < 0.1 0.33	0.44 1.40 0.74 0.45 0.71	110 97 88 112 95	75-125 75-125 75-125 75-125 75-125	0.44 1.40 0.74 0.45 0.71	0.44 1.39 0.73 0.45 0.69	110 95 85 112 90	0.0 0.7 1.4 0.0 2.9	20 20 20 20 20 20	-		< 0.1 < 0.1 < 0.1 < 0.1 < 0.1 < 0.1 < 0.1
Cadmium - Dissolved mg/l	0.0160	104	80-120	0.100 0.100 0.100	16W6119q 16W6129q 16W6132q	< 0.0005 < 0.0005 < 0.0005	0.1070	102 107 95	75-125 75-125 75-125	0.1018 0.1070 0.0952	0.1012 0.1074 0.1040	101 107 104	0.6 0.4 8.8	20 20 20	-	-	< 0.0005
Cadmium - Total mg/l	0.1000 0.1000 0.1000	119 110 116	80-120 80-120 80-120	0.500 0.400 0.400	16W6027q 16W6126q 16W6132q	< 0.0005 < 0.0005 < 0.0005	0.5794 0.4290 0.4688	116 107 117	75-125 75-125 75-125	0.5794 0.4290 0.4688	0.5494 0.4758 0.4662	110 119 117	5.3 10.3 0.6	20 20 20	-	-	< 0.0005
Calcium - Dissolved mg/l	20.0	100	80-120	1000 100	16W6027q 16D5134q	431 61.5	1340 154	91 92	75-125 75-125	1340 154	1340 153	91 92	0.0 0.7	20 20	_	-	< 1
Calcium - Total mg/l	20.0	104	80-120	500	16-W6123	360	840	96	75-125	840	830	94	1.2	20	_	-	< 1 < 1
Chloride mg/l	30.0 30.0 30.0 30.0	89 89 88 92	80-120 80-120 80-120 80-120	60.0 30.0	16-W6083 16-W6116	210 10.3	264 38.0	90 92	80-120 80-120	264 38.0	258 37.9	80 92	2.3 0.3	20 20	- - -	-	<1 <1 <1 <1 <1 <1
Chromium - Dissolved mg/l	0.0160	102	80-120	0.100 0.100 0.100	16W6119q 16W6129q 16W6132q	0.0024 < 0.002 < 0.002	0.1051 0.1152 0.0974	103 115 97	75-125 75-125 75-125	0.1051 0.1152 0.0974	0.1084 0.1150 0.1102	106 115 110	3.1 0.2 12.3	20 20 20	-	-	< 0.002
Chromium - Total mg/l	0.1000 0.1000 0.1000	107 101 103	80-120 80-120 80-120	0.500 0.400 0.400	16W6027q 16W6126q 16W6132q	< 0.002 < 0.002 < 0.002	0.5284 0.3858 0.4302	106 96 108	75-125 75-125 75-125	0.5284 0.3858 0.4302	0.5096 0.4254 0.4292	102 106 107	3.6 9.8 0.2	20 20 20	-		< 0.002

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**Quality Control Report** 

Page: 3 of 5

<b>Lab IDs:</b> 16-W6113 to 16-V	A0110	r.	roject: Mi	JU Hesk	ett CCR Grou		Evenous services		A Test the Committee of Contract		- Localita de la companya de la comp	Wo	rk Ord	er: 201682	2-4123		
Analyte	LCS Spike Amt	LCS Rec %	LCS % Rec Limits	Matrix Spike Amt	Matrix Spike ID	Matrix Spike Orig Result	Matrix Spike Result	Matrix Spike Rec %	Matrix Spike % Rec Limits	MSD/ Dup Orig Result	MSD/ Dup Result	MSD Rec %	MSD/ Dup RPD	MSD/ Dup RPD Limit (<)	Known Rec (%)	Known % Rec Limits	Method Blank
Cobalt - Dissolved mg/l	0.0160	101	80-120	0.100 0.100 0.100	16W6119q 16W6129q 16W6132q	< 0.002 0.0021 < 0.002	0.0996 0.1114 0.0959	100 109 96	75-125 75-125 75-125	0.0996 0.1114 0.0959	0.1026 0.1129 0.1080	103 111 108	3.0 1.3 11.9	20 20 20 20	-	-	< 0.002
Cobalt - Total mg/l	0.1000 0.1000 0.1000	108 101 105	80-120 80-120 80-120	0.500 0.400 0.400	16W6027q 16W6126q 16W6132q	< 0.002 < 0.002 < 0.002	0.5316 0.3908 0.4316	106 98 108	75-125 75-125 75-125	0.5316 0.3908 0.4316	0.5120 0.4402 0.4326	102 110 108	3.8 11.9 0.2	20 20 20	-	-	< 0.002
Fluoride mg/l	0.50 0.50 0.50	100 102 106	90-110 90-110 90-110	0.500 0.500	16-W6106 16-W6116	< 0.1 0.22	0.57 0.70	114 96	80-120 80-120	0.57 0.70	0.59 0.71	118 98	3.4	20 20	-	-	< 0.1 < 0.1 < 0.1 < 0.1
Lead - Dissolved mg/l	0.0160	106	80-120	0.100 0.100	16W6119q 16W6129q	< 0.0005 < 0.0005		91 103	75-125 75-125	0.0908 0.1026	0.0992 0.1083	99 108	8.8 5.4	20 20	_	_	< 0.0005
Lead - Total mg/l	0.1000 0.1000 0.1000	104 97 101	80-120 80-120 80-120	0.500 0.400 0.400	16W6027q 16W6126q 16W6132q	< 0.0005 < 0.0005 < 0.0005	1	94 96 97	75-125 75-125 75-125	0.4706 0.3828 0.3892	0.4902 0.4424 0.4374	98 111 109	4.1 14.4 11.7	20 20 20	-	-	< 0.0005
Lithium - Dissolved mg/l	0.40 0.40	105 102	80-120 80-120	0.200 0.400	16-W6113 16-W6132	< 0.1 1.09	0.20 1.58	100 122	75-125 75-125	0.20 1.58	0.19 1.46	95 92	5.1 7.9	20 20	-		< 0.1 < 0.1 < 0.1 < 0.1
Lithium - Total mg/l	0.40 0.40	105 100	80-120 80-120	0.400 0.400	16-W6027 16-W6126	1.35 < 0.1	1.65 0.41	75 102	75-125 75-125	1.65 0.41	1.68 0.40	83 100	1.8 2.5	20 20	-	-	< 0.1 < 0.1 < 0.1
Magnesium - Dissolved mg/l	20.0	104	80-120	1000 100	16W6027q 16D5134q	1010 26.4	1890 123	88 97	75-125 75-125	1890 123	1880 123	87 97	0.5	20 20	-	-	< 1
Magnesium - Total mg/l	20.0	106	80-120	500	16-W6123	710	1200	98	75-125	1200	1190	96	0.8	20	-	-	< 1 < 1
Mercury - Dissolved mg/l	0.0020	95	85-115	0.002	16-W6116	< 0.0002	0.0018	90	70-130	0.0018	0.0018	90	0.0	20	-	-	< 0.0002

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Quality Control Report
Lab IDs: 16-W6113 to 16-W6116

Project: MDU Heskett CCR Groundwater

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<b>Lab IDs:</b> 16-W6113 to 16-W	0110	Pì	oject: M	DU Hesk	ett CCR Grou		T				Work Order: 201682-4123   MSD/						
Analyte	LCS Spike Amt	LCS Rec %	LCS % Rec Limits	Matrix Spike Amt	Matrix Spike ID	Matrix Spike Orig Result	Matrix Spike Result	Matrix Spike Rec %	Matrix Spike % Rec Limits	MSD/ Dup Orig Result	MSD/ Dup Result	MSD Rec %	MSD/ Dup RPD	MSD/ Dup RPD Limit (<)	Known Rec (%)	Known % Rec Limits	Method Blank
Mercury - Total mg/l	0.0020 0.0020	95 95	85-115 85-115	0.002 0.002 0.002	AA66354 16-W6113 16-W6132	< 0.0002 < 0.0002 < 0.0002	0.0019 0.0019 0.0017	95 95 85	70-130 70-130 70-130	0.0019 0.0019 0.0017	0.0020 0.0020 0.0017	100 100 85	5.1 5.1 0.0	20 20 20	- - -	-	< 0.0002 < 0.0002
Molybdenum - Dissolved mg/l	0.0160	104	80-120	0.100 0.100 0.100	16W6119q 16W6129q 16W6132q	0.0034 < 0.002 < 0.002	0.1149 0.1246 0.1023	112 125 102	75-125 75-125 75-125	0.1149 0.1246 0.1023	0.1200 0.1296 0.1229	117 130 123	4.3 3.9 18.3	20 20 20	-	-	< 0.002
Molybdenum - Total mg/l	0.1000 0.1000 0.1000	104 98 99	80-120 80-120 80-120	0.500 0.400 0.400	16W6027q 16W6126q 16W6132q	< 0.002 < 0.002 < 0.002	0.5704 0.4002 0.4614	114 100 115	75-125 75-125 75-125	0.5704 0.4002 0.4614	0.5564 0.4632 0.5072	111 116 127	2.5 14.6 9.5	20 20 20	-	-	< 0.002
pH units	-	-	-	-	-	-	-	-	-	8.2 7.3 7.1	8.2 7.4 7.3		0.0 1.4 2.8	20 20 20	-	-	-
Potassium - Dissolved mg/l	10.0	88	80-120	200 20.0	16W6027q 16D5134q	25.7 5.1	217 24.2	96 96	75-125 75-125	217 24.2	220 24.3	97 96	1.4 0.4	20 20	_	-	< 1
Potassium - Total mg/l	10.0	91	80-120	100	16-W6123	18.6	116	97	75-125	116	114	95	1.7	20	-	_	< 1 < 1
Selenium - Dissolved mg/l	0.0160	107	80-120	0.100 0.100 0.100	16W6119q 16W6129q 16W6132q	0.1384 < 0.002 0.0031	0.2768 0.1404 0.1248	138 140 122	75-125 75-125 75-125	0.2768 0.1404 0.1248	0.2807 0.1450 0.1432	142 145 140	1.4 3.2 13.7	20 20 20	-	-	< 0.002
Selenium - Total mg/l	0.1000 0.1000 0.1000	102 118 109	80-120 80-120 80-120	0.500 0.400 0.400 0.100	16-W6027 16-W6126 16-W6132 16W6128Q	0.0778 < 0.002 < 0.002 0.0475	0.6528 0.4590 0.4656 0.1640	115 115 116 116	75-125 75-125 75-125 75-125	0.6528 0.4590 0.4656	0.6284 0.4608 0.5016	110 115 125 114	3.8 0.4 7.4	20 20 20	-	-	< 0.002 < 0.002
Sodium - Dissolved mg/l	20.0	96	80-120	1000 100	16W6027q 16D5134q	1020 101	1900 194	88 93	75-125 75-125	1900 194	1900 194	88 93	0.0	20 20	-	_	< 1
Sodium - Total mg/l	20.0	97	80-120	500	16-W6123	680	1150	94	75-125	1150	1150	94	0.0	20		-	< 1 < 1
Sulfate mg/l	100	103	80-120	100	16-W6113	< 5	98.8	99	80-120	98.8	96.6	97	2.3	20	-	-	< 5

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**Quality Control Report** 

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Lab IDs: 16-W6113 to 16-W	<u>V6116</u>	P	roject: M	DU Hesk	cett CCR Grou	ndwater						We	ork Ord	er: 201682	2-4123		
Analyte	LCS Spike Amt	LCS Rec %	LCS % Rec Limits	Matrix Spike Amt	Matrix Spike ID	Orig	Matrix Spike Result	Rec	Matrix Spike % Rec Limits	MSD/ Dup Orig Result	MSD/ Dup Result	MSD Rec %	MSD/ Dup RPD	MSD/ Dup	Known Rec	Known % Rec Limits	Method Blank
Thallium - Dissolved mg/l	0.0160	104	80-120	0.100 0.100	16W6119q 16W6129q	< 0.0005 < 0.0005		93 104	75-125 75-125	0.0933 0.1038	0.1004 0.1102	100 110	7.3 6.0	20 20	-	-	< 0.0005
Thallium - Total mg/l	0.1000 0.1000 0.1000	105 98 100	80-120 80-120 80-120	0.500 0.400 0.400	16W6027q 16W6126q 16W6132q	< 0.0005 < 0.0005 < 0.0005	0.3812	95	75-125 75-125 75-125	0.4688 0.3812 0.3848	0.4860 0.4366 0.4290	97 109 107	3.6 13.5 10.9	20 20 20	-	-	< 0.0005
Total Alkalinity mg/l CaCO3	410 410 410	94 96 97	90-110 90-110 90-110	410 410 410	16-W6098 16-W6101 16-W6115	1230 499 420	1599 873 693	90 91 67	80-120 80-120 80-120	1599 873 693	1597 887 714	90 95 72	0.1 1.6 3.0	20 20 20	95	80-120	<20 <20 <20 <20
Total Dissolved Solids mg/l	-	-	-	-	-	-	-	-	_	1700 4860	1720 4810	-	1.2	20 20	-		< 5
Total Suspended Solids mg/l	-	-	-	-	-	-	-	-	 	75 7 4	66 8 1	-	12.8 13.3 120	20	-	-	< 2 < 2

<sup>\*</sup> Due to result < 10 mg/L, data reported based on acceptance criteria of Relative % Difference of +/- 3 mg/L.

Approved by: C. Gurt (7)



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Samantha Marshall Montana Dakota Utilities 400 N. 4th

Bismarck ND 58501

Project Name: MDU Heskett CCR Groundwater

Sample Description: Field Blank 2

Event and Year: December 2016

1 of 2 Page:

Report Date: 16 Jan 17 Lab Number: 16-W6113 Work Order #:82-4123 Account #: 002800

Date Sampled: 21 Dec 16

Date Received: 22 Dec 16 8:00 Sampled By: MVTL Field Services

PO #: 160249

Temp at Receipt: 5.0C ROI

	As Receive Result	d	Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	22 Dec 16	KMD
рН	* 6.1	units	N/A	SM4500 H+ B	22 Dec 16 17:00	SVS
Total Suspended Solids	< 2	mg/l	2	I3765-85	22 Dec 16 15:40	SVS
Total Alkalinity	< 20	mg/l CaCO3	20	SM2320-B	22 Dec 16 17:00	SVS
Fluoride	< 0.1	mg/l	0.10	SM4500-F-C	22 Dec 16 17:00	SVS
Sulfate	< 5	mg/l	5.00	ASTM D516-07	5 Jan 17 15:42	EMS
Chloride	< 1	mg/l	1.0	SM4500-C1-E	4 Jan 17 14:27	EMS
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	28 Dec 16 11:20	EV
Mercury - Dissolved	< 0.0002	mg/l	0.0002	EPA 245.1	4 Jan 17 11:53	EV
Total Dissolved Solids	< 5	mg/l	10	I1750-85	22 Dec 16 13:38	SVS
Calcium - Total	< 1	mg/l	1.0	6010	4 Jan 17 16:49	KMD
Magnesium - Total	< 1	mg/l	1.0	6010	4 Jan 17 16:49	KMD
Sodium - Total	< 1	mg/l	1.0	6010	4 Jan 17 16:49	KMD
Potassium - Total	< 1	mg/l	1.0	6010	4 Jan 17 16:49	KMD
Lithium - Total	< 0.1	mg/l	0.10	6010	6 Jan 17 12:48	KMD
Boron - Total	< 0.1	mg/l	0.10	6010	5 Jan 17 12:35	KMD
Calcium - Dissolved	< 1	mg/l	1.0	6010	22 Dec 16 16:42	SZ
Magnesium - Dissolved	< 1	mg/l	1.0	6010	22 Dec 16 16:42	SZ
Sodium - Dissolved	< 1	mg/l	1.0	6010	22 Dec 16 16:42	SZ
Potassium - Dissolved	< 1	mg/l	1.0	6010	22 Dec 16 16:42	SZ
Lithium - Dissolved	< 0.1	mg/1	0.10	6010	6 Jan 17 13:48	KMD
Boron - Dissolved	< 0.1	mg/l	0.10	6010	5 Jan 17 14:35	KMD
Antimony - Total	< 0.001	mg/l	0.0010	6020	10 Jan 17 15:05	KMD
Arsenic - Total	< 0.002	mg/l	0.0020	6020	10 Jan 17 15:05	KMD
Barium - Total	< 0.002	mg/1	0.0020	6020	10 Jan 17 15:05	KMD
Beryllium - Total	< 0.0005	mg/1	0.0005	6020	10 Jan 17 15:05	KMD
Cadmium - Total	< 0.0005	mg/1	0.0005	6020	10 Jan 17 15:05	KMD
Chromium - Total	< 0.002	mg/1	0.0020	6020	10 Jan 17 15:05	KMD
Cobalt - Total	< 0.002	mg/1	0.0020	6020	10 Jan 17 15:05	KMD
Lead - Total	< 0.001 ^	mg/1	0.0005	6020	10 Jan 17 15:05	KMD
Molybdenum - Total	< 0.002	mg/1	0.0020	6020	10 Jan 17 15:05	KMD
Selenium - Total	< 0.002	mg/1	0.0020	6020	11 Jan 17 9:25	KMD
Thallium - Total	< 0.001 ^	mg/1	0.0005	6020	10 Jan 17 15:05	KMD
Antimony - Dissolved	< 0.001	mg/1	0.0010	6020	9 Jan 17 13:30	KMD
Arsenic - Dissolved	< 0.001	mg/l	0.0020	6020	9 Jan 17 13:30	KMD
Barium - Dissolved	< 0.002	mg/1	0.0020	6020	9 Jan 17 13:30	KMD
Dallam Dibbotvoa	. 0.002	5/ -				(2020/2019)

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

Project Name: MDU Heskett CCR Groundwater

Sample Description: Field Blank 2

Event and Year: December 2016

2 of 2 Page:

Report Date: 16 Jan 17 Lab Number: 16-W6113 Work Order #:82-4123 Account #: 002800

Date Sampled: 21 Dec 16

Date Received: 22 Dec 16 8:00 Sampled By: MVTL Field Services

PO #: 160249

Temp at Receipt: 5.0C ROI

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
Beryllium - Dissolved	< 0.0005 mg/l	0.0005	6020	9 Jan 17 13:30	KMD
Cadmium - Dissolved	< 0.0005 mg/l	0.0005	6020	9 Jan 17 13:30	KMD
Chromium - Dissolved	< 0.002 mg/1	0.0020	6020	9 Jan 17 13:30	KMD
Cobalt - Dissolved	< 0.002 mg/l	0.0020	6020	9 Jan 17 13:30	KMD
Lead - Dissolved	< 0.0005 mg/1	0.0005	6020	9 Jan 17 13:30	KMD
Molybdenum - Dissolved	< 0.002 mg/1	0.0020	6020	9 Jan 17 13:30	KMD
Selenium - Dissolved	$< 0.005 ^ mg/1$	0.0020	6020	9 Jan 17 13:30	KMD
Thallium - Dissolved	< 0.0005 mg/l	0.0005	6020	9 Jan 17 13:30	KMD

<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 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

Project Name: MDU Heskett CCR Groundwater

Sample Description: 101

Event and Year: December 2016

Page: 1 of 2

Report Date: 16 Jan 17 Lab Number: 16-W6114 Work Order #:82-4123 Account #: 002800

Date Sampled: 21 Dec 16 10:31 Date Received: 22 Dec 16 8:00 Sampled By: MVTL Field Services

PO #: 160249

Temp at Receipt: 5.0C ROI

	As Receive Result	ed	Method RL	Method Reference	Date Analyzed Ana	alyst
Metal Digestion			34.00 W. 30	EPA 200.2	22 Dec 16 KMI	
рН	* 7.2	units	N/A	SM4500 H+ B	22 Dec 16 17:00 SVS	
Total Suspended Solids	7	mg/l	2	I3765-85	22 Dec 16 15:40 SVS	
pH - Field	6.79	units	NA	SM 4500 H+ B	21 Dec 16 10:31 JSM	
Temperature - Field	5.74	Degrees C	NA	SM 2550B	21 Dec 16 10:31 JSM	
Total Alkalinity	456	mg/l CaCO3	20	SM2320-B	22 Dec 16 17:00 SVS	
Conductivity - Field	4805	umhos/cm	1	EPA 120.1	21 Dec 16 10:31 JSM	
Fluoride	< 0.1	mg/l	0.10	SM4500-F-C	22 Dec 16 17:00 SVS	
Sulfate	2670	mg/l	5.00	ASTM D516-07	5 Jan 17 15:42 EMS	
Chloride	16.2	mg/l	1.0	SM4500-C1-E	4 Jan 17 14:27 EMS	3
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	4 Jan 17 11:53 EV	
Mercury - Dissolved	< 0.0002	mg/l	0.0002	EPA 245.1	4 Jan 17 11:53 EV	1
Total Dissolved Solids	4280	mg/l	10	I1750-85	22 Dec 16 13:38 SV	
Calcium - Total	344	mg/l	1.0	6010	4 Jan 17 16:49 KMI	
Magnesium - Total	273	mg/l	1.0	6010	4 Jan 17 16:49 KMI	
Sodium - Total	535	mg/l	1.0	6010	4 Jan 17 16:49 KMI	
Potassium - Total	19.6	mg/l	1.0	6010	4 Jan 17 16:49 KMI	
Lithium - Total	0.54	mg/l	0.10	6010	6 Jan 17 12:48 KMI	-
Boron - Total	0.98	mg/l	0.10	6010	5 Jan 17 13:35 KMI	D C
Calcium - Dissolved	354	mg/l	1.0	6010	22 Dec 16 16:42 SZ	
Magnesium - Dissolved	282	mg/l	1.0	6010	22 Dec 16 16:42 SZ	
Sodium - Dissolved	580	mg/l	1.0	6010	22 Dec 16 16:42 SZ	
Potassium - Dissolved	17.0	mg/l	1.0	6010	22 Dec 16 16:42 SZ	
Lithium - Dissolved	0.57	mg/l	0.10	6010	6 Jan 17 14:48 KM	D
Boron - Dissolved	0.95	mg/1	0.10	6010	5 Jan 17 14:35 KM	D
Antimony - Total	< 0.001	mg/l	0.0010	6020	10 Jan 17 15:05 KM	D
Arsenic - Total	< 0.002	mg/l	0.0020	6020	10 Jan 17 15:05 KM	D
Barium - Total	0.0167	mg/l	0.0020	6020	10 Jan 17 15:05 KM	D
Beryllium - Total	< 0.0005	mg/l	0.0005	6020	10 Jan 17 15:05 KM	D
Cadmium - Total	< 0.0005	mg/1	0.0005	6020	10 Jan 17 15:05 KM	D
Chromium - Total	0.0026	mg/1	0.0020	6020	10 Jan 17 15:05 KM	D
Cobalt - Total	< 0.002	mg/1	0.0020	6020	10 Jan 17 15:05 KM	D
Lead - Total	< 0.001 ^	mg/1	0.0005	6020	10 Jan 17 15:05 KM	D
Molybdenum - Total	< 0.002	mg/1	0.0020	6020	10 Jan 17 15:05 KM	D
Selenium - Total	< 0.002	mg/l	0.0020	6020	11 Jan 17 10:40 KM	D
Thallium - Total	< 0.002	mg/l	0.0005	6020	10 Jan 17 15:05 KM	D

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:

2 of 2

Report Date: 16 Jan 17 Lab Number: 16-W6114 Work Order #:82-4123 Account #: 002800

Date Sampled: 21 Dec 16 10:31 Date Received: 22 Dec 16 8:00 Sampled By: MVTL Field Services

PO #: 160249

Temp at Receipt: 5.0C ROI

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

Project Name: MDU Heskett CCR Groundwater

Sample Description: 101

Event and Year: December 2016

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Antimony - Dissolved	< 0.001 m	ng/l	0.0010	6020	9 Jan 17 13:30	KMD
Arsenic - Dissolved	< 0.002 m	ng/l	0.0020	6020	9 Jan 17 13:30	KMD
Barium - Dissolved	0.0166 m	ng/l	0.0020	6020	9 Jan 17 13:30	KMD
Beryllium - Dissolved	< 0.0005 m	ng/l	0.0005	6020	9 Jan 17 13:30	KMD
Cadmium - Dissolved	< 0.0005 m	ng/l	0.0005	6020	9 Jan 17 13:30	KMD
Chromium - Dissolved	< 0.002 m	ng/l	0.0020	6020	9 Jan 17 13:30	KMD
Cobalt - Dissolved	< 0.002 m	ng/l	0.0020	6020	9 Jan 17 13:30	KMD
Lead - Dissolved	< 0.0005 m	ng/l	0.0005	6020	9 Jan 17 13:30	KMD
Molybdenum - Dissolved	< 0.002 m	ng/l	0.0020	6020	9 Jan 17 13:30	KMD
Selenium - Dissolved	< 0.005 ^ m	ng/l	0.0020	6020	9 Jan 17 13:30	KMD
Thallium - Dissolved	< 0.0005 m	mg/l	0.0005	6020	9 Jan 17 13:30	KMD

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

Approved by:

Claudite 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 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

Project Name: MDU Heskett CCR Groundwater

Sample Description: 70

Event and Year: December 2016

1 of 2 Page:

Report Date: 16 Jan 17 Lab Number: 16-W6115 Work Order #:82-4123 Account #: 002800

Date Sampled: 21 Dec 16 12:20 Date Received: 22 Dec 16 8:00 Sampled By: MVTL Field Services

PO #: 160249

Temp at Receipt: 5.0C ROI

	As Receive Result	ed	Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	22 Dec 16	KMD
PH *	7.6	units	N/A	SM4500 H+ B	22 Dec 16 18:00	SVS
Total Suspended Solids	2	mg/l	2	I3765-85	22 Dec 16 15:40	svs
pH - Field	7.07	units	NA	SM 4500 H+ B	21 Dec 16 12:20	JSM
Temperature - Field	6.43	Degrees C	NA	SM 2550B	21 Dec 16 12:20	JSM
Total Alkalinity	420	mg/l CaCO3	20	SM2320-B	22 Dec 16 18:00	SVS
Conductivity - Field	3863	umhos/cm	1	EPA 120.1	21 Dec 16 12:20	JSM
Fluoride	0.33	mg/l	0.10	SM4500-F-C	22 Dec 16 18:00	SVS
Sulfate	1810	mg/l	5.00	ASTM D516-07	5 Jan 17 15:42	EMS
Chloride	35.8	mg/l	1.0	SM4500-Cl-E	4 Jan 17 14:27	EMS
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	4 Jan 17 11:53	EV
Mercury - Dissolved	< 0.0002	mg/l	0.0002	EPA 245.1	4 Jan 17 11:53	EV
Total Dissolved Solids	3160	mg/l	10	I1750-85	22 Dec 16 13:38	SVS
Calcium - Total	346	mg/l	1.0	6010	4 Jan 17 16:49	KMD
Magnesium - Total	138	mg/l	1.0	6010	4 Jan 17 16:49	KMD
Sodium - Total	454	mg/l	1.0	6010	4 Jan 17 16:49	KMD
Potassium - Total	11.5	mg/l	1.0	6010	4 Jan 17 16:49	KMD
Lithium - Total	0.28	mg/l	0.10	6010	6 Jan 17 12:48	KMD
Boron - Total	0.36	mg/l	0.10	6010	5 Jan 17 13:35	KMD
Calcium - Dissolved	358	mg/l	1.0	6010	22 Dec 16 16:42	SZ
Magnesium - Dissolved	143	mg/l	1.0	6010	22 Dec 16 16:42	SZ
Sodium - Dissolved	482	mg/l	1.0	6010	22 Dec 16 16:42	SZ
Potassium - Dissolved	8.2	mg/l	1.0	6010	22 Dec 16 16:42	SZ
Lithium - Dissolved	0.28	mg/l	0.10	6010	6 Jan 17 14:48	KMD
Boron - Dissolved	0.29	mg/l	0.10	6010	5 Jan 17 15:35	KMD
Antimony - Total	< 0.001	mg/l	0.0010	6020	10 Jan 17 15:05	KMD .
Arsenic - Total	< 0.002	mg/1	0.0020	6020	10 Jan 17 15:05	KMD
Barium - Total	0.0115	mg/l	0.0020	6020	10 Jan 17 15:05	KMD
Beryllium - Total	< 0.0005	mg/l	0.0005	6020	10 Jan 17 15:05	KMD
Cadmium - Total	< 0.0005	mg/1	0.0005	6020	10 Jan 17 15:05	KMD
Chromium - Total	< 0.002	mg/l	0.0020	6020	10 Jan 17 15:05	KMD
Cobalt - Total	< 0.002	mg/l	0.0020	6020	10 Jan 17 15:05	KMD
Lead - Total	< 0.001 ^	mg/l	0.0005	6020	10 Jan 17 15:05	KMD
Molybdenum - Total	0.0044	mg/l	0.0020	6020	10 Jan 17 15:05	KMD
Selenium - Total	0.0102	mg/l	0.0020	6020	13 Jan 17 11:42	KMD
Thallium - Total	< 0.001 ^	mg/l	0.0005	6020	10 Jan 17 15:05	KMD

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 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 Groundwater

Sample Description: 70

Event and Year: December 2016

2 of 2 Page:

Report Date: 16 Jan 17 Lab Number: 16-W6115 Work Order #:82-4123 Account #: 002800

Date Sampled: 21 Dec 16 12:20 Date Received: 22 Dec 16 8:00 Sampled By: MVTL Field Services

PO #: 160249

Temp at Receipt: 5.0C ROI

	As Received Result	3	Method RL	Method Reference	Date Analyzed	Analyst
Antimony - Dissolved	< 0.001	mg/l	0.0010	6020	9 Jan 17 13:30	KMD
Arsenic - Dissolved	< 0.002	mg/l	0.0020	6020	9 Jan 17 13:30	KMD
Barium - Dissolved	0.0103	mg/l	0.0020	6020	9 Jan 17 13:30	KMD
Beryllium - Dissolved	< 0.0005	mg/l	0.0005	6020	9 Jan 17 13:30	KMD
Cadmium - Dissolved	< 0.0005	mg/l	0.0005	6020	9 Jan 17 13:30	KMD
Chromium - Dissolved	< 0.002	mg/l	0.0020	6020	9 Jan 17 13:30	KMD
Cobalt - Dissolved	< 0.002	mg/l	0.0020	6020	9 Jan 17 13:30	KMD
Lead - Dissolved	< 0.0005	mg/l	0.0005	6020	9 Jan 17 13:30	KMD
Molybdenum - Dissolved	0.0035	mg/l	0.0020	6020	9 Jan 17 13:30	KMD
Selenium - Dissolved	0.0123	mg/l	0.0020	6020	9 Jan 17 13:30	KMD
Thallium - Dissolved	< 0.0005	mg/l	0.0005	6020	9 Jan 17 13:30	KMD

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

Approved by:

Clauditte K. Canto 175/17

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 into

# = 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 Groundwater

Sample Description: 33

Event and Year: December 2016

1 of 2 Page:

Report Date: 16 Jan 17 Lab Number: 16-W6116 Work Order #:82-4123 Account #: 002800

Date Sampled: 21 Dec 16 14:53 Date Received: 22 Dec 16 8:00 Sampled By: MVTL Field Services

PO #: 160249

Temp at Receipt: 5.0C ROI

	As Receive Result	ed	Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	22 Dec 16	KMD
рН	* 7.1	units	N/A	SM4500 H+ B	22 Dec 16 18:00	SVS
Total Suspended Solids	4	mg/l	2	I3765-85	22 Dec 16 15:40	SVS
pH - Field	6.64	units	NA	SM 4500 H+ B	21 Dec 16 14:53	JSM
Temperature - Field	7.60	Degrees C	NA	SM 2550B	21 Dec 16 14:53	JSM
Total Alkalinity	467	mg/l CaCO3	20	SM2320-B	22 Dec 16 18:00	SVS
Conductivity - Field	5156	umhos/cm	1	EPA 120.1	21 Dec 16 14:53	JSM
Fluoride	0.22	mg/l	0.10	SM4500-F-C	22 Dec 16 18:00	SVS
Sulfate	3080	mg/l	5.00	ASTM D516-07	5 Jan 17 15:42	EMS
Chloride	10.3	mg/l	1.0	SM4500-Cl-E	4 Jan 17 15:25	EMS
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	4 Jan 17 11:53	EV
Mercury - Dissolved	< 0.0002	mg/l	0.0002	EPA 245.1	4 Jan 17 11:53	EV
Total Dissolved Solids	4860	mg/l	10	I1750-85	22 Dec 16 13:38	SVS
Calcium - Total	446	mg/l	1.0	6010	4 Jan 17 16:49	KMD
Magnesium - Total	434	mg/l	1.0	6010	4 Jan 17 16:49	KMD
Sodium - Total	398	mg/l	1.0	6010	4 Jan 17 16:49	KMD
Potassium - Total	20.7	mg/l	1.0	6010	4 Jan 17 16:49	KMD
Lithium - Total	0.70	mg/l	0.10	6010	6 Jan 17 12:48	KMD
Boron - Total	0.34	mg/l	0.10	6010	5 Jan 17 13:35	KMD
Calcium - Dissolved	454	mg/l	1.0	6010	22 Dec 16 16:42	SZ
Magnesium - Dissolved	442	mg/l	1.0	6010	22 Dec 16 16:42	SZ
Sodium - Dissolved	426	mg/l	1.0	6010	22 Dec 16 16:42	SZ
Potassium - Dissolved	17.6	mg/l	1.0	6010	22 Dec 16 16:42	SZ
Lithium - Dissolved	0.66	mg/l	0.10	6010	6 Jan 17 14:48	KMD
Boron - Dissolved	0.23	mg/l	0.10	6010	5 Jan 17 15:35	KMD
Antimony - Total	< 0.001	mg/l	0.0010	6020	10 Jan 17 15:05	KMD
Arsenic - Total	< 0.002	mg/l	0.0020	6020	10 Jan 17 15:05	KMD
Barium - Total	0.0150	mg/l	0.0020	6020	10 Jan 17 15:05	KMD
Beryllium - Total	< 0.0005	mg/l	0.0005	6020	10 Jan 17 15:05	KMD
Cadmium - Total	< 0.0005	mg/l	0.0005	6020	10 Jan 17 15:05	KMD
Chromium - Total	< 0.002	mg/l	0.0020	6020	10 Jan 17 15:05	KMD
Cobalt - Total	< 0.002	mg/l	0.0020	6020	10 Jan 17 15:05	KMD
Lead - Total	< 0.001 ^	mg/l	0.0005	6020	10 Jan 17 15:05	KMD
Molybdenum - Total	< 0.002	mg/l	0.0020	6020	10 Jan 17 15:05	KMD
Selenium - Total	< 0.002	mg/l	0.0020	6020	11 Jan 17 10:40	KMD
Thallium - Total	< 0.001 ^	mg/l	0.0005	6020	10 Jan 17 15:05	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 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 Groundwater

Sample Description: 33

Event and Year: December 2016

2 of 2 Page:

Report Date: 16 Jan 17 Lab Number: 16-W6116 Work Order #:82-4123 Account #: 002800

Date Sampled: 21 Dec 16 14:53 Date Received: 22 Dec 16 8:00 Sampled By: MVTL Field Services

PO #: 160249

Temp at Receipt: 5.0C ROI

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
Antimony - Dissolved	< 0.001 mg/l	0.0010	6020	9 Jan 17 13:30	KMD
Arsenic - Dissolved	< 0.002 mg/1	0.0020	6020	9 Jan 17 13:30	KMD
Barium - Dissolved	0.0141 mg/l	0.0020	6020	9 Jan 17 13:30	KMD
Beryllium - Dissolved	< 0.0005 mg/l	0.0005	6020	9 Jan 17 13:30	KMD
Cadmium - Dissolved	< 0.0005 mg/1	0.0005	6020	9 Jan 17 13:30	KMD
Chromium - Dissolved	< 0.002 mg/1	0.0020	6020	9 Jan 17 13:30	KMD
Cobalt - Dissolved	< 0.002 mg/1	0.0020	6020	9 Jan 17 13:30	KMD
Lead - Dissolved	< 0.0005 mg/1	0.0005	6020	9 Jan 17 13:30	KMD
Molybdenum - Dissolved	< 0.002 mg/1	0.0020	6020	9 Jan 17 13:30	KMD
Selenium - Dissolved	< 0.005 ^ mg/l	0.0020	6020	9 Jan 17 13:30	KMD
Thallium - Dissolved	< 0.0005 mg/l	0.0005	6020	9 Jan 17 13:30	KMD

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

Approved by:

Clauditte K. Cantle

CC\_ 175an17

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 into the control of t

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

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



Weather Conditions:

# **Field Datasheet**

**Groundwater Assessment** 

Company:	MDU Heskett	
Event:	2016	
Sample ID:	101	
Sampling Personal:	1	

Phone: (701) 258-9720

Weather Conditions:		Temp	: 35°F	
	Well Info	rmation		
Well Locked?	Yes	Ng		
Well Labeled?	Yes	No		
Casing Straight?	Ye's_	No		
Grout Seal Intact?	(Ŷes)	No	Not Vis	ible
Repairs Necessary:				
Casing	Diameter:		2"	
Water Level Bef	ore Purge:		37.02	ft
Total V	Vell Depth:		-	ft
We	ell Volume:			liters
Depth to Top	of Pump:			ft
Water Level Afte	er Sample:		41.85	ft
Measuremer	t Method:	Electric	Water Level Inc	dicator

Wind:	WOZE	>-25		Precip	Suni	ny /Partily (	Cloudy / Cl	oudy
			Sa	ımpling l	nformatio	on		
	Purgi	ng Method:	Blac	der		Co	ontrol Settir	ngs
	Sampli	ng Method:	Blac	lder	]	Purge:	<b>ઇ</b>	sec.
	Dedicat	ed Equip?:	Yes)	Nọ	]	Recover:	52	sec.
	Duplicate	Sample?:	Yes	(1)20		PSI:	`ŠÐ	
	Duplicate	Sample ID:	4			Pumping R	late: 120	mL/min
	F	urge Date:	21 Deell	0	Time Purg	ing Began:	1590	(am/pm
	Well P	urged Dry?	Yes	(No)	Time F	urged Dry:		am/pm
	Sa	mple Date:	21 Dec /6	>	Time of	Sampling:	1031	aṃ/pm
		1	:					
	Bottle	CC	R: 1L Raw,	500mL Nit	irc, 500mL l	Nitric (filtere	ed), 4-1L Ni	tric
	List:	NDDI	∃: 1L Raw, է	500mL nitri	c, 500mL ni	tiric (filtered	l), 250mL s	ulfiric
_								

#### **Field Measurements**

1								<del></del>		
	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	0926	5.37	4815	6.83	6.45	100.7	120.6	37.68	500	Clean
2	0931	6.31	4809	6,77	3,34	41.2	109.0	38.05	500	Clear
3 -	0936	6.28	4789	6,78	2.44	29,9	95,3	38,49	500	Clear
4	0946		4783	6.78	2,00	36.7	29,9	37.15	500/1000	Cle
5 ON	994666	5.92	4794	6,79	1.91	29.1	19.0	39.34	<del>500</del> 1000	de
6 100	<del>6951</del>	5.90	4766	6,79	1.92	34.6	16.1	39,50	530 1000	Cles
7	1016	602	4799	6,79	2.06	47.7	6.00	39.69	1000	Cles
8	1021	5.64	4803	6.80	2.16	36.2	5,25	39,70	520	Cles
9	1026	5.83	4603	6.49	2.18	36.0	4.92	39.83	Seo	Clon
10	1031	5,74	4605		2.14	<b>45.6</b>	4.42	39.88	<b>೯</b> ಖ	cle
Stabilized:		No	•			To	tal Volume	Removed:	7,000	mL

Comments:



**Groundwater Assessment** 

Company:	MDU Heskett
Event:	2016
Sample ID:	. FO ,
Sampling Personal:	Jeren oly

Phone: (701) 258-9	700						,	Sampling Pe	ersonai:	حامہ	en olin		
Frione. (701) 256-9	3720										i v		
Weather Conditions:		Temp:	38	°F	Wind:	11) 020	-25		Precip:	Suni	ny / Partly C	loudy / Cla	udv
	Well Info	rmation						Sai	· · · · · · · · · · · · · · · · · · ·	nformatio		riousy r Gre	ruuy
Well Locked?	Yes	(No)				Purgi	ng Method:	Blade				ntrol Setting	19
Well Labeled?	Yes	No				Sampli	ng Method:	Blade	der		Purge:	<u>ح</u>	sec
Casing Straight?		No				Dedicat	ted Equip?:	Yes	No		Recover:	<u> </u>	sec
Grout Seal Intact?	Yes	No	Not	Visible			Sample?:	Yes	(No)	İ	PSI:	30	
Repairs Necessary:						Duplicate	Sample ID:	<u> </u>			Pumping R		mL/mir
Casing	Diameter:		2"							j .	r umping re	atc. 700	11111/1111
Water Level Befo	ore Purge:	20	92	ft		F	urge Date:	21 Der 16		Time Pura	ing Began:	1155	am/pm
Total V	/ell Depth:	·		ft			urged Dry?	Yes	(No)		urged Dry:	<u> </u>	am/pm
We	II Volume:			liters			mple Date:	21 Dec 16			Sampling:	1220	
Depth to Top	of Pump:			ft								1000	am/pri
Water Level Afte	er Sample:	2	2,45	ft		Bottle	CC	R: 1L Raw,	500ml Niti	irc 500ml I	Nitric (filtere	d) / 11 Nii+	io
Measuremen	t Method:	Electric V	Vater Level	I Indicator		List:		H: 1L Raw, 5					
					Measure	ments		1. 1L 1 (dw, 0	COME MUN	o, oddiic iii	and (intered	), 200ML St	HIII IC

	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	1200	6.60	3688	7.il	1.59	-27.0	1.57	22.04	São	Clea
2	1205	6.49	3874	7,0B	1,53	15,2	0.80	22.18	500	Cler
3	1210	6.53	3864	7.09	1.35	29,1	0.89	22.22	580	Clear
4	1215	6,51	3862	7.07	1.38	38,0	0.64	22,35	S 20	Clea
5	1220	6.43	3863	707	1.30	42.2	0.66	22,32	Sæ	Clea
6	-									
7										
8										
9									<u> </u>	
10 Stabilized:	(Yes	No					tal Valuma			

Comments:

Total Volume Removed: 2500 mL



**Groundwater Assessment** 

Company:	MDU Heskett
Event:	2016
Sample ID:	^33 <sub>4</sub>
Sampling Personal:	Jenseh -

2616 E. Broadway Ave, Bism	•							Sampling F	ersonal:	Jer	Jeh-		
Phone: (701) 258-972	20										l' #		
Weather Conditions:		Temp:	35 ℉		Wind:	W@ 20.	-25		Precip:	Sunr	ny / Partly C	loudy / Clo	ıdv
V	/ell Info	rmation						Sa	mpling I	nformatio			
Well Locked?	Yes	€NP>				Purging	Method:		lder			trol Setting	s
Well Labeled?	gres)	No				Sampling	g Method:	Blac	lder		Purge:	5	sec
Casing Straight?	(Ves	No				Dedicate	d Equip?:	(Yes	No		Recover:	22	sec
Grout Seal Intact?	Yes	No	Not Visit	blè		Duplicate S	Sample?:	Yes	<b>(</b> 10)		PSI:	30	
Repairs Necessary:						Duplicate S	ample ID:	<u> </u>			Pumping Ra	ite: 100	mL/mi
Casing D	iameter:		2"							•			
Water Level Before	e Purge:		41,80	ft		Pu	rge Date:	2/Decl	6	Time Purg	ing Began:	1408	am/pr
Total Wel	Il Depth:	4	·	ft		Well Pur	ged Dry?	Yes	(10)		urged Dry:		am/pn
Well '	Volume:	-		liters		Sam	ple Date:	21 Decilo			Sampling:	1453	am/@
Depth to Top o	of Pump:			ft						·			
Water Level After	Sample:		42,37	ft		Bottle	CC	R: 1L Raw,	500mL Niti	irc. 500mL i	Vitric (filtered	l). 4-11. Nitri	C
Measurement N	Method:	Electric V	Water Level Ind	licator		List:					tiric (filtered)		
				Field	Measure	mante							

						l			T	
Stabili (3 cons	zation ecutive)	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	H13	7.47	5436	6,75	2.27	-49,4	55.7	42.02	Sco	Clean
2	MB	7.77	5221	6.66	1,52	-1.7	13.0	42.21	SOO	Clear
3	1433	7.64	5180	6.65	1.43	3.0	6.63	42.33	500	Clea
4	1438	7.65	5176	6.64	1.41	.6.1	4.07	42.35	ζευ	Clea
5	1443	7.84	5152	6.64	1.41	7.3	2.96	42.37	300	Clear
6	144 જ	7.67	5145	6,65	1,50	9.8	2,29	42.30	500	Cleo
7	1453	760	5156	6.64	1,52	13,2	1.85	42.35	Soo	Clear
8									-	
9						***************************************				
10			•							
Stabilized:	(Yes)	No	-			Т	tal Volume	Removed:	4500	mL

Comments:



# **Chain of Custody Record**

Projec	t Name:				Name of Sampler(s):
MDU	Heskett	CCR Grou	ndwater	2016	Jerry My
Report To: Attn: Address:	MDU Samantha Marshall 400 N. 4th St Bismarck, ND 58501		<u>Carbon Copy:</u> <u>Attn:</u> <u>Address</u> :	-	Work Order Number: 82 - 4123
Phone:	701-222-7829				

	Sampl	le Informat	ion				В	ottle	Туре	<del>)</del>	Fi	eld Para	ameters	Analysis
Lab Number	Sample ID	$D_{ate}$	Time	Sample Type	Gradient	500 ml HNO	1 lifer	500 ml HNO <sub>3</sub> (fillered)			Field Temperature °C	Field Spec. Cond.	Field pH	Analysis Required
Well3	Field Blank (FB) Z	21 Dec16	NA	W		X		X			NA	NA	NA	
21 Dec 16	Dup		NA	W		X	Х	X			NA	NA	NA	
MUDE	101	21 Deel 6	1031	GW		X	X	8			5,74	4805	6,79	
Well5	70	21 Deel 6	1220	GW		X	X	>			6.43	3863	7.07	
Wollb	33	21 Dallo	1453	GW		$\times$	X	X			7.60	5156	6,64	
														MDU CCR List with TSS and Dissolved CCR Metals. No RadChem.

Comments:

	Transferred by:	Sample Condition	Date/Time	∧ Received by:	Sample Condition	Date/Time	° C
1	Took	Cushin #2	21 Dec 16 1703	InalSimonan		22 Decil	POI TM 562 5.0
2							
3							





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#### CASE NARRATIVE - AMENDED 22 FEB 2017

MVTL Lab Reference No/SDG:

201682-4137

Client:

**Montana Dakota Utilities** 

Location:

**MDU Heskett** 

**Project Identification:** 

CCR December 2016

**MVTL Laboratory Identifications:** 

16-W6126 through 16-W6132

Page 1 of 2

MDU Sample Identification	MVTL Laboratory #
Field Blank (FB) 3	16-W6126
Dup 2	16-W6127
2-90	16-W6128
102	16-W6129
3-90	16-W6130
80R	16-W6131
105	16-W6132

#### I. RECEIPT

- All samples were received at the laboratory on 22 Dec 2016 at 1612.
- Samples were collected and hand delivered by MVTL Field Service personnel to the laboratory.
- Samples were received on ice and evidence of cooling had begun.
  - Temperature of samples upon receipt was 6.2°C.
- All samples were properly preserved unless noted here and/or flagged on the individual analytical laboratory report.
- No other exceptions on sample receipt were encountered on this sample set unless noted here.

#### II. HOLDING TIMES

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

#### III. METHODS

- Approved methodology was followed for all sample analyses.
  - 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).



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#### CASE NARRATIVE - AMENDED 22 FEB 2017

MVTL Lab Reference No/SDG:

201682-4137

Client:

**Montana Dakota Utilities** 

Location:

**MDU Heskett** 

**Project Identification:** 

CCR December 2016

**MVTL Laboratory Identifications:** 

16-W6126 through 16-W6132

Page 2 of 2

- o For some analytes, the reported results were elevated due to additional dilutions required to minimize the effects of sample matrix.
- The recoveries for two selenium dissolved matrix spikes/matrix spike duplicates were outside the acceptable limits. RPD for the recoveries was within limits. Poor recoveries were determined to be due to sample matrix. Data was accepted based on acceptable recovery of the LCS. No further action was taken.
- Recovery for one selenium dissolved matrix spike duplicate was outside of the acceptable limits. Recovery of the matrix spike was acceptable. RPD for the recoveries of the matrix spike/matrix spike duplicate was acceptable. No further action was taken.
- Recovery for one molybdenum total matrix spike duplicate was outside of the acceptable limits. Recovery of the matrix spike was acceptable. RPD for the recoveries of the matrix spike/matrix spike duplicate was acceptable. No further action was taken.
- Recovery for one molybdenum dissolved matrix spike duplicate was outside of the acceptable limits. Recovery of the matrix spike was acceptable. RPD for the recoveries of the matrix spike/matrix spike duplicate was acceptable. No further action was taken.
- Recovery for one beryllium dissolved matrix spike duplicate was outside of the acceptable limits. Recovery of the matrix spike was acceptable. RPD for the recoveries of the matrix spike/matrix spike duplicate was acceptable. No further action was taken.
- The recoveries for two beryllium total matrix spikes duplicates were outside the acceptable limits. Recoveries of the matrix spikes were acceptable. RPD for the recoveries was within limits. Data was accepted based on acceptable recovery of the LCS. No further action was taken.

#### V. REPORTING

 Per email dated 9 Feb 2017 from Terri Olson at Barr, the data package was amended to remove extraneous QC samples from the QC report.

All laboratory data has b	een approved	by MVTL Laboratories.			
SIGNED: Cla	ukette	Canto	DATE:_	22 26517	
Claudette Carrol	I - MVTL Bisma	arck Laboratory Manager			

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Quality Control Report – Amended 22 Feb 2017

<b>Lab IDs:</b> 16-W6126 to 16-W	V0132	Pr	oject: MI	JU Heske	ett CCR GW		work Or	r	682-413			I minorio de la morto della morto della morto della morto de la morto della mo	W PORTO A MEDICALIZADO	Martin Me Wale in a memory of Alliana	acceptation and an expensive field of	PSENSAR EREITT AND PSESSOR VALUE	Intel@otstatururoksidi.iSii
Analyte	LCS Spike Amt	LCS Rec %	LCS % Rec Limits	Matrix Spike Amt	Matrix Spike ID	Matrix Spike Orig Result	Matrix Spike Result	Matrix Spike Rec %	Matrix Spike % Rec Limits	MSD/ Dup Orig Result	MSD/ Dup Result	MSD Rec %	MSD/ Dup RPD	MSD/ Dup RPD Limit (<)	Known Rec (%)	Known % Rec Limits	Method Blank
Antimony - Dissolved mg/l	0.0160	106	80-120	0.100 0.100 0.100	16W6119q 16W6129q 16W6132q	< 0.001 < 0.001 < 0.001	0.1070 0.1164 0.0994	107 116 99	75-125 75-125 75-125	0.1070 0.1164 0.0994	0.1088 0.1174 0.1136	109 117 114	1.7 0.9 13.3	20 20 20	-	-	< 0.001
Antimony - Total mg/l	0.1000 0.1000 0.1000	115 107 111	80-120 80-120 80-120	0.500 0.400 0.400	16W6027q 16W6126q 16W6132q	< 0.001 < 0.001 < 0.001	0.5586 0.4106 0.4598	112 103 115	75-125 75-125 75-125	0.5586 0.4106 0.4598	0.5452 0.4476 0.4642	109 112 116	2.4 8.6 1.0	20 20 20	-		< 0.001
Arsenic - Dissolved mg/l	0.0160	101	80-120	0.100 0.100 0.100	16W6119q 16W6129q 16W6132q	< 0.002 0.0033 < 0.002	0.1156 0.1273 0.1053	116 124 105	75-125 75-125 75-125	0.1156 0.1273 0.1053	0.1132 0.1276 0.1200	113 124 120	2.1 0.2 13.0	20 20 20	-	-	< 0.002
Arsenic - Total mg/l	0.1000 0.1000 0.1000	112 108 112	80-120 80-120 80-120	0.500 0.400 0.400	16W6027q 16W6126q 16W6132q	< 0.002 < 0.002 < 0.002	0.5784 0.4088 0.4748	116 102 119	75-125 75-125 75-125	0.5784 0.4088 0.4748	0.5630 0.4568 0.4778	113 114 119	2.7 11.1 0.6	20 20 20	- -	-	< 0.002
Barium - Dissolved mg/l	0.0160	106	80-120	0.100 0.100 0.100	16W6119q 16W6129q 16W6132q	0.0095 0.0224 0.0237	0.1108 0.1412 0.1142	101 119 90	75-125 75-125 75-125	0.1108 0.1412 0.1142	0.1218 0.1471 0.1342	112 125 110	9.5 4.1 16.1	20 20 20	-	-	< 0.002
Barium - Total mg/l	0.1000 0.1000 0.1000 0.1000	105 99 101 98	80-120 80-120 80-120 80-120	0.500 0.400 0.400 0.100	16W6027q 16W6126q 16W6132q	0.0070 < 0.002 0.0232	0.5200 0.3976 0.4460	103 99 106	75-125 75-125 75-125	0.5200 0.3976 0.4460	0.5306 0.4676 0.5030	105 117 120	2.0 16.2 12.0	20 20 20	- - -	-	< 0.002
Beryllium - Dissolved mg/l	0.0160	101	80-120	0.100 0.100 0.100	16W6119q 16W6129q 16W6132q	< 0.0005 < 0.0005 < 0.0005	0.1114 0.1199 0.1051	111 120 105	75-125 75-125 75-125	0.1114 0.1199 0.1051	0.1164 0.1255 0.1251	116 126 125	4.4 4.6 17.4	20 20 20	-		< 0.0005
Beryllium - Total mg/l	0.1000 0.1000 0.1000	115 108 111	80-120 80-120 80-120	0.500 0.400 0.400	16W6027q 16W6126q 16W6132q	< 0.0005 < 0.0005 < 0.0005	0.5952 0.4442 0.4942	119 111 124	75-125 75-125 75-125	0.5952 0.4442 0.4942	0.5908 0.5184 0.5346	118 130 134	0.7 15.4 7.9	20 20 20	- - -		< 0.0005
Boron - Dissolved mg/l	0.40	115	80-120	0.600	16-W6132	0.29	0.98	115	75-125	0.98	0.85	93	14.2	20	_	_	< 0.1

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Quality Control Report
Lab IDs: 16-W6126 to 16-W6132

Project: MDII Heskett CCR GW Work Order: 201682-4137

<b>Lab IDs:</b> 16-W6126 to 16-V	V0132	Pr	oject: Mi	JU Heske	ett CCR GW		WOLK OL	der: 201				,	···				
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 - Total mg/l	0.40 0.40	115 110	80-120 80-120	0.400 0.400	16-W6126 16-W6132	< 0.1 0.33	0.45 0.71	112 95	75-125 75-125	0.45 0.71	0.45 0.69	112 90	0.0 2.9	20 20	-		< 0.1 < 0.1 < 0.1
Cadmium - Dissolved mg/l	0.0160	104	80-120	0.100 0.100 0.100	16W6119q 16W6129q 16W6132q	< 0.0005 < 0.0005 < 0.0005	0.1018 0.1070 0.0952	102 107 95	75-125 75-125 75-125	0.1018 0.1070 0.0952	0.1012 0.1074 0.1040	101 107 104	0.6 0.4 8.8	20 20 20	-	-	< 0.0005
Cadmium - Total mg/l	0.1000 0.1000 0.1000	119 110 116	80-120 80-120 80-120	0.500 0.400 0.400	16W6027q 16W6126q 16W6132q	< 0.0005 < 0.0005 < 0.0005	0.5794 0.4290 0.4688	116 107 117	75-125 75-125 75-125	0.5794 0.4290 0.4688	0.5494 0.4758 0.4662	110 119 117	5.3 10.3 0.6	20 20 20	- -	-	< 0.0005
Calcium - Dissolved mg/l	20.0	102	80-120	500	16-W6132	382	840	92	75-125	840	865	97	2.9	20		-	< 1 < 1
Calcium - Total mg/l	20.0 20.0 20.0 20.0 20.0	102 106 105 106	80-120 80-120 80-120 80-120	500	16-D5109 16-M4159 16-M4161 17-M3 17-M8 17-M9 16-W6133	696 2000 730 1900 12.6 194 4.4	1650 7100 1290 2710 114 690 107	95 102 112 81 101 99 103	75-125 75-125 75-125 75-125 75-125 75-125 75-125	1650 7100 107	1680 7400 105	98 108 101	1.8 4.1 1.9	20 20 20	- - - - -	- - - - -	<1 <1 <1 <1 <1 <1 <1
Chloride mg/l	30.0 30.0 30.0 30.0	88 92 90 89	80-120 80-120 80-120 80-120	30.0 30.0	16-W6116 17-D28	10.3 37.0	38.0 67.0	92 100	80-120 80-120	38.0 67.0	37.9 68.5	92 105	0.3 2.2	20 20		- - -	<1 <1 <1 <1
Chromium - Dissolved mg/l	0.0160	102	80-120	0.100 0.100 0.100	16W6119q 16W6129q 16W6132q	0.0024 < 0.002 < 0.002	0.1051 0.1152 0.0974	103 115 97	75-125 75-125 75-125	0.1051 0.1152 0.0974	0.1084 0.1150 0.1102	106 115 110	3.1 0.2 12.3	20 20 20	-	-	< 0.002
Chromium - Total mg/l	0.1000 0.1000 0.1000	107 101 103	80-120 80-120 80-120	0.500 0.400 0.400	16W6027q 16W6126q 16W6132q	< 0.002 < 0.002 < 0.002	0.5284 0.3858 0.4302	106 96 108	75-125 75-125 75-125	0.5284 0.3858 0.4302	0.5096 0.4254 0.4292	102 106 107	3.6 9.8 0.2	20 20 20	-		< 0.002

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**Quality Control Report** 

Lab IDs: 16-W6126 to 16-W6132 Project: MDU Heskett CCR GW

Work Order: 201682-4137

Analyte	LCS Spike Amt	LCS Rec %	LCS % Rec Limits	Matrix Spike Amt	Matrix Spike ID	Matrix Spike Orig Result	Matrix Spike Result	Matrix Spike Rec %	Matrix Spike % Rec Limits	MSD/ Dup Orig Result	MSD/ Dup Result	MSD Rec %	MSD/ Dup RPD	MSD/ Dup RPD Limit (<)	Known Rec (%)	Known % Rec Limits	Method Blank
Cobalt - Dissolved mg/l	0.0160	101	80-120	0.100 0.100 0.100	16W6119q 16W6129q 16W6132q	< 0.002 0.0021 < 0.002	0.0996 0.1114 0.0959	100 109 96	75-125 75-125 75-125	0.0996 0.1114 0.0959	0.1026 0.1129 0.1080	103 111 108	3.0 1.3 11.9	20 20 20		-	< 0.002
Cobalt - Total mg/l	0.1000 0.1000 0.1000	108 101 105	80-120 80-120 80-120	0.500 0.400 0.400	16W6027q 16W6126q 16W6132q	< 0.002 < 0.002 < 0.002	0.5316 0.3908 0.4316	106 98 108	75-125 75-125 75-125	0.5316 0.3908 0.4316	0.5120 0.4402 0.4326	102 110 108	3.8 11.9 0.2	20 20 20	-	-	< 0.002
Fluoride mg/l	0.50	110	90-110	0.500	16-W6125	< 0.1	0.55	110	80-120	0.55	0.57	114	3.6	20	-	-	< 0.1 < 0.1
Lead - Dissolved mg/l	0.0160 0.1000	106 98	80-120 80-120	0.100 0.100 0.100	16W6119q 16W6129q 17-W63	< 0.0005 < 0.0005 < 0.001	0.0908 0.1026 0.0893	91 103 89	75-125 75-125 75-125	0.0908 0.1026 0.0893	0.0992 0.1083 0.0904	99 108 90	8.8 5.4 1.2	20 20 20	-	- -	< 0.0005 < 0.0005
Lead - Total mg/l	0.1000 0.1000 0.1000	104 97 101	80-120 80-120 80-120	0.500 0.400 0.400	16W6027q 16W6126q 16W6132q	< 0.0005 < 0.0005 < 0.0005	0.4706 0.3828 0.3892	94 96 97	75-125 75-125 75-125	0.4706 0.3828 0.3892	0.4902 0.4424 0.4374	98 111 109	4.1 14.4 11.7	20 20 20	-	-	< 0.0005
Lithium - Dissolved mg/l	0.40	102	80-120	0.400	16-W6132	1.09	1.58	122	75-125	1.58	1.46	92	7.9	20	-	-	< 0.1 < 0.1
Lithium - Total mg/l	0.40 0.40 0.40	105 100 105	80-120 80-120 80-120	0.400 0.400 0.400	16-W6027 16-W6126 16-W6132	1.35 < 0.1 1.00	1.65 0.41 1.42	75 102 105	75-125 75-125 75-125	1.65 0.41 1.42	1.68 0.40 1.40	83 100 100	1.8 2.5 1.4	20 20 20	-	-	< 0.1 < 0.1 < 0.1 < 0.1 < 0.1
Magnesium - Dissolved mg/l	20.0	104	80-120	500	16-W6132	755	1200	89	75-125	1200	1240	97	3.3	20	-	-	< 1 < 1

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Quality Control Report
Lab IDs: 16-W6126 to 16-W6132

Projects MDII Hadrott CCD CW

<b>Lab IDs:</b> 16-W6126 to 16-W	6132	Pr	oject: ML	JU Heske	ett CCR GW	T	Nork Or	der: 201	T		<b>-</b>						
Analyte	LCS Spike Amt	LCS Rec %	LCS % Rec Limits	Matrix Spike Amt	Matrix Spike ID	Matrix Spike Orig Result	Matrix Spike Result	Matrix Spike Rec %	Matrix Spike % Rec Limits	MSD/ Dup Orig Result	MSD/ Dup Result	MSD Rec %	MSD/ Dup RPD	MSD/ Dup RPD Limit (<)	Known Rec (%)	Known % Rec Limits	Method Blank
Magnesium - Total mg/l	20.0 20.0 20.0 20.0 20.0	105 108 106 108	80-120 80-120 80-120 80-120	1000 5000 500 1000 100 500 100	16-D5109 16-M4159 16-M4161 17-M3 17-M8 17-M9 16-W6133	1230 66.0 < 5 < 10 16.9 < 5 2.3	2170 5300 540 987 119 515 106	94 105 108 99 102 103 104	75-125 75-125 75-125 75-125 75-125 75-125 75-125	2170 5300 106	2190 5550 104	96 110 102	0.9 4.6 1.9	20 20 20	- - - - - -	- - - - -	<1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1
Mercury - Dissolved mg/l	0.0020	100	85-115	0.002 0.002	16-W6127 16-W6132	< 0.0002 < 0.0002	0.0018 0.0018	90 90	70-130 70-130	0.0018 0.0018	0.0018 0.0018	90 90	0.0	20 20	-	-	< 0.0002
Mercury - Total mg/l	0.0020	95	85-115	0.002	16-W6132	< 0.0002	0.0017	85	70-130	0.0017	0.0017	85	0.0	20	-	_	< 0.0002
Molybdenum - Dissolved mg/l	0.0160	104	80-120	0.100 0.100 0.100	16W6119q 16W6129q 16W6132q	0.0034 < 0.002 < 0.002	0.1149 0.1246 0.1023	112 125 102	75-125 75-125 75-125	0.1149 0.1246 0.1023	0.1200 0.1296 0.1229	117 130 123	4.3 3.9 18.3	20 20 20	-	- - -	< 0.002
Molybdenum - Total mg/l	0.1000 0.1000 0.1000	104 98 99	80-120 80-120 80-120	0.500 0.400 0.400	16W6027q 16W6126q 16W6132q	< 0.002 < 0.002 < 0.002	0.5704 0.4002 0.4614	114 100 115	75-125 75-125 75-125	0.5704 0.4002 0.4614	0.5564 0.4632 0.5072	111 116 127	2.5 14.6 9.5	20 20 20	-	-	< 0.002
pH units	-	-	-	_	-	-	-	-	-	12.3 8.3	12.3 8.3	-	0.0	20 20	-	-	-
Potassium - Dissolved mg/l	10.0	88	80-120	100	16-W6132	19.6	115	95	75-125	115	119	99	3.4	20	-	-	< 1 < 1
Potassium - Total mg/l	10.0 10.0 10.0 10.0	95 93 91 94	80-120 80-120 80-120 80-120	200 1000 100 200 20.0 100 20.0	16-D5109 16-M4159 16-M4161 17-M3 17-M8 17-M9 16-W6133	172 442 23.8 456 7.4 42.1 4.5	364 1430 129 645 26.6 142 26.3	96 99 105 94 96 100 109	75-125 75-125 75-125 75-125 75-125 75-125 75-125	364 1430 26.3	368 1500 26.0	98 106 108	1.1 4.8 1.1	20 20 20	- - - - -		<1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1

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Page: 5 of 5

**Quality Control Report** 

Lab IDs: 16-W6126 to 16-W6132

Project: MDU Heskett CCR GW Work Order: 201682-4137

Analyte	LCS Spike Amt	LCS Rec %	LCS % Rec Limits	Matrix Spike Amt	Matrix Spike ID	Matrix Spike Orig Result	Matrix Spike Result	Matrix Spike Rec %	Matrix Spike % Rec Limits	MSD/ Dup Orig Result	MSD/ Dup Result	MSD Rec %	MSD/ Dup RPD	MSD/ Dup RPD Limit (<)	Known Rec (%)	Known % Rec Limits	Method Blank
Selenium - Dissolved mg/l	0.0160	107	80-120	0.100 0.100 0.100	16W6119q 16W6129q 16W6132q	0.1384 < 0.002 0.0031	0.2768 0.1404 0.1248	138 140 122	75-125 75-125 75-125	0.2768 0.1404 0.1248	0.2807 0.1450 0.1432	142 145 140	1.4 3.2 13.7	20 20 20	-	-	< 0.002
Selenium - Total mg/l	0.1000	118	80-120	0.400 0.400	16-W6126 16-W6132	< 0.002 < 0.002	0.4590 0.4656	115 116	75-125 75-125	0.4590 0.4656	0.4608 0.5016	115 125	0.4 7.4	20 20	-	-	< 0.002
Sodium - Dissolved mg/l	20.0	96	80-120	500	16-W6132	710	1160	90	75-125	1160	1190	96	2.6	20	-	-	< 1 < 1
Sodium - Total mg/l	20.0 20.0 20.0 20.0 20.0	98 99 98 101	80-120 80-120 80-120 80-120	1000 5000 500 1000 100 500	16-D5109 16-M4159 16-M4161 17-M3 17-M8 17-M9	1760 4550 474 3620 65.6 1140	2610 9450 1030 4380 162 1610	85 98 111 76 96 94	75-125 75-125 75-125 75-125 75-125 75-125	2610 9450	2650 9900	89 107	1.5 4.7	20 20	- - - - -	-	<1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1
Sulfate mg/l	100 100 100 100	101 101 83 96	80-120 80-120 80-120 80-120	100 4000 500	16-W6125 16-W6131 17-W61	< 5 3080 83.6	99.0 6610 493	99 88 82	80-120 80-120 80-120	99.0 6610 493	101 6540 494	101 86 82	2.0 1.1 0.2	20 20 20	- - -	- - -	< 5 < 5 < 5 < 5
Thallium - Dissolved mg/l	0.0160 0.1000	104 99	80-120 80-120	0.100 0.100	16W6119q 16W6129q	< 0.0005 < 0.0005	0.0933 0.1038	93 104	75-125 75-125	0.0933 0.1038	0.1004 0.1102	100 110	7.3 6.0	20 20	-	-	< 0.0005 < 0.0005
Thallium - Total mg/l	0.1000 0.1000 0.1000	105 98 100	80-120 80-120 80-120	0.500 0.400 0.400	16W6027q 16W6126q 16W6132q	< 0.0005 < 0.0005 < 0.0005	0.4688 0.3812 0.3848	94 95 96	75-125 75-125 75-125	0.4688 0.3812 0.3848	0.4860 0.4366 0.4290	97 109 107	3.6 13.5 10.9	20 20 20	-	-	< 0.0005
Total Alkalinity mg/l CaCO3	410	96	90-110	410 410	16-W6132 16-W6134	448 1170	826 1541	92 90	80-120 80-120	826 1541	830 1551	93 93	0.5 0.6	20 20	96	80-120	< 20 < 20
Total Dissolved Solids mg/l	-	-	_	-	_	-	-	-	-	7200	7080	-	1.7	20	_	-	< 5
Total Suspended Solids mg/l	-	-	-	-	-	_	-	-	_	176	172	-	2.3	20	-	-	< 1

Approved by:	C. Canto
	2x F617



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Samantha Marshall Montana Dakota Utilities 400 N. 4th

Bismarck ND 58501

Project Name: MDU Heskett CCR GW

Sample Description: Field Blank 3

Event and Year: December 2016

Page: 1 of 2

Report Date: 16 Jan 17 Lab Number: 16-W6126 Work Order #:82-4137 Account #: 002800

Date Sampled: 22 Dec 16

Date Received: 22 Dec 16 16:12 Sampled By: MVTL Field Services

PO #: 160249

Temp at Receipt: 6.2C ROI

	As Receiv	ed	Method	Method	Date	Ann 1
	Result		RL	Reference	Analyzed	Analys
Metal Digestion				EPA 200.2	23 Dec 16	SVS
рН	* 6.2	units	N/A	SM4500 H+ B	23 Dec 16 17:00	
Total Suspended Solids	< 2	mg/l	2	I3765-85	23 Dec 16 16:18	
Total Alkalinity	< 20	mg/l CaCO3	20	SM2320-B	23 Dec 16 17:00	
Fluoride	< 0.1	mg/l	0.10	SM4500-F-C	23 Dec 16 17:00	
Sulfate	< 5	mg/l	5.00	ASTM D516-07	5 Jan 17 15:59	
Chloride	< 1	mg/l	1.0	SM4500-C1-E	4 Jan 17 15:25	EMS
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	4 Jan 17 11:53	EV
Mercury - Dissolved	< 0.0002	mg/l	0.0002	EPA 245.1	4 Jan 17 12:54	EV
Total Dissolved Solids	< 5	mg/l	10	I1750-85	23 Dec 16 14:40	
Calcium - Total	< 1	mg/l	1.0	6010	9 Jan 17 14:39	
Magnesium - Total	< 1	mg/l	1.0	6010	9 Jan 17 14:39	
Sodium - Total	< 1	mg/l	1.0	6010	9 Jan 17 14:39	KMD
Potassium - Total	< 1	mg/l	1.0	6010	9 Jan 17 14:39	KMD
Lithium - Total	< 0.1	mg/l	0.10	6010	6 Jan 17 12:48	KMD
Boron - Total	< 0.1	mg/l	0.10	6010	5 Jan 17 13:35	KMD
Calcium - Dissolved	< 1	mg/l	1.0	6010	4 Jan 17 13:49	KMD
Magnesium - Dissolved	< 1	mg/l	1.0	6010	4 Jan 17 13:49	KMD
Sodium - Dissolved	< 1	mg/l	1.0	6010	4 Jan 17 13:49	KMD
Potassium - Dissolved	< 1	mg/l	1.0	6010	4 Jan 17 13:49	KMD
Lithium - Dissolved	< 0.1	mg/l	0.10	6010	6 Jan 17 14:48	KMD
Boron - Dissolved	< 0.1	mg/l	0.10	6010	5 Jan 17 16:35	KMD
Antimony - Total	< 0.001	mg/l	0.0010	6020	10 Jan 17 15:05	KMD
Arsenic - Total	< 0.002	mg/l	0.0020	6020	10 Jan 17 15:05	KMD
Barium - Total	< 0.002	mg/1	0.0020	6020	10 Jan 17 15:05	KMD
Beryllium - Total	< 0.0005	mg/l	0.0005	6020	10 Jan 17 15:05	KMD
Cadmium - Total	< 0.0005	mg/1	0.0005	6020	10 Jan 17 15:05	KMD
Chromium - Total	< 0.002	mg/l	0.0020	6020	10 Jan 17 15:05	KMD
Cobalt - Total	< 0.002	mg/1	0.0020	6020	10 Jan 17 15:05	KMD
Lead - Total	< 0.001 ^	mg/1	0.0005	6020	10 Jan 17 15:05	KMD
Molybdenum - Total	< 0.002	mg/1	0.0020	6020	10 Jan 17 15:05	
Selenium - Total	< 0.002	mg/l	0.0020	6020	11 Jan 17 10:40	
Thallium - Total	< 0.001 ^	mg/l	0.0005	6020	10 Jan 17 15:05	
Antimony - Dissolved	< 0.001	mg/1	0.0010	6020	9 Jan 17 13:30	
Arsenic - Dissolved	< 0.002	mg/1	0.0020	6020	9 Jan 17 13:30	
Barium - Dissolved	< 0.002	mg/1	0.0020	6020	9 Jan 17 13:30	

RL = Method Reporting Limit

# = 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

Sample Description: Field Blank 3

Event and Year: December 2016

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Report Date: 16 Jan 17 Lab Number: 16-W6126 Work Order #:82-4137 Account #: 002800

Date Sampled: 22 Dec 16

Date Received: 22 Dec 16 16:12 Sampled By: MVTL Field Services

PO #: 160249

Temp at Receipt: 6.2C ROI

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
Beryllium - Dissolved	< 0.0005 mg/l	0.0005	6020	9 Jan 17 13:30	KMD
Cadmium - Dissolved	< 0.0005 mg/l	0.0005	6020	9 Jan 17 13:30	KMD
Chromium - Dissolved	< 0.002 mg/1	0.0020	6020	9 Jan 17 13:30	KMD
Cobalt - Dissolved	< 0.002 mg/l	0.0020	6020	9 Jan 17 13:30	KMD
Lead - Dissolved	< 0.0005 mg/l	0.0005	6020	9 Jan 17 13:30	KMD
Molybdenum - Dissolved	< 0.002 mg/1	0.0020	6020	9 Jan 17 13:30	KMD
Selenium - Dissolved	< 0.005 ^ mg/l	0.0020	6020	9 Jan 17 13:30	KMD
Thallium - Dissolved	< 0.0005 mg/l	0.0005	6020	9 Jan 17 13:30	KMD

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

Claudite K. Cantes 17 Jan 17 Approved by:

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

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



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Page:

1 of 2

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

Report Date: 16 Jan 17 Lab Number: 16-W6127 Work Order #:82-4137 Account #: 002800

Date Sampled: 22 Dec 16

Date Received: 22 Dec 16 16:12 Sampled By: MVTL Field Services

PO #: 160249

Temp at Receipt: 6.2C ROI

Project Name: MDU Heskett CCR GW

Sample Description: Dup 2

Event and Year: December 2016

	As Received Result		Method	Method	Date	
			RL	Reference	Analyzed	Analyst
Metal Digestion				EPA 200.2	23 Dec 16	SVS
Hq	* 7.0	units	N/A	SM4500 H+ B	23 Dec 16 17:	
Total Suspended Solids	3	mg/l	2	13765-85	23 Dec 16 16:	
Total Alkalinity	534	mg/l CaCO3	20	SM2320-B	23 Dec 16 17:	
Fluoride	0.15	mg/l	0.10	SM4500-F-C	23 Dec 16 17:	
Sulfate	2670	mg/l	5.00	ASTM D516-07	5 Jan 17 15:	
Chloride	35.8	mg/l	1.0	SM4500-Cl-E	12 Jan 17 10:	
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	4 Jan 17 11:	
Mercury - Dissolved	< 0.0002	mg/l	0.0002	EPA 245.1	4 Jan 17 12:	
Total Dissolved Solids	4780	mg/l	10	I1750-85	23 Dec 16 14:	
Calcium - Total	575	mg/l	1.0	6010	9 Jan 17 14:	
Magnesium - Total	265	mg/l	1.0	6010	9 Jan 17 14:	
Sodium - Total	590	mg/1	1.0	6010	9 Jan 17 14:	
Potassium - Total	14.2	mg/l	1.0	6010	9 Jan 17 14:	
Lithium - Total	0.23	mg/1	0.10	6010	6 Jan 17 12:	
Boron - Total	< 0.5 @	mg/l	0.10	6010	5 Jan 17 13:	
Calcium - Dissolved	535	mg/l	1.0	6010	4 Jan 17 13:	49 KMD
Magnesium - Dissolved	251	mg/l	1.0	6010	4 Jan 17 13:	49 KMD
Sodium - Dissolved	560	mg/l	1.0	6010	4 Jan 17 13:	49 KMD
Potassium - Dissolved	13.8	mg/l	1.0	6010	4 Jan 17 13:	49 KMD
Lithium - Dissolved	0.23	mg/l	0.10	6010	6 Jan 17 14:	48 KMD
Boron - Dissolved	< 0.5 @	mg/l	0.10	6010	5 Jan 17 16:	35 KMD
Antimony - Total	< 0.001	mg/1	0.0010	6020	10 Jan 17 15:	05 KMD
Arsenic - Total	< 0.002	mg/1	0.0020	6020	10 Jan 17 15:	05 KMD
Barium - Total	0.0135	mg/1	0.0020	6020	10 Jan 17 15:	05 KMD
Beryllium - Total	< 0.0005	mg/1	0.0005	6020	10 Jan 17 15:	05 KMD
Cadmium - Total	< 0.0005	mg/1	0.0005	6020	10 Jan 17 15:	05 KMD
Chromium - Total	< 0.0003	mg/l	0.0020	6020	10 Jan 17 15:	05 KMD
Cobalt - Total	< 0.002	mg/l	0.0020	6020	10 Jan 17 15:	05 KMD
Lead - Total	< 0.002	mg/l	0.0005	6020	10 Jan 17 15:	
Molybdenum - Total	0.0038	mg/l	0.0020	6020	10 Jan 17 15:	
	0.0038	mg/l	0.0020	6020	11 Jan 17 10:	
Selenium - Total	< 0.001 ^	mg/l	0.0005	6020	10 Jan 17 15:	
Thallium - Total	< 0.001	mg/1	0.0010	6020	9 Jan 17 13:	
Antimony - Dissolved	< 0.001	mg/1	0.0010	6020	9 Jan 17 13:	
Arsenic - Dissolved			0.0020	6020	9 Jan 17 13:	
Barium - Dissolved	0.0155	mg/l	0.0020	0020	9 Uan 17 13:	20 IU-1D

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 property of the proper

# = 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

Sample Description: Dup 2

Event and Year: December 2016

Page: 2 of 2

Report Date: 16 Jan 17 Lab Number: 16-W6127 Work Order #:82-4137 Account #: 002800

Date Sampled: 22 Dec 16

Date Received: 22 Dec 16 16:12 Sampled By: MVTL Field Services

PO #: 160249

Temp at Receipt: 6.2C ROI

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
Beryllium - Dissolved	< 0.0005 mg/l	0.0005	6020	9 Jan 17 13:30	KMD
Cadmium - Dissolved	< 0.0005 mg/l	0.0005	6020	9 Jan 17 13:30	KMD
Chromium - Dissolved	< 0.002 mg/l	0.0020	6020	9 Jan 17 13:30	KMD
Cobalt - Dissolved	< 0.002 mg/1	0.0020	6020	9 Jan 17 13:30	KMD
Lead - Dissolved	< 0.0005 mg/l	0.0005	6020	9 Jan 17 13:30	KMD
Molybdenum - Dissolved	< 0.002 mg/1	0.0020	6020	9 Jan 17 13:30	KMD
Selenium - Dissolved	0.1657 mg/l	0.0020	6020	9 Jan 17 13:30	KMD
Thallium - Dissolved	< 0.0005 mg/l	0.0005	6020	9 Jan 17 13:30	KMD

\* Holding time exceeded

Claudite K. Canto 17 Jan 17 Approved by:

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 com
! = 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

Project Name: MDU Heskett CCR GW

Sample Description: 2-90

Event and Year: December 2016

1 of 2 Page:

Report Date: 16 Jan 17 Lab Number: 16-W6128 Work Order #:82-4137 Account #: 002800

Date Sampled: 22 Dec 16 12:22 Date Received: 22 Dec 16 16:12 Sampled By: MVTL Field Services

PO #: 160249

Temp at Receipt: 6.2C ROI

	As Receive Result	d	Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	23 Dec 16	SVS
рН	* 7.2	units	N/A	SM4500 H+ B	23 Dec 16 17:00	SVS
Total Suspended Solids	12	mg/l	2	I3765-85	23 Dec 16 16:18	SVS
pH - Field	7.00	units	NA	SM 4500 H+ B	22 Dec 16 12:22	JSM
Temperature - Field	7.17	Degrees C	NA	SM 2550B	22 Dec 16 12:22	JSM
Total Alkalinity	499	mg/l CaCO3	20	SM2320-B	23 Dec 16 17:00	SVS
Conductivity - Field	7254	umhos/cm	1	EPA 120.1	22 Dec 16 12:22	JSM
Fluoride	1.04	mg/l	0.10	SM4500-F-C	23 Dec 16 17:00	SVS
Sulfate	4490	mg/l	5.00	ASTM D516-07	5 Jan 17 15:59	EMS
Chloride	83.1	mg/l	1.0	SM4500-Cl-E	12 Jan 17 10:43	EMS
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	4 Jan 17 11:53	EV
Mercury - Dissolved	< 0.0002	mg/l	0.0002	EPA 245.1	4 Jan 17 12:54	EV
Total Dissolved Solids	7210	mg/l	10	I1750-85	23 Dec 16 14:40	SVS
Calcium - Total	494	mg/l	1.0	6010	9 Jan 17 14:39	KMD
Magnesium - Total	720	mg/l	1.0	6010	9 Jan 17 14:39	KMD
Sodium - Total	755	mg/l	1.0	6010	9 Jan 17 14:39	KMD
Potassium - Total	25.8	mg/l	1.0	6010	9 Jan 17 14:39	KMD
Lithium - Total	1.01	mg/l	0.10	6010	6 Jan 17 13:48	KMD
Boron - Total	0.34	mg/l	0.10	6010	5 Jan 17 13:35	KMD
Calcium - Dissolved	460	mg/l	1.0	6010	4 Jan 17 13:49	KMD
Magnesium - Dissolved	670	mg/l	1.0	6010	4 Jan 17 13:49	KMD
Sodium - Dissolved	705	mg/l	1.0	6010	4 Jan 17 13:49	KMD
Potassium - Dissolved	24.0	mg/l	1.0	6010	4 Jan 17 13:49	KMD
Lithium - Dissolved	1.03	mg/l	0.10	6010	6 Jan 17 14:48	KMD
Boron - Dissolved	0.24	mg/l	0.10	6010	5 Jan 17 16:35	KMD
Antimony - Total	< 0.001	mg/l	0.0010	6020	10 Jan 17 15:05	KMD
Arsenic - Total	< 0.002	mg/l	0.0020	6020	10 Jan 17 15:05	KMD
Barium - Total	0.0086	mg/l	0.0020	6020	13 Jan 17 11:42	KMD
Beryllium - Total	< 0.0005	mg/l	0.0005	6020	10 Jan 17 15:05	KMD
Cadmium - Total	< 0.0005	mg/l	0.0005	6020	10 Jan 17 15:05	KMD
Chromium - Total	0.0058	mg/l	0.0020	6020	10 Jan 17 15:05	KMD
Cobalt - Total	< 0.002	mg/1	0.0020	6020	10 Jan 17 15:05	KMD
Lead - Total	< 0.001 ^	mg/1	0.0005	6020	10 Jan 17 15:05	KMD
Molybdenum - Total	0.0082	mg/1	0.0020	6020	10 Jan 17 15:05	KMD
Selenium - Total	0.1411	mg/1	0.0020	6020	11 Jan 17 10:40	KMD
Thallium - Total	< 0.001 ^	mg/1	0.0005	6020	10 Jan 17 15:05	KMD
Inallian Iocal	7 0.001					

RL = Method Reporting Limit

The reporting limit was elevated for any analyte requiring a dilution as coded below:  $Q = Due \text{ to sample matrix} \\
! = Due \text{ to sample quantity} \\
# = Due \text{ to internal standard response}$ 



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Page: 2 of 2

Report Date: 16 Jan 17 Lab Number: 16-W6128 Work Order #:82-4137 Account #: 002800

Date Sampled: 22 Dec 16 12:22 Date Received: 22 Dec 16 16:12 Sampled By: MVTL Field Services

PO #: 160249

Temp at Receipt: 6.2C ROI

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

Project Name: MDU Heskett CCR GW

Sample Description: 2-90

Event and Year: December 2016

	As Received Result	d	Method RL	Method Reference	Date Analyzed	Analyst
Antimony - Dissolved	< 0.001	mg/l	0.0010	6020	9 Jan 17 13:30	KMD
Arsenic - Dissolved	< 0.002	mg/l	0.0020	6020	9 Jan 17 13:30	KMD
Barium - Dissolved	0.0097	mg/1	0.0020	6020	13 Jan 17 11:42	KMD
Beryllium - Dissolved	< 0.0005	mg/1	0.0005	6020	9 Jan 17 13:30	KMD
Cadmium - Dissolved	< 0.0005	mg/1	0.0005	6020	9 Jan 17 13:30	KMD
Chromium - Dissolved	< 0.002	mg/1	0.0020	6020	9 Jan 17 13:30	KMD
Cobalt - Dissolved	< 0.002	mg/l	0.0020	6020	9 Jan 17 13:30	KMD
Lead - Dissolved	< 0.0005	mg/1	0.0005	6020	9 Jan 17 13:30	KMD
Molybdenum - Dissolved	0.0027	mg/1	0.0020	6020	9 Jan 17 13:30	KMD
Selenium - Dissolved	0.1693	mg/l	0.0020	6020	9 Jan 17 13:30	KMD
Thallium - Dissolved	< 0.0005	mg/l	0.0005	6020	9 Jan 17 13:30	KMD

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

Claudate K. Canto Approved by:

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:

G = 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

CERTIFICATION: ND # ND-00016

(C.

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

Sample Description: 102

Event and Year: December 2016

Page: 1 of 2

Report Date: 16 Jan 17 Lab Number: 16-W6129 Work Order #:82-4137 Account #: 002800

Date Sampled: 22 Dec 16 10:25 Date Received: 22 Dec 16 16:12 Sampled By: MVTL Field Services

PO #: 160249

Temp at Receipt: 6.2C ROI

	As Receive Result	As Received Result		Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	23 Dec 16	svs
рН	* 7.0	units	N/A	SM4500 H+ B	23 Dec 16 17:00	
Total Suspended Solids	20	mg/l	2	I3765-85	23 Dec 16 16:18	
pH - Field	6.93	units	NA	SM 4500 H+ B	22 Dec 16 10:25	
Temperature - Field	4.17	Degrees C	NA	SM 2550B	22 Dec 16 10:25	
Total Alkalinity	545	mg/l CaCO3	20	SM2320-B	23 Dec 16 17:00	
Conductivity - Field	9170	umhos/cm	1	EPA 120.1	22 Dec 16 10:25	
Fluoride	0.18	mg/l	0.10	SM4500-F-C	23 Dec 16 17:00	
Sulfate	5410	mg/1	5.00	ASTM D516-07	5 Jan 17 15:59	
Chloride	8.5	mg/l	1.0	SM4500-Cl-E	12 Jan 17 10:43	
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	4 Jan 17 11:53	
Mercury - Dissolved	< 0.0002	mg/l	0.0002	EPA 245.1	4 Jan 17 12:54	
Total Dissolved Solids	8470	mg/l	10	I1750-85	23 Dec 16 14:40	
Calcium - Total	440	mg/l	1.0	6010	9 Jan 17 14:39	
Magnesium - Total	381	mg/1	1.0	6010	9 Jan 17 14:39	
Sodium - Total	1500	mg/l	1.0	6010	9 Jan 17 14:39	
Potassium - Total	20.2	mg/l	1.0	6010	9 Jan 17 14:39	
Lithium - Total	0.84	mg/1	0.10	6010	6 Jan 17 13:48	KMD
Boron - Total	1.30	mg/1	0.10	6010	5 Jan 17 13:35	KMD
Calcium - Dissolved	421	mg/1	1.0	6010	4 Jan 17 13:49	KMD
Magnesium - Dissolved	368	mg/1	1.0	6010	4 Jan 17 13:49	KMD
Sodium - Dissolved	1410	mg/1	1.0	6010	4 Jan 17 13:49	KMD
Potassium - Dissolved	19.2	mg/1	1.0	6010	4 Jan 17 13:49	KMD
Lithium - Dissolved	0.82	mg/1	0.10	6010	6 Jan 17 14:48	KMD
Boron - Dissolved	1.18	mg/1	0.10	6010	5 Jan 17 16:35	KMD
Antimony - Total	< 0.001	mg/1	0.0010	6020	10 Jan 17 15:05	KMD
Arsenic - Total	0.0042	mg/1	0.0020	6020	10 Jan 17 15:05	KMD
Barium - Total	0.0244	mg/1	0.0020	6020	10 Jan 17 15:05	KMD
Beryllium - Total	< 0.0005	mg/1	0.0005	6020	10 Jan 17 15:05	KMD
Cadmium - Total	< 0.0005	mg/1	0.0005	6020	10 Jan 17 15:05	KMD
Chromium - Total	< 0.0003	mg/1	0.0020	6020	10 Jan 17 15:05	KMD
Cobalt - Total	0.0024	mg/1	0.0020	6020	10 Jan 17 15:05	KMD
Lead - Total	< 0.001	mg/l	0.0005	6020	10 Jan 17 15:05	KMD
Molybdenum - Total	< 0.001	mg/1	0.0020	6020	10 Jan 17 15:05	
Selenium - Total	< 0.002	mg/1	0.0020	6020	11 Jan 17 10:40	KMD
Thallium - Total	< 0.001 ^	mg/l	0.0005	6020	10 Jan 17 15:05	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 con
! = Due to sample quantity + = Due to in

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



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2 of 2 Page:

Report Date: 16 Jan 17 Lab Number: 16-W6129 Work Order #:82-4137 Account #: 002800

Date Sampled: 22 Dec 16 10:25 Date Received: 22 Dec 16 16:12 Sampled By: MVTL Field Services

PO #: 160249

Temp at Receipt: 6.2C ROI

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

Project Name: MDU Heskett CCR GW

Sample Description: 102

Event and Year: December 2016

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
Antimony - Dissolved	< 0.001 mg/l	0.0010	6020	9 Jan 17 13:30	KMD
Arsenic - Dissolved	0.0033 mg/l	0.0020	6020	9 Jan 17 13:30	KMD
Barium - Dissolved	0,0224 mg/l	0.0020	6020	9 Jan 17 13:30	KMD
Beryllium - Dissolved	< 0.0005 mg/l	0.0005	6020	9 Jan 17 13:30	KMD
Cadmium - Dissolved	< 0.0005 mg/1	0.0005	6020	9 Jan 17 13:30	KMD
Chromium - Dissolved	< 0.002 mg/1	0.0020	6020	9 Jan 17 13:30	KMD
Cobalt - Dissolved	0.0021 mg/l	0.0020	6020	9 Jan 17 13:30	KMD
Lead - Dissolved	< 0.0005 mg/l	0.0005	6020	9 Jan 17 13:30	KMD
Molybdenum - Dissolved	< 0.002 mg/l	0.0020	6020	9 Jan 17 13:30	KMD
Selenium - Dissolved	< 0.005 ^ mg/l	0.0020	6020	9 Jan 17 13:30	KMD
Thallium - Dissolved	< 0.0005 mg/l	0.0005	6020	9 Jan 17 13:30	KMD

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

1c

Approved by:

Claudate K. Canto 17 Jan 17

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:  $@ = Due \text{ to sample matrix} & # = Due \text{ to concentration of other analytes} \\
! = Due \text{ to sample quantity} & + = Due \text{ to internal standard response}$ 

<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

Sample Description: 3-90

Event and Year: December 2016

Page: 1 of 2

Report Date: 16 Jan 17 Lab Number: 16-W6130 Work Order #:82-4137 Account #: 002800

Date Sampled: 22 Dec 16 13:05 Date Received: 22 Dec 16 16:12 Sampled By: MVTL Field Services

PO #: 160249

Temp at Receipt: 6.2C ROI

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion			EPA 200.2	23 Dec 16	SVS
рН	* 7.1 units	N/A	SM4500 H+ B	23 Dec 16 17:0	
Total Suspended Solids	2 mg/l	2	I3765-85	23 Dec 16 16:1	
pH - Field	6.76 units	NA	SM 4500 H+ B	22 Dec 16 13:0	
Temperature - Field	7.25 Degrees C	NA	SM 2550B	22 Dec 16 13:0	
Total Alkalinity	533 mg/l CaCO3	20	SM2320-B	23 Dec 16 17:0	
Conductivity - Field	5186 umhos/cm	1	EPA 120.1	22 Dec 16 13:0	
Fluoride	0.15 mg/l	0.10	SM4500-F-C	23 Dec 16 17:0	
Sulfate	2790 mg/l	5.00	ASTM D516-07	5 Jan 17 15:5	
Chloride	37.6 mg/l	1.0	SM4500-Cl-E	12 Jan 17 10:4	
Mercury - Total	< 0.0002 mg/1	0.0002	EPA 245.1	4 Jan 17 11:5	
Mercury - Dissolved	< 0.0002 mg/1	0.0002	EPA 245.1	4 Jan 17 12:5	
Total Dissolved Solids	4810 mg/l	10	I1750-85	23 Dec 16 14:4	
Calcium - Total	565 mg/l	1.0	6010	9 Jan 17 14:3	
Magnesium - Total	260 mg/l	1.0	6010	9 Jan 17 14:3	
Sodium - Total	575 mg/l	1.0	6010	9 Jan 17 14:3	
Potassium - Total	13.8 mg/l	1.0	6010	9 Jan 17 14:3	
Lithium - Total	0.24 mg/l	0.10	6010	6 Jan 17 13:4	
Boron - Total	< 0.5 @ mg/l	0.10	6010	5 Jan 17 13:3	
Calcium - Dissolved	535 mg/l	1.0	6010	4 Jan 17 13:4	
Magnesium - Dissolved	252 mg/l	1.0	6010	4 Jan 17 13:4	
Sodium - Dissolved	555 mg/l	1.0	6010	4 Jan 17 13:4	
Potassium - Dissolved	13.4 mg/l	1.0	6010	4 Jan 17 13:4	
Lithium - Dissolved	0.23 mg/l	0.10	6010	6 Jan 17 14:4	8 KMD
Boron - Dissolved	< 0.5 @ mg/l	0.10	6010	5 Jan 17 16:3	
Antimony - Total	< 0.001 mg/l	0.0010	6020	10 Jan 17 15:0	5 KMD
Arsenic - Total	< 0.002 mg/l	0.0020	6020	10 Jan 17 15:0	5 KMD
Barium - Total	0.0142 mg/l	0.0020	6020	10 Jan 17 15:0	5 KMD
Beryllium - Total	< 0.0005 mg/l	0.0005	6020	10 Jan 17 15:0	5 KMD
Cadmium - Total	< 0.0005 mg/l	0.0005	6020	10 Jan 17 15:0	5 KMD
Chromium - Total	< 0.002 mg/l	0.0020	6020	10 Jan 17 15:0	5 KMD
Cobalt - Total	< 0.002 mg/1	0.0020	6020	10 Jan 17 15:0	5 KMD
Lead - Total	< 0.002 mg/l	0.0005	6020	10 Jan 17 15:0	5 KMD
	0.0030 mg/l	0.0020	6020	10 Jan 17 15:0	5 KMD
Molybdenum - Total	0.1730 mg/1	0.0020	6020	11 Jan 17 10:4	
Selenium - Total	< 0.001 ^ mg/l	0.0025	6020	10 Jan 17 15:0	
Thallium - Total	< 0.00T m3/T	0.0005	J J L J		

RL = Method Reporting Limit

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

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

Project Name: MDU Heskett CCR GW

Sample Description: 3-90

Event and Year: December 2016

Page: 2 of 2

Report Date: 16 Jan 17 Lab Number: 16-W6130 Work Order #:82-4137 Account #: 002800

Date Sampled: 22 Dec 16 13:05 Date Received: 22 Dec 16 16:12 Sampled By: MVTL Field Services

PO #: 160249

Temp at Receipt: 6.2C ROI

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
Antimony - Dissolved	< 0.001 mg/l	0.0010	6020	9 Jan 17 13:30	KMD
Arsenic - Dissolved	< 0.002 mg/1	0.0020	6020	9 Jan 17 13:30	KMD
Barium - Dissolved	0.0139 mg/l	0.0020	6020	9 Jan 17 13:30	KMD
Beryllium - Dissolved	< 0.0005 mg/l	0.0005	6020	9 Jan 17 13:30	KMD ·
Cadmium - Dissolved	< 0.0005 mg/l	0.0005	6020	9 Jan 17 13:30	KMD
Chromium - Dissolved	< 0.002 mg/l	0.0020	6020	9 Jan 17 13:30	KMD
Cobalt - Dissolved	< 0.002 mg/1	0.0020	6020	9 Jan 17 13:30	KMD
Lead - Dissolved	< 0.0005 mg/1	0.0005	6020	9 Jan 17 13:30	KMD
Molybdenum - Dissolved	0.0022 mg/l	0.0020	6020	9 Jan 17 13:30	KMD
Selenium - Dissolved	0.1670 mg/l	0.0020	6020	9 Jan 17 13:30	KMD
Thallium - Dissolved	< 0.0005 mg/l	0.0005	6020	9 Jan 17 13:30	KMD

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

10

Approved by:

Claudette K. Cantep

1750017

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

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

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<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

Sample Description: 80R

Event and Year: December 2016

Page: 1 of 2

Report Date: 16 Jan 17 Lab Number: 16-W6131 Work Order #:82-4137 Account #: 002800

Date Sampled: 22 Dec 16 11:12 Date Received: 22 Dec 16 16:12 Sampled By: MVTL Field Services

PO #: 160249

Temp at Receipt: 6.2C ROI

	As Receive Result	ed	Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion		9		EPA 200.2	23 Dec 16	svs
На	* 7.4	units	N/A	SM4500 H+ B	23 Dec 16 17:00	SVS
Total Suspended Solids	6	mg/l	2	I3765-85	23 Dec 16 16:18	svs
pH - Field	6.99	units	NA	SM 4500 H+ B	22 Dec 16 11:12	DJN
Temperature - Field	8.24	Degrees C	NA	SM 2550B	22 Dec 16 11:12	DJN
Total Alkalinity	540	mg/l CaCO3	20	SM2320-B	23 Dec 16 17:00	svs
Conductivity - Field	5761	umhos/cm	1	EPA 120.1	22 Dec 16 11:12	DJN
Fluoride	0.36	mg/l	0.10	SM4500-F-C	23 Dec 16 17:00	svs
Sulfate	3080	mg/l	5.00	ASTM D516-07	5 Jan 17 16:17	EMS
Chloride	167	mg/l	1.0	SM4500-C1-E	12 Jan 17 10:43	EMS
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	4 Jan 17 11:53	EV
Mercury - Dissolved	< 0.0002	mg/l	0.0002	EPA 245.1	4 Jan 17 12:54	EV
Total Dissolved Solids	5230	mg/1	10	I1750-85	23 Dec 16 14:40	svs
Calcium - Total	290	mg/l	1.0	6010	9 Jan 17 14:39	KMD
Magnesium - Total	560	mg/l	1.0	6010	9 Jan 17 14:39	KMD
Sodium - Total	580	mg/l	1.0	6010	9 Jan 17 14:39	KMD
Potassium - Total	4.8	mg/l	1.0	6010	9 Jan 17 14:39	KMD
Lithium - Total	0.69	mg/l	0.10	6010	6 Jan 17 13:48	KMD
Boron - Total	0.33	mg/l	0.10	6010	5 Jan 17 13:35	KMD
Calcium - Dissolved	272	mg/l	1.0	6010	4 Jan 17 13:49	KMD
Magnesium - Dissolved	540	mg/l	1.0	6010	4 Jan 17 13:49	KMD
Sodium - Dissolved	552	mg/1	1.0	6010	4 Jan 17 13:49	KMD
Potassium - Dissolved	4.3	mg/l	1.0	6010	4 Jan 17 13:49	KMD
Lithium - Dissolved	0.73	mg/l	0.10	6010	6 Jan 17 14:48	KMD
Boron - Dissolved	0.25	mg/l	0.10	6010	5 Jan 17 16:35	KMD
Antimony - Total	< 0.001	mg/l	0.0010	6020	10 Jan 17 15:05	KMD
Arsenic - Total	< 0.002	mg/l	0.0020	6020	10 Jan 17 15:05	KMD
Barium - Total	0.0128	mg/l	0.0020	6020	10 Jan 17 15:05	KMD
Beryllium - Total	< 0.0005	mg/l	0.0005	6020	10 Jan 17 15:05	KMD
Cadmium - Total	< 0.0005	mg/l	0.0005	6020	10 Jan 17 15:05	KMD
Chromium - Total	< 0.002	mg/l	0.0020	6020	10 Jan 17 15:05	KMD
Cobalt - Total	< 0.002	mg/l	0.0020	6020	10 Jan 17 15:05	KMD
Lead - Total	< 0.001 ^	mg/l	0.0005	6020	10 Jan 17 15:05	KMD
Molybdenum - Total	0.0041	mg/l	0.0020	6020	10 Jan 17 15:05	KMD
Selenium - Total	0.0602	mg/1	0.0020	6020	11 Jan 17 10:40	KMD
Thallium - Total	< 0.001 ^	mg/1	0.0005	6020	10 Jan 17 15:05	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 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

Sample Description: 80R

Event and Year: December 2016

Page: 2 of 2

Report Date: 16 Jan 17 Lab Number: 16-W6131 Work Order #:82-4137 Account #: 002800

Date Sampled: 22 Dec 16 11:12 Date Received: 22 Dec 16 16:12 Sampled By: MVTL Field Services

PO #: 160249

Temp at Receipt: 6.2C ROI

	As Received Result	đ	Method RL	Method Reference	Date Analyzed	Analyst
Antimony - Dissolved	< 0.001	mg/l	0.0010	6020	9 Jan 17 13:30	KMD
Arsenic - Dissolved	< 0.002	mg/l	0.0020	6020	9 Jan 17 13:30	KMD
Barium - Dissolved	0.0126	mg/l	0.0020	6020	9 Jan 17 13:30	KMD
Beryllium - Dissolved	< 0.0005	mg/1	0.0005	6020	9 Jan 17 13:30	KMD
Cadmium - Dissolved	< 0.0005	mg/1	0.0005	6020	9 Jan 17 13:30	KMD
Chromium - Dissolved	< 0.002	mg/l	0.0020	6020	9 Jan 17 13:30	KMD
Cobalt - Dissolved	< 0.002	mg/1	0.0020	6020	9 Jan 17 13:30	KMD
Lead - Dissolved	< 0.0005	mg/1	0.0005	6020	9 Jan 17 13:30	KMD
Molybdenum - Dissolved	0.0042	mg/l	0.0020	6020	9 Jan 17 13:30	KMD
Selenium - Dissolved	0.0699	mg/1	0.0020	6020	9 Jan 17 13:30	KMD
Thallium - Dissolved	< 0.0005	mg/1	0.0005	6020	9 Jan 17 13:30	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 complete the property of the proper

# = 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

Sample Description: 105

Event and Year: December 2016

1 of 2 Page:

Report Date: 16 Jan 17 Lab Number: 16-W6132 Work Order #:82-4137 Account #: 002800

Date Sampled: 22 Dec 16 9:26 Date Received: 22 Dec 16 16:12 Sampled By: MVTL Field Services

PO #: 160249

Temp at Receipt: 6.2C ROI

	As Receive Result	As Received Result		Method Reference	Date Analyzed	Analyst
Metal Digestion	(2)			EPA 200.2	23 Dec 16	SVS
Hq	* 7.0	units	N/A	SM4500 H+ B	23 Dec 16 17:00	SVS
Total Suspended Solids	13	mg/l	2	13765-85	23 Dec 16 16:18	svs
pH - Field	6.61	units	NA	SM 4500 H+ B	22 Dec 16 9:26	DJN
Temperature - Field	7.66	Degrees C	NA	SM 2550B	22 Dec 16 9:26	DJN
Total Alkalinity	448	mg/l CaCO3	20	SM2320-B	23 Dec 16 17:00	
Conductivity - Field	7195	umhos/cm	1	EPA 120.1	22 Dec 16 9:26	DJN
Fluoride	0.30	mg/l	0.10	SM4500-F-C	23 Dec 16 17:00	
Sulfate	3920	mg/l	5.00	ASTM D516-07	13 Jan 17 11:02	
Chloride	365	mg/l	1.0	SM4500-Cl-E	12 Jan 17 10:43	
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	4 Jan 17 11:53	
Mercury - Dissolved	< 0.0002	mg/l	0.0002	EPA 245.1	4 Jan 17 12:54	
Total Dissolved Solids	7200	mg/l	10	I1750-85	23 Dec 16 14:40	
Calcium - Total	388	mg/l	1.0	6010	9 Jan 17 14:39	KMD
Magnesium - Total	755	mg/l	1.0	6010	9 Jan 17 14:39	
Sodium - Total	730	mg/l	1.0	6010	9 Jan 17 14:39	KMD
Potassium - Total	20.0	mg/l	1.0	6010	9 Jan 17 14:39	
Lithium - Total	1.00	mg/1	0.10	6010	6 Jan 17 13:48	
Boron - Total	0.33	mg/l	0.10	6010	5 Jan 17 13:35	
Calcium - Dissolved	382	mg/l	1.0	6010	4 Jan 17 13:49	
Magnesium - Dissolved	755	mg/l	1.0	6010	4 Jan 17 13:49	KMD
Sodium - Dissolved	710	mg/l	1.0	6010	4 Jan 17 13:49	
Potassium - Dissolved	19.6	mg/l	1.0	6010	4 Jan 17 13:49	KMD
Lithium - Dissolved	1.09	mg/l	0.10	6010	6 Jan 17 14:48	KMD
Boron - Dissolved	0.29	mg/l	0.10	6010	5 Jan 17 16:35	
Antimony - Total	< 0.001	mg/l	0.0010	6020	10 Jan 17 15:05	
Arsenic - Total	< 0.002	mg/l	0.0020	6020	10 Jan 17 15:05	
Barium - Total	0.0232	mg/l	0.0020	6020	10 Jan 17 15:05	
Beryllium - Total	< 0.0005	mg/l	0.0005	6020	10 Jan 17 15:05	
Cadmium - Total	< 0.0005	mg/l	0.0005	6020	10 Jan 17 15:05	KMD
Chromium - Total	< 0.002	mg/l	0.0020	6020	10 Jan 17 15:05	
Cobalt - Total	< 0.002	mg/l	0.0020	6020	10 Jan 17 15:05	KMD
Lead - Total	< 0.001 ^	mg/l	0.0005	6020	10 Jan 17 15:05	KMD
Molybdenum - Total	< 0.002	mg/l	0.0020	6020	10 Jan 17 15:05	KMD
Selenium - Total	< 0.002	mg/1	0.0020	6020	11 Jan 17 10:40	KMD
Thallium - Total	< 0.001 ^	mg/1	0.0005	6020	10 Jan 17 15:05	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



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



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

Project Name: MDU Heskett CCR GW

Sample Description: 105

Event and Year: December 2016

Page: 2 of 2

Report Date: 16 Jan 17 Lab Number: 16-W6132 Work Order #:82-4137 Account #: 002800

Date Sampled: 22 Dec 16 9:26 Date Received: 22 Dec 16 16:12 Sampled By: MVTL Field Services

PO #: 160249

Temp at Receipt: 6.2C ROI

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
Antimony - Dissolved	< 0.001 mg/1	0.0010	6020	9 Jan 17 13:30	KMD
Arsenic - Dissolved	< 0.002 mg/1	0.0020	6020	9 Jan 17 13:30	KMD
Barium - Dissolved	0.0237 mg/l	0.0020	6020	9 Jan 17 13:30	KMD
Beryllium - Dissolved	< 0.0005 mg/l	0.0005	6020	9 Jan 17 13:30	KMD
Cadmium - Dissolved	< 0.0005 mg/l	0.0005	6020	9 Jan 17 13:30	KMD
Chromium - Dissolved	< 0.002 mg/1	0.0020	6020	9 Jan 17 13:30	KMD
Cobalt - Dissolved	< 0.002 mg/l	0.0020	6020	9 Jan 17 13:30	KMD
Lead - Dissolved	$< 0.001 ^ mg/1$	0.0005	6020	12 Jan 17 17:47	CC
Molybdenum - Dissolved	< 0.002 mg/l	0.0020	6020	9 Jan 17 13:30	KMD
Selenium - Dissolved	< 0.005 ^ mg/l	0.0020	6020	9 Jan 17 13:30	KMD
Thallium - Dissolved	< 0.0005 mg/l	0.0005	6020	12 Jan 17 17:47	CC

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

17 Jan 17 Claudite K. Canto Approved by:

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 come ! = Due to sample quantity + = Due to interpretation.

# = 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).



Groundwater Assessment

Company:	MDU Heskett	
Event:	2016	
Sample ID:	2-90	
Sampling Personal:	Samely /	

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

Weather Conditions: Ten	ıp: 3 <i>0</i> °F W	/ind: 60 25-7	0	Precip	: Sunny / Partly C	Torreby / Class	
Well Information	on				nformation	rioudy / Cioc	uy
Well Locked? Yes No		Purgin	ng Method:	Bladder	T	-410-11	
Well Labeled? Yes No			ng Method:	Bladder		ntrol Settings రీ	
Casing Straight? Yes No			ed Equip?:	Yes (No	Purge:	54	sec
Grout Seal Intact? Yes No	Not Visible	Duplicate		Yes /No	Recover:	20 20	sec.
Repairs Necessary:		Duplicate S			Pumping Ra	····	mL/min
Casing Diameter:	2"				1 Trumping N	ate. 700	IIIL/IIII
Water Level Before Purge: 2	21,15 ft	Pi	urge Date: 2	22 Dec 16	Time Purging Began:	1202	
Total Well Depth:	ft		rged Dry?	Yes (No	Time Purged Dry:	1202	am/pm
Well Volume:	liters			22 Dec 16	Time of Sampling:	1222	am/pm am/om
Depth to Top of Pump:	ft					1666	ampin
Water Level After Sample: 2	1.69 ft	Bottle	CCR	2: 11 Raw 500ml Nif	irc, 500mL Nitric (filtere	٠ ١ ١ ١ ١ ١ ١ ١ ١ ١ ١ ١ ١ ١ ١ ١ ١ ١ ١ ١	
Measurement Method: Electri	ic Water Level Indicator	List:	NDDH:	: 1L Raw, 500ml_nitri	c, 500mL nitiric (filtered)	u), 4-1L NITTIC	; fisi =
	Field Mess	suramonta		, 30011134 11111	o, coome mune (milered)	, ZOUITE SUIT	IIIC

F	ie.	ld	M	ea	su	re	m	er	nts

			1					1	<u> </u>	
	ization	Temp (°C)	Spec. Cond.	Hq	DO	ORP	Turbidity	Water	mL	Discription:
	Country	( 0)	Cona.	ρη	(mg/L)	(mV)	(NTU)	Level (ft)	Removed	Clarity, Color, Odor, Ect.
SEQ#	Time		±5%	±0.1	±10%	±20 mV	±10%	0.25 ft		clear, slightly turbid, turbid
1	1207	718	7309	6.94	4.36	121,2	0.96	21,60	500	Clear
2	1212	7.06	7283	₹.01	3,71	123.9	0.75	2461	500	Clez
3	1217	7.11	7265	7,00	3,49	121.7	0,73	21.63	São	Clas
4	1222	7117	7754	7.00	3,38	120.1		21.61	\$0D	Chr
5										
6										
7										
8										-
9										
10										
Stabilized:	(Yes)	No			·	To	tal Volume	Removed:	2000	mL

Comments:



**Groundwater Assessment** 

Company:	MDU Heskett
Event:	2016
Sample ID:	.102.
Sampling Personal:	Jan My

Phone: (701) 258-9	720						_				1		
Weather Conditions:		Temp:	· 0£	°F	Wind:	W @ S	5-10		Precip:	Sunr	ny / Partly C	loudy /etc	oūdv)
	Well Info	rmation						Sa	ampling I	nformatio			
Well Locked?	Yes	No				Purgin	g Method:		der			ntrol Setting	ıs
Well Labeled?	(es	No				Samplin	g Method:	Blac	der		Purge:	5	se
Casing Straight?	Ves .	No		<u></u> >		Dedicate	d Equip?:	Yes	(NO)		Recover:	<u>SS</u>	se
Grout Seal Intact?	Yes	No	Not Vi	eible		Duplicate :	Sample?:	Yes	-(No		PSI:	30	
Repairs Necessary:						Duplicate S	ample ID:	ـــــــ		1	Pumping R		mL/m
Casing	Diameter:		2"										
Water Level Befo	ore Purge:	1-	7.22	ft		Pı	ırge Date:	32 Dec1	6	Time Purg	ing Began:	0912	am/p
Total W	/ell Depth:			ft			rged Dry?	Yes	(No)	Time P	urged Dry:		am/p
We	II Volume:			liters		San	npie Date:	22 Dei 10	2	Time of	Sampling:	1052	(am)/p
Depth to Top of Pump:				ft						· · · · · · · · · · · · · · · · · · ·			
Water Level Afte	er Sample:	1	<u> 1,  ዕ</u> ኒ	ft		Bottle	CC	R: 1L Raw	500mL Nit	irc, 500mL I	Vitric (filtere	d), 4-1L Nit	ric
Measuremen	t Method:	Electric V	Vater Level I	ndicator		List:					tiric (filtered		

## Field Measurements

i							1		T	
	lization secutive)	Temp (°C)	Spec. Cond.	Дq	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	10917	7.76	9816	6.93	1.04	-65.1	5.00	18,26	ζω.	Cles
2	0922	6.92	9734	6.92	0.95	-63,3	3,30	18,48	500	Clean
3	0927	7.01	9570	6.90	0.89	-50.3	5.36	18.75	500	Clea
4	0932	6.15	9575	6.90	1,13	-40,9	3,69	18,45	500	Cla
5	0937	Ar line		you was	med up	ater lin	Restorate		Sa	Clear
6 19	8942	212 Dacil	4~	b .			Ž.		500-	Cher
7	1005	417	8697	695	5,85	-26,5	3,89	18.30	5లు	Clea
8	1010	4.36	90S1	6,92	3,33	-28,8	4.34	18,40	Sas	Clear
9	lois	4,21	9138	6,93	2.93	-32.6		18,44	580	Clear
10	1020	*	9174	6.93	2.85	~ 34,5	4.49	18,50	500	Cles
Stabilizad:	(Vaa)	710					1 137 1		1 5 - 37 -	

Total Volume Removed: 나

9170 693 2-73 -35,2 4,20



**Groundwater Assessment** 

Company:	MDU Heskett			
Event:	2016			
Sample ID:	3-90		<del></del>	_
Sampling Percor	101: 1-11:0	0/10		

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

		$\sim$						2
Weather Conditions:	Temp:	33 €	Wind:	Light	Precip	Sunny L	artly Cloudy / Clou	ıdv
Well	Information					nformation		<u> </u>
Well Locked?	410			Purging Method:			Control Settings	
Well Labeled? Ye	S No			Sampling Method:	Bladder		Purge:	sec.
Casing Straight?	S No			Dedicated Equip?:	(Yes No	1	ecover: 55	sec.
Grout Seal Intact? Ye	s No	Not Visible		Duplicate Sample?:	(Yes) No	1	PSI:	300.
Repairs Necessary:				Duplicate Sample ID:	Dup2	Pur	nping Rate: / 00	mL/min
Casing Diame	eter:	2"			y age	1 [1 (1)	iping reate. 7 00	11112/111111
Water Level Before Pur		(,43 ft		Purge Date:	22 Decl6	Time Purging E	Began: 12マC	am/pm
Total Well De	pth:	ft		Well Purged Dry?		Time Purge		am/pm
Well Volu	me:	liters		Sample Date:	<del></del>	Time of San		am on
Depth to Top of Pu	mp: 20	0,19 ft			100 Macio	1 0. 0	· pg. ( / / /	amoni
Water Level After Sam	ple: /	8,56 ft		Bottle CC	CR: 1L Raw, 500mL Nit	irc 500ml Nitric	(filtered) 1.11 Nitri	
Measurement Meth	od: Electric W	/ater Level Indicator			H: 1L Raw, 500mL nitri			
		Eiold	N/1000		, 000 /	o, oconie mano	(mered), 200ml sur	IRIC

## Field Measurements

1			1	Į.	ł					
	ization	Temp	Spec.		DO	ORP	Turbidity		mL	Discription:
(3 cons	ecutive)	(°C)	Cond.	pН	(mg/L)	(mV)	(NTU)	Level (ft)	Removed	Clarity, Color, Odor, Ect.
SEQ#	Time		±5%	±0.1	±10% ·	±20 mV	±10%	0.25 ft		clear, slightly turbid, turbid
1	1240	7,23	5209	6.79	6,40	-104,3	1.90.	18,56	(500)	d
2	1245	7,5(	51961	4,87,	677	-11904	1.69	18,56	500	Cl
3	1255	7,44	5196	6.77	4,87	-1033	1.14	18,56	1000	Clem
4	139D	7,24	5179	6.76	3.64	-95.2	1.12	8,56	500	ch_
5	1305	7.25	5186	6,76	3.66	-93.7	1,12	18156	500	26
6		, )								
7										
8										
9										
10										
Stabilized:,	Yes	No				To	tal Volume	Removed:	3000	ml

Comments: No

Total Volume Removed: 3000 m



**Groundwater Assessment** 

Company:	MDU Heskett	
Event:	2016	
Sample ID:	MW80R	
Sampling Person	onal: Da Com AC	20. 14 C

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

												42	
Weather Conditions:		Temp:	30_°F		Wind: S	1/2	1		Precip		J. D. 11 0		
	Well Info	rmation				1 resip. Quilly 7 Farity Cloudy 7 Clo						udy	
Well Locked?			Sampling Information										
	Yes					Purgin	g Method:	Blad	der		Co	ntrol Setting	ıs
Well Labeled?	<u> </u>	No				Samplin	g Method:	Blad	der	1	Purge:	<u>~~~~</u>	
Casing Straight?	Yes	No				Dedicate	ed Equip?:	(Ves)	No	1		55	sec.
Grout Seal Intact?	Yes	No	Not Visil	ole		Duplicate :		Yes			Recover:		sec.
Repairs Necessary:		~						162	<u>4₹0</u>	-	PSI:		
	Diameter:		2"			Duplicate S	ample ID:			1	Pumping Ra	ate: 100	mL/min
Water Level Befo									<del></del>	·			
		······································	14,72	<u>π</u>				22 Rec.	<u>/ 6</u>	Time Purg	ing Began:	1047	€m/pm
	ell Depth:			ft			rged Dry?	Yes	No	Time P	urged Dry:		am/pm
	II Volume:			liters		San	nple Date:	72020	i(		Sampling:	1112	
Depth to Top	of Pump:		1930	ft			<u></u>	11 11 11	<del>''' ©</del>		odinpinig.	1112	/am/pm
Water Level Afte	r Sample:		14.95	ff		Bottle	CC	D: 11 Day	E001 N24	500 1 1	11. 1 (0).		
Measuremen		Flectric V	Water Level Ind	icator		List:	<u> </u>	R. IL Raw,	DUUML NIT	irc, 500mL i	Vitric (filtered	d), 4-1L Nitr	ic
		2.002110	rater Level Mu	icator	l	2.01.	וטטא	1: 1L Raw, 5	00mL nitri	c, 500mL ni	tiric (filtered)	, 250mL su	lfiric
				Field Me	asure	ments							

l l			1	F				7	T	
	ization ecutive)	Temp (°C)	Spec. Cond.	Hq	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Water Level (ft)	mL Removed	Discription:
SEQ#	Time		±5%	±0.1	±10%	±20 mV	±10%	0.25 ft		Clarity, Color, Odor, Ect.
1	1052	7.72	5779	4.98	3.76	111 9	2.86	14.89	500	Siedri, diigitay tarbia, tarbia
2	1057	7.95	5109	6,99	2,26	1057	100	14.91	500	C/Cay
3	1102	8121	5759	699	1,84	1022	1992	1495	500	(1-
4	1107	8113	5761	\$ 7,00	1,77	100.8	1,46	14.95	50%	2
5	1112	-8,24	5761	L.99	1071	99.7	1.40	14.95	500	10
6	•	<b>\</b>		-5-1-1-1				1-16/3	500	den
7			***************************************							
. 8										
9										
10	(f)									
Stabilized:	∬ Yes /	No				To	tal Volume	Removed:	2500	mL

Comments:



**Groundwater Assessment** 

Company:	MDU Heskett	
Event:	2016	_
Sample ID:	nw +04/105	
Sampling Perso	onal: October 16 constant	

Phone: (701) 258-9720 Weather Conditions: Temp: Well Information

Wind: 11/10 Precip: Sampling Information

Sunny / Partly Cloudy / Cloudy

Well Locked? Yes (NO) Well Labeled? Yes No Casing Straight? Xés-No Grout Seal Intact? ¥és No Not Visible Repairs Necessary: Casing Diameter: Water Level Before Purge: Total Well Depth: Well Volume: liters Depth to Top of Pump: Water Level After Sample: Measurement Method: Electric Water Level Indicator

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

Control Settings Purge: sec. Recover: sec. PSI: Pumping Rate: 小るつ mL/min

Purge Date: Time Purging Began: am/pm Well Purged Dry? Yes Time Purged Dry: C No > ⁻am/pm Sample Date: 2 Time of Sampling: 7976 nam)pm

Bottle CCR: 1L Raw, 500mL Nitirc, 500mL Nitric (filtered), 4-1L Nitric List: NDDH: 1L Raw, 500mL nitric, 500mL nitric (filtered), 250mL sulfiric

## Field Measurements

1			i i				T	T		
	ization secutive)	Temp (°C)	Spec. Cond.	На	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Water Level (ft)	mL Removed	Discription:
SEQ#	Time		±5%	±0.1	±10%	±20 mV	±10%	0.25 ft	Kemoved	Clarity, Color, Odor, Ect.
1	0856	715	11-18	1.50-		111/	7 3/	1711	6:20	clear, slightly turbid, turbid
2	1901	7,65	(1.52	<u>k=16&gt;</u>	5-14	11100	2,35	12,46	.500	Clair
	121	7,42		hobel	4,14,	111,5	3,60	13.52	500	<u> </u>
3	090,6	7,49	6252	6.64	2,73	111.1	2,44	13,50	500	: e
4	0911	7,51	6787	6.62	260	111.4	2,84	1350	500	Cl
5	10976	7,50	7058	1.62	2:00	1112	3,84	13,50	500	C
6	P921	765	7170	662	1 01	110,4	3.81	13.50	<u> </u>	
7	0926		7/95	1000	192	——————————————————————————————————————	2,0	2 //1/	500	
8	0 / 0 0	1;61	11 12	616	1,72	110.3	3, 11	13,50	500	<u>ce</u>
9										
10										
Stabilized:	/Yes	No				To	tal Volume	Removed:	3,500	mL
Cammania	. , , ,									-,

Comments: /

back ball isn't working on blatter pump water Keens going



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 Grou	ndwater	2016	Jen My Darren Wilsway
Report To:			Carbon Copy:		Work Order Number:
Attn:	Samantha Marshall		Attn:		CO ///s-
Address:	400 N. 4th St		Address:		X2 4127
İ	Bismarck, ND 58501				W 1101
Phone:	701-222-7829				

	Sampl	le Informat	ion				Е	ottle	Э Тур	е	Fi	eld Para	ameters	Analysis
Lab Number	Sample ID	Date	Time	Sample Type	Gradient	500 ml HAIG		500 ml HNO3 ffills			Field Temperature °C	Field Spec. Cond.	Field pH	Analysis Required
W6126	Field Blank (FB)	22 Decl6	NA	W		Х		Х			NA	NA	NA	
WOLDT	Dup-2	22 Ja 16	NA	W		Х	Х	Х			NA	NA	NA	
Welds	2-90	22Dal6	1555	GW		X	X	X			7.17	7254	7,00	
WODA	102	22 Decis	[025	GW		8	X	X			4.17	9170	6.93	
w6130	3-90	22 Deel6	1305	Gw		7	X				7,25	5186	6.76	
W6131	80 K	22 Dec 16	1112	Gu		X	X	X			8,24	5761		MDU CCR List with TSS and
W6132	105	ZZDuib	0926	6/W		X	X	X			7,66	7195		Dissolved CCR Metals. No RadChem.
								+						
						+		+	+	$\vdash$				
								+	+	$\vdash$				
								$\dashv$		$\vdash$				

Comments:

	Transferred by:	Sample Condition	Date/Time ,	Received by:	Sample Condition	Date/Time	° C
1	Sterne	Login	1612	Maxh		02 Je 2016	6.2°C ROT
· 2		/					BBCMT
3				-			



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:

201682-4140

IML Lab Reference No/SDG:

S1612305

Client:

**Montana Dakota Utilities** 

Location:

MDU Heskett Ash Site

**Project Identification:** 

CCR December 2016

**MVTL Laboratory Identifications:** 

16-W6139 through 16-W6145

**IML Laboratory Identifications:** 

S1612305-001 through S1612305-007

Page 1 of 2

MDU Sample Identification	MVTL Laboratory #	IML Laboratory #		
Field Blank (FB) 3	16-W6139	S1612305-001		
Dup 2	16-W6140	S1612305-002		
2-90	16-W6141	S1612305-003		
102	16-W6142	S1612305-004		
3-90	16-W6143	S1612305-005		
80R	16-W6144	S1612305-006		
105	16-W6145	S1612305-007		

### I. RECEIPT

- All samples were received at the laboratory on 22 December 2016 at 1612.
- 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 28 December 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.



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### **CASE NARRATIVE**

MVTL Lab Reference No/SDG:

201682-4140

IML Lab Reference No/SDG:

S1612305

Client:

**Montana Dakota Utilities** 

Location:

MDU Heskett Ash Site

**Project Identification:** 

CCR December 2016

**MVTL Laboratory Identifications:** 

16-W6139 through 16-W6145

**IML Laboratory Identifications:** 

S1612305-001 through S1612305-007

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 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 and DATE: 30Jan 17

Claudette Carroll - MVTL Bismarck Laboratory Manager



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Page:

1 of 1

Report Date: 27 Jan 17 Lab Number: 16-W6139 Work Order #:82-4140 Account #: 002800

Date Sampled: 22 Dec 16

Date Received: 22 Dec 16 16:12 Sampled By: MVTL Field Services

PO #: 160249

Temp at Receipt: 6.2C ROI

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

Project Name: MDU Heskett CCR Radiochem

Sample Description: Field Blank 3

Event and Year: December 2016

Method Method Date As Received Analyzed Analyst Result Reference RL 10 Jan 17 OL Radium 226 See Attached Report OL See Attached Report 22 Jan 16 Radium 228

OL = Analysis performed by an Outside Laboratory.

Approved by:

Claudite K. Canto

30 Jan 17

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

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



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



Page:

1 of 1

Report Date: 27 Jan 17 Lab Number: 16-W6140

Samantha Marshall Montana Dakota Utilities 400 N. 4th

Bismarck ND 58501

Work Order #:82-4140 Account #: 002800

Date Sampled: 22 Dec 16

Date Received: 22 Dec 16 16:12 Sampled By: MVTL Field Services

PO #: 160249

Temp at Receipt: 6.2C ROI

Project Name: MDU Heskett CCR Radiochem

Sample Description: Dup 2

Radium 226

Radium 228

Event and Year: December 2016

As Received Result

Method RL

Method Reference Date Analyzed

Analyst

OL

OL

10 Jan 17 22 Jan 16

OL = Analysis performed by an Outside Laboratory.

See Attached Report

See Attached Report

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 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 Radiochem

Sample Description: 2-90

Event and Year: December 2016

1 of 1 Page:

Report Date: 27 Jan 17 Lab Number: 16-W6141 Work Order #:82-4140 Account #: 002800

Date Sampled: 22 Dec 16 12:22 Date Received: 22 Dec 16 16:12 Sampled By: MVTL Field Services

PO #: 160249

Temp at Receipt: 6.2C ROI

	As Rece: Result	ived	Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	7.00	units	NA	SM 4500 H+ B	22 Dec 16 12:22	JSM
Temperature - Field	7.17	Degrees C	NA	SM 2550B	22 Dec 16 12:22	JSM
Conductivity - Field	7254	umhos/cm	1	EPA 120.1	22 Dec 16 12:22	JSM
Radium 226	See Atta	ached Report			10 Jan 17	OL
Radium 228		ached Report			22 Jan 16	OL

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

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



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



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

Project Name: MDU Heskett CCR Radiochem

Sample Description: 102

Event and Year: December 2016

1 of 1 Page:

Report Date: 27 Jan 17 Lab Number: 16-W6142 Work Order #:82-4140 Account #: 002800

Date Sampled: 22 Dec 16 10:25 Date Received: 22 Dec 16 16:12 Sampled By: MVTL Field Services

PO #: 160249

Temp at Receipt: 6.2C ROI

	As Recei	ived	Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	6.93	units	NA	SM 4500 H+ B	22 Dec 16 10:25 22 Dec 16 10:25	
Temperature - Field Conductivity - Field	4.17 9170	Degrees C umhos/cm	NA 1	SM 2550B EPA 120.1	22 Dec 16 10:25	JSM
Radium 226 Radium 228	See Atta	ached Report ached Report	-	22.1. 250.1-	10 Jan 17 23 Jan 16	OL OL

OL = Analysis performed by an Outside Laboratory.

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 code ! = Due to sample quantity # = Due to int

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



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



Samantha Marshall

400 N. 4th

Bismarck ND 58501

Montana Dakota Utilities

Project Name: MDU Heskett CCR Radiochem

Sample Description: 3-90

Event and Year: December 2016

Page: 1 of 1

Report Date: 27 Jan 17 Lab Number: 16-W6143 Work Order #:82-4140 Account #: 002800

Date Sampled: 22 Dec 16 13:05 Date Received: 22 Dec 16 16:12 Sampled By: MVTL Field Services

PO #: 160249

Temp at Receipt: 6.2C ROI

	As Rece: Result	ived	Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	6.76	units	NA	SM 4500 H+ B	22 Dec 16 13:05	DJN
Temperature - Field	7.25	Degrees C	NA	SM 2550B	22 Dec 16 13:05	DJN
Conductivity - Field	5186	umhos/cm	1	EPA 120.1	22 Dec 16 13:05	DJN
Radium 226	See Atta	ached Report			10 Jan 17	OL
Radium 228		ached Report			23 Jan 16	OL

OL = Analysis performed by an Outside Laboratory.

Approved by:

Clauditte K. Canto

Cc 30 Jan 17

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 Radiochem

Sample Description: 80R

Event and Year: December 2016

1 of 1 Page:

Report Date: 27 Jan 17 Lab Number: 16-W6144 Work Order #:82-4140 Account #: 002800

Date Sampled: 22 Dec 16 11:12 Date Received: 22 Dec 16 16:12 Sampled By: MVTL Field Services

PO #: 160249

Temp at Receipt: 6.2C ROI

	As Rece: Result	ived	Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	6.99	units	NA	SM 4500 H+ B	22 Dec 16 11:12	
Temperature - Field	8.24	Degrees C	NA	SM 2550B	22 Dec 16 11:12	
Conductivity - Field	5761	umhos/cm	1	EPA 120.1	22 Dec 16 11:12	DJN
Radium 226	See Atta	ached Report			10 Jan 17	OL
Radium 228		ached Report			23 Jan 16	OL

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 conduct to sample quantity + = Due to interpolation.

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



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



Samantha Marshall Montana Dakota Utilities 400 N. 4th

Bismarck ND 58501

Project Name: MDU Heskett CCR Radiochem

Sample Description: 105

Event and Year: December 2016

1 of 1 Page:

Report Date: 27 Jan 17 Lab Number: 16-W6145 Work Order #:82-4140 Account #: 002800

Date Sampled: 22 Dec 16 9:26 Date Received: 22 Dec 16 16:12 Sampled By: MVTL Field Services

PO #: 160249

Temp at Receipt: 6.2C ROI

	As Rece: Result	ived	Method RL	Method Reference	Date Analyzed		Analyst
pH - Field	6.61	units	NA	SM 4500 H+ B	22 Dec 16	9:26	DJN
Temperature - Field	7.66	Degrees C	NA	SM 2550B	22 Dec 16	9:26	DJN
Conductivity - Field	7195	umhos/cm	1	EPA 120.1	22 Dec 16	9:26	DJN
Radium 226	See Atta	ached Report			10 Jan 17		OL
Radium 228		ached Report			23 Jan 16		OL

OL = Analysis performed by an Outside Laboratory.

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 code ! = 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: 1/27/2017

CLIENT:

MVTL Laboratories, Inc.

Project: Lab Order: 201682-4140

S1612305

**CASE NARRATIVE** 

Report ID: S1612305001

Samples 16-W6139 Field Blank 3, 16-W6140 Dup 2, 16-W6141 2-90, 16-W6142 102, 16-W6143 3-90, 16-W6144 80R, and 16-W6145 105 were received on December 28, 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:



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:

201682-4140

Lab ID:

S1612305-001

COC:

ClientSample ID: 16-W6139 Field Blank 3

201682-4140

Date Reported 1/27/2017

Report ID

S1612305001

WorkOrder:

S1612305

CollectionDate: 12/22/2016

DateReceived: 12/28/2016 11:27:00 AM

FieldSampler:

Matrix:

Water

Commonte

Result	Units	Qual	RL	Method	Date Analyzed/Init	
0.2	pCi/L		0.3	SM 7500 Ra-B	01/10/2017 1009	MB
0.1	pCi/L			SM 7500 Ra-B	01/10/2017 1009	MB
-0.3	pCi/L		1	Ga-Tech	01/22/2017 1513	WN
1.6	pCi/L			Ga-Tech	01/22/2017 1513	WN
	0.2 0.1 -0.3	0.2 pCi/L 0.1 pCi/L -0.3 pCi/L	0.2 pCi/L 0.1 pCi/L -0.3 pCi/L	0.2 pCi/L 0.3 0.1 pCi/L -0.3 pCi/L 1	0.2 pCi/L 0.3 SM 7500 Ra-B 0.1 pCi/L SM 7500 Ra-B -0.3 pCi/L 1 Ga-Tech	0.2 pCi/L 0.3 SM 7500 Ra-B 01/10/2017 1009 0.1 pCi/L SM 7500 Ra-B 01/10/2017 1009 -0.3 pCi/L 1 Ga-Tech 01/22/2017 1513

These results apply only to the samples tested.

Qualifiers:

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 Х 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: A

Wade Nieuwsma, Assistant Laboratory Manager

Page 1 of 7



1673 Terra Avenue, Sheridan, Wyoming 82801

## Sample Analysis Report

Company:

MVTL Laboratories, Inc.

2616 E Broadway Ave.

Bismarck, ND 58501

ProjectName:

201682-4140

Lab ID:

S1612305-002 ClientSample ID: 16-W6140 Dup 2

COC:

201682-4140

Date Reported 1/27/2017

Report ID

ph: (307) 672-8945

S1612305001

WorkOrder:

S1612305

CollectionDate: 12/22/2016

DateReceived: 12/28/2016 11:27:00 AM

FieldSampler:

Matrix:

Water

### Comments

Comments							
Analyses	Result	Units	Qual	RL	Method	Date Analyzed/I	nit
Radionuclides - Total							· · · · · · · · · · · · · · · · · · ·
Radium 226	0.14	pCi/L		0.3	SM 7500 Ra-B	01/10/2017 1009	MB
Radium 226 Precision (±)	0.1	pCi/L			SM 7500 Ra-B	01/10/2017 1009	MB
Radium 228	-3.5	pCi/L		1	Ga-Tech	01/22/2017 1815	WN
Radium 228 Precision (±)	1.8	pCi/L			Ga-Tech	01/22/2017 1815	WN

## These results apply only to the samples tested.

Qualifiers:

Analyte detected in the associated Method Blank

Value above quantitation range Е

Analyte detected below quantitation limits

Value exceeds Monthly Ave or MCL or is less than LCL

O Outside the Range of Dilutions

Matrix Effect

### **RL** - Reporting Limit

С Calculated Value

Н Holding times for preparation or analysis exceeded

Analyzed by another laboratory

Not Detected at the Reporting Limit

Spike Recovery outside accepted recovery limits

Reviewed by:

Wade Nieuwsma, Assistant Laboratory Manager

Page 2 of 7



1673 Terra Avenue, Sheridan, Wyoming 82801

## Sample Analysis Report

Company:

MVTL Laboratories, Inc.

2616 E Broadway Ave.

Bismarck, ND 58501

ProjectName:

201682-4140

Lab ID: ClientSample ID: 16-W6141 2-90

S1612305-003

COC:

201682-4140

Date Reported

1/27/2017

Report ID

ph: (307) 672-8945

S1612305001

WorkOrder:

S1612305

CollectionDate: 12/22/2016 12:22:00 PM

DateReceived: 12/28/2016 11:27:00 AM

FieldSampler:

Matrix:

Water

Commente

Comments							
Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Radionuclides - Total							
Radium 226	0.4	pCi/L		0.3	SM 7500 Ra-B	01/10/2017 1009	MB
Radium 226 Precision (±)	0.1	pCi/L			SM 7500 Ra-B	01/10/2017 1009	MB
Radium 228	-0.9	pCi/L		1	Ga-Tech	01/22/2017 2119	WN
Radium 228 Precision (±)	1.6	pCi/L			Ga-Tech	01/22/2017 2119	WN

These results apply only to the samples tested.

Qualifiers:

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

O Outside the Range of Dilutions

Matrix Effect

**RL** - Reporting Limit

Calculated Value

Н Holding times for preparation or analysis exceeded

Analyzed by another laboratory

Not Detected at the Reporting Limit

Spike Recovery outside accepted recovery limits

Reviewed by:

Wade Nieuwsma, Assistant Laboratory Manager

Page 3 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:

201682-4140

Lab ID:

S1612305-004 ClientSample ID: 16-W6142 102

COC:

201682-4140

Date Reported

1/27/2017

Report ID

S1612305001

WorkOrder:

S1612305

CollectionDate: 12/22/2016 10:25:00 AM

DateReceived: 12/28/2016 11:27:00 AM FieldSampler:

Matrix:

Water

### Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/I	nit
Radionuclides - Total							
Radium 226	0.5	pCi/L		0.3	SM 7500 Ra-B	01/10/2017 1009	МВ
Radium 226 Precision (±)	0.1	pCi/L			SM 7500 Ra-B	01/10/2017 1009	MB
Radium 228	-1.5	pCi/L		1	Ga-Tech	01/23/2017 023	WN
Radium 228 Precision (±)	1.8	pCi/L			Ga-Tech	01/23/2017 023	WN

## These results apply only to the samples tested.

## Qualifiers:

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

Reviewed by:

Wade Nieuwsma, Assistant Laboratory Manager

Page 4 of 7



Inter-Mountain Labs

1673 Terra Avenue, Sheridan, Wyoming 82801

## Sample Analysis Report

Company:

MVTL Laboratories, Inc.

2616 E Broadway Ave.

Bismarck, ND 58501

ProjectName:

201682-4140

Lab ID:

S1612305-005 ClientSample ID: 16-W6143 3-90

COC:

201682-4140

Date Reported 1/27/2017

Report ID

ph: (307) 672-8945

S1612305001

WorkOrder:

S1612305

CollectionDate: 12/22/2016 1:05:00 PM

DateReceived: 12/28/2016 11:27:00 AM

FieldSampler:

Matrix:

Water

Comments

Comments							
Analyses	Result	Units	Qual	RL	Method	Date Analyzed/I	nit
Radionuclides - Total						,	
Radium 226	0.3	pCi/L		0.3	SM 7500 Ra-B	01/10/2017 1009	MB
Radium 226 Precision (±)	0.1	pCi/L			SM 7500 Ra-B	01/10/2017 1009	MB
Radium 228	-1.0	pCi/L		1	Ga-Tech	01/23/2017 327	WN
Radium 228 Precision (±)	1.7	pCi/L			Ga-Tech	01/23/2017 327	WN

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

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

ND Not Detected at the Reporting Limit

Spike Recovery outside accepted recovery limits

Reviewed by:

Wade Nieuwsma, Assistant Laboratory Manager

Page 5 of 7



Inter-Mountain Labs

1673 Terra Avenue, Sheridan, Wyoming 82801

## Sample Analysis Report

Company:

MVTL Laboratories, Inc.

2616 E Broadway Ave.

Bismarck, ND 58501

ProjectName:

201682-4140

Lab ID:

S1612305-006 ClientSample ID: 16-W6144 80R

COC:

201682-4140

Date Reported 1/27/2017

Report ID

ph: (307) 672-8945

S1612305001

WorkOrder:

S1612305

CollectionDate: 12/22/2016 11:12:00 AM DateReceived: 12/28/2016 11:27:00 AM

FieldSampler:

Matrix:

Water

Comments

Result	Units	Qual	DI			
		Quui	RL	Method	Date Analyzed/I	nit
0.2	pCi/L		0.3	SM 7500 Ra-B	01/10/2017 1009	MB
0.1	pCi/L			SM 7500 Ra-B	01/10/2017 1009	MB
-1.7	pCi/L		1	Ga-Tech	01/23/2017 630	WN
1.7	pCi/L			Ga-Tech	01/23/2017 630	WN
	0.1 -1.7	0.1 pCi/L -1.7 pCi/L	0.1 pCi/L -1.7 pCi/L	0.1 pCi/L -1.7 pCi/L 1	0.1 pCi/L SM 7500 Ra-B -1.7 pCi/L 1 Ga-Tech	0.1 pCi/L SM 7500 Ra-B 01/10/2017 1009 -1.7 pCi/L 1 Ga-Tech 01/23/2017 630

These results apply only to the samples tested.

Qualifiers:

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

O Outside the Range of Dilutions

Matrix Effect

**RL** - Reporting Limit

Calculated Value

Holding times for preparation or analysis exceeded

L Analyzed by another laboratory

ND Not Detected at the Reporting Limit

Spike Recovery outside accepted recovery limits

Reviewed by: A

Wade Nieuwsma, Assistant Laboratory Manager

Page 6 of 7



Inter-Mountain Labs

1673 Terra Avenue, Sheridan, Wyoming 82801

### Sample Analysis Report

Company:

MVTL Laboratories, Inc.

2616 E Broadway Ave.

Bismarck, ND 58501

ProjectName: Lab ID:

201682-4140

S1612305-007 ClientSample ID: 16-W6145 105

COC:

201682-4140

Date Reported

ph: (307) 672-8945

1/27/2017

Report ID

S1612305001

WorkOrder:

S1612305

CollectionDate: 12/22/2016 9:26:00 AM

DateReceived: 12/28/2016 11:27:00 AM

Matrix:

FieldSampler:

Water

### Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/l	nit
Radionuclides - Total							
Radium 226	0.3	pCi/L		0.3	SM 7500 Ra-B	01/10/2017 1009	MB
Radium 226 Precision (±)	0.1	pCi/L			SM 7500 Ra-B	01/10/2017 1009	MB
Radium 228	0.2	pCi/L		1	Ga-Tech	01/23/2017 932	WN
Radium 228 Precision (±)	1.5	pCi/L			Ga-Tech	01/23/2017 932	WN

These results apply only to the samples tested.

Qualifiers:

Analyte detected in the associated Method Blank

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

Calculated Value

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: A

Wade Nieuwsma, Assistant Laboratory Manager

Page 7 of 7



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

## **ANALYTICAL QC SUMMARY REPORT**

**CLIENT:** 

Project:

Work Order:

MVTL Laboratories, Inc.

S1612305

201682-4140

Date: 1/27/2017

Report ID: S1612305001

Radium 228 by Ga/Tech	Sample Type MBLK	Units: pCi/L					
MB-412 (01/21/17 14:53)	RunNo: 142633	PrepDate: 01	/03/17 0:00	Bate	chID 12769		
Analyte	Result	RL Spike	Ref Samp	%REC	% Rec Limits	Qua	
Total Radium 228	ND	1					
Radium 228 by Ga/Tech	Sample Type LCS	Uni	ts: pCi/L				
LCS-412 (01/21/17 17:54)	RunNo: 142633	PrepDate: 01/	03/17 0:00	Bate	chID 12769		
Analyte	Result	RL Spike	Ref Samp	%REC	% Rec Limits	Qua	
Total Radium 228	38	1 40.3		93.5	64.4 - 99.5		
tadium 228 by Ga/Tech	Sample Type MS	Uni	s: pCi/L				
MS-412 (01/22/17 00:01)	RunNo: 142633	PrepDate: 01/	03/17 0:00	Bate	chID 12769		
Analyte	Result	RL Spike	Ref Samp	%REC	% Rec Limits	Qua	
Total Radium 228	37	1 40.3	ND	92.5	55 - 113		
ladium 228 by Ga/Tech	Sample Type MSD	Unit	s: pCi/L		LL.V.EWISTING		
MSD-412 (01/22/17 03:04)	RunNo: 142633	PrepDate: 01/	03/17 0:00	Bate	chID 12769		
Analyte	Result	RL Cond	%RPD	%REC	% RPD Limits	Qua	
Total Radium 228	33	1 37	11.3	82.6	30		
adium 226 in Water -	Sample Type MBLK	Unit	s: pCi/L				
MB-1707 (01/11/17 13:52)	RunNo: 142395	PrepDate: 01/	03/17 0:00	Bate	chID 12733		
Analyte	Result	RL Spike	Ref Samp	%REC	% Rec Limits	Qua	
Radium 226	ND	0.3					
adium 226 in Water -	Sample Type LCS	Unit	s: pCi/L				
LCS-1707 (01/10/17 10:09)	RunNo: 142395	PrepDate: 01/	03/17 0:00	Bate	hID 12733		
Analyte	Result	RL Spike	Ref Samp	%REC	% Rec Limits	Qua	
Radium 226	5.9	0.3 5.89		99.8	65 - 131		
adium 226 in Water -	Sample Type LCSD	Unit	s: pCi/L				
LCSD-1707 (01/10/17 12:11)	RunNo: 142395	PrepDate: 01/	03/17 0:00	Bate	chID 12733		
Analyte	Result	RL Cond	%RPD	%REC	% RPD Limits	Qua	
Radium 226	6.1	0.3 5.9	3.30	103	20		
adium 226 in Water -	Sample Type MS	Unit	s: pCi/L				
S1612304-001AMS (01/10/17 10:09)	RunNo: 142395	PrepDate: 01/	03/17 0:00	Bate	hID 12733		
Analyte	Result	RL Spike	Ref Samp	%REC	% Rec Limits	Qua	

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

Page 1 of 1 .

II (a	Phone: (701) 2									204220 4442			
	00) 279-6885	Fax: (701) 258-9724							201682-4140				
Company Nam	e and Address:			Account #: Pr					Phone #:				
	n av										701-258-9720		
		VTL		Contact:							Fax #:		
	· · · · · · · · · · · · · · · · · · ·	<u>3roadway</u> ND 58501			Claud	ette	<u> </u>				For faxed report check box		
Billing Address	s (indicate if different		Name of S	ampler:						E-mail: ccarroll@mvtl.com			
2g rtaurest	maioate ii amerem		Quote Nun	-h						For e-mail report check box			
	<u>P0 B</u>		Quote Nun	nper						Date Submitted:			
		MN 56073		Project Na	me/Numbe	r.	<u>-</u>				Purchase Order #:		
		<del></del>		. rojest ita	montanio						BL5753		
		Sample Information	· · · · · · · · · · · · · · · · · · ·			[	R	ottle	Tv	ne	Analysis		
5161230	5								· y		Allalysis		
2001200	7						6						
							ml HNO3	VOC Vials Umpreserved					
IML Lab						ated	ᄪ	/ials	Jar				
	NA\/T1 1 -1- 51- 1	0" 10 1 -	Sample	Date	Time	Untreated	00	C V	155	Other			
Number	MVTL Lab Number	Client Sample ID	Туре	Sampled	Sampled	5	100	85	Glas	5	Analysis Required		
	16-W6139	Field Blank 3	GW	22-Dec-16			4				Ra226 & Ra228		
<u> </u>	16-W6140	Dup 2	GW	22-Dec-16			4				Ra226 & Ra228		
<u> </u>	16-W6141	2-90	GW	22-Dec-16	1222		4				Ra226 & Ra228		
204	16-W6142	102	GW	22-Dec-16	1025		4				Ra226 & Ra228		
<u> </u>	16-W6143	3-90	GW	22-Dec-16	1305		4				Ra226 & Ra228		
<u> </u>	16-W6144	80R	GW	22-Dec-16	1112		4				Ra226 & Ra228		
007	16-W6145	105	GW	22-Dec-16	926		4				Ra226 & Ra228		
A		erted as a numerical value								1	I		

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

Transferred by:	Date:	Time:	Sample Condition:	Received by:	Date:		Sepolars Temp:
T. Olson	23-Dec-16	1700		Kathy Bour	(Z-28.1)	11:27	6.4
2.							2.4



**Groundwater Assessment** 

Company:	MDU Heskett	
Event:	2016	
Sample ID:	2-90	
Sampling Personal:	Jan sh	

2616 E. Broadway Ave, Bis	smarck, ND							Campic ID:		<del></del>	19		
Phone: (701) 258-9	720							Sampling F	ersonal:	Jan	fly		
Weather Conditions:		Temp:	30 .	·E	Wind:	W @S-	70		Precip:	Cup	ov / Davids 77		. 1
Well Information							,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	Precip: Sunny (Partly Cloudy / Cloudy Sampling Information					
Well Locked?	Yes	NO				Purgi	ng Method:		ider			ntrol Setting	
Well Labeled?	Yes	No					ng Method:		lder		Purge:	6	sec
Casing Straight?	Yes	No					ed Equip?:	Yes	(No		Recover:		
Grout Seal Intact?	Yes	No Not Visible					Sample?:	Yes	No		PSI:	20	sec
Repairs Necessary:							Sample ID:				Pumping R		mL/mir
Casing	Diameter:		2"			, ,					i dinping it	ate. 700	11111/11111
Water Level Befo	ore Purge:	21,	15	ft		P	urge Date:	22 Deell	2	Time Pura	ing Began:	1202	am/m
Total W	ell Depth:			ft			urged Dry?	Yes	(No		urged Dry:		am/pm
We	II Volume:			liters			mple Date:	22 Deelle			Sampling:	1222	am/pn am/oñ
Depth to Top	of Pump:	_	_	ft							oupig.	1666	ampn
Water Level Afte	r Sample:	21.6	,9	ft		Bottle	CC	R: 11 Raw	500ml Niti	rc 500ml l	Vitric (filtoro	d) 1 11 Nit-:	
Measurement	Measurement Method: Electric Water Level Indicator					John January Coome Marc			rc, 500mL Nitric (filtered), 4-1L Nitric c, 500mL nitiric (filtered), 250mL sulfiric				
				Field	Measure	ments			John Intro	, 000IIIL III	ano (mierea	), 20011L Sui	mic

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	1207	7.18	7309	6.94	4.36	121,2	0.96	21,60	\$20	Clear
2	1212	7.06	7283	7.01	3,71	123.9	0.75	21,61	500	Clez
3	1217	7.11	7265	7.00	3,49	121.7		21.63		Clea
4	1222	7.17	7754	7.00	3,38	120,1	0.70	21.61	500	Che
5						F 1		-1101		
6										
7										
8										
9										
10										
Stabilized:	(Yes)	No			1	To	otal Volume	Removed:	2000	mL

Comments:



**Groundwater Assessment** 

Wind:

W3 5-10

Company:	MDU Heskett
Event:	2016
Sample ID:	.102.
Sampling Personal:	Jan Mu
	1 1 V 1

Sunny / Partly Cloudy / Cloudy)

Phone: (701) 258-9720

Weather Conditions:		Temp:	30 °F				
	Well Info	ormation					
Well Locked?	Yes	No					
Well Labeled?	(es	No					
Casing Straight?	Ves	No	>				
Grout Seal Intact?	Yes	No	Not Visible				
Repairs Necessary:							
Casing	Diameter:		2"				
Water Level Bef	ore Purge:	17	7.22 ft				
Total V	Vell Depth:	-	ft				
We	ell Volume:		liters				
Depth to Top	of Pump:		ft				
Water Level Afte	er Sample:	: 19.0\ f					
Measuremer	t Method:	Electric Water Level Indicator					

		S	ampling l	nformatio	on		
Purgi	ng Method:	Bla	dder		Co	ntrol Setti	ngs
Sampli	ng Method:	Bla	dder		Purge:	5	sec.
Dedicat	ed Equip?:	Yes	(NO)		Recover:	22	sec.
Duplicate	Sample?:	Yes	(No	1	PSI:	30	· · · · · · · · · · · · · · · · · · ·
Duplicate :	Sample ID:				Pumping R	ate: 100	> mL/min
				•			
Р	urge Date:	22 Dec. 1	16	Time Purg	ing Began:	0912	a͡͡ஹ∜pm
	urged Dry?		(No)	Time P	urged Dry:		am/pm
Sa	mple Date:	22 Dec 10	9	Time of	1025	(am)/pm	
Bottle	CC	R: 1L Raw	, 500mL Nit	irc, 500mL l	Nitric (filtere	d), 4-1L N	litric
List:				c, 500mL ni			
						<del>/ :</del>	

Precip:

## Field Measurements

1		l	1	I.						
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	0917	7.76	9816	6.93	1.04	-65.1	5.00	18,26	∑00.	Clea
2	0922	6.92	9734	6.92	0.95	-63,3	3.30	18,48	500	Clear
3	0927	707	9570	6.90	0,89	-50,3	5.36	18.75	SOD	Clea
4	0932	6.15	9575	6.90	1,13	-40,9	3,69	18.45	500	Cles
5	5937	As the	fore	p. wa	med up	arv lin			Sa	Clear
6 196	8942	ع العدال	4~	V					<u> </u>	Char
7	1005	417	86912	695	5,63	-26,5	3,89	18:30	5లు	Clea
8	1010	4.36	9051	6,92	3,33	-28,8	4.34	18,40	SOO	Clear
9	lois	4.21	9138	6.93	2.93	-32.6	4,54	18,44	500	Clear
10	1020	4,22	9174	6.93	2.85	-34,5	4.49	18,50	500	Cles
Stabilized:	(Yes)	No				To	tal Volume		Lien Mr	ml

Commonto: Yes N

Total Volume Removed: 🌿 🗪 🔻 mL

\* 22 Dec16 L

Comments:

9170 693 2.73 -35,2 4,20

18,49 500 Clear

1 page 1 of the

Final Set of had not 1025 4,17

5000 mi Remard



# **Field Datasheet**

**Groundwater Assessment** 

Company:	MDU Heskett		
Event:	2016		-
Sample ID:	3-90		
Sampling Person	al: Ad//10	Niecom	

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

Weather (	Conditions		Temp:	33	°F	Wind:	Linh	+		Precip:	& Uni	ny / Partiy (	Cloudy / Clo	udv
		Well Info	ormation				Sampling Information							
We	ell Locked?	Naco	<u>4</u> Vo				Purgi	ng Method:				T	ontrol Setting	e
We	Il Labeled?	Yes	No					ng Method:				Purge:	Antion octains	sec.
Casin	g Straight?	Yes	No					ted Equip?:		No		Recover:	55	sec.
Grout S	Seal Intact?	Yes	No	(Not )	/isible			Sample?:	(Yes)	No		PSI:		300.
Repairs N	ecessary:							Sample ID:	DUR	2_		Pumping R	ate: / 00	mL/min
	Casing	g Diameter:		2"		]			- Day			r amping r	u.u., , , , , ,	111111111111111111111111111111111111111
Wate	er Level Be	fore Purge:		2,43	ft		F	urge Date:	22 De	clf	Time Purg	ing Began:	1235	am/pm
	Total V	Vell Depth:	0'		ft		Well P	urged Dry?	Yes	No		urged Dry:		_am/pm
		ell Volume:	<del> </del>		liters		Sa	mple Date:	22 Nec	16	Time of	Sampling:	1305	am pm
	Depth to To			0,19	ft									
	er Level Aft			18256	ft	_	Bottle	C(	CR: 1L Raw,	500mL Niti	rc, 500mL l	Nitric (filtere	d), 4-1L Nitri	С
Measurement Method: Electric Water Level Indicate					Indicator		List:						l), 250mL su	
					Field	Measure	ments							
									T					
Stabil	ization	Temp	Spec.		DO	ORP	Turbidity	10/-4			Discription:			
(3 cons	ecutive)	(°C)	Cond.	рH	(mg/L)	(mV)	(NTU)	Water Level (ft)	mL Removed		Color, Ode			
SEQ#	Time		±5%	±0.1	±10%	±20 mV	±10%	0.25 ft	Removed		slightly turbid,			
1	1240	7,23	5209	6.79	6,40	-104,3	1,90	18.56	(500)	rl .				
2	1245	7,51	51961	487,	6.7	-11904	1.69	18,56	500	Q,		•		
3	1255	7,44	5191	6.77	4.87	-1033	1.14	18,56	1000	(0.	_			
4	1390	7,24	5179	6,76	3.64	-95.2	1.12	8,56	500	d				
5	1305	7.25	5186	6,76	3.66	-93.7	1.12	18056	500	ZC				
6		, ,						,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,						
7														
8														

Stabilized:/ Comments:

No

9 10

Total Volume Removed: 3000 mL



**Groundwater Assessment** 

Company:	MDU Heskett	
Event:	2016	
Sample ID:	MW80R	
Sampling Person	nal: Da Con ACTOR	 

Phone: (701) 258-9720

<u>vveatner</u> (	onditions		Temp:	-32-	.°F	Wind:	1/1/2	2 <i>4</i> )		Precip:	Sunr	Partly (	Cloudy / Clou	ıdv
		Well Inf	ormation					siduay / Gide	auy					
W	ell Locked?	Yes	,NO			1	Purai	ng Method:			nformatio	T		······································
We	ll Labeled?		No	-	· · · · · · · · · · · · · · · · · · ·	1		ng Method:					ontrol Settings	
	g Straight?		No			1		ted Equip?:				Purge:		sec.
	Seal Intact?		No	Not V	'isible	-		Sample?:		No		Recover:	55	sec.
Repairs N				1 1101 1	ISIDIC			Sample ID:	Yes	 • <b>ग्र</b> ा		PSI:		
		g Diameter:		2"			Duplicate	Sample ID.		·····	J [	Pumping R	late: / <u>උට</u>	mL/min
Wat	er Level Be			14.72	ft	1		Purao Data:	22 Rec	i (	Timo Durai	ing Dagari	N	
		Well Depth:		<u> </u>	<del>- ''</del> fi			urged Dry?		<u>/ (с.</u> No	Time Purgi	urged Dry:	1047	€m/pm
		ell Volume:			liters			mple Date:				Sampling:	11.10	am/pm
	Depth to To	p of Pump:		19.30		1	Oa	mpie Date.	72 gr	1/0	Time of	Sampling.	1112	am/pm
Wat	er Level Aft	er Sample:		14.95	ff	1	Bottle		`P. 11 Paw	500ml Niti	ing ECO1 N	Mital - Cit	D 4 41 NW 1	
l N	/leasureme	nt Method:	Electric \	Water Level	Indicator		List:						d), 4-1L Nitri l), 250mL sul	
									in in it italy, t	JOOITIL THEI	o, Journa III	une (mierec	i), 250mL sui	IIIIC
		T	1		Field	Measure	ments	<b>Y</b>						
04-1-11	·													
Stabil	ization	Temp	Spec.		DO	ORP	Turbidity	Water	mL		Discription:			
(3 cons	ecutive)	(°C)	Cond.	pН	(mg/L)	(mV)	(NTU)	Level (ft)	Removed	Clarity	, Color, Odo	or. Ect.		
SEQ#	Time		±5%	_±0.1	±10%	±20 mV	±10%	0.25 ft	*		slightly turbid,			
1	1052	7,72	5779	6,98	3,76	111,9	2.86	14.89	500	Cleo				
2	1057	7.95	5189	6,99	2.26	1057	188	14.91	500	10-				
3	1102	8121	5759	199	1,84	1022	152	1495	500	<u> </u>				
4	1107	8113	5761	A.7,00	1,77	100.8	1.4%	1495	500	7				
5	1112	-8,24	5761	E.99	1071	99,7	1.40	14.95	500	10				
6	,	<b>,</b>		- <del> </del>			- 5 i U	1 113	300	an				
7						<u> </u>								
8														

Total Volume Removed: 2500 mL

Stabilized: Yes Comments:

No

9 10



**Groundwater Assessment** 

Company:	MDU Heskett	
Event:	2016	
Sample ID:	nw 1042/05	
Sampling Pe	sonal: Darcan Machan	

2616 E. Broadway Ave, Bis	smarck, ND						;	Sampling F		7070	100	<u> </u>	-t
Phone: (701) 258-9	720							Sampling r	ersonal.	DAII	Can No	95) Wald	<del>J</del>
Weather Conditions:		Temp:	21 °F		Wind:	W10	•		Precip	· Veun	my / Partly C	loudy / Cla	
	Well Info		0			., , ,		Sa	ampling I			loudy / Cit	uuy
Well Locked?	Yes	(No)				Purgii	ng Method:		dder			ntrol Setting	15
Well Labeled?	Yes	No				Samplii	ng Method:	Blad	der	1	Purge:	i C	sec.
Casing Straight?	<u>Xés</u>	No				Dedicat	ed Equip?:	Yes	Nó	1	Recover:	73	sec.
Grout Seal Intact?	¥és .	No	Not Visib	le		Duplicate	Sample?:	Yes	(No)	1	PSI:		
Repairs Necessary:	<u>ب</u>					Duplicate :	Sample ID:		_		Pumping R	ate: 1:00	mL/min
Casing	Diameter:		2"							_		7 0 0	
Water Level Befo	ore Purge:		13.24	ft		Р	urge Date:	22/2	ell	Time Purg	ging Began:∤	851	(am)/pm
Total W	ell Depth:			ft		Well Pi	urged Dry?	Yes	No.)		ourged Dry:		am/pm
We	Il Volume:			liters		Sa	mple Date:	22000	11			0926	am)pm
Depth to Top	of Pump:	2	21.24	ft					, , , , , , , , , , , , , , , , , , , ,			0/0	- Ginpin
Water Level Afte	r Sample:		13.50	ft		Bottle	CC	R: 1L Raw,	500mL Nit	irc. 500mL	Nitric (filtere	d). 4-11 Nitr	ic
Measurement	t Method:	Electric V	Vater Level Indi	cator		List:					itiric (filtered		
				Field	Measure	ments							

Stabili (3 cons	zation ecutive)	Temp (°C)	Spec. Cond.	На	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	0856	7.65	6178	6,65	5.14	111.6	3,38	13,46	500	Chear
2	0901	7,42	6103	6.64	4,16	111,5	3,60	13,52	500	Ch.
3	0906	7,49	6252	6.64	2,73	7/11	2,44	13,50	500	Ch.
4	09(1	-7,51	6787	6.62	260	111,4	2,84	13,50	500	Ch
5	09/6	7,50	7058	1.62	2,00	111,2	3.84	13,50	500	Ch
6	0921	7.65	7170	6.62	1.96	110,4	3.81	13,50	500	d
7	0926	7.66	7195	6,61	1,92	110.3	3.71	13,50	500	ds/
8				,						
9									V	
10	Noo\	No								

Stabilized: Comments: /

Total Volume Removed: 3500 mL

Check ball isn't working on blatter pump water Keens going



# **Chain of Custody Record**

Projec	ct Name:					Name of Samp	ler(s):	
MDU	Heskett	CCR Rad	iochem	2016			Iven ely Dave	n Niesway
Report To: Attn: Address: Phone:	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 Nu	C V/	J
	Sample	Informati	on		Bott	le Туре	Field Parameters	Analysis
					///		rture °C	

	Lab Number	Sample ID	Date	Тіте	Sample Type	Gradient	1000 ml HAG	//		Field Temperature °	Field Spec. Cond.	Field pH	Analysis Required
110	W6139	Field Blank (FB)3	22 Dee 16	NA	W		4			NA		NA	
140	WHIRP	Dup -2	22 De 16	NA	W		4			NA	NA	NA	
حال	Wtol3	W61412-90	22 Dec 16	1222	GW		4			7,17	7254	7,00	,ar
シ	W6142	102	22 Deel6	1025	Gu		4			4.17	9170	6.93	
	W6143	3-90	22 Dec 16	1305	GW		4			7,25	5186	6,76	
	W6144	BOR	22 Dec 16	1112	GW		4	ja		8.24	5761	6.99	
	W6145	105	22Dec 16	0926	GW		4			7,66	7195	6.61	RadChem
							П						
							$\Box$						

Comments:

	Transferred by:	Sample Condition	Date/Time	Received by:	Sample Condition	Date/Time	°C	٦.
1	Den My	Losh	22 Pec/L	1 mad Simon	en	22 Decile	6.2°C ROY	msge
2				0.90			-	
3							-	