

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

### Sample Analysis Report

Company: MVTL Laboratories, Inc.

2616 E Broadway Ave.

Bismarck, ND 58501

ProjectName: Lab ID:

201682-2728 S1609036-004 ClientSample ID: 16-W3838 MW101

COC:

201682-2728

Date Reported

9/29/2016

Report ID

S1609036001

WorkOrder:

S1609036

CollectionDate: 8/30/2016 11:43:00 AM

9/2/2016 10:58:00 AM

DateReceived: FieldSampler:

Matrix:

Water

### Comments

Result	Units	Qual	RL	Method	Date Analyzed/l	nit
0.7	pCi/L		0.2	SM 7500 Ra-B	09/14/2016 1200	MB
0.1	pCi/L			SM 7500 Ra-B	09/14/2016 1200	MB
-1.2	pCi/L		1	Ga-Tech	09/18/2016 2020	MB
3.5	pCi/L			Ga-Tech	09/18/2016 2020	MB
	0.7 0.1 -1.2	0.7 pCi/L 0.1 pCi/L -1.2 pCi/L	0.7 pCi/L 0.1 pCi/L -1.2 pCi/L	0.7 pCi/L 0.2 0.1 pCi/L -1.2 pCi/L 1	0.7 pCi/L 0.2 SM 7500 Ra-B 0.1 pCi/L SM 7500 Ra-B -1.2 pCi/L 1 Ga-Tech	0.7 pCi/L 0.2 SM 7500 Ra-B 09/14/2016 1200 0.1 pCi/L SM 7500 Ra-B 09/14/2016 1200 -1.2 pCi/L 1 Ga-Tech 09/18/2016 2020

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: A)

Wade Nieuwsma, Assistant Laboratory Manager

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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: Lab ID:

201682-2728

ClientSample ID: 16-W3839 MW33

S1609036-005

COC:

201682-2728

Date Reported

9/29/2016

Report ID

S1609036001

WorkOrder:

S1609036

CollectionDate: 8/30/2016 1:53:00 PM DateReceived: 9/2/2016 10:58:00 AM

FieldSampler:

Matrix:

Water

### Commonte

Comments							
Analyses	Result	Units	Qual	RL	Method	Date Analyzed/I	nit
Radionuclides - Total							
Radium 226	0.4	pCi/L		0.2	SM 7500 Ra-B	09/14/2016 1200	MB
Radium 226 Precision (±)	0.1	pCi/L			SM 7500 Ra-B	09/14/2016 1200	MB
Radium 228	-3.7	pCi/L		1	Ga-Tech	09/18/2016 2321	MB
Radium 228 Precision (±)	3.3	pCi/L			Ga-Tech	09/18/2016 2321	MB

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

Not Detected at the Reporting Limit ND

Spike Recovery outside accepted recovery limits

Reviewed by: A

Wade Nieuwsma, Assistant Laboratory Manager

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

### Sample Analysis Report

Company:

MVTL Laboratories, Inc.

2616 E Broadway Ave.

Bismarck, ND 58501

ProjectName:

201682-2728

Lab ID:

S1609036-006

ClientSample ID: 16-W3840 MW3-90 COC:

201682-2728

Date Reported

9/29/2016

Report ID

S1609036001

WorkOrder:

S1609036

CollectionDate: 8/30/2016 3:15:00 PM

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

FieldSampler:

Matrix:

Water

### Comments

Result	Units	Qual	RL	Method	Date Analyzed/I	nit
0.2	pCi/L		0.2	SM 7500 Ra-B	09/14/2016 1200	MB
0.1	pCi/L			SM 7500 Ra-B	09/14/2016 1200	MB
-5.7	pCi/L		1	Ga-Tech	09/22/2016 852	MB
3.4	pCi/L			Ga-Tech	09/22/2016 852	MB
	0.2 0.1 -5.7	0.2 pCi/L 0.1 pCi/L -5.7 pCi/L	0.2 pCi/L 0.1 pCi/L -5.7 pCi/L	0.2 pCi/L 0.2 0.1 pCi/L -5.7 pCi/L 1	0.2 pCi/L 0.2 SM 7500 Ra-B 0.1 pCi/L SM 7500 Ra-B -5.7 pCi/L 1 Ga-Tech	0.2       pCi/L       0.2       SM 7500 Ra-B       09/14/2016 1200         0.1       pCi/L       SM 7500 Ra-B       09/14/2016 1200         -5.7       pCi/L       1       Ga-Tech       09/22/2016 852

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

1 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

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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:

201682-2728

Lab ID:

S1609036-007

ClientSample ID: 16-W3841 MW2-90 COC:

201682-2728

Date Reported

9/29/2016

Report ID

S1609036001

WorkOrder:

S1609036

CollectionDate: 8/30/2016 4:37:00 PM 9/2/2016 10:58:00 AM

DateReceived: FieldSampler:

Matrix:

Water

### Comments

Analyses	Result Units Qual RL		RL	Method	Date Analyzed/Init		
Radionuclides - Total							
Radium 226	0.3	pCi/L		0.2	SM 7500 Ra-B	09/14/2016 1200	МВ
Radium 226 Precision (±)	0.1	pCi/L			SM 7500 Ra-B	09/14/2016 1200	МВ
Radium 228	-1.9	pCi/L		1	Ga-Tech	09/19/2016 223	MB
Radium 228 Precision (±)	3.4	pCi/L			Ga-Tech	09/19/2016 223	MB

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

0 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: A

Wade Nieuwsma, Assistant Laboratory Manager

Page 7 of 7



Inter-Mountain Labs

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

### **ANALYTICAL QC SUMMARY REPORT**

CLIENT:

Project:

Work Order:

MVTL Laboratories, Inc.

S1609036

201682-2728

Date: 9/29/2016

Report ID: S1609036001

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

Qualifiers:

- 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

P	age	a 1	O	f	1

	300) 279-6885	Fax: (701) 258-9724									201682-2728
Company Nam	e and Address:			Account #	:						Phone #:
	K. 27				·····		***************************************				701-258-9720
	<u>M'</u>		Contact:						Fax #:		
		Broadway		Claudette						For faxed report check box	
Rilling Address	<u>ызтагск</u> s (indicate if differen	(, ND 58501		Name of Sampler: E-mail:						E-mail: ccarroll@mvtl.com	
Dilling Address	s (maicate ii umeren	t from above):								For e-mail report check box	
	PO B	ox 249		Quote Nui	nber						Date Submitted:
		<u>0X 243</u> , MN 56073		Droinet Na							8/31/2016
	NOW OHIL		Froject Na	me/Numbe	er:					Purchase Order #:	
	Sample Information					Ι		ottle	T.,		BL5655
		Cample information	T			<del> </del>	_ <u>D</u>	ottie	ı y	<u>pe</u>	Analysis
IML Lab Number	MVTL Lab Number	Client Sample ID	Sample Type	Date Sampled	Tìme Sampled	Untreated	1000 ml HNO3	VOC Vials Umpreserved	Glass Jar	L 5	Analysis Required
51609036-01	16-W3835	Dup 2		8/30/2016							Ra226 & Ra228 on all
-002	16-W3836	Field Blank		8/30/2016							
-003	16-W3837	MW70		8/30/2016	850						
-004	16-W3838	MW101		8/30/2016	1143						
-005	16-W3839	MW33		8/30/2016	1353						
-006	16-W3840	MW3-90		8/30/2016	1515						
-007	16-W3841	MW2-90		8/30/2016	1637						
	<del>                                     </del>										
		orted as a numerical value									

Transferred by:	Date:	Time:	Sample Condition:	/ Received by: /	, Date:		Temp:
C. Jackson	08/31/16	1700		Line Balbal	9/2/16	10,58	22.0
2.					111		210

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

# **Chain of Custody Record**

Projec	t Name:			Name of Sampler(s):
MDU	Heskett	CCR Radiochem	August 2016	Darren Nieswaag
Report To: Attn: Address:	Samantha Marshall 400 N. 4th St Bismarck, ND 58501	Carbon Cop Attn: Address:	<u>γ</u> :	Work Order Number: 82 - 2728
Phone:	701-222-7829	1		

	Sampl	e Informati	on			В	ottle T	уре		Fie	eld Para	meters	Analysis
Lab Number	Sample ID	Date	Time	Sample Type	Gradient	1000 ml HNO <sub>3</sub>				Field Temperature °C	Field Spec. Cond.	Field pH	Analysis Required
W3835		30Aug 16	NA	W		4				NA	NA	NA	
w3836	Field Blank (FB)	17 10 11	NA	W		4				NA		NA	
w3837	mw70	30Aug/6	0850	GW		4				9.54	4136	6,90	
W3838	nw101	30 And 6	1143	GW		4				14.11	4968	6,67	
63839	MW33	30 Aug 16	1353	GW		4				13.67	5298	6.45	
w 3840	mw3-90	30 Aug 16	1515	Gu		4				13.89	5222	6.80	MDU CCR Numerical
W3841	Mw 2-90	30Ay/b	1637	6 W		4				11.62	7676	6,86	RadChem
	1901												
	36								-				
			x										
									П				

Comments:

	Transferred by:	Sample Condition	Date/Time	Received by:	Sample Condition	Date/Time	° C
1	Jan Mis	walkin 2	30Aug (6	CiJackson		31 Aug 16	ROJ 6.2
2			100				TM588
3							30 Aug 16
	×						1845

**MVTL Calibration Worksheet** 

	IVIVIL	Calibration	VVOIRSITECT		
Site: MDU Hes	kett		Technician:	Jacker	Mess vaag
Instrument (Circle One):	#1 650 MDS 08F100203	#2 650	MDS 04H14736		#3-556 MPS 12E102056
_	, Pre Site Calibra	ation			Post Site Check
Date: 29 A	19 16 Time: 0731		mv Range +/-	Time:	1647
рН	Temp °C Pre Cal Post Cal	Post Cal Range	mv 50	рН	
Buffer 7	22,73 6,92 7.00	6.95-7.05	<del>-39, 2</del> 0 +/- 50	Buffe	17 23,92 7,03
Buffer 10	22,75 10.03 40.00	9.95-10.05	-180 +/- 50		
Conductivity			Check	Conduct	
Buffer 10000	22.88 10202 9999	±10% ~	Buffer 5000 4979	Buffer 5	5000 [23,04] [5079]
ORP	2		J ( 4)		
231 mV @ 25C	5.35 78264 257.6	±10 mV			
DO		Barometric	: Pressure (mm Hg)		
	22,18 10.6 8,20	mg/L	721.0		
Date: 30 Ar	~16 Time: 0733			Time:	1834
рН		Post Cal Range	mv Range +/- 50	pH	
Buffer 7	21.91 7.02 7.00	6.95-7.05	-40,4 0+1-50	Buffe	er7 27,82 6,99
Buffer 10	21.97 /0.01 /0.00	9.95-10.05	-2/9.3 -180 +/- 50		* *
Conductivity			Check	Conduc	
Buffer 10000	22.12 [0149 [000]	±10%	Buffer 5000 4955	Buffer	5000 237/ 5106
ORP					
231 mV @ 25C	4.65 259.4 257.3	±10 mV			
DO		Barometri	c Pressure (mm Hg)		
	21.87 8.10 8.34	mg/L	727.0		



**Groundwater Assessment** 

Company:	MDU Heskett	
Event:	August 2016	
Sample ID:	MW70	
Sampling Pe	rsonal: Da CC - NE CWARS	

2010 L. Bloadway Ave, Bis	Smarck, ND				Sampling Personal: Darran Nieswang								
Phone: (701) 258-9	720								P		\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \		
Weather Conditions:		Temp:	55	°F	Wind:	Light	Precip: Sunny / Partly Clos						ıdy
	Well Info	rmation				<b>y</b>		Sampling Information					
Well Locked?	Yes	No.				Purgir	ng Method:	Blad	lder	Control Settings			S
Well Labeled?	Yes	No				Samplir	ng Method:	Blad	lder	]	Purge:	U)	sec.
Casing Straight?	Yes	No				Dedicat	ed Equip?:	(Yes)	_ No		Recover:	56	sec.
Grout Seal Intact?	, Yes	No	Not V	isible		Duplicate	Sample?:	Yes	(No)		PSI:		
Repairs Necessary:						Duplicate \$	Sample ID:			]	Pumping R	ate: / 00	mL/min
Casing Diameter: 2"										-			
Water Level Before Purge: 2/34				ft		P	urge Date:	30 Az	rlb	Time Purg	ing Began:	19830	@m/pm
Total V	Vell Depth:			ft		Well Purged Dry?		Yes	No,	Time P	urged Dry:		am/pm
We	ell Volume:			liters		Sa	mple Date:	30AC	rlh	Time of	Sampling:	PUCT)	am/pm
Depth to Top	o of Pump:		32,75	ft				· · ·		-			
Water Level After	er Sample:	2	2,67	ft		Bottle	500 m	L Nitric	1 Lite	er Raw			
Measuremer	nt Method:	Electric V	Nater Level	Indicator		List:		500 mL Nit	ric (filtered)		4 - 1 Lite	er Nitric	
				Field	Measure	ements							
Stabilization (3 consecutive)	Temp (°C)	Temp Spec. DO (°C) Cond. pH (mg/L)			ORP (mV)	Turbidity (NTU)	Water	mL Removed					

1										
Stabil	ization	Temp	Spec.		DO	ORP	Turbidity	Water	mL	Discription:
(3 cons	ecutive)	(°C)	Cond.	рН	(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	0835	9.52	4171	6.89	1.19	177.8	5.75	22,20	500	de
2	0840	9,44	4150	6.90	1,21	178,1	4.38	22,34	500	dy
3	0845	9,52	4140	6,90	1,19	176.6	4.58	22,34	500	Car
4	0851	9,54	4136	6.90	1,18	174,9	4,76	27134	500	Clar
5										
6										
7										
8										
9					۶,					
10										
Stabilized	Yes	No		•		To	otal Volume	Removed:	2000	mi

Comments

I otal Volume Removed: \_\_\_\_\_\_mL



**Groundwater Assessment** 

Company:	MDU Heskett	
Event:	August 2016	

								Sampling Personal: []a//en/Vi23 White						
Phone: (701) 258-9	720						_	" ~						
Weather Conditions:		Temp:	62°F	=	Wind:	t~ 5	Precip: Sunny Partly Cloudy / Clo							
,	Well Info	rmation			•	•		Sa	mpling l	nformatio	n			
Well Locked?	Yes	(ولال				Purgir	ng Method:	Blad	der		Control Settings			
Well Labeled?	<u>(es)</u>	No				Samplir	ng Method:	Blad	der		Purge:	4	sec.	
Casing Straight?	Yes	No			Dedicat	ed Equip?:	(Yes)	No	]	Recover:	56	sec.		
Grout Seal Intact?	Yes	No	No Not Visible			Duplicate	Sample?:	Yes	(No		PSI:	P		
Repairs Necessary:					Duplicate S	Sample ID:	-			Pumping R	ate: <i>  00</i>	mL/min		
Casing	Diameter:		2"									,		
Water Level Befo	ore Purge:	30	7.18	ft		Р	urge Date:	30An 16		Time Purg	ing Began:	0953	(am/lpm	
Total W	/ell Depth:			ft		Well Pr	urged Dry?	Yes	<b>⟨No</b> ⟩	Time P	urged Dry:	~	am/pm	
We	ll Volume:		-	liters		Sa	mple Date:	30/40	عرك ر	Time of	Sampling:	1143	-ami/pm	
Depth to Top	p of Pump: 46, 40 f		ft					,			17			
Water Level After Sample: 41,59		ft		Bottle 500 m		L Nitric 1 Lite		er Raw						
Measurement Method: Electric Water Level Indicator				List:	_ist: 500 mL Nitric (filtered)			) 4 - 1 Liter Nitric						

### Field Measurements

		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	0958	12.55	4953	6,64	2,61	40.0	236	38.19	500	Or Tuesid
jq	082 4	1003	12,32	4917	6.65	1.25	11.6	101	38,76	1000	Stightly tubid
10	018 3	100 B	12,52	4902	6065	1.24	2.5	67.9	39.18	1000	ST
Ý	0284	1013	12,52	4910	6,65	1.00	4,6	36,1	39.35	1000	che
	5	1038	12.63	4922	6,66	1.18	13,7	17.3	39.66	1000	Char
	6	1048	12,88	4930	6,65	1,49	13,1	11,0	39.86	1000	de
	7	1058	13,50	4955	6.66	1,49	12,3	9.16	40.06	1000	C Gen
	8	1108	13,36	4943	6,65	1,42	10,2	7.93	40,22		(la)
	9	lig.	13,22	4948	6,66	1,40	6,2	6.43	40,44	1000	19
ĺ	10	1/20	14.21	4961	\$166	1109	216	4,92	40,44	1000	de
	Stabilized: Comments		No				To	otal Volume	Removed:		mL

Contined on next page



**Groundwater Assessment** 

Company:	MDU Heskett	-
Event:	August 2016	
Sample ID:	MW/01	
Sampling Persor	nal: Parren Nicema	
Date: 204	7-1/	

Phone: (701) 258-9720

**Field Measurements** 

		/**·								
Stabili (3 cons	ization 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
11	1133,	14.39	4965	6,66	1,29	0.8	4.91	40,58	500	Cles
12	1138	14,20	4973	6,66	1.22	-0.3	4,75	40,65	500	a.
13	1143	14,11	4968	6267	1,23	0,5	4.88	40,69	500	(4)
14	معبر -									
15										
16										
17										
18					_					
19										
20										
21										
22			:							
23								***************************************		
24										
25						***************************************				
26										
27										
28										
29										
30	*									
Stabilized:	/\Yes	No			***************************************	Т,	ntal Volume	Pomovod:	11 000	I

Stabilized: / Yes Comments

Total Volume Removed: 11,000 mL



Comments:

## **Field Datasheet**

**Groundwater Assessment** 

Company: MDU Heskett Event: August 2016 Sample ID:

2010 L. Bloadway Ave, Dis	marck, ND					_	Sampling Pe	rsonal:	VAVIA	n Nies	way _	
Phone: (701) 258-97	720					-			A			
Veather Conditions:		Temp:	79 °F	Wind: -	55			Precip:	Sum	Fartly C	loudy / Clou	ıdy
	Well Info	rmation	* (	~			Sar	npling l	nformatio	on		
Well Locked?	Yes	\$N⊕			Purgin	g Method:	Bladd	ler		Cor	ntrol Settings	3
Well Labeled?	<u>Xés</u>	No			Samplin	g Method:	Bladd	ler		Purge:	254	- sec.
Casing Straight?	Yes	No			Dedicate	ed Equip?:	(Ves)	No		Recover:	.56	sec.
Grout Seal Intact?	Yes	No	Wot Visible		Duplicate	Sample?:	Yes	<b>16</b>		PSI:	_	
Repairs Necessary:		~			Duplicate S	Sample ID:	هـــــــ			Pumping Ra	ate: 100	mL/min
Casing	Diameter:		2"						· ·			
Water Level Befo	ore Purge:		12,08 ft		Pi	urge Date:	7 OAry	UL.	Time Purg	ing Began:	1253	am/pm
Total W	/ell Depth:		ft ft		Well Ρι	rged Dry?	Yes	<b>(Vo)</b>	Time P	urged Dry:	-	am/pm
We	il Volume:		liters		Sar	nple Date:	30 Aus	M-	Time of	Sampling:	1353	am/om
Depth to Top	of Pump:	NY	2.03 44.52 ft									
Water Level Afte	r Sample:	· ·	12,73 ft		Bottle	500 m	L Nitric	1 Lite	r Raw			
Measuremen	t Method:	Electric \	Nater Level Indicator		List:		500 mL Nitrie	c (filtered)		4 - 1 Lite	er Nitric	
					_							

### Field Measurements

							· · · · · · · · · · · · · · · · · · ·			
	ization secutive)	Temp (°C)	Spec. Cond.	pН	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Water Level (ft)	mL Removed	Discription: Clarity, Color, Odor, Ect.
SEQ#	Time		±5%	±0.1	±10%	±20 mV	±10%	0.25 ft		clear, slightly turbid, turbid
1	1258	13,24	5762	6.59	1,46	-99.6	69,8	42.29	500	Slight twood
2	1308	13,43	5300	6.51	2.10	-51.5	25.4	42,29	501000	
3	1318	1378	5275	6.47	1.25	-32,7	16.0	42,32	1000	Cler
4	1328	14.16	5273	6.48	1.92	-23,7	7.61	42.36	1000	ru
5	1333	13.99	5279	648	1.87	-21,8	3.31	42.38	500	la
6	1338	13,73	5290	6.48	1,90	-21,2	2.65	42.43	500	Cly
7	1343	14.00	5278	6,48	1.80	-20,5	1.78	42,43	500	can
8	1348	13.83	5281	6.48	1.67	-20,0	1,77	42.50	500	Un
9	1353	13,67	5298	6.45	1.69	-22, b	1.69	4250	500	4
10		L				<u> </u>	<u> </u>	``.		
Stabilized:	Yes /	No				To	otal Volume	Removed:	6000	mL



**Groundwater Assessment** 

Company:	MDU Heskett	
Event:	August 2016	***
Sample ID:	MW 2-90	
Sampling Pe	rsonal: Parren Nicswages	

Phone: (701) 258-9	9720						_						
Weather Conditions:		Temp:	<i>(</i> ^/) °F		Wind:	511	\$ (1) Pre			sip: Sunny / Partly Cloudy)/ Cloudy			
	Well Info	rmation	0					Sa	i	nformatio			
Well Locked?	Yes	(No				Purging	Method:	Blade			Control Settin	ans	
Well Labeled?	(es/	No				Sampling	Method:	Blade	der		Purge: 4	sec	
Casing Straight?	Yes	No				Dedicate	d Equip?:	Yes	No		Recover: 56	sec	
Grout Seal Intact?	Yes	No	Not Visi	ble		Duplicate S		Yes	No		PSI:		
Repairs Necessary:	Necessary:			Duplicate Sa	ample ID:	000-	?		Pumping Rate: / 8 C	mL/mir			
Casing	Diameter:		2''				<u> </u>	15 017			r arribing reason / C	111011111	
Water Level Befo	ore Purge:	2	-1258	ft		Pu	rge Date:	301	M	Time Purg	ing Began: 1617	am/pm	
Total W	Vell Depth:			ft		Well Pur	ged Dry?	Yes	MD)		Purged Dry:	am/pm	
We	ell Volume:			liters			ple Date:	301	11		f Sampling: 1 / 2-	am/or	
Depth to Top	of Pump:		2,60	ft			·	TO FELL			<del></del>	ampi	
Water Level Afte	er Sample:			ft		Bottle	500 mL	Nitric	1 Lite	r Raw			
Measuremen	t Method:	Electric \	Nater Level Inc	dicator		List:		500 mL Nitri			4 - 1 Liter Nitric		
				Field N	/leasure	ments						1	

									1	
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#	Ţime		±5%	±0.1	±10%	±20 mV	±10%	0.25 ft		clear, slightly turbid, turbid
1	1622	11.95	7734	6.83	4,14	-18.0	0.85	21.90	500	ch -
2	1627	11.55	7719	6,87	43,90	-1.9	0.50	2692	500	M-
3	1632	11,54	7694	6.87	3,68	10.6	0,58	21.92	500	Chr.
4	1637	16,62	7676	6-86	3,83	16.3	0,53	2/192	500	
5			·							
6										
7										
8										
9										
10										
Stabilized:	/ Yes	No				To	otal Volume	Removed:	1000	ml

notal Volume Removed: \_\_\_\_\_mL



### **Groundwater Assessment**

Company: MDU Heskett Event: August 2016 Sample ID:

Sampling Personal:

2010	E. Bloady	way A	ve,	DISITIATOR,	'
	Phone:	(701)	25	8-9720	

Weather C	onditions:		Temp:	87)	°F	Wind:	5-5			Precip:	Sunn	y / Partly C	loudy / Clo	oudy
		Well Info	rmation	0 0					Sa	mpling l	nformatic	on <u> </u>		
We	II Locked?	Yes	440			•	Purgin	ng Method:	Blad	der		Co	ntrol Settin	gs
Wel	l Labeled?	(es)	No				Samplin	ng Method:	Blad	der		Purge:	Ч	sec.
Casing	g Straight?	Xes	No		<u> </u>		Dedicate	ed Equip?:	(Yes_)	No		Recover:	57	sec.
Grout S	eal Intact?	Yes	No	Not V	isible		Duplicate	Sample?:	Yes	No		PSI:	~	
Repairs Ne	ecessary:						Duplicate S	Sample ID:	<del></del>			Pumping R	ate: <i>ʃ <u>(</u>) (</i> )	) mL/min
	Casing	Diameter:		2"	5						·			
Wate	er Level Bet			19,00	\$ ft			urge Date:	30Ay	16	Time Purgi		1455	am/pm
	Total V	Vell Depth:			ft			urged Dry?	Yes	NO		urged Dry:	<del> </del>	am/pm
		ell Volume:			liters		Sar	mple Date:	30Ac	3/6	Time of	Sampling:	1515	am/6m
	Depth to To		- 12	0,17	ft		ļ		· · · · · · · · · · · · · · · · · · ·					
	er Level Aft			19112	ft		Bottle	500 m	L Nitric		r Raw		,	
N	1easureme	nt Method:	Electric \	Water Level	Indicator		List:		500 mL Nitr	ric (filtered)		4 - 1 Lit	er Nitric	
					Field	Measure	ments							
Stabili	ization	Temp	Spec.		DO	ORP	Turbidity	Water	mL		Discription:	:		
(3 cons	ecutive)	(°C)	Cond.	pН	(mg/L)	(mV)	(NTU)	Level (ft)	Removed	Clarity	, Color, Od	or, Ect.		
SEQ#	Time		±5%	±0.1	±10%	±20 mV	±10%	0.25 ft		clear	slightly turbid,	, turbid		
1	1500	12,78	5228	6.81	2.22	-195°	2.80	19,12	500	04				
2	1505	12,70	5228	6.79	2007	-196.4	1.50	19,12	500	64				
3	1510	1413	5205	6.84	2,00	-190.7	1.62	19,12	500	05-	_			
4	1515	13.80	5222	6,80	1,96	-186,6	1661	12112	500	Cler	-			
5		1// 1												
6														
7														
8														
9														
10													1	
Stabilized:		No	<del></del>			T	otal Volume	Removed:	2000	mL			•	
Comments	<b>s</b> :		/			r						•		
			Ner	e dy	2 0	lot	D.F.	175 B	in thi	5 10/4	01)	1/	~ ·	_
	<b>d</b>	Λ.,	1		(~	ι Ο ΄	UIOL	100 1	/ I / I'	<i>γ</i> ν ν τ	/   ·	1 Kti	10 1	>
	$V \cap O$	dort	10 Th	4 Wa	YET.									



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October 21, 2016

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

RE: Groundwater Sampling Event- MDU Heskett Ash Site

Dear Ms. Marshall:

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

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

Sincerely,

Jeremy Meyer

**MVTL Field Services** 



**MDU Heskett** 

**GROUNDWATER SAMPLING - NDDH** 

Attn: Samantha Marshall

400 N. 4th St

Bismarck, ND 58501

701-222-7829

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

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





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### CASE NARRATIVE

MVTL Lab Reference No/SDG:

201682-2748

Client:

**Montana Dakota Utilities** 

Location:

**MDU Heskett** 

**Project Identification:** 

CCR August 2016

**MVTL Laboratory Identifications:** 

16-W3866 through 16-W3869

Page 1 of 2

MDU Sample Identification	MVTL Laboratory #
Field Blank (FB)	16-W3866
MW104	16-W3867
MW80R	16-W3868
MW105	16-W3869

#### ١. RECEIPT

- All samples were received at the laboratory on 31 Aug 2016 at 1447.
- Samples were collected and hand delivered by MVTL Field Service personnel to the laboratory.
- Samples were received on ice and evidence of cooling had begun.
  - o Temperature of samples upon receipt was 3.8°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.

#### **ANALYSIS** IV.

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



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### **CASE NARRATIVE**

MVTL Lab Reference No/SDG:

Client: Location:

**Project Identification:** 

**MVTL Laboratory Identifications:** 

Page 2 of 2

201682-2748

**Montana Dakota Utilities** 

**MDU** Heskett

CCR August 2016

16-W3866 through 16-W3869

- The recoveries for two selenium matrix spike/matrix spike duplicate were outside the acceptable limits. RPD for the recoveries was within limits. High recoveries were determined to be due to sample matrix. Data was accepted based on acceptable recovery of the LCS. No further action was taken.
- One selenium matrix spike duplicate recovery was outside the acceptable limits. for the matrix spike was acceptable. RPD for the recoveries of the matrix spike duplicate and the matrix spike was within limits. No further action was taken.
- o Recovery for one selenium matrix spike was outside of the acceptable limits. Recovery of the matrix spike duplicate was acceptable. RPD for the recoveries of the matrix spike/matrix spike duplicate was acceptable. No further action was taken.

SIGNED:	Claudette		DATE:	16 Sep 16	
Claudette	Carroll - MVTL Bismar	ck Laboratory Ma	nager	•	

All laboratory data has been approved by MVTL Laboratories



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Samantha Marshall Montana Dakota Utilities 400 N. 4th

Bismarck ND 58501

Project Name: MDU Heskett CCR GR August 2016

Sample Description: Field Blank (FB)

Page: 1 of 2

Report Date: 15 Sep 16 Lab Number: 16-W3866 Work Order #:82-2748 Account #: 002800

Date Sampled: 31 Aug 16

Date Received: 31 Aug 16 14:47 Sampled By: MVTL Field Services

Temp at Receipt: 3.8C ROI

	As Receive Result	ed	Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	31 Aug 16 M	ML
рн	* 6.8	units	N/A	SM4500 H+ B	31 Aug 16 17:00 N	ML
Total Suspended Solids	< 1	mg/l	1	I3765-85	1 Sep 16 16:20 N	ML
Total Alkalinity	< 20	mg/l CaCO3	20	SM2320-B	31 Aug 16 17:00 N	ML
Fluoride	< 0.1	mg/l	0.10	SM4500-F-C	31 Aug 16 17:00 M	ML
Sulfate	< 5	mg/l	5.00	ASTM D516-07	2 Sep 16 9:51 H	EMS
Chloride	< 1	mg/l	1.0	SM4500-C1-E	1 Sep 16 11:50 I	EMS
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	9 Sep 16 11:30 H	EV
Mercury - Dissolved	< 0.0002	mg/l	0.0002	EPA 245.1	13 Sep 16 13:06 H	EV
Total Dissolved Solids	< 5	mg/l	5	I1750-85	1 Sep 16 15:50 N	ML
Calcium - Total	< 1	mg/l	1.0	6010	2 Sep 16 16:39 S	SZ
Magnesium - Total	< 1	mg/l	1.0	6010	2 Sep 16 16:39 S	SZ
Sodium - Total	< 1	mg/l	1.0	6010	2 Sep 16 16:39 S	SZ
Potassium - Total	< 1	mg/l	1.0	6010	2 Sep 16 16:39 S	SZ
Lithium - Total	< 0.1	mg/l	0.10	6010	7 Sep 16 9:47 H	KMD
Boron - Total	< 0.1	mg/l	0.10	6010	6 Sep 16 14:12 H	KMD
Calcium - Dissolved	< 1	mg/l	1.0	6010	12 Sep 16 13:23 H	KMD
Magnesium - Dissolved	< 1	mg/l	1.0	6010	12 Sep 16 13:23 H	KMD
Sodium - Dissolved	< 1	mg/l	1.0	6010	12 Sep 16 13:23 H	KMD
Potassium - Dissolved	< 1	mg/l	1.0	6010	12 Sep 16 13:23 H	KMD
Lithium - Dissolved	< 0.1	mg/l	0.10	6010	7 Sep 16 10:47 H	KMD
Boron - Dissolved	< 0.1	mg/l	0.10	6010	6 Sep 16 15:12 H	KMD
Antimony - Total	< 0.001	mg/l	0.0010	6020	14 Sep 16 14:15 (	CC
Arsenic - Total	< 0.002	mg/l	0.0020	6020	14 Sep 16 14:15 (	CC
Barium - Total	< 0.002	mg/l	0.0020	6020	14 Sep 16 14:15 (	CC
Beryllium - Total	< 0.0005	mg/l	0.0005	6020	14 Sep 16 14:15 (	CC
Cadmium - Total	< 0.0005	mg/l	0.0005	6020	14 Sep 16 14:15 (	CC
Chromium - Total	< 0.002	mg/l	0.0020	6020	14 Sep 16 14:15 (	CC
Cobalt - Total	< 0.002	mg/l	0.0020	6020	14 Sep 16 14:15 (	CC
Lead - Total	< 0.0005	mg/l	0.0005	6020	14 Sep 16 14:15 (	CC
Molybdenum - Total	< 0.002	mg/l	0.0020	6020	14 Sep 16 14:15 (	CC
Selenium - Total	< 0.002	mg/l	0.0020	6020	14 Sep 16 14:15 (	CC
Thallium - Total	< 0.0005	mg/l	0.0005	6020	14 Sep 16 14:15 (	CC
Antimony - Dissolved	< 0.001	mg/l	0.0010	6020	14 Sep 16 19:37 (	CC
Arsenic - Dissolved	< 0.002	mg/l	0.0020	6020	14 Sep 16 19:37 (	CC
Barium - Dissolved	< 0.002	mg/l	0.0020	6020	14 Sep 16 19:37 (	CC
Beryllium - Dissolved	< 0.0005	mg/l	0.0005	6020	14 Sep 16 19:37 (	CC
Cadmium - Dissolved	< 0.0005	mg/l	0.0005	6020	14 Sep 16 19:37 (	CC

RL = Method Reporting Limit

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

@ = Due to sample matrix # = Due to 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 GR August 2016 Sample Description: Field Blank (FB)

2 of 2 Page:

Report Date: 15 Sep 16 Lab Number: 16-W3866 Work Order #:82-2748 Account #: 002800

Date Sampled: 31 Aug 16 Date Received: 31 Aug 16 14:47

Sampled By: MVTL Field Services

Temp at Receipt: 3.8C ROI

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
Chromium - Dissolved	< 0.002 mg/l	0.0020	6020	14 Sep 16 19:37	CC
Cobalt - Dissolved	< 0.002 mg/1	0.0020	6020	14 Sep 16 19:37	CC
Lead - Dissolved	< 0.0005 mg/1	0.0005	6020	14 Sep 16 19:37	CC
Molybdenum - Dissolved	< 0.002 mg/1	0.0020	6020	14 Sep 16 19:37	CC
Selenium - Dissolved	$< 0.005 ^ mg/1$	0.0020	6020	15 Sep 16 15:19	CC
Thallium - Dissolved	< 0.0005 mg/l	0.0005	6020	15 Sep 16 15:19	CC

<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 code #= Due to sample quantity #= Due to integrate #= Due to integr

# = 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 GR August 2016

Sample Description: MW104

Page: 1 of 2

Report Date: 15 Sep 16 Lab Number: 16-W3867 Work Order #:82-2748 Account #: 002800

Date Sampled: 31 Aug 16 9:00 Date Received: 31 Aug 16 14:47 Sampled By: MVTL Field Services

Temp at Receipt: 3.8C ROI

	As Receive Result	ed	Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	31 Aug 16	ML
Hq	* 6.9	units	N/A	SM4500 H+ B	31 Aug 16 17:00	ML
Total Suspended Solids	10	mg/l	1	I3765-85	1 Sep 16 16:20	ML
pH - Field	6.88	units	NA	SM 4500 H+ B	31 Aug 16 9:00	DJN
Temperature - Field	12.4	Degrees C	NA	SM 2550B	31 Aug 16 9:00	DJN
Total Alkalinity	562	mg/l CaCO3	20	SM2320-B	31 Aug 16 17:00	ML
Conductivity - Field	14048	umhos/cm	1	EPA 120.1	31 Aug 16 9:00	DJN
Fluoride	0.49	mg/l	0.10	SM4500-F-C	31 Aug 16 17:00	ML
Sulfate	10500	mg/l	5.00	ASTM D516-07	2 Sep 16 10:33	EMS
Chloride	99.6	mg/l	1.0	SM4500-Cl-E	1 Sep 16 11:50	EMS
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	9 Sep 16 11:30	EV
Mercury - Dissolved	< 0.0002	mg/l	0.0002	EPA 245.1	13 Sep 16 13:06	EV
Total Dissolved Solids	14600	mg/l	5	I1750-85	1 Sep 16 15:50	ML
Calcium - Total	441	mg/l	1.0	6010	2 Sep 16 17:39	SZ
Magnesium - Total	1620	mg/l	1.0	6010	2 Sep 16 17:39	SZ
Sodium - Total	2100	mg/l	1.0	6010	2 Sep 16 17:39	SZ
Potassium - Total	37.8	mg/l	1.0	6010	2 Sep 16 17:39	SZ
Lithium - Total	2.92	mg/l	0.10	6010	7 Sep 16 9:47	KMD
Boron - Total	1.03	mg/l	0.10	6010	6 Sep 16 14:12	KMD
Calcium - Dissolved	467	mg/l	1.0	6010	12 Sep 16 13:23	KMD
Magnesium - Dissolved	1670	mg/l	1.0	6010	12 Sep 16 13:23	KMD
Sodium - Dissolved	2180	mg/l	1.0	6010	12 Sep 16 13:23	KMD
Potassium - Dissolved	35.6	mg/l	1.0	6010	12 Sep 16 13:23	KMD
Lithium - Dissolved	2.66	mg/1	0.10	6010	7 Sep 16 10:47	KMD
Boron - Dissolved	0.98	mg/l	0.10	6010	6 Sep 16 15:12	KMD
Antimony - Total	< 0.001	mg/l	0.0010	6020	14 Sep 16 14:15	CC
Arsenic - Total	< 0.001	mg/l	0.0020	6020	14 Sep 16 14:15	CC
Barium - Total	0.0087	mg/l	0.0020	6020	14 Sep 16 14:15	CC
Beryllium - Total	< 0.0005	mg/l	0.0005	6020	14 Sep 16 14:15	CC
Cadmium - Total	< 0.0005	mg/l	0.0005	6020	14 Sep 16 14:15	CC
Chromium - Total	< 0.0003	mg/l	0.0020	6020	14 Sep 16 14:15	CC
Cobalt - Total	0.0021	mg/l	0.0020	6020	14 Sep 16 14:15	CC
Lead - Total	< 0.0021	mg/l	0.0005	6020	14 Sep 16 14:15	CC
Molybdenum - Total	< 0.002	mg/l	0.0020	6020	14 Sep 16 14:15	CC
Selenium - Total	0.1752	mg/l	0.0020	6020	14 Sep 16 14:15	CC
Thallium - Total	< 0.0005	mg/l	0.0005	6020	14 Sep 16 14:15	CC
Antimony - Dissolved	< 0.0003	mg/l	0.0010	6020	14 Sep 16 19:37	CC
Arsenic - Dissolved	< 0.001	mg/l	0.0010	6020	14 Sep 16 19:37	CC
WIPCHIC - DIPPOINED	< 0.002	j / ±	0.0020			

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

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

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

CERTIFICATION: ND # ND-00016

all conditions affecting the sample are the same, including sampling by MVTL. As a mutual protection to clients, the public and ourselves, all reports are submitted as the confidential property of clients, and authorization for



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

Project Name: MDU Heskett CCR GR August 2016

Sample Description: MW104

2 of 2 Page:

Report Date: 15 Sep 16 Lab Number: 16-W3867 Work Order #:82-2748 Account #: 002800

Date Sampled: 31 Aug 16 9:00 Date Received: 31 Aug 16 14:47 Sampled By: MVTL Field Services

Temp at Receipt: 3.8C ROI

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
Barium - Dissolved	0.0079 mg/l	0.0020	6020	14 Sep 16 19:37	CC
Beryllium - Dissolved	< 0.0005 mg/1	0.0005	6020	14 Sep 16 19:37	CC
Cadmium - Dissolved	< 0.0005 mg/1	0.0005	6020	14 Sep 16 19:37	CC
Chromium - Dissolved	< 0.002 mg/1	0.0020	6020	14 Sep 16 19:37	CC
Cobalt - Dissolved	0.0021 mg/l	0.0020	6020	14 Sep 16 19:37	CC
Lead - Dissolved	< 0.0005 mg/l	0.0005	6020	14 Sep 16 19:37	CC
Molybdenum - Dissolved	< 0.002 mg/1	0.0020	6020	14 Sep 16 19:37	CC
Selenium - Dissolved	0.1612 mg/l	0.0020	6020	15 Sep 16 15:19	CC
Thallium - Dissolved	< 0.0005 mg/l	0.0005	6020	15 Sep 16 15:19	CC

\* Holding time exceeded

Approved by:

Clauditte K. 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



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

Project Name: MDU Heskett CCR GR August 2016

Sample Description: MW80R

1 of 2 Page:

Report Date: 15 Sep 16 Lab Number: 16-W3868 Work Order #:82-2748 Account #: 002800

Date Sampled: 31 Aug 16 10:24 Date Received: 31 Aug 16 14:47 Sampled By: MVTL Field Services

Temp at Receipt: 3.8C ROI

	As Receive	ed	Method	Method	Dat		_
	Result		RL	Reference	Ana	lyzed	Analyst
Metal Digestion				EPA 200.2	31	Aug 16	ML
рН	* 7.1	units	N/A	SM4500 H+ B	31	Aug 16 17:00	ML
Total Suspended Solids	7	mg/l	1	I3765-85	1	Sep 16 16:20	ML
pH - Field	7.01	units	NA	SM 4500 H+ B	31	Aug 16 10:24	DJN
Temperature - Field	12.6	Degrees C	NA	SM 2550B	31	Aug 16 10:24	DJN
Total Alkalinity	537	mg/l CaCO3	20	SM2320-B	31	Aug 16 17:00	ML
Conductivity - Field	5734	umhos/cm	1	EPA 120.1	31	Aug 16 10:24	DJN
Fluoride	0.30	mg/l	0.10	SM4500-F-C	31	Aug 16 17:00	ML
Sulfate	2950	mg/l	5.00	ASTM D516-07	2	Sep 16 10:33	EMS
Chloride	181	mg/l	1.0	SM4500-Cl-E	1	Sep 16 11:50	EMS
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	9	Sep 16 11:30	EV
Mercury - Dissolved	< 0.0002	mg/l	0.0002	EPA 245.1	13	Sep 16 13:06	EV
Total Dissolved Solids	5120	mg/l	5	I1750-85	1	Sep 16 15:50	ML
Calcium - Total	284	mg/l	1.0	6010	2	Sep 16 17:39	SZ
Magnesium - Total	570	mg/l	1.0	6010	2	Sep 16 17:39	SZ
Sodium - Total	595	mg/l	1.0	6010	2	Sep 16 17:39	SZ
Potassium - Total	< 5 @	mg/l	1.0	6010	2	Sep 16 17:39	SZ
Lithium - Total	1.11	mg/l	0.10	6010	7	Sep 16 9:47	KMD
Boron - Total	0.39	mg/l	0.10	6010	6	Sep 16 14:12	KMD
Calcium - Dissolved	302	mg/l	1.0	6010	12	Sep 16 13:23	KMD
Magnesium - Dissolved	595	mg/l	1.0	6010	12	Sep 16 13:23	KMD
Sodium - Dissolved	645	mg/l	1.0	6010	12	Sep 16 13:23	KMD
Potassium - Dissolved	4.0	mg/l	1.0	6010	12	Sep 16 13:23	KMD
Lithium - Dissolved	0.94	mg/l	0.10	6010	7	Sep 16 10:47	KMD
Boron - Dissolved	0.36	mg/l	0.10	6010	6	Sep 16 15:12	KMD
Antimony - Total	< 0.001	mg/l	0.0010	6020	14	Sep 16 14:15	CC
Arsenic - Total	< 0.002	mg/l	0.0020	6020	14	Sep 16 14:15	CC
Barium - Total	0.0140	mg/l	0.0020	6020	14	Sep 16 14:15	CC
Beryllium - Total	< 0.0005	mg/l	0.0005	6020	14	Sep 16 14:15	CC
Cadmium - Total	< 0.0005	mg/l	0.0005	6020	14	Sep 16 14:15	CC
Chromium - Total	< 0.002	mg/l	0.0020	6020	14	Sep 16 14:15	CC
Cobalt - Total	< 0.002	mg/l	0.0020	6020	14	Sep 16 14:15	CC
Lead - Total	< 0.0005	mg/l	0.0005	6020	14	Sep 16 14:15	CC
Molybdenum - Total	0.0039	mg/l	0.0020	6020	14	Sep 16 14:15	CC
Selenium - Total	0.0617	mg/l	0.0020	6020	14	Sep 16 14:15	CC
Thallium - Total	< 0.0005	mg/l	0.0005	6020	14	Sep 16 14:15	CC
Antimony - Dissolved	< 0.001	mg/l	0.0010	6020	14	Sep 16 19:37	CC
Arsenic - Dissolved	< 0.002	mg/l	0.0020	6020	14	Sep 16 19:37	CC

RL = Method Reporting Limit

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! = Due to sample quantity + = Due to int

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+ = 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 GR August 2016

Sample Description: MW80R

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Report Date: 15 Sep 16 Lab Number: 16-W3868 Work Order #:82-2748 Account #: 002800

Date Sampled: 31 Aug 16 10:24 Date Received: 31 Aug 16 14:47 Sampled By: MVTL Field Services

Temp at Receipt: 3.8C ROI

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
Barium - Dissolved	0.0109 mg/l	0.0020	6020	14 Sep 16 19:37	CC
Beryllium - Dissolved	< 0.0005 mg/1	0.0005	6020	14 Sep 16 19:37	CC
Cadmium - Dissolved	< 0.0005 mg/l	0.0005	6020	14 Sep 16 19:37	CC
Chromium - Dissolved	< 0.002 mg/1	0.0020	6020	14 Sep 16 19:37	CC
Cobalt - Dissolved	< 0.002 mg/1	0.0020	6020	14 Sep 16 19:37	CC
Lead - Dissolved	< 0.0005 mg/1	0.0005	6020	14 Sep 16 19:37	CC
Molybdenum - Dissolved	0.0031 mg/l	0.0020	6020	14 Sep 16 19:37	CC
Selenium - Dissolved	0.0589 mg/l	0.0020	6020	15 Sep 16 15:19	CC
Thallium - Dissolved	< 0.0005 mg/l	0.0005	6020	15 Sep 16 15:19	CC

\* Holding time exceeded

Approved by:

Clauditte K. 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 interport to the conduct to the conduct

# = Due to concentration of other analytes
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Samantha Marshall Montana Dakota Utilities 400 N. 4th Bismarck ND 58501

Project Name: MDU Heskett CCR GR August 2016

Sample Description: MW105

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Report Date: 15 Sep 16 Lab Number: 16-W3869 Work Order #:82-2748 Account #: 002800

Date Sampled: 31 Aug 16 12:44 Date Received: 31 Aug 16 14:47 Sampled By: MVTL Field Services

Temp at Receipt: 3.8C ROI

	As Receive Result	ed	Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	31 Aug 16	ML
	* 6.7	units	N/A	SM4500 H+ B	31 Aug 16 17:00	ML
Total Suspended Solids	15	mg/l	1	I3765-85	1 Sep 16 16:20	ML
pH - Field	6.64	units	NA	SM 4500 H+ B	31 Aug 16 12:44	DJN
Temperature - Field	13.1	Degrees C	NA	SM 2550B	31 Aug 16 12:44	DJN
Total Alkalinity	449	mg/l CaCO3	20	SM2320-B	31 Aug 16 17:00	ML
Conductivity - Field	7590	umhos/cm	1	EPA 120.1	31 Aug 16 12:44	DJN
Fluoride	0.25	mg/l	0.10	SM4500-F-C	31 Aug 16 17:00	ML
Sulfate	4550	mg/l	5.00	ASTM D516-07	2 Sep 16 10:33	EMS
Chloride	425	mg/l	1.0	SM4500-Cl-E	1 Sep 16 11:50	EMS
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	9 Sep 16 11:30	EV
Mercury - Dissolved	< 0.0002	mg/l	0.0002	EPA 245.1	13 Sep 16 13:06	EV
Total Dissolved Solids	7190	mg/l	5	I1750-85	1 Sep 16 15:50	ML
Calcium - Total	408	mg/l	1.0	6010	2 Sep 16 17:39	SZ
Magnesium - Total	830	mg/l	1.0	6010	2 Sep 16 17:39	SZ
Sodium - Total	800	mg/l	1.0	6010	2 Sep 16 17:39	SZ
Potassium - Total	20.1	mg/l	1.0	6010	2 Sep 16 17:39	SZ
Lithium - Total	1.47	mg/l	0.10	6010	7 Sep 16 9:47	KMD
Boron - Total	0.41	mg/l	0.10	6010	6 Sep 16 14:12	KMD
Calcium - Dissolved	445	mg/l	1.0	6010	12 Sep 16 13:23	KMD
Magnesium - Dissolved	880	mg/l	1.0	6010	12 Sep 16 13:23	KMD
Sodium - Dissolved	885	mg/l	1.0	6010	12 Sep 16 13:23	KMD
Potassium - Dissolved	20.5	mg/l	1.0	6010	12 Sep 16 13:23	KMD
Lithium - Dissolved	1.39	mg/l	0.10	6010	7 Sep 16 10:47	KMD
Boron - Dissolved	0.39	mg/l	0.10	6010	6 Sep 16 15:12	KMD
Antimony - Total	< 0.001	mg/l	0.0010	6020	14 Sep 16 14:15	CC
Arsenic - Total	< 0.002	mg/l	0.0020	6020	14 Sep 16 14:15	CC
Barium - Total	0.0240	mg/l	0.0020	6020	14 Sep 16 14:15	CC
Beryllium - Total	< 0.0005	mg/l	0.0005	6020	14 Sep 16 14:15	CC
Cadmium - Total	< 0.0005	mg/l	0.0005	6020	14 Sep 16 14:15	CC
Chromium - Total	< 0.002	mg/l	0.0020	6020	14 Sep 16 14:15	CC
Cobalt - Total	< 0.002	mg/l	0.0020	6020	14 Sep 16 14:15	CC
Lead - Total	< 0.0005	mg/l	0.0005	6020	14 Sep 16 14:15	CC
Molybdenum - Total	< 0.002	mg/l	0.0020	6020	14 Sep 16 14:15	CC
Selenium - Total	0.0036	mg/l	0.0020	6020	14 Sep 16 14:15	CC
Thallium - Total	< 0.0005	mg/l	0.0005	6020	14 Sep 16 14:15	CC
Antimony - Dissolved	< 0.001	mg/l	0.0010	6020	14 Sep 16 19:37	CC
Arsenic - Dissolved	< 0.002	mg/l	0.0020	6020	14 Sep 16 19:37	CC

RL = Method Reporting Limit

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

Project Name: MDU Heskett CCR GR August 2016 Sample Description: MW105

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Report Date: 15 Sep 16 Lab Number: 16-W3869 Work Order #:82-2748 Account #: 002800

Date Sampled: 31 Aug 16 12:44 Date Received: 31 Aug 16 14:47 Sampled By: MVTL Field Services

Temp at Receipt: 3.8C ROI

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
Barium - Dissolved	0.0171 mg/l	0.0020	6020	14 Sep 16 19:37	CC
Beryllium - Dissolved	< 0.0005 mg/1	0.0005	6020	14 Sep 16 19:37	CC
Cadmium - Dissolved	< 0.0005 mg/1	0.0005	6020	14 Sep 16 19:37	CC
Chromium - Dissolved	< 0.002 mg/1	0.0020	6020	14 Sep 16 19:37	CC
Cobalt - Dissolved	< 0.002 mg/l	0.0020	6020	14 Sep 16 19:37	CC
Lead - Dissolved	< 0.0005 mg/1	0.0005	6020	14 Sep 16 19:37	CC
Molybdenum - Dissolved	< 0.002 mg/l	0.0020	6020	14 Sep 16 19:37	CC
Selenium - Dissolved	$< 0.005 ^ mg/l$	0.0020	6020	15 Sep 16 15:19	CC
Thallium - Dissolved	< 0.0005 mg/1	0.0005	6020	15 Sep 16 15:19	CC

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

Approved by:

Clauditte K. Canto

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

# = 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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Quality Control Report Lab IDs: 16-W3866 to 16-W3869

Project: MDU Heskett CCR GR August 2016

Work Order: 201682-2748

Page: 1 of 5

Lab IDS: 10-W3800 to 10-W3809 Project: MIDU Heskett CCR GR August 2016									Work Order: 201682-2748								
Analyte	LCS Spike Amt	LCS Rec %	LCS % Rec Limits	Matrix Spike Amt	Matrix Spike ID	Matrix Spike Orig Result	Matrix Spike Result	Matrix Spike Rec %	Matrix Spike % Rec Limits	MSD/ Dup Orig Result	MSD/ Dup Result	MSD Rec %	MSD/ Dup RPD	MSD/ Dup RPD Limit (<)	Known Rec (%)	Known % Rec Limits	Method Blank
Antimony - Dissolved mg/l	0.1000	110	80-120	0.100	16-W3869	< 0.001	0.1084	108	75-125	0.1084	0.1138	114	4.9	20	-	-	< 0.001
Antimony - Total mg/l	0.1000	104	80-120	0.400 0.400 0.400	16W3855q 16W3874q 16W3898q	< 0.001 < 0.001 < 0.001	0.4272 0.4506 0.4428	107 113 111	75-125 75-125 75-125	0.4272 0.4506 0.4428	0.4114 0.4456 0.4556	103 111 114	3.8 1.1 2.8	20 20 20	-		< 0.001
Arsenic - Dissolved mg/l	0.1000	110	80-120	0.100	16-W3869	< 0.002	0.1165	116	75-125	0.1165	0.1212	121	4.0	20	_	_	< 0.002
Arsenic - Total mg/l	0.1000	104	80-120	0.400 0.400 0.400	16W3855q 16W3874q 16W3898q	0.0032 0.0064 0.0028	0.4442 0.4668 0.4684	110 115 116	75-125 75-125 75-125	0.4442 0.4668 0.4684	0.4186 0.4570 0.4740	104 113 118	5.9 2.1 1.2	20 20 20	-	-	< 0.002
Barium - Dissolved mg/l	0.1000	102	80-120	0.100	16-W3869	0.0171	0.1272	110	75-125	0.1272	0.1258	109	1.1	20	-	-	< 0.002
Barium - Total mg/l	0.1000	105	80-120	0.400 0.400 0.400	16W3855q 16W3874q 16W3898q	0.0702 0.0482 0.0304	0.4890 0.4812 0.4766	105 108 112	75-125 75-125 75-125	0.4890 0.4812 0.4766	0.4828 0.4888 0.4784	103 110 112	1.3 1.6 0.4	20 20 20	- - -		< 0.002
Beryllium - Dissolved mg/l	0.1000	112	80-120	0.100	16-W3869	< 0.0005	0.1179	118	75-125	0.1179	0.1197	120	1.5	20	-	_	< 0.0005
Beryllium - Total mg/l	0.1000	106	80-120	0.400 0.400	16W3855q 16W3874q	< 0.0005 < 0.0005	0.5018 0.5008	125 125	75-125 75-125	0.5018 0.5008 0.4986	0.4690 0.4878 0.5002	117 122	6.8 2.6 0.3	20 20 20	-	-	< 0.0005
Boron - Dissolved mg/l	0.40	110	80-120	0.600	16-W3869	0.39	0.96	95	75-125	0.96	0.96	95	0.0	20	-	-	< 0.1 < 0.1
Boron - Total mg/l	0.40	102	80-120	0.400 0.400 0.400 0.400	16-D3542 16-W3786 16-W3829 16-W3855	1.51 0.21 0.42 0.26	1.92 0.58 0.78 0.66	102 92 90 100	75-125 75-125 75-125 75-125	1.92 0.58 0.78 0.66	1.99 0.59 0.80 0.69	120 95 95 108	3.6 1.7 2.5 4.4	20 20 20 20 20	- - -	-	< 0.1 < 0.1 < 0.1
Cadmium - Dissolved mg/l	0.1000	114	80-120	0.100	16-W3869	< 0.0005	0.1046	105	75-125	0.1046	0.1098	110	4.9	20	-	-	< 0.0005
Cadmium - Total mg/l	0.1000	109	80-120	0.400 0.400 0.400	16W3855q 16W3874q 16W3898q	< 0.0005 < 0.0005 < 0.0005	0.4452 0.4612 0.4532	111 115 113	75-125 75-125 75-125	0.4452 0.4612 0.4532	0.4246 0.4690 0.4518	106 117 113	4.7 1.7 0.3	20 20 20	-	-	< 0.0005

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**Quality Control Report** 

Page: 2 of 5

Lab IDs: 16-W3866 to 16-	W3869	P	roject: Ml	DU Hesk	ett CCR GR A		6			Work Order: 201682-2748							
Analyte	LCS Spike Amt	LCS Rec %	LCS % Rec Limits	Matrix Spike Amt	Matrix Spike ID	Matrix Spike Orig Result	Matrix Spike Result	Matrix Spike Rec %	Matrix Spike % Rec Limits	MSD/ Dup Orig Result	MSD/ Dup Result	MSD Rec %	MSD/ Dup RPD	MSD/ Dup RPD Limit (<)	Known Rec (%)	Known % Rec Limits	Method Blank
Calcium - Dissolved mg/l	20.0 20.0	108 106	80-120 80-120	500 500	16-W3827 16-W3869	505 445	1040 1020	107 115	75-125 75-125	1040 1020	1020 995	103 110	1.9 2.5	20 20	- - -	- - -	< 1 < 1 < 1 < 1
Calcium - Total mg/l	20.0 20.0	102 114	80-120 80-120	500 100 100	16W3829q 16W3859q 16W3885q	358 17.8 60.9	800 121 155	88 103 94	75-125 75-125 75-125	800 121 155	800 121 158	88 103 97	0.0 0.0 1.9	20 20 20		-	< 1 < 1 < 1 < 1
Chloride mg/l	30.0	101	80-120	30.0	16-W3827	84.1	112	93	80-120	112	113	96	0.9	20	-	-	< 1 < 1 < 1
Chromium - Dissolved mg/l	0.1000	103	80-120	0.100	16-W3869	< 0.002	0.1106	111	75-125	0.1106	0.1155	116	4.3	20	-	-	< 0.002
Chromium - Total mg/l	0.1000	97	80-120	0.400 0.400 0.400	16W3855q 16W3874q 16W3898q	< 0.002 < 0.002 < 0.002	0.4026 0.4136 0.4216	101 103 105	75-125 75-125 75-125	0.4026 0.4136 0.4216	0.3860 0.4100 0.4282	96 102 107	4.2 0.9 1.6	20 20 20		-	< 0.002
Cobalt - Dissolved mg/l	0.1000	102	80-120	0.100	16-W3869	< 0.002	0.1080	108	75-125	0.1080	0.1132	113	4.7	20	-	-	< 0.002
Cobalt - Total mg/l	0.1000	99	80-120	0.400 0.400 0.400	16W3855q 16W3874q 16W3898q	< 0.002 < 0.002 < 0.002	0.4172 0.4188 0.4166	104 105 104	75-125 75-125 75-125	0.4172 0.4188 0.4166	0.3900 0.4096 0.4290	98 102 107	6.7 2.2 2.9	20 20 20	-	-	< 0.002
Fluoride mg/l	0.50	100	90-110	0.500 0.500	16-D3564 16-W3869	2.46 0.25	2.90 0.66	88 82	80-120 80-120	2.90 0.66	2.93 0.67	94 84	1.0 1.5	20 20	-	-	< 0.1 < 0.1
Lead - Dissolved mg/l	0.1000	105	80-120	0.100	16-W3869	< 0.0005	0.1012	101	75-125	0.1012	0.1014	101	0.2	20	-	-	< 0.000
Lead - Total mg/l	0.1000	101	80-120	0.400 0.400 0.400	16W3855q 16W3874q 16W3898q	0.0006 < 0.0005 0.0010	0.4066 0.4256 0.4022	102 106 100	75-125 75-125 75-125	0.4066 0.4256 0.4022	0.4006 0.4282 0.4134	100 107 103	1.5 0.6 2.7	20 20 20	-	-	< 0.000
Lithium - Dissolved mg/l	0.40	100	80-120	0.800 0.800	16-W3827 16-W3869	1.24 1.39	1.87 2.13	79 93	75-125 75-125	1.87 2.13	1.91 2.05	84 82	2.1 3.8	20 20	-	-	< 0.1 < 0.1 < 0.1

**MVTL** 

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**Quality Control Report** 

Page: 3 of 5

<b>Lab IDs:</b> 16-W3866 to 16-W	13009	r.	roject: M	DO Hesk	ett CCR GR A		O Language	N NESTERA SECURIO	- During Circumstance	Lucio de la companya	1-22	Wo.	rk Orde	er: 201682	2-2748		
Analyte	LCS Spike Amt	LCS Rec %	LCS % Rec Limits	Matrix Spike Amt	Matrix Spike ID	Matrix Spike Orig Result	Matrix Spike Result	Matrix Spike Rec %	Matrix Spike % Rec Limits	MSD/ Dup Orig Result	MSD/ Dup Result	MSD Rec %	MSD/ Dup RPD	MSD/ Dup RPD Limit (<)	Known Rec (%)	Known % Rec Limits	Method Blank
Lithium - Total mg/l	0.40	92	80-120	0.400 0.400	16-W3786 16-W3829	0.81 0.44	1.19 0.92	95 120	75-125 75-125	1.19 0.92	1.18 0.93	92 122	0.8	20 20	-	-	< 0.1 < 0.1 < 0.1
Magnesium - Dissolved mg/l	20.0 20.0	111	80-120 80-120	500 500	16-W3827 16-W3869	720 880	1260 1460	108 116	75-125 75-125	1260 1460	1240 1420	104 108	1.6 2.8	20 20	- - -	- - -	<1 <1 <1 <1
Magnesium - Total mg/l	20.0 20.0	106 117	80-120 80-120	500 100 100	16W3829q 16W3859q 16W3885q	148 7.4 28.4	625 113 128	95 106 100	75-125 75-125 75-125	625 113 128	630 113 129	96 106 101	0.8 0.0 0.8	20 20 20		-	< 1 < 1 < 1 < 1
Mercury - Dissolved mg/l	0.0020	90	85-115	0.002 0.002	16-W3868 16-W3869	< 0.0002 < 0.0002		90 85	70-130 70-130	0.0018 0.0017	0.0018 0.0017	90 85	0.0	20 20		-	< 0.0002
Mercury - Total mg/l	0.0020	95	85-115	0.002 0.002 0.002	A43991 16-W3866 16-W3896	< 0.0002 < 0.0002 < 0.0002	0.0019	90 95 95	70-130 70-130 70-130	0.0018 0.0019 0.0019	0.0018 0.0019 0.0018	90 95 90	0.0 0.0 5.4	20 20 20	-	-	< 0.0002
Molybdenum - Dissolved mg/l	0.1000	105	80-120	0.100	16-W3869	< 0.002	0.1140	114	75-125	0.1140	0.1208	121	5.8	20	-	-	< 0.002
Molybdenum - Total mg/l	0.1000	102	80-120	0.400 0.400 0.400	16W3855q 16W3874q 16W3898q	0.0074 0.0069 0.0024	0.4220 0.4358 0.4456	104 107 111	75-125 75-125 75-125	0.4220 0.4358 0.4456	0.4098 0.4268 0.4594	101 105 114	2.9 2.1 3.0	20 20 20	-	-	< 0.002
pH units	-	-	-	-	-	-	-	-	-	12.2 7.5	12.2 7.5	-	0.0	20 20	_	_	_
Potassium - Dissolved mg/l	10.0 10.0	106 103	80-120 80-120	100 100	16-W3827 16-W3869	23.4 20.5	136 140	113 120	75-125 75-125	136 140	134 137	111 116	1.5 2.2	20 20	-	-	< 1 < 1 < 1 < 1

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Quality Control Report Lab IDs: 16-W3866 to 16-W3869

Page: 4 of 5

Project: MDU Heskett CCR GR August 2016 Work Order: 201682-2748

	B. 10-W3600 to 10-W3609 Project: MDU Heskett CCR GR August 2016						Work Order: 201682-2748										
Analyte	LCS Spike Amt	LCS Rec %	LCS % Rec Limits	Matrix Spike Amt	Matrix Spike ID	Matrix Spike Orig Result	Matrix Spike Result	Matrix Spike Rec %	Matrix Spike % Rec Limits	MSD/ Dup Orig Result	MSD/ Dup Result	MSD Rec %	MSD/ Dup RPD	MSD/ Dup RPD Limit (<)	Known Rec (%)	Known % Rec Limits	Method Blank
Potassium - Total mg/l	10.0	91 100	80-120 80-120	100 20.0 20.0	16W3829q 16W3859q 16W3885q	10.3 2.8 4.4	105 24.1 24.0	95 106 98	75-125 75-125 75-125	105 24.1 24.0	108 24.1 24.3	98 106 99	2.8 0.0 1.2	20 20 20	-	-	< 1 < 1 < 1 < 1
Selenium - Dissolved mg/l	0.1000	118	80-120	0.100	16-W3869	< 0.005	0.1246	125	75-125	0.1246	0.1332	129	6.7	20	_		< 0.002
Selenium - Total mg/l	0.1000	115	80-120	0.400 0.400 0.400	16W3855q 16W3874q 16W3898q	< 0.002 < 0.002 0.0024	0.5170 0.5496 0.5150	129 137 128	75-125 75-125 75-125	0.5170 0.5496 0.5150	0.4934 0.5120 0.5286	123 128 132	4.7 7.1 2.6	20 20 20	-	-	< 0.002
Sodium - Dissolved mg/l	20.0 20.0	112 110	80-120 80-120	500 500	16-W3827 16-W3869	805 885	1340 1450	107 113	75-125 75-125	1340 1450	1300 1420	99 107	3.0 2.1	20 20	-	-	< 1 < 1 < 1 < 1
Sodium - Total mg/I	20.0 20.0	98 108	80-120 80-120	500 100 100	16W3829q 16W3859q 16W3885q	493 222 65.3	950 311 162	91 89 97	75-125 75-125 75-125	950 311 162	940 313 160	89 91 95	1.1 0.6 1.2	20 20 20	-	-	< 1 < 1 < 1 < 1
Sulfate mg/l	100 100	97 96	90-110 90-110	100 10000	16-W3828 16-W3867	< 5 10500	95.4 18800	95 83	80-120 80-120	95.4 18800	105 18900	105 84	9.6 0.5	20 20	-	-	< 5 < 5
Thallium - Dissolved mg/l	0.1000	94	80-120	0.100	16-W3869	< 0.0005	0.0876	88	75-125	0.0876	0.0881	88	0.6	20	-	-	< 0.0005
Thallium - Total mg/l	0.1000	98	80-120	0.400 0.400 0.400	16W3855q 16W3874q 16W3898q	< 0.0005 < 0.0005 < 0.0005	0.3982	97 100 96	75-125 75-125 75-125	0.3870 0.3982 0.3838	0.3766 0.4124 0.3880	94 103 97	2.7 3.5 1.1	20 20 20	-	-	< 0.0005
Total Alkalinity mg/l CaCO3	410	99	90-110	410 410	16-W3830 16-W3831	459 484	850 871	95 94	80-120 80-120	850 871	847 872	95 95	0.4	20 20	94	80-120	< 20 < 20
Total Dissolved Solids mg/l	-		-	-	_	-	-	-	-	642	645	-	0.5	20	_	_	< 5
Total Suspended Solids mg/l	_	-	-	-		-	-	-	-	338 15	328 15	-	3.0	20 20	-	-	< 1

Approved by: C-Gurco



2616 E. Broadway Ave, Bismarck, ND

**Water Level** 

Phone: (701) 258-9720

Sampling P		snaag		MDU Heskett
Well ID MW1-90 MW-2	Date 31/Aug 16 31/Aug 16 31/Aug 16	Time 1352 1355 1359	Depth to Water  11.86  38.68	Comments
nw-8 mw-4B	31/Aug 16	140[	17.70	

## **MVTL Calibration Worksheet**

Site: MDU He	skett	Technician:	Darren Nieswaag
Instrument (Circle One):	#1 650 MDS 08F100203	#2 650 MDS 04H14736	#3 556 MPS 12E102056
pH Buffer 7 Buffer 10 Conductivity Buffer 10000	Pre Site Calibration   72 7   Time: 072 7   Post Cal   Post Cal   7.00   7.00   10.00	Post Cal Range mv 50  6.95-7.05	Post Site Check  Time: 143 9  pH
ORP 231 mV @ 25C DO	22,24     8,53     8,24       5,32     256,3     257.2       22,24     8,53     8,24	Barometric Pressure (mm Hg) mg/L 72-1, 0	
pH  Buffer 7  Buffer 10  Conductivity  Buffer 10000	Temp °C Pre Cal Post Cal	Post Cal Range mv 50  6.95-7.05 0 +/- 50  9.95-10.05 -180 +/- 50  Check  ±10% Buffer 5000	Time:  pH Temp °C Reading  Buffer 7  Conductivity  Buffer 5000
ORP 231 mV @ 25C DO	22,24 8.53 8,24	±10 mV  Barometric Pressure (mm Hg)  mg/L	Dullet 5000



**Groundwater Assessment** 

Company:	MDU Heskett	
Event:	August 2016	
Sample ID:	mw/04	

2616 E. Broadway Ave, Bis	marck, ND					•	Sampling F	Personal:	De Com	Niesv	NGas	
Phone: (701) 258-97	720					-		<i></i>				
Veather Conditions:		Temp:	68°F	Wind:	555	10		Precip:	Sunr	y / Fartly C	loudy / Clo	oudy
1	Well Info	rmation	00	L			S	ampling I	nformatio	on	· · · · · ·	
Well Locked?	Yes	(AS)			Purgir	ng Method:	Bla	dder		Со	ntrol Setting	gs
Well Labeled?	Æes	No			Samplin	ng Method:	Bla	dder		Purge:	4	sec.
Casing Straight?	Æes	No			Dedicate	ed Equip?:	Øes	No		Recover:	56	sec.
Grout Seal Intact?	Yes	No	Not Visible		Duplicate	Sample?:	Yes	(No)		PSI:		
Repairs Necessary:					Duplicate S	Sample ID:			·	Pumping R	ate:/ <i>(</i> ) /)	mL/min
Casing	Diameter:		2"				_					
Water Level Befo	re Purge:	19	1,4 ft		Р	urge Date:	31/tu	, 16	Time Purg	ing Began:	0830	(am/pm
Total W	ell Depth:	سر	ft		Well Pเ	urged Dry?	Yes	(NG)	Time P	urged Dry:		am/pm
Wel	Il Volume:	-	liters		Sai	mple Date:	SIAn	-74	Time of	Sampling:	0900	am/pm
Depth to Top	of Pump:	22	2.20 ft			-						
Water Level Afte	r Sample:	14	.71 ft		Bottle	500 m	L Nitric	1 Lite	r Raw			
Measurement	t Method:	Electric \	Water Level Indicator		List:		500 mL Ni	tric (filtered)		4 - 1 Lite	er Nitric	
			Field	Measure	monte							

	ization ecutive)	Temp (°C)	Spec. Cond.	рН	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Level (ft)	mL Removed	
SEQ#	Time		±5%	±0.1	±10%	±20 mV	±10%	0.25 ft		clear, slightly turbid, turbid
1	0835	12,14	14050	86.86	1.56	180,0	10,6	14,71	500	Ca
2	0840	12.14	14060	6,86	1.42	177.6	11.8	14.71	500	de
3	0850	12.63	14025	6.87	1.52	167.8	4.51	14,71	10000	car
4	0855	12.48	14052	6,88	1,52	165.0	4.61	14.71	500	(Com
5	0800	12.44	14048	6.88	1,58	163,0	4.30	14.71	500	Ch_
6							_			
7										
8										
9										
10									2010	

Comments:

Total Volume Removed: <u>メクルク</u> mL



**Groundwater Assessment** 

Company:	MDU Heskett	
Event:	August 2016	
Sample ID:	My 80R	

Zo to Z. Broadway 7 tro, Bio	J							Samping P	ersonai. 🎤	1asse.	1 /V /2	Surac	-5
Phone: (701) 258-9	720						_					<i>M</i>	
Weather Conditions:		Temp:	7/ °F		Wind:	se 5-	10		Precip:	Sunn	iy / Partly C	loudy / Clo	udy
	Well Info	rmation						Sa	mpling Ir	nformatio	on		
Well Locked?	Yes	(No				Purging Method:		Bladder		Control Se		ntrol Setting	s
Well Labeled?	Ø(es	No				Samplir	ng Method:	Bladder			Purge:	4	sec.
Casing Straight?	(Yes	No				Dedicat	ed Equip?:	(Yes)	No		Recover:	56	sec.
Grout Seal Intact?	(Yes	No	No Not Visible			Duplicate	Sample?:	Yes	NO)		PSI:		
Repairs Necessary:						Duplicate \$	Sample ID:				Pumping Ra	ate: / <u>0</u>	mL/min
Casing	Diameter:		2"										
Water Level Before Purge:		1	4.80	ft		Р	urge Date:	3(As	16	Time Purgi		1004	am/pm
Total Well Depth:				ft			urged Dry?	Yes	(NO		urged Dry:		am/pm
Well Volume:			liters			Sample Date:		3/Ans	1Axlb Tin		e of Sampling:   / 0 2		(am)pm
Depth to Top	of Pump:		9.30	ft									_
Water Level After Sample:			15.09	ft		Bottle	500 m	L Nitric	1 Lite	r Raw			
Measuremen	t Method:	Electric Water Level Indicator				List:		500 mL Nitric (filtered)			4 - 1 Liter Nitric		

### **Field Measurements**

	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	1009	12,21	5774	7.01	1,11	152,1	1,25	15.02	4500	cler
2	1014	12,44	5762	7.01	0.98	150.1	1.33	15,04	500	Clea
3	1019	12,65	5770	7.02	0.99	146.2	1.39	15.06	500	1 Can
4	1024	12,62	5734	7.01	0,93	143,0	1,42	15.09	500	cla
5			•							
6										
7										
8							÷.,			
9										
10	/									
Stabilized:	Yes)	No			**************************************	To	otal Volume	Removed:	2000	mL



**Groundwater Assessment** 

Company: MDU Heskett

Event: August 2016

Sample ID: M W D S

Sampling Personal: Mayer Magazian

Phone: (701) 258-9720

Phone: (701) 258-9720							•			
Weather Conditions:	Wind:	5/= / O Precip:			Sunny / Partly Cloudy / Cloudy					
Well In	formation		4	-	****	Sa	mpling l	nformatio	on	·
Well Locked? Yes	(Na)			Purgir	Purging Method: Bladder			Control Settings		
Well Labeled? (Yes				Samplin	g Method:	Bladder			Purge: 💋 🐪	F sec.
Casing Straight? Yes	No			Dedicate	ed Equip?:	(es	No		Recover: 56	sec.
Grout Seal Intact? Yes	No	No Not Visible		Duplicate	Sample?:			PSI:		
Repairs Necessary:	pairs Necessary:				Duplicate Sample ID:			•	Pumping Rate: / &	0 mL/min
Casing Diameter: 2"										-9
Water Level Before Purge	Water Level Before Purge: 13,60 ft			Purge Date: 3/ Am/6		16	Time Purging Began:		FM mpm	
Total Well Depth: ft		<b>f</b> t		Well Purged Dry? Yes Mo			(N)	Time Purged Dry: am/pm		
Well Volume	e: -	- liters		Sample Date: 3/4/45/6 Time				Time of	Sampling: /ヱタム	am/pm
Depth to Top of Pump: $21.24$ ft						, •				
Water Level After Sample: 13, 90 ft			Bottle 500 mL Nitric		1 Lite	r Raw				
Measurement Method: Electric Water Level Indicator				List: 500 mL Nitric (filtered)			) 4 - 1 Liter Nitric			
		Field	Measure	ements						

	Stabili (3 cons	zation ecutive)	Temp (°C)	Spec. Cond.	рН	DO (mg/L)	ORP (mV)	Turbidity (NTU)		mL Removed	Discription: Clarity, Color, Odor, Ect.
	SEQ#	Time		±5%	±0.1	±10%	±20 mV	±10%	0.25 ft		clear, slightly turbid, turbid
113	4 1 ~	1034	12,91	6427	6.67	2.85	123.9	39.6	13,79	500	Clar
11	4421	1039	14,27	6419	6,68	0,71	47/19,5	17,3	13,79	\$1000	Clar
	3	1154	12.86	6896	-brother	0.76	118.3	8,49	13,90	1000	ch-
	4	1204	12,771	102	6464	0.61	116.9	8.40	13,90	1000	ch
	5	1214	12,45	7296	6.65	0.70	115.7	7.73	13.90	1000	Cler
	6	1224	12.63	7407	6.65	0.53	114.6	6,70	13,90	1000	Chi
	7	1234	12,94	7555	6,64	0.58	113,4	4.88	13,90	1000	Car
	8	1239	13.05	7555	6.62	0.52	113,6	4.78	13,90	1500	Cler
	9	1244	13.06	7590	6,64	0,55	113n1	4.71	13,90	501	u
	10	) Yes	No							8500	7.500 mL (TAO 10/1

Stabilized: Mes No Comments:



# **Chain of Custody Record**

Projec	t Name:				Name of Sampler(s	<u>a)</u> :
MDU	Heskett	CCR Grou	ndwater	August 2016	Varren	Niesmans
Report To:	MDU		Carbon Copy:		Work Order Numb	or:
Attn:	Samantha Marshall		Attn:		Work Order Name	<del>"</del> 82-2748
Address:	400 N. 4th St		Address:			02 2110
	Bismarck, ND 58501					
Phone:	701-222-7829					

		Samp	le Informati	on				Bot	ttle T	уре	Fie	eld Para	meters	Analysis
1	Lab Number	Sample ID	Dale	Time	Sample Type	Gradient	500 ml HNO	1 liter 53	o mi HNO <sub>3</sub> (filtered)		Field Temperature °C	Field Spec. Cond.	Field pH	Analysis Required
:	_	<del>Dup 1</del>	_	NA	w			× ×				NA	NA	
	W3866	Field Blank (FB)	3/Aug/L	NA	W		X	хх	$\neg$			NA	NA	
	W3867	m v 104	31 Aug/6	0900	GW		X	XX	1		12,44	14048	6.88	
	w3868	nw80R	RiAugib	1024	GW		X	XX	-		12.62	5734	7.01	
	W3369	mw 105	31 Aug 16	1244	GW		X	XX			13.06	7590	6,64	
L				•										MDU CCR List with TSS and Dissolved CCR Metals. No
														RadChem.
		fe"												
		× 2 / 2 / 4 //												

Comments: \* ON 3/Aug. 16

	Transferred by:	Sample Condition	Date/Time	Received by:	Sample Condition	Date/Time	°C
1	Daver Vien	* ogin	3/1/2/5	C. Jackson		31 Aug 16	3,8°C 7m588
2							ROI
3							



MINNESOTA VALLEY TESTING LABORATORIES, INC.

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



October 21, 2016

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

RE: Groundwater Sampling Event- MDU Heskett Ash Site

Dear Ms. Marshall:

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

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

Sincerely,

Jeremy Meyer

**MVTL Field Services** 



**MDU Heskett** 

**GROUNDWATER SAMPLING - NDDH** 

Attn: Samantha Marshall

400 N. 4th St

Bismarck, ND 58501

701-222-7829

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

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



MINNESOTA VALLEY TESTING LABORATORIES, INC.

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



### CASE NARRATIVE

**MVTL Lab Reference No/SDG:** 

201682-2749

IML Lab Reference No/SDG:

S1609050

Client:

**Montana Dakota Utilities** 

Location:

**MDU Heskett Ash Site** 

**Project Identification:** 

CCR August 2016

**MVTL Laboratory Identifications:** 

16-W3870 through 16-W3873

**IML Laboratory Identifications:** 

\$1609050-001 through \$1609050-004

Page 1 of 2

MDU Sample Identification	MVTL Laboratory #	IML Laboratory #
Field Blank (FB)	16-W3870	\$1609050-001
MW104	16-W3871	S1609050-002
MW80R	16-W3872	S1609050-003
MW105	16-W3873	S1609050-004

### I. RECEIPT

- All samples were received at the laboratory on 31 August 2016 at 1447.
- Samples were collected and hand delivered by MVTL Field Service personnel to the laboratory.
- Samples were received on ice and evidence of cooling had begun.
  - o Temperature of samples upon receipt was 3.8°C.
- No other exceptions on sample receipt were encountered on this sample set unless noted here.
- All samples requiring radiochemistry analysis were sent via courier to Inter-Mountain Labs (IML) for analysis there. Samples were received at IML on 6 September 2016.
  - o All samples were properly preserved unless noted on the individual analytical laboratory report or on the IML Case Narrative.

### II. HOLDING TIMES

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

### III. METHODS

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



## MINNESOTA VALLEY TESTING LABORATORIES, INC.

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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

201682-2749

S1609050

Montana Dakota Utilities MDU Heskett Ash Site

CCR August 2016

**16-W3870** through **16-W3873** 

\$1609050-001 through \$1609050-004

### 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 Canto \_\_\_\_ DATE: \_\_\_ 70CT/L

Claudette Carroll - MVTL Bismarck Laboratory Manager





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

Page: 1 of 1

Report Date: 6 Oct 16 Lab Number: 16-W3870 Work Order #:82-2749 Account #: 002800

Date Sampled: 31 Aug 16 Date Received: 1 Sep 16 14:47

Sampled By: MVTL Field Services

Project Name: MDU Heskett CCR Radiochem Aug. 2016

Sample Description: Field Blank (FB)

Temp at Receipt: 3.8C ROI

	Received Method RL	Method Reference	Date Analyzed	Analyst
Radium 226 See	e Attached Report		14 Sep 16	OL
	e Attached Report		21 Sep 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 complete the property of the proper

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





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

Report Date: 6 Oct 16 Lab Number: 16-W3871 Work Order #:82-2749

1 of 1

Account #: 002800

Page:

Date Sampled: 31 Aug 16 9:00 Date Received: 1 Sep 16 14:47 Sampled By: MVTL Field Services

Project Name: MDU Heskett CCR Radiochem Aug. 2016 Sample Description: MW104

Temp at Receipt: 3.8C ROI

	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 ched Report	NA NA 1	SM 4500 H+ B SM 2550B EPA 120.1	31 Aug 16 31 Aug 16 31 Aug 16 14 Sep 16 21 Sep 16	9:00	DJN

OL = Analysis performed by an Outside Laboratory.

Approved by:

Clauditte K. Canto 70CT6

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 interport to the conduct to the conduct

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





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

Report Date: 6 Oct 16

Page:

Lab Number: 16-W3872 Work Order #:82-2749 Account #: 002800

1 of 1

Date Sampled: 31 Aug 16 10:24 Date Received: 1 Sep 16 14:47 Sampled By: MVTL Field Services

Project Name: MDU Heskett CCR Radiochem Aug. 2016

Sample Description: MW80R

Temp at Receipt: 3.8C ROI

	As Receiv Result	red	Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	7.01	units	NA	SM 4500 H+ B	31 Aug 16 10:24	
Temperature - Field	12.6	Degrees C	NA	SM 2550B	31 Aug 16 10:24	DJN
Conductivity - Field	5734	umhos/cm	1	EPA 120.1	31 Aug 16 10:24	DJN
Radium 226	See Attac	hed Report			14 Sep 16	OL
Radium 228		hed Report			21 Sep 16	OL

OL = Analysis performed by an Outside Laboratory.

(C

Approved by:

Clauditte K. Canteo 70(T16

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 integrate # = Due to integrate

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





Samantha Marshall Montana Dakota Utilities 400 N. 4th

Bismarck ND 58501

1 of 1 Page:

Report Date: 6 Oct 16 Lab Number: 16-W3873 Work Order #:82-2749 Account #: 002800

Date Sampled: 31 Aug 16 12:44 Date Received: 1 Sep 16 14:47 Sampled By: MVTL Field Services

Project Name: MDU Heskett CCR Radiochem Aug. 2016

Sample Description: MW105

Temp at Receipt: 3.8C 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	31 Aug 16 12:44 31 Aug 16 12:44 31 Aug 16 12:44 14 Sep 16 21 Sep 16	DJN

OL = Analysis performed by an Outside Laboratory.

Approved by:

Clauditte K. Canto 70CT16

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

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

@ = Due to sample matrix # = Due to coded below:

! = 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: 9/29/2016

CLIENT:

Lab Order:

MVTL Laboratories, Inc.

Project:

201682-9720

S1609050

**CASE NARRATIVE** 

Report ID: S1609050001

Samples 16-W3870 Field BLANK, 16-W3871 MW104, 16-W3872 MW80R, and 16-W3873 MW105 were received on September 6, 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:

201682-9720

Lab ID:

S1609050-001

COC:

ClientSample ID: 16-W3870 Field BLANK

201682-2749

Date Reported 9/29/2016

Report ID

S1609050001

WorkOrder:

S1609050

CollectionDate: 8/31/2016

9/6/2016 11:43:00 AM DateReceived:

FieldSampler:

Matrix:

Water

Result	Units	Qual	RL	Method	Date Analyzed/Init	
0.2	pCi/L		0.2	SM 7500 Ra-B	09/14/2016 1436	MB
0.1	pCi/L			SM 7500 Ra-B	09/14/2016 1436	MB
-1.0	pCi/L		1	Ga-Tech	09/21/2016 209	MB
3.5	pCi/L			Ga-Tech	09/21/2016 209	MB
	0.2 0.1 -1.0	0.2 pCi/L 0.1 pCi/L -1.0 pCi/L	0.2 pCi/L 0.1 pCi/L -1.0 pCi/L	0.2 pCi/L 0.2 0.1 pCi/L -1.0 pCi/L 1	0.2 pCi/L 0.2 SM 7500 Ra-B 0.1 pCi/L SM 7500 Ra-B -1.0 pCi/L 1 Ga-Tech	0.2       pCi/L       0.2       SM 7500 Ra-B       09/14/2016 1436         0.1       pCi/L       SM 7500 Ra-B       09/14/2016 1436         -1.0       pCi/L       1       Ga-Tech       09/21/2016 209

These results apply only to the samples tested.

Qualifiers:

Analyte detected in the associated Method Blank

Ε 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 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:

201682-9720

Lab ID:

S1609050-002

ClientSample ID: 16-W3871 MW104 COC:

201682-2749

Date Reported

9/29/2016

Report ID

S1609050001

WorkOrder:

S1609050

CollectionDate: 8/31/2016 9:00:00 AM 9/6/2016 11:43:00 AM

DateReceived: FieldSampler:

Matrix:

Water

### Comments

Comments							
Analyses	Result	Units	Qual	RL	Method	Date Analyzed/l	nit
Radionuclides - Total							
Radium 226	0.5	pCi/L		0.2	SM 7500 Ra-B	09/14/2016 1436	МВ
Radium 226 Precision (±)	0.1	pCi/L			SM 7500 Ra-B	09/14/2016 1436	MB
Radium 228	0.4	pCi/L		1	Ga-Tech	09/21/2016 510	MB
Radium 228 Precision (±)	3.1	pCi/L			Ga-Tech	09/21/2016 510	MB

These results apply only to the samples tested.

Qualifiers:

Analyte detected in the associated Method Blank В

Е Value above quantitation range

Analyte detected below quantitation limits

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

0 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: A

Wade Nieuwsma, Assistant Laboratory Manager

Page 2 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:

201682-9720

Lab ID:

S1609050-003

ClientSample ID: 16-W3872 MW80R COC:

201682-2749

Date Reported

9/29/2016

Report ID

S1609050001

WorkOrder:

S1609050

CollectionDate: 8/31/2016 10:24:00 AM

DateReceived:

9/6/2016 11:43:00 AM

FieldSampler:

Matrix:

Water

### Comments

Comments							
Analyses	Result	Units	Qual	RL	Method	Date Analyzed/I	nit
Radionuclides - Total							
Radium 226	0.19	pCi/L		0.2	SM 7500 Ra-B	09/14/2016 1436	MB
Radium 226 Precision (±)	0.1	pCi/L			SM 7500 Ra-B	09/14/2016 1436	MB
Radium 228	-2.3	pCi/L		1	Ga-Tech	09/21/2016 811	MB
Radium 228 Precision (±)	3.4	pCi/L			Ga-Tech	09/21/2016 811	MB

These results apply only to the samples tested.

Qualifiers:

Analyte detected in the associated Method Blank В

Ε Value above quantitation range

Analyte detected below quantitation limits

Value exceeds Monthly Ave or MCL or is less than LCL

О Outside the Range of Dilutions

Matrix Effect

**RL** - Reporting Limit

Calculated Value

Holding times for preparation or analysis exceeded

Analyzed by another laboratory L

ND Not Detected at the Reporting Limit

Spike Recovery outside accepted recovery limits

Reviewed by: A

Wade Nieuwsma, Assistant Laboratory Manager

Page 3 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:

201682-9720

Lab ID:

S1609050-004

ClientSample ID: 16-W3873 MW105 COC:

201682-2749

Date Reported 9/29/2016

Report ID

S1609050001

WorkOrder:

S1609050

CollectionDate: 8/31/2016 12:44:00 PM

9/6/2016 11:43:00 AM

DateReceived: FieldSampler:

Matrix:

Water

### Comments

Comments							
Analyses	Result	Units	Qual	RL	Method	Date Analyzed/l	nit
Radionuclides - Total							
Radium 226	0.3	pCi/L		0.2	SM 7500 Ra-B	09/14/2016 1436	МВ
Radium 226 Precision (±)	0.1	pCi/L			SM 7500 Ra-B	09/14/2016 1436	МВ
Radium 228	-5.1	pCi/L		1	Ga-Tech	09/21/2016 1112	MB
Radium 228 Precision (±)	3.3	pCi/L			Ga-Tech	09/21/2016 1112	MB

These results apply only to the samples tested.

Qualifiers:

Analyte detected in the associated Method Blank

Value above quantitation range Ε

Analyte detected below quantitation limits

Value exceeds Monthly Ave or MCL or is less than LCL

Outside the Range of Dilutions

Matrix Effect

**RL** - Reporting Limit

С Calculated Value

Holding times for preparation or analysis exceeded

Analyzed by another laboratory

ND Not Detected at the Reporting Limit

Spike Recovery outside accepted recovery limits

Reviewed by:

Wade Nieuwsma, Assistant Laboratory Manager

Page 4 of 4



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

### **ANALYTICAL QC SUMMARY REPORT**

CLIENT:

MVTL Laboratories, Inc.

Date: 9/29/2016

Work Order:

S1609050

Report ID: S1609050001

**Project:** 201682-9720

Radium 228 by Ga/Tech	Sample Type MBLK	Units: pCi/L		
MB-385 (09/20/16 11:04)	RunNo: 138998	PrepDate: 09/12/16 12:00	0 BatchID: 12321	
Analyte	Result	RL Spike Ref Sam	np %REC % Rec Limits Qu	Qual
Total Radium 228	ND	1		
Radium 228 by Ga/Tech	Sample Type LCS	Units: pCi/L		
LCS-385 (09/20/16 14:05)	RunNo: 138998	PrepDate: 09/12/16 12:00	0 BatchID: 12321	
Analyte	Result	RL Spike Ref Sam	np %REC % Rec Limits Qu	Qual
Total Radium 228	42	1 38.5	109 61.3 - 120	
Radium 228 by Ga/Tech	Sample Type MS	Units: pCi/L		
MS-385 (09/20/16 20:07)	RunNo: 138998	PrepDate: 09/12/16 12:00	D BatchID: 12321	
Analyte	Result	RL Spike Ref Sam	p %REC % Rec Limits Qu	≀ual
Total Radium 228	41	1 38.5 ND	107 64.3 - 120	
Radium 228 by Ga/Tech	Sample Type MSD	Units: pCi/L		
MSD-385 (09/20/16 23:08)	RunNo: 138998	PrepDate: 09/12/16 12:00	) BatchID: 12321	
Analyte	Result	RL Conc %RPD	%REC % RPD Limits Qu	lual
Total Radium 228	45	1 41 8.97	117 20	
Radium 226 in Water - Total by SM7500RA_B	Sample Type MBLK	Units: pCi/L		
MB-1661 (09/14/16 14:36)	RunNo: 138741	PrepDate: 09/07/16 0:00	BatchID: 12299	
Analyte	Result	RL Spike Ref Sam	p %REC % Rec Limits Qu	ual
Radium 226	ND	0.2		
Radium 226 in Water - Total by SM7500RA_B	Sample Type LCS	Units: pCi/L		
LCS-1661 (09/14/16 14:36)	RunNo: 138741	PrepDate: 09/07/16 0:00	BatchID: 12299	
Analyte	Result	RL Spike Ref Sam	p %REC % Rec Limits Qu	ual
Radium 226	4.8	0.2 5.99	79.9 67.1 - 122	
Radium 226 in Water - Total by SM7500RA_B	Sample Type MS	Units: pCi/L		
MS-1661 (09/14/16 14:36)	RunNo: 138741	PrepDate: 09/07/16 0:00	BatchID: 12299	
Analyte	Result	RL Spike Ref Sam	p %REC % Rec Limits Qu	ual
Radium 226	5.6	0.2 5.99 ND	94.0 65 - 131	
Radium 226 in Water - Total by SM7500RA_B	Sample Type MSD	Units: pCi/L		
MSD-1661 (09/14/16 14:36)	RunNo: 138741	PrepDate: 09/07/16 0:00	BatchID: 12299	
Analyte	Result	RL Conc %RPD	%REC % RPD Limits Qu	ual
Radium 226	5.0	0.2 5.6 12.2	83.3 20	

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

## **Chain of Custody Record**

Pa	ae	1	of	1	_

Toll Free: (800) 279-6885								201682-2749				
Company Name and Address:			Account #:							Phone #:		
	MVTL								701-258-9720			
2616		Contact:	•	•					Fax #:			
	E Broadway ck, ND 58501		Name of C	Claud	lette	<u>e</u>				For faxed report check box		
Billing Address (indicate if differ	ent from above):		Name of S	ampier:						E-mail: ccarroll@mvtl.com		
and a sum of the sum o	one from above).		Quote Nui	mher						For e-mail report check box  Date Submitted:		
PC	Box 249		Guoto Hui	iibei						9/1/2016		
New U	lm, MN 56073		Project Na	me/Numbe	er:					Purchase Order #:		
										BL5656		
	Sample Information					В	ottle	Ty	pe	Analysis		
A 17-20-												
51409050						603	pa					
					pa	王	als	ar				
IML Lab		Sample	Date	Time	Untreated	E 0	ores	l SS	F			
Number MVTL Lab Numb	er Client Sample ID	Type	Sampled	Sampled	Unt	100	VOC Vials Umpreserved	Glass Jar	Other	Analysis Required		
<u>00 l</u> 16-W3870	Field Blank		8/31/2016							Ra226 & Ra228 on all		
<u>mZ</u> 16-W3871	MW104		8/31/2016	900								
<u>003</u> 16-W3872	MW80R		8/31/2016	1024								
004 16-W3873	MW105		8/31/2016	1244								
	1	1						1	T	[		

Comments:	ΔII	results	must	ha	ranortad	20	a numerical value.
••	,	roound	must	20	reported	as	a mumerical value.

Transferred by:	Date:	Time:	Sample Condition:	Received by:	Date:		Temp:
C. Jackson		1700		Kathy Bus	9.6.16	11:43	16.75
2.				6 77			



## Laboratories, Inc.

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

# **Chain of Custody Record**

Projec	t Name:				Name of Sampler(s):		
MDU	Heskett	CCR Radi	ochem	August 2016	Jassen	Nieswaag	
Report To:	MDU		Carbon Copy:		Work Order Number:		
Attn:	Samantha Marshall		Attn:		WOIN OTAGE NAMES	82-2749	
<u>Address</u> :	400 N. 4th St		Address:			02	
	Bismarck, ND 58501						
Phone:	701_222_7829						

	Sampl	e Informati	on				Bottle	Туре	Fie	eld Para	meters	Analysis
Lab Number	Sample ID	Date	Time	Sample Type	Gradient	1000 ml HNO <sub>3</sub>			Field Temperature °C	Field Spec. Cond.	Field pH	Analysis Required
•	-Dup-1-	-	NA	W		+4+			NA	NA	NA	
W3870	Field Blank (FB)	3 Aug L	NA	w		4			NA	NA	NA	
W3871	MW104		P900	GW		4			12,44	14048	6,88	
w3872			1024	GW		4			12.62		0 0	
	* AW 105 MW 105	31 Aug 16	1244	CW		4	$\top$		13,06	7590	6,64	
							$\top$					MDU CCR Numerical
												RadChem
111						$\top$	$\top$					
						++	++	2				
						++		+				
			3.5		,		+	+				
	3(1)		L	1								

Comments: # DN 31 Aug/6

	Transferred by:	Sample Condition	Date/Time	Received by:	Sample Condition	Date/Time	°C
1	Dany Nie	Login	31A216	C. Jackson		31 Aug 16	3.8°C 700588
2			1. (		6		POI
3							-

# **MVTL Calibration Worksheet**

Site: IVIDU He	eskett	Technician: Var/contreswaag							
Instrument (Circle One):	#1 650 MDS 08F100203	#2 650 MDS 04H14736	#3 556 MPS 12E102056						
Date: 3 My	Pre Site Calibr	ation	Post Site Check Time: (43 9						
pH  Buffer 7  Buffer 10  Conductivity  Buffer 10000  ORP  231 mV @ 25C  DO	22,53 [0147] [9999]	barometric Pressure (mm Hg)	pH Temp °C Reading  Buffer 7 2-3.11 7.02  Conductivity  Buffer 5000 23,44 4951						
Date:	Time:	mg/L [LL, O	Time:						
pH  Buffer 7  Buffer 10  Conductivity	Temp °C Pre Cal Post Cal	Post Cal Range mv 50 6.95-7.05 0 +/- 50 9.95-10.05 -180 +/- 50 Check	pH Temp °C Reading  Buffer 7  Conductivity						
Buffer 10000 <b>ORP</b> 231 mV @ 25C <b>DO</b>	22,24 8.53 8,24	±10% Buffer 5000  ±10 mV  Barometric Pressure (mm Hg)  mg/L	Buffer 5000						



2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

**Water Level** 

Sampling Pe		waag		Company:  MDU Heskett
Well ID	Date	Time	Depth to Water	Comments
MW1-90	31Aug 16	1352	11.86	
MW-2	31 Aug/6	1355	38.68	
nw-8	31 Aug 16	1359	17.03	•
MW-4B	31 Auglis	1401	17.70	
	,			
·				



**Groundwater Assessment** 

Company:	M	OU Heske	ett	
Event:	Αι	ıgust 201	6	
Sample ID:	mw	104		
Sampling Do	conal: 0	- 7	1/	

			0.0	and tracer	7,00000	HIGHE		Sample IL	・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・	1//97			
2616 E. Broadway Ave, Bi	smarck, ND							Sampling		<u> </u>	A/~ac\a	6	
Phone: (701) 258-9	9720							Camping	Croonal.	VA TILV	Niesw	<u>uas</u>	
·			-14	3									
Neather Conditions:		Temp:	-60X	°F	Wind:	5E5	-10		Precip	: Suni	ny / Fartly Clo	oudy / Clo	oudv
	Well Info	rmation						S	ampling l				
Well Locked?	Yes	(Ne)				Purgir	ng Method:		dder		T	trol Setting	ns.
Well Labeled?	Xes	No				Samplir	ng Method:	Bla	dder		Purge:	<del>U</del>	se
Casing Straight?	Æes	No				Dedicat	ed Equip?:	des	No	_	Recover:	= =	se
Grout Seal Intact?	Yes	No	Not V	isible/			Sample?:	Yes	No	1	PSI:		30,
Repairs Necessary:						Duplicate S	Sample ID:		-	1	Pumping Rat	$\frac{-}{e/D}$	mL/mi
Casing	Diameter:	-	2"				•	·		J	i announg reac	<u> </u>	11127111
Water Level Bef	ore Purge:	19	1.41	ft		Р	urge Date:	31/2u	16	Time Purg	ing Began:	7830	(am) pr
Total V	Vell Depth:			ft		Well Pu	urged Dry?		MB		urged Dry:	<u> </u>	am/pr
We	ell Volume:	_		liters		Sai	mple Date:	31An	111			700	(am/pr
Depth to Top	o of Pump:	22	2.20	ft				11/1	<del>~~~~~</del>	. <b>J</b>	· · · · · · · · · · · · · · · · · · ·	100	<u> </u>
Water Level After	er Sample:	14	.71	ft		Bottle	500 m	L Nitric	1 Lite	er Raw			
Measuremer	nt Method:	Electric \	Water Level	Indicator		List:		500 mL Ni	tric (filtered)		4 - 1 Liter	Nitric	
				F: 1.1									
				rieia	Measure	ements		T					

							T	·	1	
	lization 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	0835	12,14	14050	86.86	1,56	180,0	106	14.71	500	16-
2	0840	12.14	14060	6,86	1.42	177.6	11.8	14.71	500	S.
3	0850	12.63	14025	6.87	1.52	167.8	4.51		1000	19
4	0855	12.48	14052	6.88	1,52	165.0	4.61	14.71	500	(C-
5	0800	12.44	14048	6.88	1.58	163,0		14.71	500	(L)
6							1120			
7										
8										
9					_					
10										
Stabilized:		No				To	tal Volume	Removed:	3000	mL.
Comments										•



**Groundwater Assessment** 

Company:	MDU Heskett
Event:	August 2016
Sample ID:	MWSOR
Sampling Per	sonal: Dance William

Sunny / Partly Cloudy / Cloudy

Purge:

Recover:

Control Settings

sec.

sec.

mL/min

am/pm am/pm am/pm

Precip:

Bladder

Bladder

No

(Yes)

Sampling Information

Phone: (701) 258-9720

Temp:

(No

No

No

**Well Information** 

Yes

X(es)

Yes

Weather Conditions:

Well Locked?

Well Labeled?

Casing Straight?

Comments

Grout S	Seal Intact?	(Yes	No	Not V	isible		Duplicate	Sample?:	Yes	No)		PSI:	
Repairs Ne	ecessary:						Duplicate 9	Sample ID:	<del> </del>	_		Pumping R	ate: [10 0
:	Casing	Diameter:		2"									
Wate	er Level Be	fore Purge:	1	4.80	ft		P	urge Date:	3(As	16	Time Purg	ing Began:	1004
	Total V	Well Depth:			ft		Well Pเ	urged Dry?	Yes	NO	Time P	urged Dry:	
	W	ell Volume:			liters		Sa	mple Date:	3/1900	16	Time of	Sampling:	10241
1	Depth to To	p of Pump:		9.30	ft					7			<u> </u>
- Wate	er Level Aft	er Sample:	, i	5.09	ft		Bottle	500 m	L Nitric	1 Lite	r Raw		
N	/leasureme	nt Method:	Electric V	Vater Level	Indicator	:	List:		500 mL Niti	ric (filtered)		4 - 1 Lite	er Nitric
					Field	Measure	mante						
					i icia	Measure	ments						
Stabil	ization	Taman	8		D0	ODD		10/			Discription:		
(3 cons	secutive)	Temp (°C)	Spec. Cond.	рН	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Water Level (ft)	mL Removed	Clasite	-		
SEQ#	Time	( 0)	±5%	±0.1	±10%	±20 mV	±10%	0.25 ft	Kemoved		r, Color, Odessightly turbid,		
<del></del>	ļ	12 2 1	~~711		1 / /					Clear,	siightiy turbia,	LUTOIG	
1	1009	12,21	5/19	7.0	1111	152,1	1,25	15.00	4500	Cler			
2	1014	12,44	5762	7,01	0,98	150.1	1.33	15,04	500	Cle	حريح		
3	1019	12,65	5770	7.02	0.99	146.2	1.39	15.06	500	1Cm	_		
4	1024	12,62	5734	7,01	0,93	143,0	1.42	15.09	500	cl			
5	,												
6													
7													
8													
9													
10	/												
Stabilized:	Yes)	No	•			To	otal Volume	Removed:	2000	mL			

Wind: Se 5-10

Purging Method:

Sampling Method:

Dedicated Equip?:



**Groundwater Assessment** 

Company:	MDU Heskett
Event:	August 2016
Sample ID:	MW/05
Sampling Pe	rsonal: Da Con Al-aCillater

Phone: (701) 258-9720

						_	-		<del></del>				
Weather Conditions:		Temp:	77	°F	Wind:	55-10	2		Precip:	Sunr	y I Partly C	loudy / Clo	udy
	Well Info	rmation			2			Sa	ampling I	nformatio	on		
Well Locked?	Yes.	(No)				Purgir	ng Method:	Blac	der		Co	ntrol Setting	s
Well Labeled?	(Yes	No				Samplir	ng Method:	Blac	der		Purge:	25 4	sec.
Casing Straight?	Yes	No				Dedicat	ed Equip?:	(es)	No		Recover:	56	sec.
Grout Seal Intact?	Yes	No	Not V	/isible		Duplicate	Sample?:	Yes	Nø		PSI:		
Repairs Necessary:						Duplicate 9	Sample ID:	~			Pumping R	ate: 100	mL/min
Casing	Diameter:		2"						_	-		1129	
Water Level Bet	fore Purge:	[3	.60	ft		Р	urge Date:	31Au	16	Time Purg	ing Began:	1029p	2 (am) pm
Total V	Vell Depth:	•	_	ft		Well Pr	urged Dry?	Yes	(No		urged Dry:		am/pm
We	ell Volume:	•	~	liters		Sa	mple Date:	3/Acasi	11	Time of	Sampling:	1244	am/pm
Depth to To	p of Pump:	-21	24	ft									
Water Level Aft	er Sample:	13	20	ft		Bottle	500 m	L Nitric	1 Lite	r Raw			
Measuremer	nt Method:	Electric	<b>N</b> ater Level	Indicator		List:		500 mL Nit	ric (filtered)	I	4 - 1 Lit	er Nitric	
	Field Measurements												

	Stabili (3 cons	zation ecutive)	Temp (°C)	Spec. Cond.	рН	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Water Level (ft)	mL Removed	Discription: Clarity, Color, Odor, Ect.
	SEQ#	Time		±5%	±0.1	±10%	±20 mV	±10%	0.25 ft		clear, slightly turbid, turbid
113	4 1 2	1034	12.91	6427	6.67	2.85	123.9	39.6	13,79	500	Clar
11	442 1	1037	14,27	6419	6.68	0,71	47/19,5	17,3	13,79	\$1000	Clar
	3	1154	12.86	6896	- Conflet	0.76	118.3	8,49	13,90	1000	Ch
	4	1204	12,77	#162	6464	0.61	116.9	8.40	13.90	1000	cly
	5	1214	12,45	7296	6,65	0.70	115.7	7.73	13.90	1000	Clay
	6	1224	12.63	7407	6-65	0.53	114.6	6,70	13.90	1000	Chi
	7	1234	12,94	7555	6,64	0.58	113,4	4.88	13,90	1000	C. Cer
	8	1239	13.05	7555	6.62	0.52	113,6	4.78	13,90	1500	Cler
	9	12421	13.06	1590	6,64	0,55	113n1	4.71	13,90	500	a
	10									Ø A	7 500 (740 40/40/40)
	Stabilized:	<del>`</del>	No	•			To	otal Volume	Removed:	0700	7, <del>500 mL (TAO 1</del> 0/18/16)

Stabilized: No Comments:



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



### CASE NARRATIVE - AMENDED 21 NOV 17 (Reporting)

**MVTL Lab Reference No/SDG:** 

201782-2789

Client:

**Montana Dakota Utilities** 

Location:

**MDU Heskett** 

**Project Identification:** 

**CCR October 2017** 

**MVTL Laboratory Identifications:** 

17-W4292 through 17-W4299

Page 1 of 2

MDU Sample Identification	MVTL Laboratory #
103	17-W4292
44R	17-W4293
13	17-W4294
Dup-1	17-W4295
102	17-W4296
70	17-W4297
101	17-W4298
FB1	17-W4299

### I. RECEIPT

- All samples were received at the laboratory on 5 Oct 17 at 0800.
- Samples were collected and hand delivered by MVTL Field Service personnel to the laboratory.
- Samples were received on ice and evidence of cooling had begun.
  - o Temperature of samples upon receipt was 4.2°C.
- All samples were properly preserved unless noted here and/or flagged on the individual analytical laboratory report.
- No other exceptions on sample receipt were encountered on this sample set unless noted here.

### II. HOLDING TIMES

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

### III. METHODS

- Approved methodology was followed for all sample analyses.
  - o Methods 6010D was 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 analytes, the reported results were elevated due to additional dilutions required to minimize the effects of sample matrix.





### CASE NARRATIVE - AMENDED 21 NOV 17 (Reporting)

MVTL Lab Reference No/SDG:

201782-2789

Client:

**Montana Dakota Utilities** 

Location:

**MDU Heskett** 

**Project Identification:** 

CCR October 2017

**MVTL Laboratory Identifications:** 

17-W4292 through 17-W4299

Page 2 of 2

o Recovery for one sulfate matrix spike was outside of the acceptable limits. Recovery of the matrix spike duplicate was acceptable. RPD for the recoveries of the matrix spike/matrix spike duplicate was acceptable. No further action was taken.

### REPORTING ٧.

10 Nov 17: Per email dated 9 Nov 17 from Terri Olson with Barr Engineering, the case narrative was field summary sheets were amended to correct for errors.

All laboratory data has been approved by MVTL Laboratories.

SIGNED:

DATE: 21NOVIT

Claudette Carroll - MVTL Bismarck Laboratory Manager

### **Claudette Carroll**

From:

Terri A. Olson <TOlson@barr.com>

Sent:

Thursday, November 09, 2017 9:10 PM

To:

Claudette Carroll

Subject:

RE: 201782-2789 MDU HESK CCR OCT 17.pdf

Follow Up Flag:

Follow up

Flag Status:

Flagged

Hi Claudette,

I reviewed this report and noted the following:

- The MW101 data on the Field Data Report (FDR) does not match the raw data for the following:
  - Total Volume Removed: FDR = 3000, raw data = 7000
  - Temperature: FDR = 14.53, raw data = 10.89
  - O Conductivity: FDR = 4854, raw data = 4829
  - o Turbidity: FDR = 10.10, raw data = 2.82
- The MW70 data on the FDR has pH = 6.69, raw data = 6.96
- In previous CCR reports, a note was included in the report's case narrative under Section III. Methods stating Methods 6010D and 6020B were used for the metals analyses. Since only Appendix III parameters were analyzed and reported, Method 6020B was not used, only method 6010D.

### Thank-you,

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

TOlson@barr.com www.barr.com



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If you no longer wish to receive marketing e-mails from Barr, respond to  $\underline{communications@barr.com}$  and we will be happy to honor your request.

From: Claudette Carroll [mailto:ccarroll@mvtl.com]

Sent: Wednesday, November 01, 2017 5:05 PM

**To:** Barr Data Management <BarrDM@barr.com>; Jesse Hedlund <jhedlund@mvtl.com>; Julie Crispin <jcrispin@mvtl.com>; Marshall, Samantha <Samantha.Marshall@mdu.com>; Mary Hames <mhames@mvtl.com>; Steve Bowen <sbowen@mvtl.com>; Terri A. Olson <TOlson@barr.com>; Tonia D. O'Brien <tobrien@barr.com>

Subject: 201782-2789 MDU HESK CCR OCT 17.pdf

Hello all,

Please find attached one data package for the CCR sampling done in Oct 2017 at MDU Heskett. Hard copies and EDDs will follow. I will send the State package shortly.

Have a great night,

## Claudette



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Providing Analytical Excellence Since 1951

<u>ccarroll@mvtl.com</u> 701-258-9720

2616 E. Broadway Ave/Bismarck, ND 58501

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MEMBER ACIL

Page: 1 of 1

**Quality Control Report** 

Lab IDs: 17-W4292 to 17-W4299

Project: MDU Heskett - CCR

Work Order: 201782-2789

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	110 108	80-120 80-120	8.00 0.400 0.400	17-W4262 17-W4264 17-W4297	2.48 < 0.1 0.52	10.8 0.44 0.91	104 110 98	75-125 75-125 75-125	10.8 0.44 0.91	10.7 0.43 0.92	103 108 100	0.9 2.3 1.1	20 20 20	-	-	< 0.1 < 0.1 < 0.1 < 0.1
Calcium - Total mg/l	20.0 20.0	104 106	80-120 80-120	100 100 500	17W4263q 17W4304q 17W4312q	41.8 5.8 500	137 104 995	95 98 99	75-125 75-125 75-125	137 104 995	134 106 1020	92 100 104	2.2 1.9 2.5	20 20 20	-	-	<1 <1 <1 <1
Chloride mg/l	30.0 30.0	89 91	80-120 80-120	30.0	17-W4261	24.6	53.6	97	80-120	53.6	52.8	94	1.5	20	-	-	< 1 < 1
Fluoride mg/l	0.50 0.50	90 96	90-110 90-110	0.500 0.500	17-W4293 17-W4304	0.60 0.44	1.00 0.91	80 94	80-120 80-120	1.00 0.91	1.01 0.92	82 96	1.0	20 20	-	-	< 0.1 < 0.1
pH units	-	-	-	-	-	-	-	-	-	7.4 7.1	7.5 7.2	-	1.3 1.4	20 20	-		-
Sulfate mg/l	100 100	102 93	80-120 80-120	4000 500	17-W4299 17-D3526	< 200 339	3730 731	93 78	80-120 80-120	3730 731	3610 739	90 80	3.3 1.1	20 20	-		< 5 < 5
Total Dissolved Solids mg/l	-		-	-	-	-	-	-	- - -	1100 < 10 4820	1070 < 10 4830		2.8 0.0 0.2	20 * 20	-	-	< 10 < 10

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

Approved by: C. CMSQ





CERTIFICATE of ANALYSIS - CCR

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

Project Name: MDU Heskett

Sample Description: 103

Event and Year: October 2017

Page: 1 of 8

Report Date: 27 Oct 17 Lab Number: 17-W4292 Work Order #: 82-2789

Account #: 002800 Date Sampled: 4 Oct 17 9:19

Date Received: 5 Oct 17 8:00 Sampled By: MVTL Field Services

PO #: 165275

Temp at Receipt: 4.2C ROI

	As Receiv Result	ed	Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	5 Oct 17	SVS
pH - Field	6.68	units	NA	SM 4500 H+ B	4 Oct 17 9:19	DJN
рН	* 7.1	units	0.1	SM4500 H+ B	6 Oct 17 18:00	SVS
Temperature - Field	8.49	Degrees C	NA	SM 2550B	4 Oct 17 9:19	DJN
Conductivity - Field	5055	umhos/cm	1	EPA 120.1	4 Oct 17 9:19	DJN
Fluoride	0.12	mg/l	0.10	SM4500-F-C	6 Oct 17 18:00	SVS
Sulfate	2770	mg/l	5.00	ASTM D516-07	26 Oct 17 8:11	EMS
Chloride	147	mg/l	1.0	SM4500-Cl-E	11 Oct 17 14:40	RAG
Total Dissolved Solids	4630	mg/l	10	I1750-85	6 Oct 17 14:32	SVS
Calcium - Total	600	mg/l	1.0	6010D	16 Oct 17 11:30	SZ
Boron - Total	< 0.5 @	mg/l	0.10	6010D	12 Oct 17 14:40	SZ

\* Holding time exceeded

Approved by:

Clauditte K. Canto

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

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

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

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





Page:

2 of 8

CERTIFICATE of ANALYSIS - CCR

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

Project Name: MDU Heskett

Sample Description: 44R

Event and Year: October 2017

Report Date: 27 Oct 17 Lab Number: 17-W4293 Work Order #: 82-2789 Account #: 002800

Date Sampled: 4 Oct 17 10:26 Date Received: 5 Oct 17 8:00 Sampled By: MVTL Field Services

PO #: 165275

Temp at Receipt: 4.2C ROI

	As Receiv Result	red	Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	5 Oct 17	SVS
pH - Field	6.54	units	NA	SM 4500 H+ B	4 Oct 17 10:26	DJN
рН	* 7.0	units	0.1	SM4500 H+ B	6 Oct 17 18:00	SVS
Temperature - Field	8.62	Degrees C	NA	SM 2550B	4 Oct 17 10:26	DJN
Conductivity - Field	9132	umhos/cm	1	EPA 120.1	4 Oct 17 10:26	DJN
Fluoride	0.60	mg/l	0.10	SM4500-F-C	6 Oct 17 18:00	SVS
Sulfate	5650	mg/l	5.00	ASTM D516-07	10 Oct 17 15:31	RAG
Chloride	226	mg/l	1.0	SM4500-C1-E	11 Oct 17 14:40	RAG
Total Dissolved Solids	9400	mg/l	10	I1750-85	6 Oct 17 14:32	SVS
Calcium - Total	414	mg/l	1.0	6010D	16 Oct 17 11:30	SZ
Boron - Total	0.56	mg/l	0.10	6010D	12 Oct 17 14:40	SZ

\* Holding time exceeded

Approved by:

Clauditte K. Cante / NOVIT

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

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

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

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





Page:

3 of 8

CERTIFICATE of ANALYSIS - CCR

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

Project Name: MDU Heskett

Sample Description: 13

Event and Year: October 2017

Report Date: 27 Oct 17 Lab Number: 17-W4294 Work Order #: 82-2789

Account #: 002800

Date Sampled: 4 Oct 17 11:32 Date Received: 5 Oct 17 8:00 Sampled By: MVTL Field Services

PO #: 165275

Temp at Receipt: 4.2C ROI

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	5 Oct 17	SVS
pH - Field	6.86	units	NA	SM 4500 H+ B	4 Oct 17 11:32	DJN
рн	* 7.4	units	0.1	SM4500 H+ B	6 Oct 17 18:00	SVS
Temperature - Field	8.84	Degrees C	NA	SM 2550B	4 Oct 17 11:32	DJN
Conductivity - Field	10339	umhos/cm	1	EPA 120.1	4 Oct 17 11:32	DJN
Fluoride	0.82	mg/l	0.10	SM4500-F-C	6 Oct 17 18:00	SVS
Sulfate	5990	mg/l	5.00	ASTM D516-07	10 Oct 17 15:31	RAG
Chloride	81.9	mg/l	1.0	SM4500-C1-E	11 Oct 17 14:40	RAG
Total Dissolved Solids	9660	mg/l	10	I1750-85	6 Oct 17 14:32	SVS
Calcium - Total	405	mg/l	1.0	6010D	16 Oct 17 13:30	SZ
Boron - Total	0.70	mg/l	0.10	6010D	12 Oct 17 14:40	SZ

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

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





CERTIFICATE of ANALYSIS - CCR

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

Project Name: MDU Heskett

Sample Description: Dup-1

Event and Year: October 2017

Page: 4 of 8

Report Date: 27 Oct 17 Lab Number: 17-W4295 Work Order #: 82-2789 Account #: 002800

Date Sampled: 4 Oct 17

Date Received: 5 Oct 17 8:00 Sampled By: MVTL Field Services

PO #: 165275

Temp at Receipt: 4.2C ROI

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	5 Oct 17	SVS
рН	* 7.4	units	0.1	SM4500 H+ B	6 Oct 17 18:00	SVS
Fluoride	0.86	mg/l	0.10	SM4500-F-C	6 Oct 17 18:00	SVS
Sulfate	6100	mg/l	5.00	ASTM D516-07	10 Oct 17 15:31	RAG
Chloride	80.9	mg/l	1.0	SM4500-C1-E	11 Oct 17 14:40	RAG
Total Dissolved Solids	9450	mg/l	10	I1750-85	6 Oct 17 14:32	SVS
Calcium - Total	404	mg/l	1.0	6010D	16 Oct 17 13:30	SZ
Boron - Total	0.72	mg/l	0.10	6010D	12 Oct 17 14:40	SZ

\* Holding time exceeded

Approved by:

Claudite K. Canto

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

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





Page: 5 of 8

CERTIFICATE of ANALYSIS - CCR

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

Project Name: MDU Heskett

Sample Description: 102

Event and Year: October 2017

Report Date: 27 Oct 17 Lab Number: 17-W4296 Work Order #: 82-2789 Account #: 002800

Date Sampled: 4 Oct 17 13:24 Date Received: 5 Oct 17 8:00 Sampled By: MVTL Field Services

PO #: 165275

Temp at Receipt: 4.2C ROI

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	5 Oct 17	SVS
pH - Field	6.82	units	NA	SM 4500 H+ B	4 Oct 17 13:24	DJN
pH	* 7.3	units	0.1	SM4500 H+ B	6 Oct 17 18:00	SVS
Temperature - Field	10.0	Degrees C	NA	SM 2550B	4 Oct 17 13:24	DJN
Conductivity - Field	7741	umhos/cm	1	EPA 120.1	4 Oct 17 13:24	DJN
Fluoride	0.19	mg/l	0.10	SM4500-F-C	6 Oct 17 18:00	SVS
Sulfate	4500	mg/l	5.00	ASTM D516-07	10 Oct 17 15:31	RAG
Chloride	7.3	mg/l	1.0	SM4500-Cl-E	11 Oct 17 14:40	RAG
Total Dissolved Solids	7300	mg/l	10	I1750-85	6 Oct 17 14:32	SVS
Calcium - Total	453	mg/l	1.0	6010D	16 Oct 17 13:30	SZ
Boron - Total	1.28	mg/l	0.10	6010D	12 Oct 17 15:20	SZ

\* Holding time exceeded

Approved by:

Clauditte K. Cantlo

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

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

@ = Due to sample matrix # = Due to co
! = Due to sample quantity + = Due to in

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





Page: 6 of 8

Report Date: 27 Oct 17 Lab Number: 17-W4297 Work Order #: 82-2789 Account #: 002800

Date Sampled: 4 Oct 17 14:19 Date Received: 5 Oct 17 8:00 Sampled By: MVTL Field Services

PO #: 165275

Temp at Receipt: 4.2C ROI

CERTIFICATE of ANALYSIS - CCR

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

Project Name: MDU Heskett

Sample Description: 70

Event and Year: October 2017

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	5 Oct 17	SVS
pH - Field	6.96	units	NA	SM 4500 H+ B	4 Oct 17 14:19	DJN
рН	* 7.6	units	0.1	SM4500 H+ B	6 Oct 17 18:00	SVS
Temperature - Field	11.9	Degrees C	NA	SM 2550B	4 Oct 17 14:19	DJN
Conductivity - Field	4618	umhos/cm	1	EPA 120.1	4 Oct 17 14:19	DJN
Fluoride	0.29	mg/l	0.10	SM4500-F-C	6 Oct 17 18:00	SVS
Sulfate	2370	mg/l	5.00	ASTM D516-07	10 Oct 17 15:31	RAG
Chloride	30.0	mg/l	1.0	SM4500-Cl-E	11 Oct 17 14:40	RAG
Total Dissolved Solids	4000	mg/l	10	I1750-85	6 Oct 17 14:32	SVS
Calcium - Total	404	mg/l	1.0	6010D	16 Oct 17 13:30	SZ
Boron - Total	0.52	mg/l	0.10	6010D	12 Oct 17 15:20	SZ

\* Holding time exceeded

Approved by:

Clauditte K. Cantlo

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

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

@ = Due to sample matrix # = Due to co
! = Due to sample quantity + = Due to in

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





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CERTIFICATE of ANALYSIS - CCR

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

Project Name: MDU Heskett

Sample Description: 101

Event and Year: October 2017

Report Date: 27 Oct 17 Lab Number: 17-W4298 Work Order #: 82-2789 Account #: 002800

Date Sampled: 4 Oct 17 15:59 Date Received: 5 Oct 17 8:00 Sampled By: MVTL Field Services

PO #: 165275

Temp at Receipt: 4.2C ROI

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	5 Oct 17	SVS
pH - Field	6.68	units	NA	SM 4500 H+ B	4 Oct 17 15:59	DJN
рН	* 7.2	units	0.1	SM4500 H+ B	6 Oct 17 18:00	SVS
Temperature - Field	10.9	Degrees C	NA	SM 2550B	4 Oct 17 15:59	DJN
Conductivity - Field	4829	umhos/cm	1	EPA 120.1	4 Oct 17 15:59	DJN
Fluoride	< 0.1	mg/l	0.10	SM4500-F-C	6 Oct 17 18:00	SVS
Sulfate	2560	mg/l	5.00	ASTM D516-07	10 Oct 17 15:31	RAG
Chloride	17.6	mg/l	1.0	SM4500-Cl-E	11 Oct 17 14:40	RAG
Total Dissolved Solids	4340	mg/l	10	I1750-85	6 Oct 17 14:32	SVS
Calcium - Total	392	mg/l	1.0	6010D	16 Oct 17 13:30	SZ
Boron - Total	1.24	mg/l	0.10	6010D	12 Oct 17 15:20	SZ

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

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





Page:

8 of 8

CERTIFICATE of ANALYSIS - CCR

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

Project Name: MDU Heskett

Sample Description: FB1

Event and Year: October 2017

Report Date: 27 Oct 17 Lab Number: 17-W4299 Work Order #: 82-2789 Account #: 002800

Date Sampled: 4 Oct 17 Date Received: 5 Oct 17 8:00

Sampled By: MVTL Field Services

PO #: 165275

Temp at Receipt: 4.2C ROI

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion		38		EPA 200.2	5 Oct 17	SVS
рН	* 6.1	units	0.1	SM4500 H+ B	6 Oct 17 18:00	SVS
Fluoride	< 0.1	mg/l	0.10	SM4500-F-C	6 Oct 17 18:00	SVS
Sulfate	< 5	mg/l	5.00	ASTM D516-07	10 Oct 17 15:31	RAG
Chloride	< 1	mg/l	1.0	SM4500-C1-E	11 Oct 17 14:40	RAG
Total Dissolved Solids	< 10	mg/l	10	I1750-85	6 Oct 17 14:32	SVS
Calcium - Total	< 1	mg/l	1.0	6010D	16 Oct 17 13:30	SZ
Boron - Total	< 0.1	mg/l	0.10	6010D	12 Oct 17 15:20	SZ

\* 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 concentration of other analytes
! = Due to sample quantity + = 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



November 17, 2017

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

RE: Groundwater Sampling Event- MDU Heskett Ash Site

Dear Ms. Marshall:

It was brought to MVTL's attention by BARR that the field data report for the October 2017 had some transcription errors. Please see the attached field data report with the corrections.

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

Sincerely,

Jeremy Meyer

**MVTL Field Services** 



WO#

82-2789

82-2797

82-2798

### **MDU Heskett**

**GROUNDWATER SAMPLING** 

Attn: Samantha Marshall

400 N. 4th St

Bismarck, ND 58501

701-222-7829

WELL ID	PURGE DATE	START PURGE TIME	SAMPLE DATE	TIME OF SAMPLE	WELL CASING ELEVATION	STATIC WATER LEVEL (ft)	WATER LEVEL START	WATER LEVEL END	VOLUME REMOVED (mL	SAMPLE METHOD	TEMP (°C)	EC	рН	Turbidity NTU	SAMPLE APPEARANCE OR COMMENT
2-90	5-Oct-17	11:23	5-Oct-17	11:53	1686.60	1664.79	21.81	22.18	3000.0	Bladder	9.16	7456	6.97	0.51	clear
3-90	5-Oct-17	10:09	5-Oct-17	10:34	1686.01	1666.21	19.80	19.88	2500.0	Bladder	9.49	4859	6.88	0.64	clear
13	4-Oct-17	10:57	4-Oct-17	11:32	1724.98	1694.36	30.62	31.12	3500.0	Bladder	8.84	10339	6.86	1.28	clear
33	5-Oct-17	8:30	5-Oct-17	9:40	1717.91	1676.43	41.48	41.72	7000.0	Bladder	9.71	4952	6.58	2.53	clear
70	4-Oct-17	13:54	4-Oct-17	14:19	1706.36	1684.87	21.49	22.06	2500.0	Bladder	11.94	4618	6.96*	0.39	clear
80R	5-Oct-17	14:24	5-Oct-17	14:59	NA	NA	14.33	14.58	3500.0	Bladder	12.03	5656	7.10	0.38	clear
44R	4-Oct-17	9:46	4-Oct-17	10:26	NA	NA	27.58	27.66	4000.0	Bladder	8.62	9132	6.54	1.62	clear
101	4-Oct-17	14:49	4-Oct-17	15:59	NA	NA	36.54	NR	7000.0*	Bladder	10.89*	4829*	6.68	2.82*	clear
102	4-Oct-17	12:24	4-Oct-17	13:24	NA	NA	17.94	20.52	6000.0	Bladder	10.03	7741	6.82	0.94	clear
103	4-Oct-17	8:39	4-Oct-17	9:19	NA	NA	31.80	34.11	4000.0	Bladder	8.49	5055	6.68	0.27	clear
104	5-Oct-17	13:15	5-Oct-17	13:55	NA	NA	13.82	14.08	4000.00	Bladder	12.01	14044	6.94	0.41	clear
105	5-Oct-17	15:25	5-Oct-17	16:00	NA	NA	13.14	13.24	3500.0	Bladder	11.89	6514	6.76	2.92	clear
1-90	5-Oct-17	12:22	5-Oct-17	12:47	1675.86	1664.10	11.76	11.83	2500.0	Bladder	11.37	9736	6.85	0.33	clear
******															· · · · · · · · · · · · · · · · · · ·

NR = Not Recorded on Field Sheet NA = Not Applicable

\*Amended on 17 Nov 17



Comments:

# **Field Datasheet**

**Groundwater Assessment** 

Company:	MDU Heskett	•
Event:	2017	
Sample ID:	103	
Sampling Personal:	Dance	Mr. O. A.

Phone: (701) 258-9720

Phone: (701) 258-9	9720						_			9 0-1			
Weather Conditions:		Temp:	40 .	F	Wind:	WIR			Precip	Sun	ny / Partly C	loudy√ Clo	udv
	Well Info	rmation						Sa	mpling I	nformatio			
Well Locked?	Yes	No)				Purgir	ng Method:	Blad	der		Cor	ntrol Setting	ıs
Well Labeled?	Yes	No				Samplir	ng Method:	Blad	der	1	Purge:	2	sec.
Casing Straight?	(Yes	No				Dedicate	ed Equip?:	(Yes)	No	1	Recover:	55	sec.
Grout Seal Intact?	∕ <b>Yes</b>	No	Not Vi	sible		Duplicate	Sample?:	Yes	NO		PSI:	20	
Repairs Necessary:						Duplicate S	Sample ID:				Pumping Ra		mL/min
Casing	Diameter:		2"							4	<u> </u>		
Water Level Bef	ore Purge:	3	71.80	ft		Р	urge Date:	406	17	Time Purg	ing Began:	19839	(am/pm
Total W	Vell Depth:	-	_	ft		Well Pu	urged Dry?	Yes	No	Time F	urged Dry:		am/pm
We	ell Volume:			liters		Sar	mple Date:	4 oct	7	Time of	Sampling: (	2919	am/pm
Depth to Top	o of Pump:			ft				<u> </u>					- C- P
Water Level Afte	er Sample:	34	<u> </u>	ft		Bottle	1L	Raw, 500m	L Nitirc, 50	0mL Nitric	(filtered), 250	mL Sulfuri	С
Measuremen	nt Method:	Electric V	Vater Level II	ndicator		List:							
					_						***		

### 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	0844	8,85	5049	6.67	8047	251,8	2-01	32.51	500	ch
2	0849	8.63	5066	6.67	6,51	2529	0.86	32.63	500	Cl
3	0854	8.54	5061	667	4,72	253,07	0.66	32,94	5011	d
4	0859	8.51	5064	6.67	3,30	254,5	032	33,04	500	ch
5	0904	8,42	548	6.68	2.82	255,5	0,27	33,14	500	a
6	0909	8,44	5060	b, 68	2,28	256,1	0,32	33,28	500	d.
7	0914	8.43	5060	6.68	2.32	256.9	0.26	33,41	500	de
8	0919	8,49	5055	6.68	2,26		0.27	33,49	500	
9		•					,			
10										
Stabilized:	Yes	No				To	tal Volume	Removed:	4000	mL



**Groundwater Assessment** 

Company:	MDU Heskett		
Event:	2017		
Sample ID:	448		
Sampling Personal:	Dage	Alica	 

Phone: (701) 258-9720

Comments

Weather Conditions:		Temp:	42°F	Wind:	W10	)		Precip:	Suni	ny / Rartly C	<u>الكاليُّ ال</u> مloudyُ	udy /	
,	Well Infor	mation	(				Sampling Information						
Well Locked?	Yes	(No)			Purgin	g Method:	Blac	dder		Coi	ntrol Setting	ıs	
Well Labeled?	(Yes)	No			Samplin	g Method:	Blac	Bladder		Purge:	5	sec.	
Casing Straight?	Yes	No			Dedicate	d Equip?:	Yes	<u> </u>		Recover:	55	sec.	
Grout Seal Intact?	(Yes)	No	Not Visible	:	Duplicate 9	Sample?:	Yes	(No)		PSI:	20		
Repairs Necessary:	· Sandanananananananananananananananananan			Duplicate S	ample ID:	~	-		Pumping Ra	ate: /00	mL/min		
Casing	Diameter:		2"										
Water Level Befo	ore Purge:	2	7,58 ft		Pu	ırge Date:	40CT	17		ing Began:	0946	(and/pm	
Total W	/ell Depth:	c.	<del>-</del> ft			rged Dry?		(No)	Time F	urged Dry:	·	am/pm	
We	ll Volume:		- liters		San	nple Date:	400	17	Time of	Sampling:	1026	/am/pm	
Depth to Top	of Pump:	31	5,16 ft										
Water Level After Sample: 27.66			7.66 ft		Bottle 1L Raw, 500mL Nitirc, 500mL Nitric (filtered), 250 mL Sul						0 mL Sulfur	ic	
Measurement Method: Electric Water Level Indicator				List:									
			Field	Moseur	omonte								

	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	0951	8,65	9155	6.59	8.04	283.0	4.23	27.7/	500	ch
2	1006	8.84	9153	6.54	2.10	281.6	3,64	27.66	\$1500	Ch
3	1011	8,51	9136	6,54	1.89	281,0	2.24	27-66	500	a
4	1016	8.89	9137	6,53	1.50	280,5	1,52	27,65	500	d-
5	1021	8,74	9123	6.54	1.63	2800	1,51	27.65	500	
6	1026	8,62	9132	6.54	1.71	2800	1,62	27.66	500	Cl-
7	(						•			
. 8										
9										
10										
Stabilized	Yes )	No				To	otal Volume	Removed:	4000	mL



**Groundwater Assessment** 

Wind: (~)

Purging Method:

Sampling Method:

42

Temp:

(No)

No

**Well Information** 

Yes

Yes/

Company:	MDU Heskett	t	
Event:	2017		
Sample ID:	.13		-
Sampling Personal:	Darren	allesnon	_

Precip:

Bladder

Bladder

Sampling Information

∕Sunny∕l Partly Cloudy / Cloudy

Purge:

Control Settings

sec.

sec.

mL/min

am/pm am/pm (am)pm

2616 E. Broadway Ave, Bismarck, N	۷D
Phone: (701) 258-9720	

Well Locked?

Well Labeled?

Weather Conditions:

Comments:

							-		Y		****		1 . 4.90.1	
		g Straight?		No				Dedica	ted Equip?:	Yes	No		Recover:	55
	Grout S	Seal Intact?	Yes	(No)	Not V	/isible	]	Duplicate	Sample?:	Yes	No		PSI:	
	Repairs Ne		<u> </u>	-			]	Duplicate	Sample ID:	PIND	-/	1 .	Pumping R	Rate: /a ()
			g Diameter:	·	2"					o com	1	-	<u> </u>	
	Wate	er Level Be	fore Purge:	•	<u> 30.62</u>	ft		F	ourge Date:	400	17	Time Purg	ing Began:	1057
		Total V	Nell Depth:	•	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	ft		Well P	urged Dry?	Yes	√No>	Time F	Purged Dry:	
		W	ell Volume:		***************************************	liters		Sa	mple Date:	40ct		Time of	f Sampling:	1132
-		Depth to To	p of Pump:			ft							<u> </u>	11/-
1	Wate	er Level Aft	ter Sample:	امر	3/1/2	ft		Bottle	11	Raw. 500m	L Nitirc 50	Oml Nitric	(filtered) 25	0 mL Sulfurio
	N	1easureme	nt Method:	Electric	Water Level	Indicator		List:			,		((0.04), 20	o me danano
			T	l		Field	Measure	ments		,				
	Stabili	zation	Temp	Spec.		DO	ORP	Turbidity	Water	mL		Discription:		
	(3 cons	ecutive)	(°C)	Cond.	pН	(mg/L)	(mV)	(NTU)	Level (ft)	Removed	Clarity, Color, Odor, Ect.			
	SEQ#	Time		±5%	5% ±0.1 ±10%			±10%	0.25 ft		clear,	slightly turbid,	turbid	
	1	1102	8.98	10700	6.87	4.45	296,1	12.1	30,99	500	cles	<u> </u>		
-	2	1117	8.66	10550	604	2.80	2950	2.05	31,02	1500	Olea			
7	3	1122	8,85	10527	6.84	2.65	294.6	1.24	31,02	500	cl~			
•	4	1127	8,90	10468	64460	2.18	294.3	1.17	31.08	500	Col -			
-	5	1132	8.84		66.86	2.85	2014.2	1.28	31.11	500	<u>~0</u>			
	6		W-1-1-1	100	<i>9</i> -	- 3_		1 * 6/	7,10		<u> </u>		,	
	7													
l	8													
	9													
	10													
	Stabilized:	(Yes)	No				To	tal Volume	Removed:	3500	mL			
	i .ammente	* B /								,				



**Groundwater Assessment** 

Company:	MDU Heskett
Event:	2017
Sample ID:	962/02
Sampling Personal:	Daller Wisway

Phone: (701) 258-9720

Friorie. (701) 236-91									1					
Weather Conditions:	····	Temp:	45 °F	-	Wind: <b>l</b>	110			Precip: (Sun			/ Partly C	loudy / Clo	udy
,	Well Info	rmation				Sampling Information								
Well Locked?	Yes	ĺ NΘ)				Purgir	ng Method:	Blad	der	Control Settings				
Well Labeled?	? Yes No				Samplir	ng Method:	Blad	der	] [		Purge:	15	sec.	
Casing Straight?	Tes	No				Dedicat	ed Equip?:	Yes	No			Recover:	55	sec.
Grout Seal Intact?	<b>Yes</b>	No	Not Vis	ible		Duplicate	Sample?:	Yes 4	NO			PSI:	20	
Repairs Necessary:						Duplicate :	Sample ID:				P	umping Ra	ate: 🖊 🗸 🗸	mL/min
Casing	Diameter:		2"		2					'				
Water Level Befo	re Purge:	17.94 ft			Purge Date:		4 Oct	17	Time	Purgin	g Began:	1224	am/pm)	
Total W	ell Depth:	¥	<u> '</u>	ft		Well Purged Dry?		Yes	( <u>a</u>	Tii	me Pui	rged Dry:	<del></del>	am/pm
Wel	l Volume:	<		liters	4	Sa	mple Date:	4 Oct	フ	Tin	ne of S	Sampling:	1324	am/pm
Depth to Top	of Pump:	2	7,05	ft	***									
Water Level Afte	r Sample:	2 &	152	ft	, i	Bottle	1L	Raw, 500m	L Nitirc, 50	0mL N	litric (fil	Itered), 250	mL Sulfuri	С
Measurement	: Method:	Electric V	Vater Level In	dicator		List:								
				Field I	Measure	ments								

Stabili (3 cons	zation ecutive)	Temp (°C)	Spec. Cond.	рН	DO O		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	1229	9.89	9509	6.88	7.30	-21,4	12:8	18,51	500	cloar	
2	1239	9,72	9776	6.83	3,04	-45,4	3.63	19.09	1000	Clan	
3	1249	9.83	9188	6.77	2,30	-42,7	1.97	19,57	1000	Clear	
4	1304	9.89	83L8	6.75	130	- 32.7	0, 93	19.81	1500	Class	
5	1314	10.09	7971	6,79	1,39	-30cl	1.00	19.96	1000	a	
6	1319	10110	7821	6,77	1,36	-30.6	0.91	20.08	500	ch	
7	1324	10,03	7741	6.82	1,38	-28,7	0.94	20118	500	Clar	
8											
9											
10									1		
Stabilized: Comments	Yes	No Total Volume Removed: 6 Dt0 mL									



**Groundwater Assessment** 

Company:	MDU Heskett
Event:	2017
Sample ID:	70
Sampling Personal:	0-01/2-01

Phone: (701) 258-9720

										A STATE OF THE PARTY OF THE PAR				
Weather Conditions:	eather Conditions: Temp: 45°F				Wind:	1/1	)	Precip: Sunny / Partly Cloudy / Cloudy						
Well Information						Sampling Information								
Well Locked?	Yes	(N)	₩			Purgir	ng Method:	Bla	dder		Со	ntrol Setting	s	
Well Labeled?	Yes	No				Samplir	ng Method:	Bla	dder		Purge:	5	sec.	
Casing Straight?	Yes	No				Dedicat	ed Equip?:	(Yes)	No		Recover:	5-5	sec.	
Grout Seal Intact?	Yes	No	Not Visil	ole		Duplicate	Sample?:	Yes	_QVo>		PSI:	210		
Repairs Necessary:	·					Duplicate \$	Sample ID:	<u> </u>			Pumping R	ate: ) (9 ()	mL/min	
Casing Diameter: 2"									,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,					
Water Level Bef	ore Purge:	2	-1,49	ft		Purge Date:		40ct	17	Time Purging Began: 135-4 a		am/pm		
Total W	Vell Depth:			ft		Well Pu	urged Dry?	Yes	₹ <b>1</b> 0	T: 5 15			am/pm	
We	ell Volume:			liters		Sai	mple Date:	4001	7		Sampling:	1419	am/pm	
Depth to Top	of Pump:			ft			·		· · · · · · · · · · · · · · · · · · ·	L		<del>/   [.</del>		
Water Level After Sample: 27.06 ft			Bottle	Bottle 1L Raw, 500mL Nitirc, 500mL Nitric (filtered), 250 mL S				0 mL Sulfuri	С					
Measuremen	t Method:	Electric V	Vater Level Ind	icator		List:					(			
	Field Measurements													

	ization 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	1359	11,46	4658	6.96	2,41	99,7	0.97	21.94	500	Cler
2	1904	11,32	4629	6.96	1,56	105.4	0,41	22.04	500	ch
3	1409	11,40	4616	6.96	1,15	110.8	0, 47	22.04	500	ch
4	1414	11.80	4612	6,96	1.16	114.9	0.40	22,04	500	dr
5	1419	11.94	4618	6,96	6.18	120,0	0,39	22.04	500	d
6										
7										
8										
9	,									
10										
Stabilized: Comments		No				To	otal Volume	Removed:	2500	mL



Comments

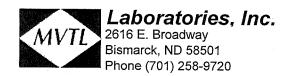
### **Field Datasheet**

**Groundwater Assessment** 

Company:	MDU Heskett	
Event:	2017	
Sample ID:	101	
Sampling Personal:	Darren	NIESWALL

Phone: (701) 258-9720

Weather C	onditions:		Temp:	50	°F	Wind:	d: W 3 Precip: Sunny / Partly Cloudy / Clo				loudy / Clou	ıdy		
		Well Info	ormation					Sampling Information						
We	ell Locked?	Yes	(Ng)				Purgi	ng Method:	1		Control Settings			3
Wel	l Labeled?	/Yes	No				Sampli	ng Method:	Blac	lder		Purge:	5	sec.
Casing	g Straight?	)/es	No				Dedicat	ed Equip?:	Yes	No	-	Recover:	53-	sec.
Grout S	eal Intact?	Yes	No	Not V	isible .		Duplicate	Sample?:	Yes	Ø(o)		PSI:	25	
Repairs Ne	ecessary:						Duplicate	Sample ID:			P	umping R	ate: 100	mL/min
	Casing	Diameter:		2"							<b>L</b>	<u> </u>	U	
Water Level Before Purge: 36.54 ft				F	urge Date:	404	-17	Time Purgin	g Began:	1449	am/pm)			
Total Well Depth: ft			ft		Well P	urged Dry?	Yes	(No)	Time Pu	rged Dry:		am/pm		
	We	ell Volume:			liters		Sa	mple Date:	4041	7	Time of S	Sampling:	1559	am/pm
	Depth to To	p of Pump:			ft								<del></del>	
Wate	er Level Aft	er Sample:			ft		Bottle	Bottle 1L Raw, 500mL Nitirc, 500mL Nitric (filtered), 250 mL Sulfuric					;	
N	leasuremer	nt Method:	Electric V	Vater Level	Indicator		List:							
					Field	Measure	ments							
Stabili	zation	Temp	Spec.		DO	ORP	Turbidity	Water	mL	ם	iscription:			
(3 cons	ecutive)	(°C)	Cond.	рH	(mg/L)	(mV)	(NTU)	Level (ft)	Removed	Clarity,	Color, Odor	, Ect.		
SEQ#	Time		±5%	±0.1	±10%	±20 mV	±10%	0.25 ft		clear, s	lightly turbid, tu	ırbid		
	· · · · · · · · · · · · · · · · · · ·	7 - 7												



# **Chain of Custody Record**

MDU Heskett  Report To: MDU Attn: Samantha Marshall Address: 400 N. 4th St Bismarck, ND 58501 phone: 701-222-7829 email:  MDU Carbon Copy: Attn: Address:  Address:  October 2017   Name of Sampler(s):  Name of Sampler(s):  Name of Sampler(s):	Project Name:		Event:	Work Order Number:
Attn: Samantha Marshall Attn:  Address: 400 N. 4th St Address:  Bismarck, ND 58501  phone: 701-222-7829  Name of Sampler(s):  Attn:  Address:  Address:		MDU Heskett	October 2017	82 - 2789
	Attn: Address: phone:	Samantha Marshall 400 N. 4th St Bismarck, ND 58501	Attn:	$\Lambda$

	Sample	e Information					Bott	le Ту <sub>І</sub>	ре		Fi	eld Para	meters	Analysis
Lab Number	Sample ID	$D_{ate}$	Time	Sample Type	1113	1 -		250 mL Sulfuric			Temp (°C)	Spec. Cond.	Fa	Analysis Required
2786	103	40c+17 1	919 0	GW	X		Х	х		8	1.49			
W4293	44 R	40ct171	026 G	-w	×	7	X	X			62	9132		
WYA94	13	40et17 1	1132 6	-w	À	+	+	+			284	10339	1 21	
W4295		4 Oct 17	- 6	- w	ト	14	+	7				_		
WYZGLONY	·别 43-102	40417 1	324 6	w	/x	1×	X	义		j	0,03	7741	687-	
W4297	70	40ct 17 1	419 G	w		×	X	X			1,94	4618	629h	MDU Appendix III & List AA
WY293	191	400+17 19	559 G	w	X	X	X	X			0.89	4829	6.68	
24299	FB 1	40CT17 -	ن ر <u>ن</u>		X	X	X	X		1		,,,,	0.00	

Comments:

Relinquished By:		Sample Condition:				
Name:	Date/Time	Location:	Temp (°C)			
10e 1/m	40c+17 1450	Log In Walk In #2)	COT 4, 2 TM562 / TM588			
2	,					

Recei	ived by:
Name:	Date/Time
Nechman	05 Qt17
MULTIPORT	0800



### 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.mytl.com



#### **CASE NARRATIVE**

MVTL Lab Reference No/SDG:

201782-2797

Client:

**Montana Dakota Utilities** 

Location:

**MDU Heskett** 

**Project Identification:** 

CCR October 2017

**MVTL Laboratory Identifications:** 

17-W4311 through 17-W4318

Page 1 of 2

MDU Sample Identification	MVTL Laboratory #
33	17-W4311
3-90	17-W4312
Dup-2	17-W4313
2-90	17-W4314
104	17-W4315
80R	17-W4316
105	17-W4317
FB2	17-W4318

#### I. RECEIPT

- All samples were received at the laboratory on 6 Oct 17 at 0800.
- Samples were collected and hand delivered by MVTL Field Service personnel to the laboratory.
- Samples were received on ice and evidence of cooling had begun.
  - o Temperature of samples upon receipt was 4.2°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.
- Due to a login error, total dissolved solids was not assigned to the samples at sample receipt. Per
  email and telephone conversation with Samantha Marshall (MDU), total dissolved solids analysis was
  added to the samples and analyzed beyond hold time. The sample sites were be recollected again at
  a later date and analyzed for total dissolved solids.

#### III. METHODS

- Approved methodology was followed for all sample analyses.
  - Method 6010D was used to analyze the metals.



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### **CASE NARRATIVE**

**MVTL Lab Reference No/SDG:** 

201782-2797

Client:

**Montana Dakota Utilities** 

Location:

**MDU Heskett** 

**Project Identification:** 

CCR October 2017

**MVTL Laboratory Identifications:** 

17-W4311 through 17-W4318

Page 2 of 2

### IV. ANALYSIS

- All acceptance criteria was met for calibration, method blanks, laboratory control samples, laboratory fortified matrix/matrix duplicates unless noted here and/or flagged on the individual analytical laboratory report.
  - For some analytes, the reported results were elevated due to additional dilutions required to minimize the effects of sample matrix.
  - Recovery for one sulfate matrix spike was outside of the acceptable limits. Recovery of the matrix spike duplicate was acceptable. RPD for the recoveries of the matrix spike/matrix spike duplicate was acceptable. No further action was taken.

All laboratory data ha	is been approved by MVTL Laborat	ories.		
SIGNED:	audotte Com P	DATE:	LONOVIT	×
Claudette Car	roll - MVTL Bismarck Laboratory M	lanager		

## MINNESOTA VALLEY TESTING LABORATORIES, INC.

**MVTL** 

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**MEMBER ACIL** 

Page: 1 of 1

Quality Control Report
Lab IDs: 17-W4311 to 17-W4318

Lab IDs: 17-W4311 to 17-W4318																	
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	98	80-120	0.400	17-W4313	< 0.1	0.47	118	75-125	0.47	0.47	118	0.0	20	-	_	< 0.1 < 0.1
Calcium - Total mg/l	20.0 20.0	106 104	80-120 80-120	100 500 500	17W4304q 17W4312q 17W4313q	5.8 500 480	104 995 985	98 99 101	75-125 75-125 75-125	104 995 985	106 1020 985	100 104 101	1.9 2.5 0.0	20 20 20	- - -	- - -	<1 <1 <1 <1
Chloride mg/l	30.0 30.0 30.0 30.0	89 91 89 90	80-120 80-120 80-120 80-120	30.0 30.0	17-W4261 17-W4318	24.6	53.6 26.8	97 89	80-120 80-120	53.6 26.8	52.8 25.6	94 85	1.5 4.6	20 20	-	-	<1 <1 <1 <1
Fluoride mg/l	0.50	94	90-110	0.500 0.500	17-W4311 17-W4314	0.22 0.93	0.65 1.36	86 86	80-120 80-120		0.66 1.37	88 88	1.5	20 20	-	-	< 0.1 < 0.1
pH units	-	-	-	-	-	-	-	<u>-</u>	-	12.2 7.4	12.1 7.5	-	0.8 1.3	20 20	· · · · · · · · · · · · · · · · · · ·	-	-
Sulfate mg/l	100 100 100 100	93 89 100 102	80-120 80-120 80-120 80-120	4000 4000 500 2000	17-W4299 17-W4316 17-D3526 17-D3894	< 200 2960 339 1220	3730 7040 731 2920	93 102 78 85	80-120 80-120 80-120 80-120	3730 7040 731 2920	3610 6920 739 3150	90 99 80 96	3.3 1.7 1.1 7.6	20 20 20 20 20	- - -		< 5 < 5 < 5 < 5
Total Dissolved Solids mg/l	-	-	-	-	-	-		-	_	35000	34100	-	2.6	20	-	_	< 10

Approved by:	C. Canol
	10 NOVIT





CERTIFICATE of ANALYSIS - CCR

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

Project Name: MDU Heskett

Sample Description: 33

Event and Year: October 2017

1 of 8 Page:

Report Date: 9 Nov 17 Lab Number: 17-W4311 Work Order #: 82-2797 Account #: 002800

Date Sampled: 5 Oct 17 9:40 Date Received: 6 Oct 17 8:00 Sampled By: MVTL Field Services

PO #: 165275

Temp at Receipt: 4.2C ROI

	As Recei Result	ved	Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	6 Oct 17	EMS
pH - Field	6.58	units	NA	SM 4500 H+ B	5 Oct 17 9:40	DJN
На	* 6.9	units	0.1	SM4500 H+ B	9 Oct 17 17:00	SVS
Temperature - Field	9.71	Degrees C	NA	SM 2550B	5 Oct 17 9:40	DJN
Conductivity - Field	4952	umhos/cm	1	EPA 120.1	5 Oct 17 9:40	DJN
Fluoride	0.22	mq/l	0.10	SM4500-F-C	9 Oct 17 17:00	SVS
Sulfate	2790	mg/l	5.00	ASTM D516-07	10 Oct 17 15:31	RAG
Chloride	11.9	mg/l	1.0	SM4500-C1-E	11 Oct 17 14:40	RAG
Total Dissolved Solids	* 4720	mq/l	10	I1750-85	3 Nov 17 16:30	SVS
Calcium - Total	481	mg/l	1.0	6010D	16 Oct 17 13:30	SZ
Boron - Total	0.30	mg/l	0.10	6010D	1 Nov 17 13:09	SZ

\* 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 to sample quantity + = Due to interpretations of the property of the proper

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





2 of 8 Page:

CERTIFICATE of ANALYSIS - CCR

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

Project Name: MDU Heskett

Sample Description: 3-90

Event and Year: October 2017

Report Date: 9 Nov 17 Lab Number: 17-W4312 Work Order #: 82-2797 Account #: 002800

Date Sampled: 5 Oct 17 10:34 Date Received: 6 Oct 17 8:00 Sampled By: MVTL Field Services

PO #: 165275

Temp at Receipt: 4.2C ROI

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst	
Metal Digestion pH - Field	6.88	units	NA	EPA 200.2 SM 4500 H+ B	6 Oct 17 5 Oct 17 10:34	EMS DJN	
рн	* 7.2	units	0.1	SM4500 H+ B	9 Oct 17 17:00 5 Oct 17 10:34	SVS DJN	
Temperature - Field Conductivity - Field	9.49 4859	Degrees C umhos/cm	NA 1	SM 2550B EPA 120.1	5 Oct 17 10:34 5 Oct 17 10:34	DJN	
Fluoride	0.12	mg/l	0.10	SM4500-F-C	9 Oct 17 17:00 10 Oct 17 15:31	SVS RAG	
Sulfate Chloride	2410 37.6	mg/l mg/l	5.00 1.0	ASTM D516-07 SM4500-Cl-E	11 Oct 17 14:40	RAG	
Total Dissolved Solids	* 4400	mg/l	10	I1750-85 6010D	3 Nov 17 16:30 16 Oct 17 13:30	SVS SZ	
Calcium - Total Boron - Total	500 0.11	mg/l mg/l	0.10	6010D	1 Nov 17 13:09	SZ	

\* Holding time exceeded

Approved by:

Clauditte K. Canto

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

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





Page:

Report Date: 9 Nov 17 Lab Number: 17-W4313 Work Order #: 82-2797 Account #: 002800

3 of 8

Date Sampled: 5 Oct 17

Date Received: 6 Oct 17 8:00 Sampled By: MVTL Field Services

PO #: 165275

Temp at Receipt: 4.2C ROI

CERTIFICATE of ANALYSIS - CCR

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

Project Name: MDU Heskett

Sample Description: Dup-2

Event and Year: October 2017

	As Receiv Result	ved .	Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion		li li		EPA 200.2	6 Oct 17	EMS
Н	* 7.2	units	0.1	SM4500 H+ B	9 Oct 17 17:00	SVS
Fluoride	0.12	mg/l	0.10	SM4500-F-C	9 Oct 17 17:00	SVS
Sulfate	2380	mg/l	5.00	ASTM D516-07	10 Oct 17 16:14	RAG
Chloride	36.7	mg/l	1.0	SM4500-Cl-E	11 Oct 17 14:40	RAG
Total Dissolved Solids	* 4380	mg/1	10	I1750-85	3 Nov 17 16:30	SVS
Calcium - Total	480	mg/l	1.0	6010D	16 Oct 17 14:30	SZ
Boron - Total	< 0.1	mg/l	0.10	6010D	1 Nov 17 13:09	SZ

\* 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 inf

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





4 of 8 Page:

CERTIFICATE of ANALYSIS - CCR

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

Project Name: MDU Heskett

Sample Description: 2-90

Event and Year: October 2017

Report Date: 9 Nov 17 Lab Number: 17-W4314 Work Order #: 82-2797 Account #: 002800

Date Sampled: 5 Oct 17 11:53 Date Received: 6 Oct 17 8:00 Sampled By: MVTL Field Services

PO #: 165275

Temp at Receipt: 4.2C ROI

			Method Reference	Date Analyzed	Analyst	
Metal Digestion pH - Field pH Temperature - Field Conductivity - Field Fluoride Sulfate	6.97 * 7.4 9.16 7456 0.93 4280	units units Degrees C umhos/cm mg/l mg/l	NA 0.1 NA 1 0.10 5.00 1.0	EPA 200.2 SM 4500 H+ B SM4500 H+ B SM 2550B EPA 120.1 SM4500-F-C ASTM D516-07 SM4500-C1-E	6 Oct 17 5 Oct 17 11:53 9 Oct 17 17:00 5 Oct 17 11:53 5 Oct 17 11:53 9 Oct 17 17:00 10 Oct 17 16:14 11 Oct 17 14:40	EMS DJN SVS DJN DJN SVS RAG RAG
Chloride Total Dissolved Solids Calcium - Total Boron - Total	73.3 * 7330 488 < 0.5 @	mg/l mg/l mg/l mg/l	1.0 10 1.0 0.10	I1750-85 6010D 6010D	3 Nov 17 16:30 16 Oct 17 14:30 1 Nov 17 13:09	SVS SZ SZ

\* 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:  $@ = Due ext{ to sample matrix}$  # = Due to concentration of other analytes

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





Page:

CERTIFICATE of ANALYSIS - CCR

Samantha Marshall Montana Dakota Utilities 400 N 4th St

Bismarck ND 58501

Project Name: MDU Heskett

Sample Description: 104

Event and Year: October 2017

Report Date: 9 Nov 17 Lab Number: 17-W4315 Work Order #: 82-2797

5 of 8

Account #: 002800

Date Sampled: 5 Oct 17 13:55 Date Received: 6 Oct 17 8:00 Sampled By: MVTL Field Services

PO #: 165275

Temp at Receipt: 4.2C ROI

As Received Result			Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	6 Oct 17	EMS
pH - Field	6.94	units	NA	SM 4500 H+ B	5 Oct 17 13:55	DJN
Hq	* 7.4	units	0.1	SM4500 H+ B	9 Oct 17 17:00	SVS
Temperature - Field	12.0	Degrees C	NA	SM 2550B	5 Oct 17 13:55	DJN
Conductivity - Field	14044	umhos/cm	1	EPA 120.1	5 Oct 17 13:55	DJN
Fluoride	0.50	mg/l	0.10	SM4500-F-C	9 Oct 17 17:00	SVS
Sulfate	10200	mg/l	5.00	ASTM D516-07	10 Oct 17 16:14	RAG
Chloride	99.6	mg/l	1.0	SM4500-Cl-E	11 Oct 17 14:40	RAG
Total Dissolved Solids	* 15300	mg/l	10	I1750-85	3 Nov 17 16:30	SVS
Calcium - Total	430	mg/l	1.0	6010D	16 Oct 17 14:30	SZ
Boron - Total	0.81	mg/l	0.10	6010D	1 Nov 17 13:09	SZ

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





Page: 6 of 8

CERTIFICATE of ANALYSIS - CCR

Samantha Marshall Montana Dakota Utilities 400 N 4th St

Bismarck ND 58501

Project Name: MDU Heskett

Sample Description: 80R

Event and Year: October 2017

Report Date: 9 Nov 17 Lab Number: 17-W4316 Work Order #: 82-2797 Account #: 002800

Date Sampled: 5 Oct 17 14:59 Date Received: 6 Oct 17 8:00 Sampled By: MVTL Field Services

PO #: 165275

Temp at Receipt: 4.2C ROI

	As Receive Result	ed	Method RL	Method Reference	Date Analyzed	Analyst	
Metal Digestion				EPA 200.2	6 Oct 17	EMS	
pH - Field	7.10	units	NA	SM 4500 H+ B	5 Oct 17 14:59	DJN	
На	* 7.6	units	0.1	SM4500 H+ B	9 Oct 17 17:00	SVS	
Temperature - Field	12.0	Degrees C	NA	SM 2550B	5 Oct 17 14:59	DJN	
Conductivity - Field	5656	umhos/cm	1	EPA 120.1	5 Oct 17 14:59	DJN	
Fluoride	0.29	mg/l	0.10	SM4500-F-C	9 Oct 17 17:00	SVS	
Sulfate	2960	mg/l	5.00	ASTM D516-07	10 Oct 17 16:14	RAG	
Chloride	155	mg/l	1.0	SM4500-Cl-E	11 Oct 17 14:40	RAG	
Total Dissolved Solids	* 5070	mg/l	10	I1750-85	3 Nov 17 16:30	SVS	
Calcium - Total	290	mg/l	1.0	6010D	16 Oct 17 14:30	SZ	
Boron - Total	< 0.5 @	mg/l	0.10	6010D	1 Nov 17 13:09	SZ	

\* Holding time exceeded

Clauditte Approved by: K. Canto 9 NOVIT

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 in

CERTIFICATION: ND # ND-00016

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





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CERTIFICATE of ANALYSIS - CCR

Samantha Marshall Montana Dakota Utilities 400 N 4th St

Bismarck ND 58501

Project Name: MDU Heskett

Sample Description: 105

Event and Year: October 2017

Report Date: 9 Nov 17 Lab Number: 17-W4317 Work Order #: 82-2797 Account #: 002800

Date Sampled: 5 Oct 17 16:00 Date Received: 6 Oct 17 8:00 Sampled By: MVTL Field Services

PO #: 165275

Temp at Receipt: 4.2C ROI

*	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	6 Oct 17	EMS
pH - Field	6.76	units	NA	SM 4500 H+ B	5 Oct 17 16:00	DJN
pH	* 7.2	units	0.1	SM4500 H+ B	9 Oct 17 17:00	SVS
Temperature - Field	11.9	Degrees C	NA	SM 2550B	5 Oct 17 16:00	DJN
Conductivity - Field	6514	umhos/cm	1	EPA 120.1	5 Oct 17 16:00	DJN
Fluoride	0.24	mg/l	0.10	SM4500-F-C	9 Oct 17 17:00	SVS
Sulfate	3310	mg/l	5.00	ASTM D516-07	31 Oct 17 12:28	EMS
Chloride	346	mg/l	1.0	SM4500-Cl-E	11 Oct 17 14:40	RAG
Total Dissolved Solids	* 6290	mg/1	10	I1750-85	3 Nov 17 16:30	SVS
Calcium - Total	367	mg/1	1.0	6010D	16 Oct 17 14:30	SZ
Boron - Total	< 0.5 @	mg/l	0.10	6010D	1 Nov 17 13:09	SZ

\* Holding time exceeded

Approved by: Clauditte K. Canteo

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

! = Due to sample quantity





Page:

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CERTIFICATE of ANALYSIS - CCR

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

Sample Description: FB2

Project Name: MDU Heskett

Event and Year: October 2017

Report Date: 9 Nov 17 Lab Number: 17-W4318 Work Order #: 82-2797 Account #: 002800

Date Sampled: 5 Oct 17

Date Received: 6 Oct 17 8:00 Sampled By: MVTL Field Services

PO #: 165275

Temp at Receipt: 4.2C ROI

As Received Result			Method RL	Method Reference	Date Analyzed	Analyst	
Metal Digestion				EPA 200.2	6 Oct 17	EMS	
рН	* 6.3	units	0.1	SM4500 H+ B	9 Oct 17 17:00	SVS	
Fluoride	< 0.1	mg/l	0.10	SM4500-F-C	9 Oct 17 17:00	SVS	
Sulfate	< 5	mg/l	5.00	ASTM D516-07	26 Oct 17 8:11	EMS	
Chloride	< 1	mg/l	1.0	SM4500-C1-E	11 Oct 17 15:17	RAG	
Total Dissolved Solids	* < 10	mg/l	10	I1750-85	3 Nov 17 16:30	SVS	
Calcium - Total	< 1	mg/1	1.0	6010D	16 Oct 17 14:30	SZ	
Boron - Total	< 0.1	mg/l	0.10	6010D	1 Nov 17 13:09	SZ	

\* Holding time exceeded

Approved by:

Clauditte K. Canteo 1NUVI7

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 interport to the conduct to the conduct

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



Company:	MDU Heskett	
Event:	2017	
Sample ID:	33	

VIVIL		oid Di	atabi	1000	Event:	2017				
		3roundwate	r Assessn	nent	Sample ID: 33					
2616 E. Broadway Ave, Bismarck, ND					Sampling Personal:	Dari	arren Niesman			
Phone: (701) 258-9720						, , , ,	,,,,			
Veather Conditions:	Temp: 46	· · · · · · · · · · · · · · · · · · ·	Wind:	Light	Precip	: Suni	ny / Partly C	loudy / Clou	ıdy	
Well Info	rmation			<i>y</i>	Sampling	Informatio	on			
Well Locked? Yes	410)		Γ	Purging Method:	Bladder		Со	ntrol Settings	3	
Well Labeled? Ass	No		1 i	Sampling Method:	Bladder	7	Durge:	<del>-</del>	SAC	

	Well Info	rmation	
Well Locked?	Yes	<b>₫</b>	
Well Labeled?	Yes	No	
Casing Straight?	<b>(€</b> )	No	
Grout Seal Intact?	Yes	No	Not Visible
Repairs Necessary:			
Casing	Diameter:		2"
Water Level Bet	ore Purge:		41,48 ft
Total V	Vell Depth:	·	ft ft
We	ell Volume:		liters
Depth to To	p of Pump:		ft
Water Level Aft	er Sample:	41	1,72 ft
Measuremer	nt Method:	Electric	Water Level Indicator

		Sa	ampling I	nformation	on		
Purgir	ng Method:	Blac	der		Co	ntrol Setting:	s
Samplir	ng Method:	Blac	der		Purge:	5	sec.
Dedicat	ed Equip?:	(Les	No		Recover:	55	sec.
Duplicate	Sample?:	Yes	(No)		PSI:	20	
Duplicate S	Sample ID:				Pumping R	late: / o ひ	mL/min
Р	urge Date:	5 Oct	$17_{\gamma}$	Time Purg	ing Began:	0830	am/pm
Well Pu	urged Dry?	Yes	No	Time F	Purged Dry:		<del>am/p</del> m
Sa	mple Date:	5041	7	Time of	f Sampling:	0940	æm/pm
Bottle	1L	Raw, 500n	nL Nitirc, 50	00mL Nitric	(filtered), 25	0 mL Sulfuri	С
List:							

### **Field Measurements**

Stabilization (3 consecutive) SEQ # Time		Temp (°C)	Spec. Cond. ±5%	<b>pH</b> ±0.1	DO (mg/L) ±10%	ORP (mV) ±20 mV	Turbidity (NTU) ±10%	Water Level (ft) 0.25 ft	mL Removed	Discription: Clarity, Color, Odor, Ect. clear, slightly turbid, turbid
1	0835	9,94	5213	6,88	8.38	45,2	85.1	41.58	500	Slightly taked
2	0905	9.67	4969	6:59	2.26	60,5	26.9	41.20	3000	Cler
3	9920	9,70	4956	6.58	2.15	61.5	8.18	41.70	1500	cler
4	0930	9.15	4945	6,58	2.05	64,2	2.66	41,71	9000	de
5	0935	9:73	4950	6.58	2.01	64.9	2.51	41,73	500	ch
6	0940	9,71	4952	b. 58	2.06	66.7	2,53	41,71	500	a
7								•		
8										
9										
10							<u> </u>	<u> </u>		
Stabilized:	/ Yes	No				To	otal Volume	Removed:	7000	mL

Had to pull pump check ball got stuck



Comments:

# **Field Datasheet**

**Groundwater Assessment** 

Company:	MDU Heskett
Event:	2017
Sample ID:	3-90
Sampling Personal:	Darlen Niesman

Phone: (701) 258-9	720						-		· · · · · · · · · · · · · · · · · · ·				7
Weather Conditions:		Temp:	50.	·F	Wind:	Cight			Precip:	Sunr	ny / Partly C	loudy (Clo	udy
	Well Info					7, 0		Sampling Information					
Well Locked?	Yes	Mg)				Purgir	ng Method:	В	adder		Со	ntrol Setting	s
Well Labeled?	Yes	No				Samplir	ng Method:	В	adder		Purge:	5	sec.
Casing Straight?	Yes	No				Dedicat	ed Equip?:	Yes	No No		Recover:	55	sec.
Grout Seal Intact?	Yes	No	(Not Vi	sjible		Duplicate	Sample?:	(Tes			PSI:	20	
Repairs Necessary:			_			Duplicate :	Sample ID:	Dup	-2		Pumping R	ate: /20	mL/min
	Diameter:		2"					,- V					
Water Level Bef		1	19.80	ft		Р	urge Date:	500	617	Time Purg	ing Began:	1009	am/pm
	/ell Depth:			ft		Well P	urged Dry?	Yes	(No	Time P	urged Dry:	′	am/pm
	ll Volume:		~	liters		Sa	mple Date:	FOCT	17	Time of	Sampling:	1034	(am/pm
Depth to Top		-	_	ft								L L	
Water Level After		19	180	ft		Bottle	1L	Raw, 50	0mL Nitirc, 50	0mL Nitric	(filtered), 25	0 mL Sulfur	ic
Measuremen		Electric V	Water Level I	ndicator		List:							
				Field	Measure	ments							

Stabilization (3 consecutive) SEQ # Time		Temp (°C)	Spec. Cond. ±5%	<b>pH</b> ±0.1	DO (mg/L) ±10%	ORP (mV) ±20 mV	Turbidity (NTU) ±10%	Water Level (ft) 0.25 ft	mL Removed	Discription: Clarity, Color, Odor, Ect. clear, slightly turbid, turbid
1	1014	8,73	4857	6.86	4.30	42.5	1.70	19.86	500	de
2	1019	8,96	4829	6.87	2.81	4215	1.82	19.88	500	Ch
3	1024	9,14	4860	6.88	2,78	56.1	0.67	19.90	500	de
4	1029	937	4860	6.89	2.83	62,3	0,71	19.87	500	d
5	1034	9,49	4859	6,88	2,77	64,3	0,64	19,87	500	ili
6		•	.,							
7										
8										
9										
10							<u></u>	<u> </u>	L	
Stabilized:	/(Yes/	No	_			To	otal Volume	Removed:	2500	mL



**Groundwater Assessment** 

Company:	MDU Heske	tt
Event:	2017	
Sample ID:	2-90	
Sampling Personal:	Varien	Vieswaag
	. , ,	

Phone: (701) 258-9720

1 Holle. (101) 200-0	7720						_						
Weather Conditions:		Temp:	0.	F	Wind:	(191	A		Precip:	Sunr	ny / Partly C	loudy / ¢lo	udy 🔪
	Well Info	rmation						Sa	ampling l	nformatio	on		
Well Locked?	Yes	No				Purgir	ng Method:	Blad	dder		Coi	ntrol Setting	s
Well Labeled?	(Gez)	No				Samplir	ng Method:	Blad	der		Purge:	5	sec.
Casing Straight?	(Yes)	No				Dedicat	ed Equip?:	(Yes)	No		Recover:	55	sec.
Grout Seal Intact?	Yes	No	Wot Vis	jble		Duplicate	Sample?:	Yes	NO		PSI:	jο	
Repairs Necessary:		7				Duplicate \$	Sample ID:				Pumping Ra	ate: / 00	mL/min
Casing	Diameter:		2"					_					
Water Level Bef	ore Purge:	21	.81	ft		Р	urge Date:	50 CF	17	Time Purg	ing Began:	1123	@m/pm
Total V	Vell Depth:	-		ft		Well P	urged Dry?	Yes	<b>√10</b> 0	Time P	urged Dry:		_am/pm
We	ell Volume:	2-		liters		Sa	mple Date: 5	-Out 1	7	Time of	Sampling:	1153	(am/pm
Depth to Top	o of Pump:	-	-	ft					(				
Water Level After	er Sample:	27	2.18	ft		Bottle	1L F	Raw, 500n	nL Nitirc, 50	0mL Nitric	(filtered), 25	0 mL Sulfuri	С
Measuremer	nt Method:	Electric V	Vater Level lı	ndicator		List:							

### Field Measurements

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	1128	9,26	7574	6.907	811	226.9	1,24	2212	500	de
2	1133	9.28	7550	6,96	5.71	237,0	1,39	22.18	500	Clean
3	1138	9,29	7531	6,97	5.00	236.9	1,25	22.18	500	ch
4	1143	9,22	7509	6.96	4.71	241,6	0:59	22,18	500	de
5	1148	9,16,	フリブフ	6.97	4.64	247.5	0,56	22.18	500	a
6	1153	9.16	7456	6.97	4.53	249.8	0.51	22.18	500	CL
7					4,53				-	<u> </u>
8										
9										
10	Voc	) No					otal Volume		7000	ml

Stabilized: / Yes / No Comments: /

Total Volume Removed: 1000 mL



**Groundwater Assessment** 

Company:	MDU Heskett	
Event:	2017	
Sample ID:	104	

Phone:	(701)	258-9720	

Phone: (701) 258-9	1720									<del>-</del>	
Weather Conditions:		Temp:	5 € °F	Wind:	CIAT		Precip:	Sunr	Sunny / Partly Cloudy / Cloudy		
	Well Info	rmation				Sampling Information					
Well Locked?	Yes	No			Purging Method:	Blad	ider		Co	ntrol Settings	5
Well Labeled?	Xes	No			Sampling Method:	Blac	der		Purge:	5	sec.
Casing Straight?	Yes	No			Dedicated Equip?:	Yes	No		Recover:	35	sec.
Grout Seal Intact?	Yes	No	Not Visible		Duplicate Sample?:	Yes	(No)		PSI:	20	
Repairs Necessary:		-			Duplicate Sample ID:	=			Pumping R	ate/ 🕖 🕡	mL/min
Casing	Diameter:		2"							7	
Water Level Befo	ore Purge:		13,82 ft		Purge Date:	500	-17	Time Purgi	ng Began:	1315	am/pm
Total W	/ell Depth:		ft		Well Purged Dry?	Yes	(Nø	Time P	urged Dry:		am/pm
We	ll Volume:		liters		Sample Date:	5000	7	Time of	Sampling:	1355	am/pm
Depth to Top	of Pump:		ft								
Water Level After	er Sample:		14,08 ft		Bottle 11	_ Raw, 500m	nL Nitirc, 50	0mL Nitric (	filtered), 25	0 mL Sulfurio	;
Measuremen	t Method:	Electric '	Water Level Indicator		List:						
				_		·	·	·			

### Field Measurements

	ization ecutive)	Temp (°C)	Spec. Cond.	рН	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Water Level (ft)	mL Removed	Discription: Clarity, Color, Odor, Ect.
SEQ#	Time		±5%	±0.1	±10%	±20 mV	±10%	0.25 ft		clear, slightly turbid, turbid
1	1320	12.16	140.75	1.95	3,02	284.1	1.13	14.00	500	clear
2	1325	1199	14057	4,94	2,06	2833	1,71	14.08	500	l.
3	1330	12.06	14050	6,924	800	282.4	0.80	14.08	500	
4	1335	12,00	14065	6,941	676-	28/11	0.86	14,08	500	dr
5	1340	12,52	14058	6.93	99	279,4	0,80	14.08	500	ch
6	1345	12.45	14064	6.94	0,29	277,5	0.44	14,08	500	d
7	1350	12,12	14062	6.93	0.93	26,7	0.47	14,08	500	dr
8	1355	12,01	14044	694	0.93	275,5	0.41	14,08	500	Ch
9									See 2	
10	4									

Stabilized: Yes No Comments: No

Total Volume Removed: 4000 mL



Comments/:

## **Field Datasheet**

**Groundwater Assessment** 

Company:	MDU Heskett		
Event:	2017		
Sample ID:	KDR		
Sampling Personal:	1-11lm	a Com	

Phone: (701) 258-9	720						Dav		0		
Weather Conditions:		Temp:	55°F	Wind:	NW10	Precip	Precip: Sunny / Partly Cloudy / Cloud				
	Well Info	rmation			, , ,	Sampling					
Well Locked?	Yes	(No			Purging Method:	Bladder		Co	ntrol Setting	s	
Well Labeled?	<b>Yes</b>	No			Sampling Method:	Bladder		Purge:	5	sec.	
Casing Straight?	Yes	No			Dedicated Equip?:	(Yes No		Recover:	55	sec.	
Grout Seal Intact?	Xes	No	Not Visible		Duplicate Sample?:	Yes (No		PSI:			
Repairs Necessary:					Duplicate Sample ID:			Pumping R	ate: / ე 🤈	mL/min	
Casing	Diameter:		2"								
Water Level Befo	ore Purge:		4.33 ft		Purge Date:	50417	Time Purg	ing Began:	1424	agent pm	
Total W	Vell Depth:		ft		Well Purged Dry?	Yes (No)	Time P	urged Dry:		am/pm	
We	ell Volume:		liters		Sample Date:	50017	Time of	Sampling:	1459	am/pm	
Depth to Top	o of Pump:		ft			,					
Water Level Afte	er Sample:	10	15 8 ft		Bottle 1L	. Raw, 500mL Nitirc, 5	00mL Nitric	(filtered), 25	0 mL Sulfuri	С	
Measuremen	nt Method:	Electric V	Vater Level Indicator		List:						
			T: . I d	********							

#### Field Measurements

Stabili (3 cons	ization ecutive)	Temp (°C)	Spec. Cond.	рН	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Water Level (ft)	mL Removed	Discription: Clarity, Color, Odor, Ect.
SEQ#	Time		±5%	±0.1	±10%	±20 mV	±10%	0.25 ft		clear, slightly turbid, turbid
1	1429	11.89	5680	7,09	4,02	2845	0,82	14,58	500	d_
2	1444	11,61	5663	7.10	1.18	2826	0,60	1456	1500	ch
3	1449	1223	5655	7/10	0,97	2826	0,33	1458	500	
4	1454	12:11	5657	7,10	0.93	282,0	0,33	14,58	500	de
5	1459	12,03	5656	7,10	0,89	281,7	0,38	14.58	500	Cl
6								-		
7										
8										
9							:			
10										
Stabilized:	/ \	No				Тс	otal Volume	Removed:	3500	mL



**Groundwater Assessment** 

Company:	MDU Heskett	
Event:	2017	
Sample ID:	105	
Sampling Personal:	Dr. CCC	NEO WALLS

,	L. Dibauv	vay Ave,	Dismarck,	145
	Phone:	(701) 25	8-9720	

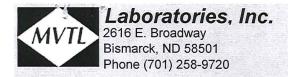
Phone: (701) 258-9	720												
Weather Conditions:		Temp:	B55	°F	Wind:	W 5			Precip:	Sun	y / Partly C	loudy / Clou	dy
	Well Info	rmation	w > 0			,		S	ampling I	nformatio	on		
Well Locked?	Yes	No				Purgir	ng Method:	Bla	dder		Со	ntrol Settings	
Well Labeled?	Yes	No				Samplir	ng Method:	Bla	dder		Purge:	5	sec.
Casing Straight?	Yes	No				Dedicat	ed Equip?:	Yes	No No		Recover:	55	sec.
Grout Seal Intact?	Yes	No	Not V	isible		Duplicate	Sample?:	Yes	No		PSI:		
Repairs Necessary:						Duplicate \$	Sample ID:	<u> </u>			Pumping R	ate: / එ <u>රි</u>	mL/min
Casing	Diameter:		2''									<i>V</i>	
Water Level Befo	ore Purge:		13,14	ft		P	urge Date:	500	+17_	Time Purg	ing Began:	1525	am/pm
Total W	/ell Depth:			ft		Well Pu	urged Dry?	Yes	No	Time P	urged Dry:		am/pm
We	ll Volume:			liters		Sai	mple Date:	5001	-(7	Time of	Sampling:	1600	am/pm
Depth to Top	of Pump:			ft				,				, ,	
Water Level Afte	er Sample:		3,24	√ ft		Bottle	1L	Raw, 500	mL Nitirc, 50	00mL Nitric	(filtered), 25	0 mL Sulfurio	,
Measuremen	t Method:	Electric V	Vater Level	Indicator		List:							
				Field	Measure	ments							
									·	Discription			

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	1530	1242	DE 5912	6,79	2,30	287.8	3,10	13,24	500	Clas
2	1535	11,65	5710	6,79	1,00	2828	3,15	13,21	500	Cler
3	1540	11,48	5732	6,79	0.78	281,4	2,23	13,20	500	Ch
4	1545	11,34	5896	6,79	0,55	278,0	2,32	13,23	500	dr
5	15 50	11,38	\$6104	6,78	0,45	275,9	2,82	13.23	500	de
6	1555	11.68	6325	6,77	0,43	273,5	3,00	13,23	500	CG_
7	1600	11.89	6514	6,76	0,39	272,2	2,92	13,23	500	G
8				,						
9										
10	$\overline{)}$									_

Stabilized: / \Yes\ Comments:

**MVTL Calibration Worksheet** 

	IVIVIL	Calibration w	vorksneet	Δ					
Site: MDU He	eskett		Technician:	larran Miesway					
Instrument (Circle One):	#1 650 MDS 08F100203	#2 650 MDS	S 04H14736	#3 556 MPS 12E102056					
	Pre Site Calib	ration		Post Site Check					
Date: 400	f 17 Time: 0740			Time: 1602					
<b>pH</b> Buffer 7 Buffer 10	Temp °C         Pre Cal         Post Cal           18.64         7.03         7.00           89.83         9.98         10.00	6.95-7.05	mv Range +/- mv 50 23,6 0 +/- 50 20.6 -180 +/- 50	pH Temp °C Reading Buffer 7 17,57 6.98					
Conductivity Buffer 10000	19,79 10230 10002	±10% Buffe	Check er 5000 4983	Conductivity  Buffer 5000 77, 97 4977	,]				
ORP 231 mV @ 25C DO	13,73 7,78 9,89	±10 mV  Barometric Pre	ssure (mm Hg)						
pH Buffer 7 Buffer 10 Conductivity Buffer 10000 ORP 231 mV @ 250	Temp °C Pre Cal Post Cal 20,59 6,94 7,00 20,56 70,01 70,00  20,27 70048 70999	6.95-7.05 - Z 9.95-10.05 - X ±10% Buff	mv Range +/- mv 50 Q 2 0 +/- 50 Q 8, 2 -180 +/- 50 Check Fer 5000 4992	pH Temp °C Reading Buffer 7 [18,498] 7,000  Conductivity Buffer 5000 [19,27]	_				
DO	19,78 9.97 8.61	Barometric Pre	essure (mm Hg)						



# **Chain of Custody Record**

Project Name:		Event:	Work Order Number:
	MDU Heskett	October 2017	82-2797
Report To: Attn: Address: phone: email:	MDU Samantha Marshall 400 N. 4th St Bismarck, ND 58501 701-222-7829	Carbon Copy: Attn: Address:	Name of Sampler(s):  Darren Wieswaag

	Sample Information							е	Fi	eld Para	meters	Analysis
Lab Number	Sample ID	$D_{ate}$	Time	Sample Type		1 liter 500mL Nite:	500mL Nitric (fillered) 250 mL Sulfuric		Temp (°C)	Spec. Cond.	Ha	Analysis Required
W4311	33	50c+17	0940	GW			x x		9.71	4952	6.58	
W431Z	3-90	50 ct 17	1034	6in	)	XX	XX		9,49	4859	6.88	
W4313	Pup-2	500H7		Gw	5	1+	+ +					
W4314	.,,	50d17	1153	GW		$\angle$	$\times$		9.16	7456	6,97	*
W4315	104	50ct 17	1355	6w	Ď	XX	XX		1201	14044	6.94	MDII Appondiv III 9 Liet AA
W4312	ROR	50417	1459	600	>		XX		12,03	5656	7.10	MDU Appendix III & List AA
W4317	105	50ct 17	1600	6 m		XX	XX		11.89	6514	6.76	
W4318	FB2	50017	_	_	کر	X	XX			_	_	
	,											
		1						iku .				

Comments:

Relinquished By:	Sample Condition:				
Name:	Date/Time	Location:	Temp (°C)		
1 Dan No	50417	Log In Walk In #2	KOT4, Z TM562/TM588		
2					

Rece	eived by:
Name:	Date/Time
Buchgan	60411 0300



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### **CASE NARRATIVE**

MVTL Lab Reference No/SDG:

201782-3145

Client:

**Montana Dakota Utilities** 

Location:

**MDU Heskett** 

**Project Identification:** 

**CCR November 2017** 

**MVTL Laboratory Identifications:** 

17-W5141 through 17-W5148

Page 1 of 1

MDU Sample Identification	MVTL Laboratory #
33	17-W5141
3-90	17-W5142
Dup-2	17-W5143
2-90	17-W5144
104	17-W5145
80R	17-W5146
105	17-W5147
FB2	17-W5148

#### I. RECEIPT

- All samples were received at the laboratory on 6 Nov 17 at 1413.
- Samples were collected and hand delivered by MVTL Field Service personnel to the laboratory.
  - O These samples were submitted as replacement samples for samples submitted in Oct 2017 (201782-2797) where the TDS analysis exceeded hold time due to an error at sample receipt/login.
- 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

• All holding times were met for both preparation and analysis unless noted here.

### III. METHODS

Approved methodology was followed for all sample analyses.

### IV. ANALYSIS

 All acceptance criteria was met for calibration, method blanks, laboratory control samples, laboratory fortified matrix/matrix duplicates unless noted here and/or flagged on the individual analytical laboratory report.

All laboratory dat	a has been appro	ved by MVTL Laborat	tories.	
SIGNED:	Claudette	antl	DATE:	MINON
Claudette	e Carroll - MVTL Bi	smarck Laboratory N	/lanager	

### MVTL

### MINNESOTA VALLEY TESTING LABORATORIES, INC.

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**MEMBER ACIL** 

Page: 1 of 1

Quality Control Report
Lab IDs: 17-W5141 to 17-W5148

Project MDII Heskett - CCR

Work Order: 201782-3145

Analyte	LCS Spike Amt	LCS Rec %	LCS % Rec Limits	Matrix Spike Amt	Matrix Spike ID	Matrix Spike Orig Result	Matrix Spike Result	Matrix	Matrix Spike % Rec Limits	MSD/ Dup Orig	MSD/ Dup Result	MSD Rec %	MSD/ Dup RPD	MSD/ Dup RPD Limit (<)	Rec	Known % Rec Limits	Method Blank
Total Dissolved Solids mg/l	-	_	-	-	-	-	-	-	-	6650	6950	-	4.4	20	-	-	< 10

(-Canol) Approved by:





Page:

1 of 8

CERTIFICATE of ANALYSIS - CCR

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

Project Name: MDU Heskett Sample Description: 33

Event and Year: November 2017

Report Date: 14 Nov 17 Lab Number: 17-W5141 Work Order #: 82-3145 Account #: 002800

Date Sampled: 6 Nov 17 9:07 Date Received: 6 Nov 17 14:13 Sampled By: MVTL Field Services

Temp at Receipt: 5.0C ROI

	As Recei Result	ved	Method RL	Method Reference	Date Analyzed	Analyst
pH - Field Temperature - Field Conductivity - Field Total Dissolved Solids	6.33 6.31 4859 4670	units Degrees C umhos/cm mg/l	NA NA 1	SM 4500 H+ B SM 2550B EPA 120.1 I1750-85	6 Nov 17 9:07 6 Nov 17 9:07 6 Nov 17 9:07 8 Nov 17 10:56	JSM JSM JSM SVS

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 in

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





Page:

2 of 8

CERTIFICATE of ANALYSIS - CCR

Samantha Marshall Montana Dakota Utilities 400 N 4th St

Bismarck ND 58501

Project Name: MDU Heskett Sample Description: 3-90

Event and Year: November 2017

Report Date: 14 Nov 17 Lab Number: 17-W5142 Work Order #: 82-3145 Account #: 002800

Date Sampled: 6 Nov 17 10:00 Date Received: 6 Nov 17 14:13 Sampled By: MVTL Field Services

Temp at Receipt: 5.0C ROI

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
pH - Field Temperature - Field Conductivity - Field Total Dissolved Solids	6.71 6.71 4815 4340	units Degrees C umhos/cm mg/l	NA NA 1 10	SM 4500 H+ B SM 2550B EPA 120.1 I1750-85	6 Nov 17 10:00 6 Nov 17 10:00 6 Nov 17 10:00 8 Nov 17 10:56	JSM JSM

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 in

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





Page:

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CERTIFICATE of ANALYSIS - CCR

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

Project Name: MDU Heskett Sample Description: Dup2

Event and Year: November 2017

Report Date: 14 Nov 17 Lab Number: 17-W5143 Work Order #: 82-3145 Account #: 002800

Date Sampled: 6 Nov 17

Date Received: 6 Nov 17 14:13 Sampled By: MVTL Field Services

Temp at Receipt: 5.0C ROI

Date Method Method As Received Analyst Result RL Reference Analyzed I1750-85 8 Nov 17 10:56 SVS 4360 10 Total Dissolved Solids mg/1

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





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CERTIFICATE of ANALYSIS - CCR

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

Project Name: MDU Heskett Sample Description: 2-90

Event and Year: November 2017

Report Date: 14 Nov 17 Lab Number: 17-W5144 Work Order #: 82-3145 Account #: 002800

Date Sampled: 6 Nov 17 11:02 Date Received: 6 Nov 17 14:13 Sampled By: MVTL Field Services

Temp at Receipt: 5.0C ROI

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	6.88	units Degrees C	NA NA	SM 4500 H+ B SM 2550B	6 Nov 17 11:02 6 Nov 17 11:02	
Temperature - Field Conductivity - Field Total Dissolved Solids	7415 7440	umhos/cm mg/l	1	EPA 120.1 I1750-85	6 Nov 17 11:02 8 Nov 17 10:56	JSM

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 in

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





Page:

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CERTIFICATE of ANALYSIS - CCR

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

Project Name: MDU Heskett Sample Description: 104

Event and Year: November 2017

Report Date: 14 Nov 17 Lab Number: 17-W5145 Work Order #: 82-3145 Account #: 002800

Date Sampled: 6 Nov 17 11:55 Date Received: 6 Nov 17 14:13 Sampled By: MVTL Field Services

Temp at Receipt: 5.0C ROI

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
pH - Field Temperature - Field Conductivity - Field Total Dissolved Solids	6.82 7.60 14134 15400	units Degrees C umhos/cm mg/l	NA NA 1 10	SM 4500 H+ B SM 2550B EPA 120.1 I1750-85	6 Nov 17 11:55 6 Nov 17 11:55 6 Nov 17 11:55 8 Nov 17 10:56	JSM JSM

Approved by:

Clauditte K. Canteo

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

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

@ = Due to sample matrix # = Due to conduct to sample quantity + = Due to interpolation.

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





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CERTIFICATE of ANALYSIS - CCR

Samantha Marshall Montana Dakota Utilities 400 N 4th St

Bismarck ND 58501

Project Name: MDU Heskett

Event and Year: November 2017

Sample Description: 80R

Report Date: 14 Nov 17 Lab Number: 17-W5146 Work Order #: 82-3145 Account #: 002800

Date Sampled: 6 Nov 17 12:34 Date Received: 6 Nov 17 14:13 Sampled By: MVTL Field Services

Temp at Receipt: 5.0C ROI

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	6.95	units	NA	SM 4500 H+ B	6 Nov 17 12:34	
Temperature - Field	8.39	Degrees C	NA	SM 2550B	6 Nov 17 12:34	JSM
Conductivity - Field	5617	umhos/cm	1	EPA 120.1	6 Nov 17 12:34	JSM
Total Dissolved Solids	5000	mg/l	10	I1750-85	8 Nov 17 10:56	SVS

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





Page:

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CERTIFICATE of ANALYSIS - CCR

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

Project Name: MDU Heskett Sample Description: 105

Event and Year: November 2017

Report Date: 14 Nov 17 Lab Number: 17-W5147 Work Order #: 82-3145

Account #: 002800

Date Sampled: 6 Nov 17 13:37 Date Received: 6 Nov 17 14:13 Sampled By: MVTL Field Services

Temp at Receipt: 5.0C ROI

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	6.60	units	NA	SM 4500 H+ B	6 Nov 17 13:37	JSM
Temperature - Field	7.20	Degrees C	NA	SM 2550B	6 Nov 17 13:37	JSM
Conductivity - Field	6991	umhos/cm	1	EPA 120.1	6 Nov 17 13:37	JSM
Total Dissolved Solids	6650	mg/l	10	I1750-85	8 Nov 17 10:56	SVS

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 code in # = Due to sample quantity # = Due to in

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



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CERTIFICATE of ANALYSIS - CCR

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

Project Name: MDU Heskett Sample Description: FB2

Event and Year: November 2017

Report Date: 14 Nov 17 Lab Number: 17-W5148 Work Order #: 82-3145 Account #: 002800

Date Sampled: 6 Nov 17

Date Received: 6 Nov 17 14:13 Sampled By: MVTL Field Services

Temp at Receipt: 5.0C ROI

Date As Received Method Method Analyst Reference Analyzed RL Result 8 Nov 17 10:56 SVS I1750-85 Total Dissolved Solids < 10 10 mg/1

Approved by:

Clauditte K. Cantle

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

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

CERTIFICATION: ND # ND-00016



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November 9, 2017

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

RE: Groundwater Sampling Event - MDU Heskett Ash Site

Dear Ms. Marshall:

On November 6, 2017, MVTL Laboratories' Field Services division collected groundwater samples at the MDU Heskett site near Mandan, ND for the Heskett Coal Combustion Rule.

Re-sampling was conducted on 6 wells for TDS due to a log in error at the lab. The samples collected were, placed on ice and transported back to the MVTL laboratory in Bismarck, ND for analysis.

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

Sincerely,

Jeremy Meyer

**MVTL Field Services** 

### **MVTL Calibration Worksheet**

			141416	Calibratio	ii vvoik.	Silect	_	Λ			
Site: MDU He	skett				-	Technician:	Jen	roh		<del></del>	
Instrument (Circle One):	#1 650 MD	S 08F10	0203	#2 65	0 MDS 04H14	736		2056			
		Pre	Site Calibra	ation			Post Site Check				
Date: 6 Www	17 Time	e:						Time: \300			
рН	Temp°C Pr	e Cal	Post Cal	Post Cal Range	mv	mv Range +/- 50		рН	Temp °C	Reading	
Buffer 7	18.02 7.0	07	7.20	6.95-7.05	-33.B	0 +/- 50		Buffer 7	18.16	7.01	
Buffer 10	17.83 9.	95	10.00	9.95-10.05	207.6	-180 +/- 50					
Conductivity						Check		Conductivity			
Buffer 10000	17.83 101	166	10005	±10%	Buffer 5000	4984		Buffer 5000	17,91	4976	
ORP											
231 mV @ 25C	8, DZ ZS	53, 7	250,8	±10 mV							
DO				Barometri	c Pressure (m	ım Ha)					
	17.43 108	3,0	101.7	mg/L	773.0						
Date:	Time	2:						Time:			
рН	Temp °C Pr	e Cal	Post Cal	Post Cal Range	mv	mv Range +/- 50		pН	Temp °C	Reading	
Buffer 7			į.	6.95-7.05		0 +/- 50		Buffer 7			
Buffer 10				9.95-10.05		-180 +/- 50					
Conductivity					•	Check		Conductivity	,		
Buffer 10000				±10%	Buffer 5000			Buffer 5000			
ORP											
231 mV @ 25C				±10 mV							
DO				Barometri	ic Pressure (m	ım Hg)					
				mg/L							



#### **Groundwater Assessment**

Company:	MDU Heskett
Event:	2017
Sample ID:	, 33,
Sampling Personal:	Jan den -

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

( ,							-						
Weather Conditions:		Temp:	30	°F	Wind:	Wesa	Ю		Precip:	Sunr	ny / Partly C	Cloudy / Cl	oudy
	Well Info	rmation						Sa	ımpling l	nformatio	on		
Well Locked?	Yes	160				Purgii	ng Method:	Blac	lder		Co	ntrol Settin	gs
Well Labeled?	Yes	No				Samplii	ng Method:	Blac	lder		Purge:	5	sec.
Casing Straight?	Yes	No				Dedicat	ed Equip?:	€es	No		Recover:	55	sec.
Grout Seal Intact?	Yes	No	Not-V	isible		Duplicate	Sample?:	Yes	No		PSI:	40	
Repairs Necessary:				$\times$		Duplicate	Sample ID:	***************************************			Pumping R	ate: /00	mL/min
Casing	Diameter:		2"										
Water Level Bef	ore Purge:	1	41.52	ft		F	urge Date:	6 Nov 1	7	Time Purg	ing Began:	UB37	am/pm
Total V	Vell Depth:			ft		Well P	urged Dry?	Yes	No	Time P	urged Dry:		am/pm
We	ell Volume:			liters		Sa	mple Date:	6 N01	7	Time of	Sampling:	0907	am/pm
Depth to Top	o of Pump:			ft									
Water Level After	er Sample:	4	1,76	ft		Bottle	1L	Raw, 500m	nL Nitirc, 50	0mL Nitric	(filtered), 25	0 mL Sulfu	ric
Measurement Method: Electric Water Level Indicator List:		List:		* * * * * * * * * * * * * * * * * * * *									

#### **Field Measurements**

	ization secutive)	Temp (°C)	Spec. Cond.	pН	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Water Level (ft)	mL Removed	Discription: Clarity, Color, Odor, Ect.
SEQ#	Time		±5%	±0.1	±10%	±20 mV	±10%	0.25 ft		clear, slightly turbid, turbid
1	0842	7.16	5401	6,48	4.73	-31.5	10,2	41.58	500,0	Clear
2	0847	7,08	5342	6,43	3,34	-ZE, E	6.06	41.68	500.0	Clear
3	0852	6.47	4974	6,34	2.99	7.4	2.92	41,70	50v.0	Clea
4	0857	6.30	4912	6.34	3,08	24.6	3.65	41,71	500,0	Cles
5	0902	6.07	4875	6,35	3,05	37,4	3,35	41.72	500.0	Cles
6	0907	6.31	4859	6,33	3.10	39,9	3,41	41.73	5000	Cles
7								•		
8										
9										
10										

Stabilized: Yes No
Comments:

Total Volume Removed: 3000,0 mL



**Groundwater Assessment** 

Company:	MDU Heskett	
Event:	2017	
Sample ID:	3-90,	
Sampling Personal:	Jen Henry	

Phone: (70	1) 258	-972	n		

Phone: (701) 258-9	9720						_						
Weather Conditions:		Temp:	30 ·1	=	Wind:	N @5-	10		Precip	: Sun	ny / Partly C	Cloudy / Clo	udy
	Well Info	rmation						S	ampling	Informatio	on		
Well Locked?	Yes	(N)				Purging	Method:	Bla	dder		Co	ntrol Setting	s
Well Labeled?	Yes	No				Sampling	Method:	Bla	ıdder		Purge:	<u>Š</u>	sec.
Casing Straight?	Yes	No				Dedicate	d Equip?:	<i>Y</i> es	No		Recover:	22	sec.
Grout Seal Intact?	Yes	No	Not Vis	ible		Duplicate S	Sample?:	Yes	No		PSI:	70	
Repairs Necessary:						Duplicate S	ample ID:	Duy	1		Pumping R	ate: 100	mL/min
Casing	Diameter:		2"										
Water Level Bef	ore Purge:	le le	9,35	ft		Pu	irge Date:	6 Na	17	Time Purg	ing Began:	0930	@m/pm
Total V	Vell Depth:	4		ft		Well Pu	rged Dry?	Yes	(No2	Time F	urged Dry:		am/pm
We	ell Volume:	-		liters		Sam	ple Date:	6 Na	17	Time of	f Sampling:	1000	am/pm
Depth to Top	p of Pump:	20	1,20	ft									
Water Level Afte	er Sample:	Beb	- Purp	ft		Bottle	1L	Raw, 500	mL Nitirc, 5	00mL Nitric	(filtered), 25	0 mL Sulfur	ic
Measurement Method: Electric Water Level Indicator			List:										
							•						

#### **Field Measurements**

	ization secutive)	Temp (°C)	Spec. Cond.	pН	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Water Level (ft)	mL Removed	Discription: Clarity, Color, Odor, Ect.
SEQ#	Time		±5%	±0.1	±10%	±20 mV	±10%	0.25 ft		clear, slightly turbid, turbid
1	0935	667	4862	6.69	2.57	-21.2	1.16	20.05	500,0	Cles
2	0940	6.61	4816	6.73	3,20	-18,2	1,31	2010	500.0	Cles
3	0943	6 +7	4813	6,72	2.95	-16.2	1.16	20.11	500,0	Cles
4	6950	6,56	4797	6171	3,51	-B.2	0.87	20,12	500,0	Cles
5	3955	6.44	4814	6,72	3.45	-0.6	6.63	20,13	500,0	Clear
6	1000	6,71	4815	6.71	3,38	5.6	0.79	20,15	500,0	Clear
7										
8										·
9										
10	L						4-13/-1			

Stabilized: Yes No
Comments:

Total Volume Removed: \$00000 mL



**Groundwater Assessment** 

Company:	MDU Heskett
Event:	2017
Sample ID:	2-90 1
Sampling Personal:	Jeny Man-

Phone: (701) 258-9720

Weather Conditions:		Temp:	30 °F		Wind:	Nos	-10		Precip	Suni	ny / Partly C	loudy / Clo	udy
	Well Info	rmation						Sa	mpling l	nformatio	on		
Well Locked?	Yes	NO				Purgir	ng Method:	Blad	der		Co	ntrol Setting	s
Well Labeled?	Yes	No				Samplir	ng Method:	Blad	der		Purge:	5	sec.
Casing Straight?	(es)	No		)		Dedicat	ed Equip?:	Yes)	No		Recover:	55	sec.
Grout Seal Intact?	Yes	No	Not Visi	ible		Duplicate	Sample?:	Yes	/Ño		PSI:	20	
Repairs Necessary:						Duplicate :	Sample ID:				Pumping R	ate: / 0つ	mL/min
Casing	Diameter:		2''										
Water Level Befo	ore Purge:	21	. <b>૯૧</b>	ft		P	urge Date:	6 No	17	Time Purg	ing Began:	1032	am/pm
Total W	/ell Depth:			ft		Well P	urged Dry?	Yes	NO	Time P	urged Dry:		am/pm
We	Il Volume:			liters		Sa	mple Date:	6 No	17	Time of	Sampling:	1102	am/pm
Depth to Top	of Pump:	22	.,40	ft									
Water Level Afte	r Sample:	Be	low Pump	ft		Bottle	1L	Raw, 500m	L Nitirc, 50	0mL Nitric	(filtered), 25	0 mL Sulfuri	С
Measuremen	t Method:	Electric V	Vater Level In	dicator		List:							
		***************************************											

#### **Field Measurements**

	ization ecutive)	Temp (°C)	Spec. Cond.	<b>pH</b> ±0.1	DO (mg/L) ±10%	ORP (mV) ±20 mV	Turbidity (NTU) ±10%	Water Level (ft) 0.25 ft	mL Removed	Discription: Clarity, Color, Odor, Ect. clear, slightly turbid, turbid
1	037	7.12	7460	6,78	6.81	67.1	1,53	22,35	5000	Cles
2	1042	6.96	7496	6.85	5,45	67.9	0.95	22,36	500,0	Cles
3	1047	6.66	7460	6.84	5,62	45.2	0,97	22.36	500.0	Clea
4	1052	6.65	7466	6.85	5,81	BliB	0.67	22,37	500,0	Cles
5	1057	7.09	7432	6.84	5,42	85.9	0.68	22,37	500,0	Clea
6	1102	6.86	7415	6.66	5,64	&β, <i>O</i>	0.71	22,39	5000	Clean
7										
8										·
9										
10									72 12 22 2	

Stabilized: Yes No
Comments:

Total Volume Removed: 3000.0 mL



### **Groundwater Assessment**

Company:	MDU Heskett
Event:	2017
Sample ID:	104,
Sampling Personal:	b. Mr.

											1 7-		
Phone: (701) 258-9	9720												
Weather Conditions:		Temp:	°F		Wind:				Precip:	Sunr	ny / Partly C	Cloudy / Clo	oudy
	Well Info	rmation						Sa	mpling l	nformatio	on		
Well Locked?	Aes	(NB)				Purgir	ng Method:	Blad	der		Co	ntrol Setting	js s
Well Labeled?	Yes	No				Samplin	ng Method:	Blad	der		Purge:	5	sec.
Casing Straight?	Yes	No				Dedicat	ed Equip?:	Yes∕	No		Recover:	55	sec.
Grout Seal Intact?	Yes	No	Not Vis	ible		Duplicate	Sample?:	Yes	(No)		PSI:	20	
Repairs Necessary:		***				Duplicate :	Sample ID:		-		Pumping R	ate: 100	mL/min
Casing	Diameter:		2"										
Water Level Bef	ore Purge:	i	14.13	ft		Р	urge Date:	6 Nov 1	7	Time Purg	ing Began:	1120	am/pm
Total V	Vell Depth:	,		ft		Well Pi	urged Dry?	Yes	No)	Time P	urged Dry:		am/pm
We	ell Volume:	-		liters		Sa	mple Date:	6 Na	干	Time of	Sampling:	1155	∠am/pm
Depth to Top	o of Pump:	-		ft									
Water Level After	er Sample:		14,48	ft		Bottle	1L	Raw, 500m	L Nitirc, 50	0mL Nitric	(filtered), 25	0 mL Sulfur	ic
Measuremer	nt Method:	Electric \	Water Level In	dicator		List:							
				Field	Measure	ments							

	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	1125	7,46	14021	6,83	3,13	119.3	3,02	14,42	500,0	Clear
2	1130	7.36	14000	6.80	1.95	123.4	1,74	14,45	500,0	Clear
3	1135	7.85	14041	6.82	1,97	126.5	1,10	14.49	500,0	Clesv
4	1140	7,32	14057	6.80	226	131.1	1,20	14,45	500,0	Clear
5	1145	7,54	14065	6,80	2.64	135.8	0,91	14,46	500,0	Clear
6	1150	7.17	14085	6,82	2,48	137.7	0.84	14.47	500,0	Cles
7	1155	7.60	14134	6.82	2,55	140.1	0.71	14.46	50010	Cles
8										
9										
10 Stabilizad:		<u>No</u>					tal Valuma	<u> </u>		ml

Stabilized: Yes No Total Volume Removed: るいん mL



**Groundwater Assessment** 

Company:	MDU Heskett
Event:	2017
Sample ID:	. 80 R
Sampling Personal:	lema H.

Phone: (701) 258-9720	

·							_	camping i	0.00.14		• 1/ 5		
Phone: (701) 258-9	9720						-				1. )		
Weather Conditions:		Temp:	30 €		Wind:	Nøs	-10		Precip:	Sun	ny / Partiy C	loudy / Clo	udy
	Well Info	rmation						Sa	ımpling l	nformati	on	Acceptance for the second seco	
Well Locked?	Yes	<b>D</b>				Purgir	ng Method:	Blac	lder		Co	ntrol Setting	ıs
Well Labeled?	(es)	No				Samplir	ng Method:	Blad	lder		Purge:	5	sec.
Casing Straight?	Yes	No				Dedicat	ed Equip?:	Y es	No		Recover:	55	sec.
Grout Seal Intact?	Yes	No	Not Visil	ble		Duplicate	Sample?:	Yes	<b>MO</b>		PSI:	15	
Repairs Necessary:						Duplicate S	Sample ID:	,	_		Pumping R	ate: /0 <sup>O</sup>	mL/min
Casing	Diameter:		2"										
Water Level Bef	ore Purge:		4,55	ft		Р	urge Date:	6 Na 1	7	Time Purg	ging Began:	1209	am/pm
Total V	Vell Depth:	ح		ft		Well Pu	urged Dry?	Yes	<b>NO</b> )	Time I	Purged Dry:		am/pm
We	ell Volume:			liters		Sai	mple Date:	6 Nov1	7	Time o	f Sampling:	1234	am/pm
Depth to Top	o of Pump:			ft									
Water Level After	er Sample:	1	4.86	ft		Bottle	1L	Raw, 500n	nL Nitirc, 50	0mL Nitric	(filtered), 25	0 mL Sulfur	ic
Measuremer	nt Method:	Electric V	Vater Level Ind	licator		List:							
												***************************************	

#### **Field Measurements**

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	1214	8.52	5641	6.99	2,24	133.9	1.16	14.60	500.0	Clear
2	1219	8.54	5621	6.97	1.59	133.6	0.59	14.83	500,0	Clear
3	1224	8.35	3640	6.98	1,79	131.9	0,62	14.86	500,0	Clea
4	1229	8.61	5620	6,97	1,58	132,5	0.68	14,90	5000	Cler
5	1234	B.39	5617	6,95	1.65	132.6	0.7-1	14.87	500	(les-
6										
7										
8										
9										
10	Vos	No					atal Volume	<u> </u>		ml

Stabilized: Yes

Total Volume Removed: 75,00,0 mL



**Groundwater Assessment** 

Company:	MDU Heskett
Event:	2017
Sample ID:	/05 p
Sampling Personal:	Jen Hen

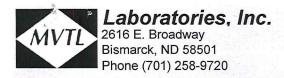
Phone: (701) 258-9720

14 (1 0 1:/:			30 °F		3.6.0	N@5-	= (3)		D		( D	N	
Weather Conditions:		Temp:	50 °F		vvina:	<u> </u>	10	·	Precip:	Sunr	iy / Hartiy t	Houdy / Clo	lay
	Well Info	rmation						Sai	mpling l	nformatio	on		
Well Locked?	Yes	(No				Purgii	ng Method:	Blade	der		Co	ontrol Setting:	S
Well Labeled?	Υ̂êş	No				Sampli	ng Method:	Blade	der		Purge:	5	sec.
Casing Straight?	< <del>√es</del>	No				Dedicat	ed Equip?:	(Yes)	No		Recover:	SS	sec.
Grout Seal Intact?	Уés	No	Not Visi	ble		Duplicate	Sample?:	Yes	K6		PSI:	15	
Repairs Necessary:						Duplicate:	Sample ID:				Pumping R	late: 100	mL/min
Casing	Diameter:		2"										
Water Level Bef	ore Purge:		3,05	ft		F	urge Date:	6 Nov 1	チ	Time Purg	ing Began:	1247	am/pm
Total V	Vell Depth:			ft		Well P	urged Dry?	Yes	Øø̂	Time P	urged Dry:		am/pm
We	ell Volume:	,		liters		Sa	mple Date:	6 Nov 1	チ	Time of	Sampling:	1337	am/ <del>p</del> m
Depth to Top	o of Pump:			ft									
Water Level After	er Sample:		13.45	ft		Bottle	1L	Raw, 500ml	_ Nitirc, 50	0mL Nitric (	filtered), 25	0 mL Sulfuri	3
Measuremer	nt Method:	Electric \	Nater Level Inc	licator		List:			·	-			

#### **Field Measurements**

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	1252	7.77	5175	6,67	1.43	141.0	1.68	13,35	500,0	Clean
2	1257	7.66	5102	6.66	1,18	1387	1.35	13,42	500,0	Uce
3	1302	7.31	5361	6.65	1,27	138.0	0.93	13,45	5000	Clex
4	1307	7.14	5854	6.63	1.23	138.9	0.88	13.46	5010	Cler
5	(312	7.60	6210	6.60	1.20	140.8	1,11	13.45	520,0	Chr
6	1317	7.45	6387	6.59	1.14	142,6	0,75	13,45	500,0	Clear
7	1322	7.05	6613	6.60	1.31	143.0	0.92	13.46	500,0	(len
8	1327	7.62	6737	6.59	1.46	145,0	0,79	13.45	500,0	Clear
9	1332	1 1 -	6787	6,58	1.38	147.3	0,85	13,46		Cler
10	1337	7.20	6991	6,60	1.36	147.7	0.88	13,46	500,0	Cles

Stabilized: Comments: No Total Volume Removed: 5600 0 mL



# **Chain of Custody Record**

Project Name	:	Event:	Work Order Number:
	MDU Heskett	November 2017	82 - 3145
Report To: Attn: Address: phone: email:	MDU Samantha Marshall 400 N. 4th St Bismarck, ND 58501 701-222-7829	Carbon Copy: Attn: Address:	Name of Sampler(s):

	Sample Information								е	Fi	eld Para	ameters	Analysis
Lab Number	Sample ID	Date	Time	Sample Type		1 liter	500mL Nitric 500mL Nitric (file.	(payarris)		Temp (°C)	Spec. Cond	Ha	Analysis Required
W5141	33	6N217	0907	GW		х				6.31	4859	6.33	
W5143	3-90	6Nov 17	1000	GW		Х				6.71	4815	6,71	
W5143		6 Nov 17	NA	GW		Х					-		
PPPECI	2-90	6 Nw 17	1102	GW		Х				6,86	7415	6.88	
WSIYS	401	6No. 17	1155	GW		Х				7,60	14134	6.82	TDS
WSIYL	BOR	6NW 17	1234	GW		Х				8,39	5617	6.95	150
W5147	105	6 Nov 17	1337	GW		Х				7.20	6991	6.60	
W5148	ABZ	6N017	NA	GW		Х					_	_	
				W		Х							
											1		

Comments: resample

Relinquished By:		Sample Condition:					
Nam <del>∳</del> :	Date/Time	Location:	Temp (°C)				
1- 1- May	6N217-	Log In Walk In #2	KO( S,O TM562/TM588				
2							

ed by:
Date/Time
6 Nova017
1913



MINNESOTA VALLEY TESTING LABORATORIES, INC.

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



October 14, 2016

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

RE: Groundwater Sampling Event- MDU Heskett Ash Site

Dear Ms. Marshall:

From October 12-13, 2016, MVTL Laboratories' Field Services division collected groundwater samples at the MDU Heskett site near Mandan, ND for the Heskett Coal Combustion Rule analytical list. All wells were located and were found to be in generally good condition. The wells for CCR were purged and sampled using a dedicated bladder pump and BARR's SOP for low flow purging and sampling. The samples collected were, placed on ice and transported back to the MVTL laboratory in Bismarck, ND for analysis. The field data report for the sampling event accompanies this letter.

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

Sincerely,

Jeremy Meyer

**MVTL Field Services** 



WO# 82-3374 82-3373

### **MDU** Heskett

GROUNDWATER SAMPLING - NDDH

Attn: Samantha Marshall

400 N. 4th St

Bismarck, ND 58501

701-222-7829

WELL ID	PURGE DATE	START PURGE TIME	SAMPLE DATE	TIME OF SAMPLE	WELL CASING ELEVATION	STATIC WATER LEVEL (ft)	WATER LEVEL START	TOTAL DEPTH	WATER LEVEL END	VOLUME IN WELL (L)	VOLUME REMOVED (mL	SAMPLE METHOD	TEMP (°C)	EC	pН	Turbidity NTU	SAMPLE APPEARANCE
2-90	13-Oct-16	11:19	13-Oct-16	11:49	1686.60	1664.88	21.72	24.80	NA*	1.9	3000.0	Bladder	8.29	7601	6.87	0.24	clear
3-90	12-Oct-16	9:47	12-Oct-16	10:12	1686.01	1666.46	19.55	21.93	19.63	1.5	2500.0	Bladder	7.60	5289	6.79	0.68	clear
13	13-Oct-16	7:53	13-Oct-16	8:13	1724.98	1694.46	30.52	41.90	31.13	7.0	2000.0	Bladder	7.39	10508	6,86	1.50	clear
33	13-Oct-16	8:05	13-Oct-16	8:45	1717.91	1675.59	42.32	46.55	42.84	2.6	4000.0	Bladder	7.32	5399	6.50	1.41	clear
70	12-Oct-16	13:22	12-Oct-16	13:47	1706.36	1684.74	21.62	43.06	24.30	13.2	2500.0	Bladder	8.32	3932	7.01	0.63	clear
80R	13-Oct-16	9:22	13-Oct-16	9:52	NA	NA	14.71	30.10	15.00	9.5	3000.0	Bladder	9.38	5683	7.12	1.62	clear
44R	12-Oct-16	7:47	12-Oct-16	8:07	NA	. NA	28.71	45.88	28.82	10.6	2000.0	Bladder	7.52	8838	6.58	0.33	clear
101	12-Oct-16	14:35	12-Oct-16	15:55	NA	NA	37.12	57.09	42.60	12.3	8000.0	Bladder	9.12	4690	6.76	4.08	clear
102	12-Oct-16	10:51	12-Oct-16	11:41	NA	NA	18.13	33,20	22.81	9.3	5000.0	Bladder	8.82	7677	6.86	0.46	clear
103	12-Oct-16	9:07	12-Oct-16	9:42	NA	NA	33.25	47.10	37.36	8.5	3500.0	Bladder	7.83	4871	6.74	1.47	clear
104	13-Oct-16	12:50	13-Oct-16	13:15	NA	NA	14.46	32.85	14.67	11.3	2500.0	Bladder	10.56	14302	6.89	1.61	clear
105	13-Oct-16	11:22	13-Oct-16	11:57	NA	NA	13.44	32.39	13,70	11.7	3500.0	Bladder	8.85	7202	6.77	3.83	clear
1-90	NA	NA	13-Oct-16	12:35	1675.86	1664.07	11.79	17.02	NA NA	NA.	NA NA	WL.	NA	NA	NA	NA	Water Level Only
										1	l IVA	VVL.	130	14/4	IVA	INA	vvaler Level Only

<sup>\*</sup> not recorded during this sampling event

Ammended on 18 Nov 16



#### **Groundwater Assessment**

Company:	MDU Heskett
Event:	2016
Sample ID:	MW 101
Sampling Personal:	Jeren pleya

Phone: (701) 258-9720

( , 200 0 .												
Weather Conditions:		Temp:	45	°F	Wind:	S @ S-10		Precip:	Suni	ny /@artiy C	louely / Clo	udy
V	<b>N</b> ell Info	rmation					Sa	mpling l	nformatio	on		
Well Locked?	Yes	(ala)				Purging Method:	Blad	der		Coi	ntrol Setting	ıs
Well Labeled?	Y€8	No				Sampling Method:	Blad	der		Purge:	4	sec.
Casing Straight?	KG8	No				Dedicated Equip?:	(Jes	No	]	Recover:	56	sec.
Grout Seal Intact?	Yes	No	Not \	/isible		Duplicate Sample?:	Yes	ØÎo∙		PSI:	35	
Repairs Necessary:				:		Duplicate Sample ID:				Pumping Ra	ate: /00	mL/min
Casing [	Diameter:		2"		•							
Water Level Befo	re Purge:	7	(712	ft		, Purge Date:	12 oc+1	6	Time Purg	ing Began:	1435	am/pm
Total We	ell Depth:	~		. ft		Well Purged Dry?	Yes	(No	Time F	urged Dry:	4	am/pm
Wel	l Volume:	-		liters		Sample Date:	120c+11	0	Time o	f Sampling:	1555	am/øm
Depth to Top	of Pump:			ft								
Water Level After	r Sample:		42.60	ft		Bottle CC	CR: 1L Raw,	500mL Nit	irc, 500mL	Nitric (filtere	d), 4-1L Nit	ric
Measurement	: Method:	Electric W	ater Leve	l Indicator		List:						
					•							

#### 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	1440	9,14	4673	6.77	3,35	34.6	212.0	38,35	500	Clear
2	1455	8:93	4654	6.76	2.41	12.8	31.7	39,58	1500	Clear
3	HISOKIO	8.97	4646	6.76	2,53	16.3	13.2	40.07	1500	Clear
4	1455/52	5 9,12	4662	6,76	2,70	21.3	14.6	40.73	1500	clar
5	1530	9.07	4676	6,75	2.72	25.2	11.5	40.89	500	Clear
6	1535	8.99	4660	6.75	2.67	24.2	8,75	41.05	500	cle
7	1540	9.05	4678	6.76	2,68	21.4	7,23	41.24	500	Clear
8	1545	9,01	4682	6,76	2.64	18.4	5.92	41.40	500	Cles
9	1550	9.04	4687	6.76	2.62	15,2	4,70	41.48	500	Cles
10	1555	9,12	4690	6,76	2.60	13,6	4.08	41.58	500	cli
Stabilized:	Xes	No				Т	otal Volume	Removed	REACT	ml

Total Volume Removed: 8000 mL



#### **Groundwater Assessment**

Company:	MDU Heskett
Event:	2016
Sample ID:	MW 102
Sampling Personal:	Jean Hoye

Phone: (701) 258-9720

Phone: (701) 258-9	9720									Į.			
Weather Conditions:		Temp:	45	°F	Wind:	N 05-10			Precip:	Sunny	/ Partly C	loudy/ Clou	ildy
	Well Info	rmation						Sar	npling l	nformation	<b>1</b>		
Well Locked?	Yes	(No)				Purging Meth	od:	Blado	ler		Co	ntrol Settings	3
Well Labeled?	Æs	No				Sampling Meth	od:	Blado	ler		Purge:	4	sec.
Casing Straight?	Yes	No				Dedicated Equi	p?:	(Yes)	No		Recover:	56	sec.
Grout Seal Intact?	Ø\$	No	Not V	/isible		Duplicate Sample	?:	Yes	No	1	PSI:	20	
Repairs Necessary:						Duplicate Sample	ID:	Du	1	F	umping R	ate: /0つ	mL/min
Casing	Diameter:		2"									· · · · · · · · · · · · · · · · · · ·	
Water Level Bef	fore Purge:		18,13	ft		Purge Da	ate:	12 Oct 1)	6	Time Purgir	ıg Began:	1051	∰/pm
Total V	Vell Depth:	•		ft		Well Purged D	ry?	Yes	(No)	Time Pu	rged Dry:		am/pm
We	ell Volume:	_		liters		Sample Da	ate:	12 Oct 16	•	Time of S	Sampling:	1141	am/pm
Depth to To	p of Pump:		·	ft									
Water Level Aft	er Sample:		Z, 61	ft		Bottle	CCF	R: 1L Raw, 5	500mL Nit	irc, 500mL N	itric (filtere	d), 4-1L Nitri	С
Measuremer	nt Method:	Electric \	Nater Level	Indicator		List:						······································	
				<b>5</b> -1-1-1						· · · · · · · · · · · · · · · · · · ·			

#### **Field Measurements**

Stabili (3 cons	zation ecutive)	Temp (°C)	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		clear, slightly turbid, turbid
1	1056	8,74	9510	6,91	2.44	-46,4	3,38	19,16	500	Clean
2	1801	6,77	9438	6.67	2.44	-43.8	3,62	19,49	Soo	Clean
3	1106	6.64	9 179	6.83	2.49	-3 D.6	2.32	14.64	Seo	Clear
4	Hil	B.CB	8914	6:82	2.51	-27.8	1,93	19.94	500	Clea
5	1116	8.90	8681	6.81	2,52	-270	1.44	20,04	500	Clear
6	1121	8.43	8377	6,81	2,56	-78.1	0,85	20,26	500	Clear
7	1126	8.97	1902	6.82	2,61	-29.9	0.63	20,56	500	Clear
8	1131	8.86	7573	6.84	3:07	-27.1	0.52	20,72	200	Cles
9	1136	8,83	7559	6.85	3,28	-24.6	0.48	20.80	500	Clear
10 stabilized:	1141 Yes7	8.82	7677	6.86	3.27	-25,7	0.46	20.68	500	Clear



**Groundwater Assessment** 

Company:	MDU Heskett
Event:	2016
Sample ID:	MW 103
Sampling Personal:	Jen des-

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

, ,							_						
Weather Conditions:		Temp:	40	°F	Wind:	N85-	10		Precip:	Sunr	ny / Partly C	loudy (Clo	udy
	Well Info	rmation						Sa	mpling l	nformatio	on		
Well Locked?	<b>FERRIS</b>	· (No)	,			Purgir	ng Method:	Blad	der		Co	ntrol Setting	s
Well Labeled?	Xes	No				Samplin	ng Method:	Blad	der		Purge:	4	se
Casing Straight?	(Yes)	No				Dedicate	ed Equip?:	Yes	No	1	Recover:		se
Grout Seal Intact?	Yes	No	Not Vi	sible		Duplicate	Sample?:	Yes	No	1	PSI:	25	
Repairs Necessary:						Duplicate S	Sample ID:			1	Pumping R	ate: 100	mL/n
Casing	Diameter:		2"							_			
Water Level Bef	fore Purge:	2	33, 2 <i>5</i>	ft		P	urge Date:	12 Oct 16	9	Time Purg	ing Began:	F2907	am
Total V	Vell Depth:	-		ft		Well Po	urged Dry?	Yes	(NO)	Time F	Purged Dry:	<del></del>	am/p
We	ell Volume:	**		liters		Sa	mple Date:	12 Oct 4		Time of	f Sampling:	0942	(am/r
Depth to To	p of Pump:	`		ft			<del></del>			.•			
Water Level Aft	er Sample:	7	37.36	ft		Bottle	CC	R: 1L Raw,	500mL Nit	irc, 500mL	Nitric (filtere	ed), 4-1L Nitr	ric
Measuremer	nt Method:	Electric V	Vater Level I	Indicator		List:		·					
					,	·							

#### **Field Measurements**

	lization 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	0912	7.80	4849	6.74	5.21	232,8	2.72	34.21	500	Clea
2	0917	7.76	4683	6.75	5,63	231.7	2.81	34,43	500	Clear
3	0922	7.84	4891	6175	5,69	230.8	1,92	34.81	500	Clear
4	0927	7.81	4891	6,75	5.66	230,3	1.07	35,06	500	Clear
5	0932	7.79	4887	6.74	5.63	229.8	1.21	35.35	500	Clear
6	0937	176	4883	6,74	5.59	229,3	1.38	35.39	50	Clas
7	0942	7.83	4871	6,74	5.44	227.8	1.47	35.52	500	clear
8										
9										
10 tabilized:	: (Yes)	No					tal Volume			-



**Groundwater Assessment** 

Company:	MDU Heskett
Event:	2016
Sample ID:	MWYYR
Sampling Personal:	Jeanny Klen

Phone: (701) 258-9	720						_				į.	1	
Weather Conditions:	Veather Conditions: Temp: 40 °F				Wind:	1005-	10	Precip: Sunny / Partiy Cloudy / Cloudy					
	Well Info	rmation						Sampling Information					
Well Locked?	<u> </u>	(No)				Purgir	ng Method:	Blad			<del>/</del>	ntrol Setting	s
Well Labeled?	(es)	No				Samplir	ng Method:	Blad	der	1	Purge:	2.1	sec.
Casing Straight?	Yes	No				Dedicate	ed Equip?:	Yes	No	1	Recover:	56	sec.
Grout Seal Intact?	(Yes)	No	Not Visik	ole		Duplicate	Sample?:	Yes	(No	1	PSI:	20	
Repairs Necessary:						Duplicate S	Sample ID:				Pumping R		mL/min
Casing	Diameter:		2"							<b>-</b>	<u> </u>		
Water Level Befo	ore Purge:		28,71	ft		Р	urge Date:	120x11	0	Time Purg	ing Began:	0747	am∕pm
Total W	/ell Depth:			ft		Well Pu	urged Dry?	Yes	(N)	Time F	Purged Dry:		am/pm
We	ll Volume:		<del></del>	liters		Sai	mple Date:	12 Oct 10	9	Time o	f Sampling:	0807	am/pm
Depth to Top	of Pump:		<del></del>	ft									<u> </u>
Water Level Afte	r Sample:		28,62	ft		Bottle	CC	R: 1L Raw,	500mL Nit	irc, 500mL	Nitric (filtere	d), 4-1L Nitr	ic
Measuremen	t Method:	Electric V	Vater Level Ind	icator		List:							
				Field	Measure	monte							

Stabili	izatîon	Temp	Spec.		DO	ORP	Turbidity	Water	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	0752	7.54	8684	6.56	25,5	252.6	1.05	28.81	500	Clear
2	0757	1.70	8849	6.57	2.89	251,3	0.63	Z8,82	500	Clear
3	0802	7.61	<del>୬</del> ୫३5	6.58	2.80	249.7	0,35	28.81	500	Cles
4	0807	7.52	8838	6.58	2.71	248.5		28,82	500	Clea
5							:			
6										
7										
8										
9										
10	L									
Stabilized:	Yes/	No	-			To	otal Volume	Removed:	2000	mL.



**Groundwater Assessment** 

<u>C</u>	Company:	MDU Heskett
E	Event:	2016
S	Sample ID:	Mw70
	Sampling Personal:	Some of

							-	Sampling F	ersonai:	ر می	com_		
Phone: (701) 258-9	720						-				,		
Weather Conditions:		Temp:	45	°F	Wind:	5 05-	10		Precip:	Sunr	ny / Partly C	loudy / Clou	dy
	Well Info	rmation						Sa	ampling l	nformatio	on		
Well Locked?	Yes	No				Purgir	ng Method:	Blac	dder		Cor	ntrol Settings	
Well Labeled?	Yes	No	÷			Samplir	ng Method:	Blac	der		Purge:	4	sec.
Casing Straight?	(Yes)	No				Dedicat	ed Equip?:	(Yes	No		Recover:	56	sec.
Grout Seal Intact?	Yes	No	Not V	isible		Duplicate	Sample?:	Yes	(NO)		PSI:	25	
Repairs Necessary:						Duplicate \$	Sample ID:				Pumping Ra	ate: 100	mL/min
Casing	Diameter:		2"										
Water Level Befo	ore Purge:	2	1.62	ft		P	urge Date:	12 Oct 1	6	Time Purg	ing Began:	1322	am/pm
Total W	Vell Depth:	<u> </u>		ft		Well P	urged Dry?	Yes	(No)	Time F	urged Dry:		am/pm
We	ell Volume:	-		liters		Sa	mple Date:	12 Oct	16	Time of	Sampling:	1347	am/pm
Depth to Top	o of Pump:	4		ft									
Water Level Afte	er Sample:	2	પા૩૦	ft		Bottle	CC	R: 1L Raw	, 500mL Nit	irc, 500mL	Nitric (filtere	d), 4-1L Nitri	c .
Measuremen	nt Method:	Electric \	Nater Level	Indicator		List:							
				Field	Measure	ements							

Stabiliz		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	1327	೪.52	3942	7.02	2,55	43,7	3.86	22,09	500	Clear
2	1332	830	3940	7.02	2:37	48.9	2.27	22,15	500	Clear
3	1337	8.33	3927	7.01	2.36	SIS	1,37	22,20	Seo	Cler
4	1342	8.26	3935	7.02	2.36	54.3	0.60	22,23	SOO	Cles
5	1347	8,32	3932	7.01	2.34	56.5	0.63	22.33	500	Clea
6										
7										
8										
9			:							
10										
Stabilized:	(Yès)	No				T	otal Volume	Removed:	2500	mL



**Groundwater Assessment** 

Company:	MDU Heskett	
Event:	2016	
Sample ID:	MW 13	
Sampling Personal:	Jen eln-	

2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9	9720						_						
Weather Conditions:		Temp:	30	°F	Wind:	NO5-1	D		Precip:	Sunr	ny LPartly C	loudy TCIo	udy
	Well Info	rmation						Saı	mpling l	nformatio	on		
Well Locked?	Yes	(NO)				Purgir	ng Method:	Blade	der		Co	ntrol Setting	ıs
Well Labeled?	(Yès)	No				Samplin	ng Method:	Blade	der		Purge:	Ħ	sec.
Casing Straight?	(Pes)	No				Dedicate	ed Equip?:	XES)	No		Recover:	56	sec.
Grout Seal Intact?	Yes	No	Not	Visible		Duplicate	Sample?:	Yes	(No)	]	PSI:	20	
Repairs Necessary:						Duplicate S	Sample ID:	<del>رسس</del> ر ۽			Pumping R	ate: 100	mL/min
Casing	Diameter:		2"							-			
Water Level Bef	ore Purge:	3	0.52	ft		Р	urge Date:	13 Oct 16	,	Time Purg	ing Began:	0753	@m/pm
Total V	Vell Depth:			ft		Well Pu	urged Dry?	Yes	(NO)	Time F	urged Dry:	********	am/pm
We	ell Volume:	•		liters		Sai	mple Date:	13 Oct 16		Time o	f Sampling:	0813	am/pm
Depth to Top	o of Pump:			ft									
Water Level Afte	er Sample:	3	1.13	ft		Bottle	CC	R: 1L Raw,	500mL Nit	irc, 500mL	Nitric (filtere	ed), 4-1L Nit	ric
Measuremer	nt Method:	Electric W	/ater Leve	el Indicator		List:							

#### Field Measurements

	lization 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	0758	6,90	10513	6.85	3,04	240,8	4.88	31,00	500	Clear
2	0803	7.03	16540	6,90	2.43	239.9	3,58	31.07	500	Cles
3	OBOB	7,35	10509	6,88	2.42	238,0	2,57	31.07	500	Cbar .
4	0813	7,39	1650B	6,86	2.44	2383	1,50	31,08	S®O	Clen
5										
6	į									
7	1									
8										
9										
10										

Stabilized: (Yes) No

Total Volume Removed: Zoco mL



Comments:

## **Field Datasheet**

#### **Groundwater Assessment**

Company:	MDU Heskett
Event:	2016
Sample ID:	MWBR.
Sampling Personal:	Jern Mu -

Phone: (701) 258-9720

Priorie: (701) 258-97	720						_				•		
Weather Conditions:	eather Conditions: Temp: 代の °F				Wind: 809-10				Precip: Sunny /(Partly Cloudy / Cloudy				
	Well Info	rmation						Sa	ampling l	nformatio	on		
Well Locked?	Yes	No				Purgii	ng Method:	Blad	lder		Co	ntrol Setting	s
Well Labeled?	XFS	No				Samplii	ng Method:	Blad	lder	1	Purge:	الم	sec
Casing Straight?	<u> </u>	No				Dedicat	ed Equip?:	(Yes	No		Recover:	56	sec
Grout Seal Intact?	Y eş	No	Not Vis	ible		Duplicate	Sample?:	(Yes	No	1	PSI:	20	
Repairs Necessary:						Duplicate	Sample ID:	Duy	2		Pumping R	ate: /00	mL/mir
Casing I	Diameter:		2"					· · · · · · · · · · · · · · · · · · ·		<b>-</b>			
Water Level Befo	re Purge:	14.	71	ft		F	urge Date:	13 oct 1	6	Time Purg	ing Began:	0922	@m/pm
Total W	ell Depth:		_	ft		Well P	urged Dry?	Yes	(No)	Time F	urged Dry:		am/pm
Wel	l Volume:			liters		Sa	mple Date:	13 Oct (		Time of	Sampling:	0952	@n/pm
Depth to Top	of Pump:	_		ft			i	- <b>3</b> . F					
Water Level After	r Sample:	15	r00	ft		Bottle	CC	R: 1L Raw,	500mL Ni	tirc, 500mL	Nitric (filtere	d), 4-1L Nitr	c
Measurement Method: Electric Water Level Indicator			List:		<u> </u>		<del></del>						
						t	· · · · · · · · · · · · · · · · · · ·	<del></del>					

### **Field Measurements**

	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	0927	9.33	5693	7, 4	2.86	230.3	7.0 <b>3</b>	1498	Soo	Clean
2	0932	9.35	5701	7.12	Z. 08	228.6	1.51	15.02	São	Clear
3	0937	9:44	5688	7,12	1,96	227,3	1.24	15,04	São	Clear
4	0942	9,43	5884	7,12	1.83	225.9	(.53	19.06	Seo	Clear
5	0947	9.35	569%	7,12	1075	724.4	1.58	15.04	500	Clear
6	0952	9,3%	5683	7,12	1.74	223.0	1,62	15.05	500	Cles
7										
8										
9										The state of the s
10										



#### **Groundwater Assessment**

Company:	MDU Heskett	
Event:	2016	
Sample ID:	MWIOS	
Sampling Personal:	Jeren gly-	

Phone: (701) 258-9720

( , === -							-							
Weather Conditions: Temp: 4			40 ·	F	Wind:	5 0 5-1	0	Precip: Sunny Partly Cloudy / Cloudy						
,				Sampling Information										
Well Locked?	Yes	(ND)				Purgin	g Method:	Bladder			Control Settings		s	
Well Labeled?	Yes)	No					g Method:	Bladder			Purge:	4	sec.	
Casing Straight?	<b>}</b>	No				Dedicate	d Equip?:	ੴes} No		1	Recover:	56	sec.	
Grout Seal Intact?	res	No	Not Vis	sible		Duplicate S	Sample?:	Yes (No		1	PSI:	15	***************************************	
Repairs Necessary:						Duplicate S	ample ID:	_			Pumping R	ate: /00	mL/min	
Casing	Diameter:		2"				· · · · · · · · · · · · · · · · · · ·			_	· · · · · ·			
Water Level Befo	ore Purge:	13	13,44 ft			Purge Date:		13 Oct	16	Time Purging Began:		1122	am)/pm	
Total W	/ell Depth:			ft		Well Pu	rged Dry?	Yes	(g)	Time P	urged Dry:	******	am/pm	
We	Il Volume:			liters		San	nple Date:	13 Oct	16	Time of	Sampling:	1157	am/pm	
Depth to Top	of Pump:			ft						<u> </u>				
Water Level After Sample:		13	.70	ft		Bottle	CC	R: 1L Raw	. 500mL Nit	irc, 500mL	Nitric (filtere	d), 4-1L Nitr	ic	
Measurement Method:		Electric W	Vater Level Ir	ndicator		List:	***************************************		•		(,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	71	<del></del>	

### **Field Measurements**

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	1127	9,06	6314	6.80	3,13	231.7	7.69	13,74	500	Clear
2	1132	8.91	6207	6,80	1.64	728,4	4.14	13,76	500	Clear
.3	1137	8.83	6465	6.20	1,49	225,3	3,11	13.76	500	Cks
4	1145	8,87	6768	6,79	1.45	222.9	2.94	13.76	500	Clean
5	1147	8.87	6935	6.78	1.46	221.3	3,61	13.77	500	Clez
6	İ(SZ	8.64	7091	6,77	45	219.5	3,92	13.79	500	Clear
7	1157	8.85	7202	6.77	1.45	218.0	3,63	13,80	500	Clea
88										
9										THE COMMISSION OF THE COMMISSI
10										

Stabilized: Yes No
Comments:

Total Volume Removed: 3500 mL

### **MVTL Calibration Worksheet**

Site: MDU Hes	kett		_		Technician:	Jeremy F	leye		_	
Instrument (Circle One):	#1 650 MD	OS 08F100203	#2 65	50 MDS 04H14	736	#3 556 MPS 12E102056				
		Pre Site Calil	oration			Post Site Check				
Date: (2 Oct 1)	<u> Time</u>	e: 0640				Tim	e: 170	6		
рН		re Cal Post Cal	Post Cal Range	· mv	mv Range +/- 50		рН	Temp °C	Reading	
Buffer 7		.03 7.00	6.95-7.05	-29,5	0 +/- 50		Buffer 7	19,02	7.02	
Buffer 10	19,19 (0	0,00 10,00	9.95-10.05	-205,9	-180 +/- 50					
Conductivity			<del></del> 1		Check	Co	onductivity	<i>'</i>		
Buffer 10000	7.64 [0	414 (0000	±10%	Buffer 5000	4995	E	Buffer 5000	16:11	4998	
ORP										
231 mV @ 25C	18.67 22	26.4 237.5	±10 mV							
DO			Baromet	ric Pressure (n	ım Hg)					
	15,70 14	14.4% 101.5%	mg/L	771.08						
Date: 13 Oc	f (6 Time	e: 0700				Tim	ie: 1330	>		
рН	Temp °C Pr	re Cal Post Ca	Post Cal Range	mv	mv Range +/- 50		рН	Temp °C	Reading	
Buffer 7	20,07 6:	99 7.00	6.95-7.05	-28,8	0 +/- 50		Buffer 7	19.96	7.01	
Buffer 10	[9.83 (0	0,00	9.95-10.05	-205.7	-180 +/- 50					
Conductivity					Check	С	onductivit	у		
Buffer 10000	20,54 9	751 9999	±10%	Buffer 5000	4989		Buffer 5000	19.87	5002	
ORP										
231 mV @ 25C	20,51 2	32.9 237.5	±10 mV							
DO			Baromet	ric Pressure (r	nm Hg)					
	27.93 92	2,4% 99,8%	<b>√</b> mg/L	758,1	7					



**Groundwater Assessment** 

Company:	MDU Heskett
Event:	2016
Sample ID:/hw-3	3
Sampling Personal:	Davien Nieswan

Phone: (701) 258-97	720												
Weather Conditions:		Temp:	23	°F	Wind:	Light		Precip:	Sunr	ny / Partly C	loudy / Clo	udy	
7	Well Info	rmation					Sa	Sampling Information					
Well Locked?	Yes	No				Purging Method:	Blad	der	Control Settings			s	
Well Labeled?	Yes	No				Sampling Method:	Blad	lder		Purge:	5	sec.	
Casing Straight?	Yes	No	em petronome	and a first and the second		Dedicated Equip?:	(Yes)	No-1	-	Recover:	55	sec.	
Grout Seal Intact?	Yes	No	o Not Visible			Duplicate Sample?:	Yes	~(Ng)		PSI:	<u> </u>	-5	
Repairs Necessary:				-		Duplicate Sample ID:				Pumping R	ate: <i>  00</i>	mL/min	
Casing	Diameter:		2"					بر					
Water Level Befo	ore Purge:	4	2,32	– ft		Purge Date	16	Time Purging Began: 0505 fam/pm					
Total W	/ell Depth:		<del></del>	ft		Well Purged Dry?	Yes	(No)	Time Purged Dry: am/pm				
We	ll Volume:			liters		Sample Date	13041	7	Time of	f Sampling:	MQ45	am/pm	
Depth to Top of Pump: 44.53 ft													
Water Level After Sample: '42.89 ft					Bottle C	CR: 1L Raw,	500mL Nit	irc, 500mL	Nitric (filtere	d), 4-1L Nitr	ic		
Measuremen	t Method:	Electric V	Vater Lev	el Indicator		List:							
				Field	Measure	ements							

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	0810	7.05	5586	656	3,81	3.2	6.20	42.90	500	Color y marine
2	0815	6,79	5487	6,53	3.05	27.6	7.93	42,82	-500	de
3	0825	6.55	5454	6.52	3.18	45,3	14.84	42.82	1000	ch
4	0830	6467	5446	6,51	700h	46,1	3.30	4282	500	C4_
5	0835	6,80	5427	650	2,80	47,0	1,53	4282	500	CS_
6	2840	6.96	5412	6,50	2,92	47,9	1.52	4282	500	de
7	845	7,32	5399	6,50	2,98	48.0	1:41	42.82	500	ce
8					£					
9										
10	15								1000	
Stabilized	: Yes	No				T	otal Volume	Removed:	Lef (1 ()()	mL



Comments

## **Field Datasheet**

**Groundwater Assessment** 

Company:	MDU Heskett	
Event:	2016	
Sample ID:	MW 2-90	
Sampling Pe	rsonal: Darren Nieswang	

Phone: (701) 258-9720

` ,							-			<del>\</del>			
Weather Conditions:		Temp:	40°F		Wind:	Light	<i></i>	Precip	Sunn	y∕ <i>l</i> Partly Cl	oudy / Clo	udy	
	Well Info	rmation	, -			1,00		Sampling Information					
Well Locked?	Yes	KO			-	Purging	Method:	Bladder		Control Settings			
Well Labeled?	yeş	No				Sampling	Method:	Bladder	] [	Purge:	55	sec.	
Casing Straight?	Yes	No				Dedicated	d Equip?:	Yes No		Recover:	5	sec.	
Grout Seal Intact?	Yes	No	Not Visible	le		Duplicate S	ample?:	Yes (Ma)	] [	PSI:			
Repairs Necessary:		No.				Duplicate Sa	ample ID:			Pumping Ra	te: ) 0 <i>0</i>	mL/min	
Casing	Diameter:		2"					,					
Water Level Bef	ore Purge:		レルマン	ft	ft Purge Date: 13 Oct (6 Time Purging Began					ng Began:	1119	am/pm	
Total W	Vell Depth:			ft		Well Pur	ged Dry?	Yes (No)	Time P	urged Dry:		am/pm	
We	ell Volume:			liters		Sam	ple Date:	130c+16	Time of	Sampling:	1)49	√am/pm	
Depth to Top	of Pump:	2	2.30	ft									
Water Level After Sample:				ft		Bottle	CC	R: 1L Raw, 500mL Ni	tirc, 500mL 1	Vitric (filtered	l), 4-1L Nit	ric	
Measurement Method:		Electric	Water Level Indi	cator		List:							
				Field Me	asure	ments							

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	1124	8,71	7677	693	5.40	57.1	0,76	21.92	500	cles	
2	1129	8,30	7680		96.88	\$61.0	0.47	21.93	500	cl	
3	1134	8:28	7649	6.88	4,28	62.0	0.52	22.10	500	cla	
4	1139	8:09	7639	687	3,75	63,2	0,29	22.04	500	d	
5	1144	8,07	7623	6,87	3.63	63,7	0.30	22.00	500	de	
6	1149	8,29	7601	6,87	3,52	63,9	0.24	22,04	500	4	
7		,			•						
8											
9											
10									1000		
Stabilized:	Yes No Total Volume Removed: 3000 mL										